Conference Summary: The Evolving Structure of the U.S. Treasury Market (October 20-21, 2015)

This note provides a high level summary of information exchanged at "The Evolving Structure of the U.S. Treasury Market" a conference held at the Federal Reserve Bank of New York (New York Fed) on October 20-21, 2015. The conference, jointly organized by the U.S. Department of the Treasury, the Federal Reserve Board, the New York Fed, the U.S. Securities and Exchange Commission (SEC), and the U.S. Commodity Futures Trading Commission (CFTC), was attended by a diverse set of roughly 300 domestic and international representatives from the official sectors, media, academics, and market participants. Key issues discussed included: (i) the Joint Staff Report: The U.S. Treasury Market on October 15, 2014 (JSR) and the current Treasury market structure, (ii) several sub-topics related to the current structure of the Treasury market, (iii) some potential operational risks, (iv) the current set of regulatory requirements for the Treasury market, and (v) repo market considerations.

Understanding the evolution of the Treasury market's structure is critical given the fundamental role the Treasury market plays in global financial markets, where the Treasury market is viewed as a reliable source of liquidity and safety, particularly in times of turbulence. Counselor to the Secretary of the U.S. Treasury Antonio Weiss emphasized that the conference was a continuation of work undertaken to produce the JSR, and that work on issues raised by October 15 would continue in the wake of report and the conference. To this end, he announced that the bodies that issued the JSR would issue a request for information (RFI) following the conference. Finally, he suggested market participants should strive to ensure that the Treasury market structure is appropriate for the road ahead, rather than be a reflection of the world in the rearview mirror.

Federal Reserve Governor Jerome Powell began by asking conference participants to consider if there were significant problems in the Treasury market, and if so, whether they are likely to self-correct. In particular he highlighted the issue of market liquidity, asking conference participants to consider the state of play both during normal times and under stress, and what would be the costs and benefits of market-led or regulatory responses. Governor Powell pointed out that discontinuities in market liquidity were important to consider given the risk-free character of the Treasury market. He noted that, "the value of any security, even a U.S. Treasury, will reflect not just its inherent credit risk but also investors' faith in the markets where it is traded. We need investors to have full faith in the *structure and functioning* of Treasury markets themselves." Governor Powell also noted the importance of repo markets to Treasury cash market liquidity, and given ongoing structural changes to repo markets now was a good time to consider whether expanded use of central clearing would support market liquidity.

In his opening remarks, Federal Reserve Bank of New York President William Dudley noted that trading in the Treasury markets has become increasingly electronic and in many cases highly automated. While the impact of such changes in technology are part of the healthy ongoing debate surrounding the state of Treasury market liquidity they also raise other important questions such as whether they carry new operational risks, or have increased risk to the clearing and settlement infrastructure for Treasury markets. President Dudley advised conference participants to consider whether there are changes that could improve the function, integrity, and efficiency of the Treasury market, and noted that the expertise of attendees at the conference made this an excellent opportunity to make progress on a range of important related topics.

Joint Staff Report and the Current Treasury Market Structure

To supplement information in the JSR, which relied on data only from futures markets and the main interdealer brokerage platforms, staff from the New York Fed and the CFTC presented new data on Treasury trading activity in the dealer-to-customer market and the interest rate swaps market on October 15. The main findings of this work were that this activity was largely consistent with the findings from the JSR and did not point to any one cause for the October 15 volatility in the event window. The supplemental data also highlighted the large volume of cash market trading that routinely occurs away from the two major interdealer brokerage (IDB) trading platforms. However, it was also noted that on October 15, the major trading platforms saw a much greater increase in volume relative to dealer-to-customer trading giving IDB platforms a higher than typical share of total trading volume.

A range of views were expressed regarding what lessons could be drawn from the trading activity on October 15 and the effectiveness of the current Treasury market structure more generally. Representatives from Principal Trading Firms (PTFs) were more likely to express the view that October 15 was a less unusual trading day in many respects, with pricing and quoting taking place in continuous fashion and the market functioning as intended. On the other hand, representatives from the dealer community tended to take a different view, suggesting that October 15 illustrated that the current Treasury market structure and its ability to provide liquidity has become more fragile and less robust than in the past. Participants from the buy-side, on balance, indicated that the intraday volatility seen on October 15 was unusual and important to understand, but also noted that they were largely unaffected because they have a longer time horizon for investing. Many, however, noted that substantial intraday price volatility in the absence of significant fundamental news was a cause for concern and several warned that increased volatility could lead to higher risk premiums

Participants discussed the increased presence of PTFs and automated trading more generally, as well as the effect of automated trading on Treasury market liquidity. Participants generally agreed that electronic and automated trading were here to stay, but there was less agreement on its impact on market liquidity. Questions about whether market liquidity is now worse under stress seemed to remain an important and open question for most conference participants. One presentation argued that measuring transaction costs in the modern Treasury market structure is more subtle than what is captured by simply observing the bid-ask spread at the top of the order book, and that it was important to take "slippage" into account when assessing transaction costs across different trade sizes.[1] Participants also observed the need to distinguish between average liquidity and liquidity risk, noting that while liquidity may be equivalent or even better that it has been in past periods as a general matter, it also may be more subject to instances of deterioration, particularly during episodes of sharp volatility.

There was a brief debate—but no agreement—as to whether "internalization" was a healthy or efficient practice for the market.[2] Dealers cited economic efficiency of internalization, noting that it was a long standing practice and expected it would continue. Platform operators were

[1] Slippage is the difference between the expected price of a trade and the executed price of the trade.

[2] Internalization refers to when dealers are able to match client orders internally without accessing other liquidity pools, resulting in a "dark" provision of liquidity.

more likely to argue that it resulted in more correlated order flow being routed to the platforms, increasing the potential for volatility.

Some conference participants said they no longer see bank dealers as the primary market makers in benchmark securities in the cash market and that this role is largely, although not completely, being filled by PTFs. Discussions around market making included the observation that dealer-to-customer trading remained critically important, and included a substantial volume of voice trading.[3]

Conference participants offered some views on why PTFs have gained a strong share of secondary trading at the expense of bank dealers. Some PTF participants offered the view that dealer liquidity provision is provided at a premium that PTFs view as large relative to the temporal risk they take on, allowing them to provide liquidity at tighter spreads and on average this improves market liquidity and gains them higher market share. One PTF claimed that PTFs need to be faster and more sophisticated since they have no direct view of customer order flow to inform their trading, and suggested that both sophistication and speed were needed given the very competitive environment.

Academic work was presented which showed that increased trading speeds have not eliminated arbitrage opportunities for the fastest traders, and argued that such persistence of arbitrage profits despite increasing execution speeds was a permanent feature of any trading system that treated time as continuous. The work noted that a continuous central limit order book provided incentives for a race for speed, and argued that high frequency "batch auctions" rather than trading in continuous time would increase the efficiency of price discovery and limit the advantages of speed. Another academic paper argued that the combination of a central limit order book and high frequency trading can lead to higher liquidity risk, but that several recent policy proposals such as a transaction tax or minimum quote life would do little to address that risk. Another academic presentation compared Treasury market structure to equity markets, asking whether markets for on-the-run Treasuries should be fully "lit."

There was considerable debate among conference participants on what, if any, market structure changes may be needed to make for a more fair and efficient market. Some argued that the "speed race" had adverse consequences for the overall health of the market, and that maintaining a liquid and robust market would require changes and perhaps coordinated experimentation with a variety of structural initiatives. Others argued that markets were already functioning well, even on October 15th, and that there was little need for substantial change.

Current Data and Transparency

A number of conference participants, spanning a very wide range of market engagement, expressed support for additional data collection and reporting on dealer-to-customer activity in order to improve regulatory monitoring and market transparency. While participants advocated

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[3] Work was presented that showed dealer-to-customer trading on October 15 displayed similar, though comparably muted, patterns as the interdealer market, with observed quotes for benchmark securities closely tracking the interdealer market. Furthermore, bank dealer use of internal high speed electronic streaming platforms does not account for a large share of activity, which is mostly electronic request-for-quote (RfQ) and voice.

for increased public transparency into trading activity, some did so with the caveat that any new reporting and transparency requirements would need to be well-designed to avoid inhibiting the trading of large positions, imposing unnecessary burdens, or introducing other unintended consequences. There was general agreement that the unique importance of the Treasury market required careful deliberation before undertaking any fundamental changes, including in the area of data collection and transparency.

That said, some conference participants described Treasury market transparency as bifurcated, with the more visible order book information available from IDB platforms compared to dealer-to-customer trading, which some argued was too opaque. One participant observed that it was surprising that the Treasury market, the most important fixed income market, was not subject to TRACE reporting. Finally, it was also discussed that while IDB data is available to be purchased by participants, intraday pricing on important interest rate benchmarks, such as the 10-year Treasury note, were not in the public domain in the same way that equity prices were generally available.

Potential Operational Risks

A number of participants highlighted the potential for operational risks to cause market disruptions; this was most notable during a panel that reviewed, among other topics, the risks to the clearing and settlement infrastructure posed by the increased presence of PTFs. Panel participants noted that clearing and settlement across different participant types is not consolidated or consistent, and that there is limited visibility into potential risks posed by bilateral clearing and settlement arrangements. Moreover, panelists noted that post-trade risk management considerations may need to be amended in an environment of low-latency trading. In particular, the traditional risk control of margin collection may be inadequate given the speed with which an unexpected exposure can occur (e.g., Knight Capital famously lost over $400 million in 45 minutes due to a coding error).[4]

Participants discussed that the majority of benchmark cash volume is now executed by non-Central Counterparty ("CCP") member firms and this trend to move clearance and settlement outside the CCP is worth further consideration.[5] Given the fundamentally different nature of PTF trading, the industry might need to design a new pricing model that works for both PTF participants and the current CCP membership before this trend to clear cash trades outside the CCP reverses.[6] In the meantime, conference participants were asked to contemplate whether IDB platforms and the Treasury market CCP are exposed to a significant credit event at a non-CCP member firm. A contrast was also drawn between the current state in the cash market and the repo market, where the market is working toward greater central clearing of repo transactions to improve funding market liquidity.

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[4] Knight Capital put into production an algorithm with a coding error that rapidly accumulated unintended exposures. It took 10-minutes for human intervention to stop the program and another 35 minutes to liquidate the unwanted positions. Some have observed that execution speeds continue to increase while human intervention speeds remain relatively fixed.

[5] The CCP for the Treasury cash market is the Fixed Income Clearing Corporation, within the Government Securities Division of the Depository Trust and Clearing Corporation.

[6] It was also noted that increased balance sheet costs and tighter pricing of intraday credit extensions are making bilateral clearing arrangements more expensive.

The operational risk panel also discussed the importance of gaps in the risk management chain or gaps in risk manager visibility due to trading occurring across three independent venues. (Most price discovery for Treasury securities takes place on eSpeed and BrokerTec and on the Chicago Mercantile Exchange for Treasury and other interest rate futures.) In addition, the JSR work revealed that the largest market participants are active across at least two and often all three of these venues, resulting in sizable cross platform trading by individual participants. These gaps in the risk management chain are relevant because they may hamper the management of credit risk, the efficacy of exposure limit controls, and settlement risk controls. They also call into question whether each venue can accurately measure cross market exposures, especially on an intraday basis (e.g., hedges could be missed in futures market if only cash market data are visible, and missed in cash market if only futures data are available). Finally, remarks by both SEC Chair Mary Jo White and Chairman Timothy Massad suggested that additional regulatory scrutiny of operational risk controls may be needed at firms and trading venues to address the rapid growth and related risks of automated trading.

Regulatory Environment and Best Practices

A number of participants indicated that regulatory oversight of the Treasury market has not been closely evaluated in the past 20 years and may need to be updated in light of changes in the structure of the market and its participants. For example, a number of participants highlighted the limited oversight of PTFs, which now account in aggregate for the majority of cash market trading in benchmark securities. Several PTF conference participants indicated their support for more stringent registration requirements and oversight, although there were a range of views on this subject and few specifics regarding the scope and nature of such requirements.

In her remarks, SEC Chair Mary Jo White highlighted several potential features of equity market regulation that may inform enhanced regulation in the Treasury market. Although no specific suggestions for the Treasury market areas yet formulated, Chair White posed questions about the current regulations, and exemptions, applicable to the Treasury market. Broad areas to consider included:

- Operational integrity,
- Volatility moderators,
- Intermediary registration and regulation,
- Public price transparency, and
- Regulatory access to data.

Some possible rule changes with high potential impact on the current Treasury ecosystem would include the following ; (i) volatility moderators, such as trading pauses and anti-disruptive trading rules, that would likely need to be carefully coordinated across liquidity pools, (ii) increased oversight and transparency into the practices of Alternative Trading Systems (ATSs), (iii) increased registration and oversight of PTFs, (iv) enhanced public price transparency, (v) enhanced regulator access to data, and (vi) continued cooperation among regulators.

CFTC Chairman Timothy Massad indicated that the CFTC was happy with the cooperative working relationship between the official staffs that produced the JSR on October 15, and expected that such cooperation and data driven analysis would continue as officials and market participants pursued the next steps outlined in the report. The CFTC currently has ongoing work to improve market oversight around automated and electronic trading, regardless of whether such trading is high frequency or not. The CFTC will release for public comment any new guidance before final adoption, as is its common practice. The proposals under consideration include:

- Enhanced pre-trade risk controls at both firms and exchanges,
- Closing any gaps in PTF firm registration that exist, and
- Introducing measures to limit the practice of self-trading.

As was the case during discussion of changes to Treasury market structure, some conference participants underscored the need to consider the unique features of the Treasury market and its importance to the broader financial markets when considering changes to regulatory policy.

Finally, a few conference participants expressed surprise at the level of self-trading disclosed in the JSR. Some were surprised that self-trading had increased during the event window to a very substantial share of trading in the event window for some benchmark issues, while others expressed surprise that it was routinely as high as 5 percent during the control dates. Some saw the potential for self-trading to distort the quality of transaction information that is disclosed to platform users in real time, since self-trading is not flagged in real time. If it were flagged, participants would have the opportunity to independently judge if it had any distortive impacts or provided useful information to others in the market. It was also noted by some conference participants that the potential for wrongdoing is more than the potential benefit of self-trading. Other conference participants seem less concerned and argued that self-trading to some extent may be unavoidable in high frequency trading.

The conference concluded with a panel discussion of regulatory requirements and best practices for the U.S. Treasury market. Panelists noted that some increased registration of new entrants was likely and urged that any new regulatory requirements be tailored to recognize differences in business make-up of various participants. There was also some discussion of the need for regulators to remain mindful of the cumulative impact of regulations on market behavior and suggested monitoring for any unintended consequences. There was also recognition that best practices can play a constructive role. For the Treasury market, The Treasury Market Practices Group (TMPG) has been active in promulgating best practice guidance since 2007 in support of market the integrity and efficiency. The TMPG most recently updated its best practices in May 2015 to include guidance on the use of automated trading in covered markets: https://www.newyorkfed.org/medialibrary/microsites/tmpg/files/TPMG_June%202015_Best%20Practices.pdf.

Repo Market Considerations

Although the repo market was not a focus in the JSR, the repo market was included in the conference agenda due to its important role in support of cash market liquidity and dealer-to-customer trading in particular. At a high level, the repo panel expected retrenchment in the overall size of the repo market to continue, largely due to ongoing implementation of more rigorous capital requirements. Panel members also saw repo markets as less vulnerable to disruption, due to the reduction of intraday credit extension as intraday credit facilities are now more limited.

Participants on the repo panel generally believed that required spreads on Treasury repo have widened since the crisis. Pre-crisis spreads were closer to 1-2 basis points, and now spreads are closer to 15 basis points. Given leverage ratios of 5-6 percent, and return-on-equity requirements of approximately 10 percent, the spread necessary for the repo business to become profitable as a standalone function was estimated to fall in the 40 to 50 basis point range. That said, it was also noted that not all firms require each repo trading to be self-sufficient from a profit standpoint, but instead view this service in the context of a broader set of client services/relationships, which ultimately might limit volatility and spread widening in practice. Panel members also observed that pressure in repo markets at quarter-ends, particularly among foreign dealers, suggested that the repo market can function with wide spreads and greater volatility if necessary.

Panelists offered various views about the degree to which repo markets have been affected by regulation. Some noted that the new leverage ratio requirements, predictably, are leading to higher costs of dealer intermediation in the repo business, since this business requires large use of balance sheet with low expected returns. One panelist expected that the more difficult regulation to adjust to will be CCAR, given its change in focus each year, and opined that this uncertainty was intentionally part of its design. There was some concern expressed by panelists that the current implementation of regulations could push portions of the repo market into shadow banking, where risks might be borne by less regulated, less visible entities. One panelist suggested that the repo market seemed to have transitioned from one of the world's deepest markets to an allocated market, which is now available in rigid quantities to more select customers. Despite these concerns, panelists generally recognized that the more rigorous regulatory framework had improved financial market stability generally, and the benefit of more financial stability must be weighed in any cost-benefit analysis regarding regulatory impact.

The repo panel concluded with a discussion of central clearing. Panelists viewed netting potential of central clearing as a potentially powerful contribution to the markets – as it would allow for broader access to credit extension with the potential to improve funding market liquidity. Panelists also expressed the view that it is preferable to maintain the participation of a broader array of buy-side participants, so that the repo market would remain two-sided and deep. Some panelists expressed the concern that a large portion of the buy-side may not be able to participate in central clearing due to the potential exposure to losses in the event of a member default. In response, some panelists suggested consideration of a European model of central clearing which allows for different classes of clearing memberships with respect to risk sharing. Some panelists noted that the intraday liquidity necessary to establish central repo clearing could be significant, particularly if the participation model did not result in a substantial amount of netting across transactions.