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David R. Pearl
Office of the Executive Secretary
Attention: Treasury Market RFI
U.S. Department of the Treasury
1500 Pennsylvania Avenue, NW
Washington, D.C. 20220
Submitted via electronic filing: www.regulations.gov

Re: Treasury Market RFI (Docket No. TREAS–DO–2015–0013)

Dear Mr. Pearl:

Ronin Capital, LLC appreciates the opportunity to respond to the U.S. Treasury Department regarding its Request for Information (RFI) on the evolution of market structure in the U.S. Treasury market.

The structure of liquidity provision in the secondary market for U.S. Treasuries has changed. The “Joint Staff Report: The U.S. Treasury Market on October 15, 2014” (hereafter the “JSR”) provided an analysis of participant-level transaction data that enabled government researchers to make some important generalizations about the type and character of firms actively participating in the market.¹ The growing influence of principal trading firms (PTFs) in a market that has been historically dominated by bank-dealers likely elicited some surprise from members of the official sector. Given the critical importance of the U.S. Treasury market, both as the principal means of financing our federal government and as a significant risk-free investment and hedging vehicle for global investors, we believe the official sector is right to question whether this structural change has implications for the depth, liquidity and functioning of the market. If current trends in the evolution of the market are not desirable, a response from the official sector is likely warranted. However, it is important that any response be an informed response, and we commend the staff of the Treasury Department for developing this RFI in coordination with the staffs of the Board of Governors of the Federal Reserve System, the Federal Reserve Bank of New York, the U.S. Securities and Exchange Commission, and the U.S. Commodity Futures Trading Commission (hereafter the “Joint Staffs”).

The official sector has mentioned an inability to effectively analyze and draw conclusions about market liquidity and structure due to a lack of data. Liquidity analysis is even more difficult in the private sector, where knowledge of participant-level transactional data is sparse to non-existent. Despite the fact that private-sector responses to this RFI are subjective in nature, hopefully some valuable insights will be obtained to help guide ongoing work. It is our hope that the JSR is an important first step by the official sector towards lifting the veil on this complex and opaque market.

¹ https://www.treasury.gov/press-center/press-releases/Documents/Joint_Staff_Report_Treasury_10-15-2015.pdf

We believe technology has played a major role in altering the liquidity landscape. But regulation enacted since the recent financial crisis has also played its own significant part in this transformation. The influence and interaction of these two major factors in reshaping liquidity provision are ongoing. New risks have emerged and current risk mitigation mechanisms are likely outdated and in need of modification given this structural evolution. We appreciate the opportunity to express our views on this critical matter.

Background

Ronin Capital, LLC is a registered broker-dealer headquartered in Chicago. We engage in proprietary trading and do not have any customers. We trade a diversified list of products as well as deploy an equally diversified list of strategies among the various assets classes we trade. We are active participants in the U.S. Treasury market and are self-clearing members of both the Fixed Income Clearing Corporation (FICC) and the Chicago Mercantile Exchange (CME). Our trading strategies within the U.S. Fixed Income market would be best characterized as relative value and basis trading. Because we trade our own money, we are acutely cognizant of the importance of managing our own risk. Given we hold overnight positions, we have a vested interest in the proper functioning of the U.S. Treasury market. We traditionally have served as “shock absorbers” and liquidity providers during the nearly two decades we have been involved in trading U.S. Treasuries, providing liquidity when volatility (and often opportunity) presents itself in the market. The views expressed in this RFI are the views of the authors and do not necessarily reflect the views of Ronin Capital, LLC.

Opening Statement

The U.S. Treasury market has always been a deep and liquid market. It enjoys special status and rightly so, for U.S. Treasuries have the full faith and credit of the U.S. government. This risk-free characteristic enables U.S. Treasuries to serve as an effective hedge for many different types of financial instruments. This utility results in superior liquidity, which in turn enhances the price discovery process. Investors are more than willing to pay a premium in return for this enhanced liquidity – a premium estimated as high as 15%.² Since the U.S. Treasury market is the primary means of financing the U.S. federal government, this liquidity premium greatly benefits the U.S. taxpayer. Given the potential fiscal consequences of unintentionally diminishing liquidity in the U.S. Treasury market, either through action or inaction, we believe it is critical for regulators to have access to all relevant data needed to make informed decisions. We believe this Request for Information (RFI) is an important next step in analyzing structural changes that have taken place in the U.S. Treasury market.

On October 15, 2014, the U.S. Treasury market experienced an abnormally high level of volatility without a clear precipitating cause. The unexplained nature of this unexpected volatility in the most liquid market in the world galvanized the Joint Staffs to conduct a thorough study of factors that may have caused or contributed to the extreme price action on that day. The resultant document, the “Joint Staff Report: The U.S. Treasury Market on October 15, 2014” (JSR), provided some insight into this opaque and fragmented market. One notable finding of this report is the growing influence of PTFs, who now account for a “majority of trading and standing quotes in the order book in both futures and inter-dealer cash markets.”³ This is significant because the JSR states that “PTFs are uniquely characterized by their almost exclusive use of automated trading, lower fill ratios, and primarily principal trading activity” as well as the fact that “PTFs in general carry little inventory overnight.”⁴ This structural change in a market that

² https://www.newyorkfed.org/research/staff_reports/sr590.html pg. 25

³ RFI p. 2

⁴ JSR pp. 13, 25

was previously dominated by bank-dealers certainly surprised many observers and calls into question whether regulatory and risk mitigation mechanisms have kept up with changes in the market. Before a proper response can be considered, it seems prudent to understand why this structural change has occurred. We believe technology has played a major role in this evolution. Automated trading dominates electronic markets and this shift has brought new entrants into a market historically dominated by bank-dealers. But regulation enacted since the recent financial crisis has also played a significant role in altering the liquidity landscape. We will now comment on both of these influences.

Primary Dealers

Primary dealers have traditionally provided liquidity across the entire U.S. Treasury maturity curve. They serve the critical function of distribution of newly auctioned securities to clients. Primary dealers also provide liquidity to other broker-dealers via the inter-dealer markets as well as directly to their customers through the dealer-to-customer (DtC) market. They hold inventory in order to support supply and demand imbalances. Most primary dealers employ sophisticated technology infrastructure for managing inventory accumulated during auctions as well as via their participation in making markets. In the repo market, primary dealers serve a critical role as credit-facing intermediaries between collateral holders and cash investors (such as Money Market Funds). This credit-facing role supports the market directly via participation in the repo markets (both bilateral and tri-party) as well as through internal prime brokerage relationships. The financial industry relies on this primary dealer infrastructure (both credit-facing as well as technological) to provide the liquidity needed to support continuous trading across the maturity curve in U.S. Treasuries. Whereas liquidity in on-the-runs has migrated over time to the electronic platforms run by inter-dealer brokers, liquidity in off-the-runs and the financing markets is still largely dependent on the participation of primary dealers.

Why are primary dealers retreating from the U.S. Treasury market? Participating in the U.S. Treasury market no longer generates a profitable return on capital for those primary dealers that are subject to regulatory leverage ratios. Most primary dealers have been designated as G-SIBs (Global Systemically Important Banks). The lack of diversity in primary dealer membership means that regulation targeting the "too big to fail" problem has the unfortunate side effect of reducing liquidity in U.S. Treasuries.⁵ Leverage ratios incentivize primary dealers to reduce participation in market making and internalize flow in order to maintain tighter control of inventory. The G-SIBs have a responsibility to their shareholders to maximize return on capital. If participation in the U.S. Treasury market no longer generates an adequate return, these banks will reduce their involvement in the inter-dealer and dealer-to-customer markets, if not pull away entirely. Because of this lack of diversity among primary dealers, we believe some aspects of regulation implemented since the recent financial crisis may seriously impact liquidity in the U.S. Treasury market. Is the U.S. Financial System actually safer if G-SIBs are less involved in the U.S. Treasury market?

The retreat from market participation by primary dealers results in two important changes that affect liquidity. The first is direct. Primary dealers are less aggressive when making markets - they require wider spreads and are willing to transact in much smaller increments. While they may still be active in the market, they require more profitability and prioritize internalization of flow in order to maintain tighter control of inventory. The second effect is more indirect, but perhaps more troublesome for liquidity. G-SIBs are actively reducing their prime brokerage footprint. Prime brokers are moving towards a pay for

⁵ The number of primary dealers grew to a peak of 46 in 1988. That number has declined significantly. Consolidation in the banking sector has certainly played a role. It is unclear why there aren't more regional banks or non-bank broker-dealers serving as primary dealers. Standards for becoming a primary dealer do not include being a "large money center bank."

balance sheet model. Any prime brokerage client falling below a certain threshold in generated fees, relative to their balance sheet needs, is no longer viewed as a desirable customer. Many of these prime brokerage clients trade U.S. Treasuries, but they require leverage in order to hold positions. With banks retreating from supporting this leverage many prime brokerage clients will be forced to exit the business. Even large macro multi-asset funds that generate substantial fees for the banking industry are having their leverage curtailed. In fact, there is a potential risk that a number of G-SIBs may eventually give up their primary dealer status and forgo the asset class entirely (as Credit Suisse has done in Europe).⁶ Will other firms be able to fill this void? Unfortunately, regulation that is intended to curtail "too big to fail" is also affecting the ability of other firms to replace the liquidity provided by the G-SIBs.

Liquidity Void

There are a diversity of reasons as to why small and mid-sized broker-dealers will have difficulty filling a liquidity void created by the retreat of the G-SIBs. Some of these reasons are quite direct. There are some indications that regulatory leverage ratios may also be put into place for broker-dealers in general - not just those firms viewed as systemically important. This type of blunt approach would certainly force any broker-dealers without massive customer bases (i.e. profitability through customer fee generation) to immediately exit the business. While some G-SIBs may continue to trade U.S. Treasuries in some form (albeit reduced position or balance sheet usage) in order to service their largest customers, smaller firms will make decisions based on profitability alone. Without any ability to generate a meaningful return, these smaller firms will just exit the business. Other threats come from regulation meant to prevent systemic risk that ends up being a substantial cost on market participants that do not pose any systemic risk themselves.⁷ We believe any regulation focusing on settlement risk in U.S. Treasuries, as opposed to market risk, punishes hedged position taking and further diminishes liquidity. U.S. Treasuries serve as an effective hedge for other products due to its superior credit and liquidity qualities. If regulation makes it uneconomic to utilize U.S. Treasuries as a hedge, the market will go elsewhere. This will certainly not benefit liquidity in U.S. Treasuries and may even increase systemic risk. Any hedging product used in place of U.S. Treasuries brings additional credit risk into the system. How is this potential state of affairs beneficial to the U.S. Financial System?

A legitimate concern of market participants is that there is a general regulatory push to bluntly reduce or eliminate leverage in the U.S. Treasury market. We understand that such an undertaking might be viewed as politically expedient. However, there is no way to generate a meaningful return in U.S. Treasuries without leverage. Without leverage, spreads in U.S. Treasuries would need to widen considerably before position-holding liquidity providers would again find the market worth participating in. Some segment of the market still needs to hold inventory in U.S. Treasuries. Reducing leverage, and thus reducing the ability of all firms to hold inventory, seems an extremely risky proposition without reducing debt issuance. Certainly high-frequency traders, which generally do not hold any inventory overnight, are not the solution. If the only entities willing to hold positions in U.S. Treasuries are "buy and hold," meaningful liquidity in the U.S. Treasury market will be nonexistent. This might seem an extreme conclusion, but it is a completely plausible outcome if leverage is regulated out of the market. Leverage and liquidity in the U.S. Treasury market go hand in hand. Destroying leverage across all firms (not just among those firms deemed systemically important) will devastate liquidity in U.S. Treasuries and ultimately risk losing the liquidity premium our sovereign debt has historically benefitted from. In fact, negative swap spreads provide some ancillary evidence that this liquidity premium has already diminished somewhat. We believe

⁶ <http://www.bloomberg.com/news/articles/2015-10-22/credit-suisse-exiting-bond-role-sounds-alarm-for-european-market>

⁷ The Fixed Income Clearing Corporation (FICC) is currently formulating a rule change to try and prevent systemic settlement risk posed by its largest members. This liquidity plan is called the Capped Contingent Liquidity Framework (CCLF).

U.S. Treasuries are special - care needs to be taken to ensure that regulatory efforts do not have the unintended consequence of hurting the U.S. taxpayer.

Technology Shift

Until relatively recently, trading in the U.S. Treasury cash markets was dominated by broker-dealers, bifurcated between the dealer-to-customer and inter-dealer markets.⁸ In the inter-dealer markets, price discovery and trade facilitation were enhanced by inter-dealer brokers (IDBs), who served as an intermediary between broker-dealers, and allowed transactions to be conducted anonymously. These inter-dealer markets eventually became electronic, and access was granted to non-dealers. Today, trading in the inter-dealer cash markets, as documented by the JSR, is dominated by PTFs. The inter-dealer cash markets bear “some resemblance to other highly liquid markets, including equities and foreign exchange markets, where PTFs and dealers transact in automated fashion, sometimes in large volumes and at high speed.”⁹

We believe automated trading has brought many changes to the U.S. Treasury market. Some of these changes are quite welcome. There has been a measurable reduction of costs as well as increases in efficiency, which has benefitted many market participants. But the JSR also shows that there has been a technology-led shift in the type and character of firms actively participating in the U.S. Treasury market. Some of these firms participate in the market in a manner that can be exclusively characterized as high-frequency in nature. We believe this evolution of market structure has introduced a number of new risks and challenges that may require an official sector response.

Clearing and Settlement Risks

The JSR mentions a number of risks associated with high--frequency trading (HFT). Risks associated with clearing and settlement are specifically mentioned as follows:

Traditionally, firms trading on the interdealer platforms have cleared through the Fixed Income Clearing Corporation (FICC), which offers central clearing services for cash Treasury securities. However, as PTFs have gained access to the platforms, they have remained outside the FICC membership and clear with each other either bilaterally, or through a prime broker for trades executed with a FICC member. The significance of trading volume of firms outside the FICC membership—now larger in aggregate than that of FICC netting members—raises the question of whether trades cleared for non--CCP members are processed as prudently as those for firms inside the CCP. Trades cleared outside the CCP may not be subject to the same level of settlement risk mitigation techniques such as margin collection, disciplined clearing fund balance requirements, and pre-defined loss sharing arrangements.¹⁰

We believe this shift in volume away from the FICC presents risk to the U.S. Financial System. CCPs provide a number of beneficial economic functions that are lacking in the bilateral market. Important among these functions are risk mutualization and the ability to manage member defaults in an orderly fashion (and thus avoid “fire sale” risk). Unfortunately, the evolution of market structure away from centralized clearing brings additional asymmetrical risk to the U.S. Treasury market.

⁸ The JSR defines bank-dealers as SEC-registered broker-dealers that are owned by a bank. Primary dealers are a subset of this broker-dealer category. Non-bank dealers are independent SEC-registered broker-dealers.

⁹ RFI p. 3

¹⁰ JSR p. 55

FICC

We believe risk mitigation measures have not evolved sufficiently in order to counteract threats posed by changes in the structure and liquidity of the U.S. Treasury market. But we also believe this evolution of market structure, coupled with new regulatory measures, has actually weakened a number of existing risk mitigation mechanisms. In this context, it seems appropriate to examine the role that the Government Securities Division (GSD) of the Fixed Income Clearing Corporation (FICC) serves within the U.S. Financial System. This is summarized as follows:

The Government Securities Division (GSD) of the Fixed Income Clearing Corporation (FICC), a subsidiary of DTCC, provides real-time trade matching, clearing, risk management and netting for trades in US government debt issues, including repurchase agreements or repos. Securities transactions processed by FICC's Government Securities Division include Treasury bills, bonds, notes, zero-coupon securities, government agency securities and inflation-indexed securities.¹¹

The services that the GSD provides are not that dissimilar from those provided by other Central Counterparty Clearing Houses (CCPs). The main distinguishing characteristic of the GSD relates to the quality and importance of the securities that are cleared. The GSD only clears securities backed by the full faith and credit of the U.S. government. We believe this distinction makes the GSD special.

PTFs now dominate the inter-dealer markets. The structural shift in the type and character of firms participating in the inter-dealer cash markets has resulted in significant volume being cleared outside of the FICC. This is despite the beneficial economic functions provided by central counterparties (CCPs). In a recent speech, Federal Reserve Governor Jerome Powell highlighted some of the benefits typically provided by a CCP:¹²

- a reduction in the potential cost of counterparty default coming from the orderly liquidation of a defaulting member's positions,
- greater transparency and a reduction in operational risk from enhanced reporting requirements and standardization of data, and
- the sharing of risk among members of the CCP through some mutualization of the costs of a counterparty's default.

CCPs provide a rules-based framework for handling many threats to market stability. In contrast, the response of any bilateral counterpart to market stress becomes a “known unknown.” Uncertainty regarding the credit quality of counterparts in the bilateral market can lead to undesirable responses to market stress including “generalized runs on the market” or “fire sales.”¹³ Certainly, the possibility of these types of responses by market participants are a risk to liquidity. We believe eliminating this threat to the U.S. Financial System by strengthening centralized clearing should be a priority.

Centralized clearing provides another added benefit. Enhanced reporting requirements and standardization of data enable the official sector to monitor the market more effectively. The official sector currently lacks the comprehensive data needed to “fully assess new developments, and analyze market events.”¹⁴ If every trade cleared via a CCP, issues related to a lack of transparency would be solved.

11 <http://www.dtcc.com/about/businesses-and-subsidiaries/ficc.aspx>

12 <http://www.federalreserve.gov/newsevents/speech/powell20151117a.htm>

13 https://www.newyorkfed.org/research/staff_reports/sr529.html

14 RFI p. 5

Finally, we believe there is an indirect threat to market liquidity and stability arising from a shift in volume away from the FICC. Transactional costs are dependent on volume. The FICC has recently needed to increase fees because of a “decline in the dollar values of transactions.”¹⁵ This is a negative trend we believe the official sector should be concerned with. If CCPs are truly viewed as being beneficial for mitigating risk in the U.S. Treasury market, steps should be taken to support and improve the value proposition offered by CCPs. Otherwise, we believe the bilateral market will continue to grow at the expense of centralized clearing. There is settlement risk in every transaction. Allowing some of the largest participants in the U.S. Treasury market to ignore settlement risk both weakens FICC and creates an unlevel playing field.

CCLF

Previously in this note we’ve opined on some of the effects of regulation on liquidity, particularly focusing on regulation which discourages primary dealers (and other bank-dealers) from holding inventory in U.S. Treasuries. However, we believe there is another regulatory threat to liquidity that merits mention. This threat comes from a new rule being formulated that would require GSD members to fund a Capped Contingent Liquidity Facility (CCLF). This proposed liquidity facility is intended to protect the FICC from settlement risk that might arise during the default of its largest member firm (i.e. a “Cover 1” default). The assumption is made that a defaulting “Cover 1” member firm will have previously funded a portfolio of GSD securities (via repo), but will be unable to unwind these financing trades because of instantaneous default. FICC is thus left with a portfolio of U.S. government debt and lacks the liquidity (i.e. cash) to settle these trades. The purpose of the CCLF is to provide a rules-based mechanism to obtain the cash needed for settlement without bringing any securities to market (fears of a “fire sale”). This is accomplished via the execution of MRAs (Master Repurchase Agreements) with GSD members. In other words, GSD members are required to mutualize settlement risk that is too big for the FICC to handle on its own.

The FICC has a better credit rating than any of its members. And yet, the FICC is unable to obtain the credit needed to fund this settlement liability. We believe transferring this settlement liability from FICC to its membership only propagates the problem. It is possible that a number of GSD member firms may not be able to meet the requirements demanded by the CCLF. It is also possible that a number of firms may simply decide that the cost-benefit analysis of adhering to this requirement no longer justifies remaining within FICC. Certainly, there is the potential for a decline in FICC membership. Such a decline in membership certainly does not strengthen FICC, nor is it beneficial for liquidity in the U.S. Treasury market.

There are other threats to liquidity present in the CCLF. One such threat stems from the allocation method utilized to predetermine contributions to the liquidity framework. Each GSD member firm is assigned a CCLF requirement that is based on their maximum settlement size over a previous predetermined period (currently six months). Unfortunately, this liquidity need makes no distinction between hedged and unhedged positions. We believe regulation focusing on settlement risk as opposed to market risk punishes hedged position taking. Hedged position taking (relative value trading) is critical for liquidity provision in securities that are less liquid (“off-the-runs”). Additionally, the utilization of a look-back metric, which penalizes firms for stepping in and providing additional liquidity, discourages firms from increasing liquidity when it may be needed most (times of stress, month-end, quarter-end). Six months is a long time to be penalized for any short term increase in market participation.

¹⁵ <https://www.sec.gov/rules/sro/ficc/2016/34-76840.pdf>

Another threat to liquidity contained within the CCLF relates to the actual mutualization of settlement risk among GSD members. We believe the declaration of a “CCLF Event” following a large member default has the potential to drain liquidity at the worst time possible. This is simply because the execution of MRAs by FICC will drain cash from member firms and thus from the U.S. Financial System. In stressed financial conditions this seems to be an undesirable result. Fears of a “fire sale” in U.S. Treasuries, which history has shown to be in demand during a crisis, will likely make conditions worse in other asset classes.

This leads us back to examining the FICC as a vector for propagating systemic risk. We believe it is important to keep in mind that the CCLF is a liquidity framework focused on the prevention of settlement risk rather than actual risk. While an argument could be made that the instantaneous default of the largest GSD member could pose a short-term liquidity problem for the FICC, it would be extremely difficult to prove that the FICC would be exposed to significant mark-to-market losses stemming from holding a portfolio of U.S. government debt.¹⁶ We believe the GSD is special, because it only services debt obligations that are fully and explicitly guaranteed by the full faith and credit of the U.S. government. These debt obligations are classified as high-quality liquid assets (HQLA), the type of assets that G-SIBs and other large banking organizations are required to hold because such assets “can be converted easily and quickly into cash.”¹⁷ And yet, the FICC is forced to come up with an alternative liquidity plan (the CCLF) for monetizing HQLA without bringing them to market. The last financial crisis created tremendous demand for U.S. Treasuries and other HQLA. Thus, we believe fears of a “fire sale” in U.S. government debt are unfounded. There is limited market risk associated with holding a portfolio of U.S. government debt. The systemic risk the FICC is presented with is settlement risk - not market risk. A scenario in which assets held in the Clearing Fund would be ineffective in offsetting market-to-market losses from holding a portfolio of U.S. Treasuries is impossible to imagine. This hypothetical systemic risk presented to the FICC is an external risk, a liquidity need propagated by the default of a G-SIB or other large institution. If this risk is truly a concern of regulators, we believe it should be mitigated directly. Smaller and mid-sized firms have no ability to present systemic risk. The FICC has dealt with the default of smaller institutions easily in the past. Why are smaller institutions required to subsidize systemic risk that can only be caused by our largest institutions? One could argue that the CCLF is anticompetitive for smaller and mid-sized firms that pose no risk to the FICC.¹⁸

We believe implementation of the CCLF will actually diminish liquidity while encouraging the growth of the bilateral market. If greater transparency in the U.S. Treasury market is viewed as a desirable result, it is critically important to enact a liquidity solution that will serve to encourage new membership in the FICC rather than driving existing members out of the business or into the bilateral shadows.

Bilateral Versus CCP

A lot of emphasis has been placed on trying to ensure that the FICC does not pose systemic risk. But at the same time there is a much larger bilateral market for U.S. government debt that operates outside of the controlled framework of a CCP.¹⁹ While solutions to combat “fire sale” risk can be required within the operating framework of a CCP, such solutions are completely unavailable in the context of bilateral

¹⁶ For those worried about the FICC posing systemic risk there are alternatives. The Federal Reserve could open access to the Fed Book Entry system, the Fedwire and limited access to the Discount Window to non-bank financial intermediaries (e.g., broker-dealers, insurance companies and investment management companies).

¹⁷ <http://www.federalreserve.gov/newsevents/press/bcreg/20140903a.htm>

¹⁸ Since the last financial crisis there has been a regulatory effort to protect systemically important institutions from default risk posed by other systemically important institutions. This is an important undertaking, but care need to be taken that smaller firms aren't unintentionally harmed by these efforts.

¹⁹ <http://libertystreeteconomics.newyorkfed.org/2014/07/lifting-the-veil-on-the-us-bilateral-repo-market.html#.VthGhkrLcu>

agreements. The response of any bilateral counterpart to a liquidity crisis becomes a “known unknown.” Eliminating this threat to the U.S. Financial System would seem to be a high priority.

There is some thought that the decentralized nature of bilateral agreements provides stability in a crisis. Unfortunately, the latest financial crisis did not show this to be the case.²⁰ Pre-default “fire sale” risk can limit the ability of a stressed firm to secure funding. This can cause a stressed firm to “delever” to raise much needed cash - sales of securities propagate through the system, which can affect other firms due to mark-to-market accounting rules. Post-default “fire sales” arise when cash investors are left with repo collateral following a default. The subsequent rush to sell collateral in a disorderly manner results in market instability. The FICC, in its role as a CCP, provides an effective means of mitigating both of these types of “fire sale” risks. Precisely because funding trades within the FICC are blind-brokered, there is no worry about trading anonymously with a stressed dealer. After a default occurs, FICC is able to ensure that securities from a defaulted dealer are liquidated in an orderly fashion.²¹ Another risk present in the bilateral market is an informational risk. Once it becomes known that a firm is under duress, bilateral counterparts often act in their own interest and rapidly increase haircuts or seize collateral. Bilateral counterparts may even be incentivized to use information to “trade against the positions” of a firm in distress. There are no fixed rules for handling these bilateral scenarios. In contrast, CCPs have defined rules to ensure the orderly liquidation of a defaulting member’s portfolio.

The fact that the FICC enables blind-brokered repo trading is quite important - and not just in the context of preventing “fire sale” risk. The FICC enables a “level playing field” for smaller and mid-sized firms, particularly for those firms that are not associated with a bank holding company (BHC). Such firms “consistently borrow cash (against securities) in this market.”²² In this capacity, the FICC assumes the important role of a credit-facing intermediary, which enhances liquidity provision. Despite problems with equating credit ratings with default risk (Bear Stearns and Lehman Brothers are appropriate examples), many cash investors are more comfortable dealing with larger firms who generally have higher credit ratings than smaller firms. The FICC serves as an extremely important credit-facing intermediary in this capacity. In fact, it would probably be beneficial for the FICC to expand this role given the regulatory pressure on the G-SIBs.

Finally, it is important to note that the official sector has a difficult time evaluating bilateral risk due to a lack of data. Thus, determining a proper course of action under stressful conditions can be quite difficult. CCPs don’t take market risk. The official sector can evaluate the risk facing a CCP and decide if intervention is required. We recognize it is inexpedient to contemplate central bank intervention of any kind. However, we believe “moral hazard” associated with providing liquidity to a CCP pales in comparison to providing a risk backstop for an individual risk-taking firm.

Federal Reserve

We believe that the implementation of the CCLF will result in reduced liquidity in U.S. Treasuries and weaken the FICC. If reduced liquidity is not a desired result, it seems worthwhile to consider alternative solutions to the CCLF. Keeping a results-based outcome in mind, we believe it is important to ask if the

²⁰ In the bilateral market, stress manifested itself in the form of a large and rapid increase in haircuts, creating a generalized run on the market. In the tri-party repo market, haircuts barely moved but some firms experienced dramatic decreases in the amount of financing they obtained in this market. http://www.newyorkfed.org/research/staff_reports/sr529.pdf p. 17

²¹ https://www.newyorkfed.org/medialibrary/media/research/epr/2015/epr_2015_primer-on-the-gcf-repo-financial-plumbing_lo.pdf?la=en p. 19

²² https://www.newyorkfed.org/medialibrary/media/research/epr/2015/2015_epr_primer-on-the-gcf-repo-empirical-analysis_lo.pdf?la=en p. 21

Federal Reserve is missing an important opportunity to strengthen the FICC and thus make the U.S. Financial System more resilient without risking U.S. taxpayer dollars. We believe a “Cover 1” default in U.S. Treasuries does not pose any significant market risk to the FICC or its members. Such a default would only pose temporary settlement risk. If “fire sale” risk in U.S. Treasuries is of major concern, this risk could be easily mitigated by granting the FICC access to the Fed Discount Window. It has long been the role of central banks to lend against HQLA at relatively high interest rates during periods of financial stress. However, we do understand that explicit access is likely impossible due to the perception that such access would be politicized as a “premeditated bailout.” This characterization is unfortunate, because the credit profile of the FICC is actually of much higher quality than its member banks. CCPs do not take on market risk. The FICC is no exception. European governments have recognized the superior credit qualities of CCPs and thus have granted explicit central bank access in many situations. The rationale for denying CCPs access to the Fed Discount Window *for U.S. government debt* when risk-taking banks have explicit access for lesser quality collateral is counterintuitive.²³ It is hard to understand the moral hazard associated with providing liquidity for U.S. government debt. We believe it is extremely unlikely, if not impossible, for a GSD member firm to go into instantaneous default due to losses incurred within FICC. Certainly, such a default would be due to external losses that FICC would have no insight into. Where is the moral hazard in explicitly providing temporary liquidity for U.S. government debt?

The Federal Reserve employed extraordinary measures to combat the last financial crisis. In the post-crisis aftermath, there has been a lot of criticism of the Federal Reserve’s role as the lender of last resort (LOLR). Much of this criticism has revolved around the moral hazard associated with being a risk backstop. While some of this criticism might be justifiable in hindsight, we believe prohibiting the Federal Reserve from providing liquidity for U.S. government debt may have significant unintended consequences. Historically, there have been a number of cases where it was important for the Federal Reserve to be able to temporarily inject liquidity.²⁴ The Federal Reserve responded aggressively to the liquidity challenge presented during the Sep 11th terrorist attacks by purchasing large amounts of U.S. Treasuries both outright and via repurchase agreements.²⁵ As mentioned previously, it is impossible to imagine the instantaneous default of a G-SIB due to losses incurred from trading U.S. government debt. The FICC has no more ability to predict the instantaneous default of a G-SIB than they would to predict a terrorist attack. Again, it seems difficult to associate moral hazard with providing liquidity to the FICC for U.S. government debt.

Finally, we believe it is important to point out the significant involvement of the Federal Reserve in the U.S. Treasury market during “normal” times. A current example is the RRP program.²⁶ The major beneficiaries of the RRP program are Money Market Funds (MMFs) whose liquidity needs have proven quite pressing particularly at quarter ends. This is an active example of a Federal Reserve program set up to inject liquidity that does not just benefit primary dealers or credit-worthy banks. Is providing liquidity to a CCP for U.S. government debt fundamentally different? In fact, an argument could be made that the RRP program actually places the Federal Reserve in direct competition with FICC.²⁷ The Federal Reserve

23 <https://www.frbdiscountwindow.org/RightNavPages/Pledging-Collateral.aspx>

24 A well-known instance of Fed intervention occurred on Thursday, November 21, 1985, when a computer outage at The Bank of New York (a predecessor of The Bank of New York Mellon) prevented that bank from effecting deliveries of Treasury securities. The bank was unable to resolve the problem until the following day and had to finance overnight (at its own expense) the customer securities that it was unable to deliver. It borrowed in excess of \$20 billion from the Federal Reserve Bank of New York and incurred interest expenses of \$5 million. https://www.richmondfed.org/publications/research/economic_brief/2015/eb_15-05

25 <https://www.stlouisfed.org/publications/regional-economist/january-2002/the-federal-reserves-response-to-the-sept-11-attacks>

26 https://www.newyorkfed.org/markets/rrp_faq.html

27 The introduction of the Federal Reserve’s overnight reverse repo facility in 2014 may also have had a negative effect on the volume of GCF Repo activity, as it provided an alternative to dealers lending cash.

<http://libertystreeteconomics.newyorkfed.org/2015/07/have-dealers-strategies-in-the-gcf-repo-market-changed.html#.VuJGvIqrKUK>

views its involvement in repo markets as one of its major tools for implementing monetary policy. SOMA was set up to be “a store of liquidity in the event an emergency need for liquidity arises.”²⁸ The Federal Reserve is heavily involved in providing liquidity for the U.S. Treasury market on a day to day basis. Preventing the Federal Reserve from temporarily providing liquidity for U.S. government debt in a crisis seems to be grossly inconsistent. We can only assume that such policy satisfies some political objective that has little to do with supporting price stability.

We believe U.S. Treasuries are special. The U.S. taxpayer benefits significantly from the superior liquidity of the U.S. Treasury market.²⁹ We believe the CCLF threatens liquidity in the U.S. Treasury market and will weaken the FICC. The Federal Reserve could eliminate this threat by specifically providing the FICC liquidity for U.S. government debt. However, it appears fears of moral hazard associated with our own sovereign debt will inhibit the Federal Reserve from being able to provide this critical liquidity in the event of a crisis. We believe “one size fits all” regulation runs the risk of making it uneconomic to hold positions in U.S. Treasuries. Who will be left to provide liquidity in the U.S. Treasury market?

HFT

The JSR confirmed the growing influence of PTFs in the U.S. Treasury market. The JSR also took the further step of generalizing the trading activity of PTFs:

- Almost exclusive use of automated trading
- Low fill ratios
- Principal trading activity
- Little to no overnight inventory

These characteristics are hallmarks of high-frequency trading (HFT). Despite this generalization, the JSR makes it clear that other types of firms (bank-dealers, hedge funds) are also participating in HFT while some PTFs are not. In other words, HFT is a type of trading activity. While some PTFs are solely engaged in HFT, there is nothing special about the structure of PTFs that makes them more or less qualified to participate in HFT. We believe this is a critical point. If ultimately the official sector decides that HFT is not a desirable type of trading activity, we believe the activity itself, rather than the type of firm, should be regulated. That being said, there are some characteristics of HFT that are worth examining further in terms of the evolving nature of liquidity provision in the U.S. Treasury market.

HFT is incredibly competitive. Informational arbitrage is extremely profitable, but there are massive diminishing returns to not being the fastest. There is an ongoing competition for speed that results in a small number of winners and a large number of losers. This characteristic results in concentration. The JSR found that “the 10 most active PTFs conducted more than 90 percent of the trading activity of all PTFs.”³⁰ Further light was shed on the concentration in the U.S. Treasury market when Risk.net released a confidential list (the “Risk.net List”) of the top ten firms transacting on the BrokerTec inter-dealer market.³¹ According to this list, ten firms are involved in a staggering 99% of U.S. Treasury transactions conducted in this important market. It is also significant to note that eight of the top ten firms on this list are not banks. Instead, this list contains a “big contingent of HFT specialists.”

28 http://nyapps.newyorkfed.org/markets/soma/sysopen_accholdings.html

29 <http://www.nber.org/papers/w9312.pdf>

30 JSR p. 4

31 <http://www.risk.net/risk-magazine/news/2426923/client-list-reveals-hft-dominance-on-brokertec>

Not only is there concentration among firms, but significant volume in the U.S. Treasury market appears to be transacted by HFT specialists. This isn't really surprising. The informational arbitrage that occurs in the U.S. Treasury market is no different from arbitrage opportunities occurring in many other product areas. As documented in the JSR, there is massive cross-market activity between the futures and cash markets by these HFT specialists.³² When the inter-dealer cash markets began supporting electronic protocols commonly used by other exchange and trading venues, the ability for HFT specialists to easily compete in the U.S. Treasury market was assured.³³

It is clear that HFT now exerts significant influence on the U.S. Treasury market. It is unclear, however, whether HFT has brought "an improvement in average liquidity conditions at the cost of rare but severe bouts of volatility that coincide with significant strains in liquidity."³⁴ By definition, HFT liquidity is temporary because most inventory accumulated is not held overnight. HFT specialists "make trading decisions, including liquidity provision decisions, primarily on the basis of immediate profitability and the level of market risk, rather than as a service offered in the context of existing customer relationships that are intended to be profitable over time."³⁵ HFT specialists certainly have a different optimization function for dealing with inventory when compared with firms that prioritize dealer-to-customer trading. Despite a reluctance to hold overnight positions, we believe it is quite possible that HFT specialists can dampen volatility over shorter time horizons through market making activity. However, HFT specialists certainly have relatively small internal risk limits which prevent them from holding significant inventory. Once these limits are reached, HFT specialists certainly could exacerbate any market move through internal risk mitigation. Additionally, HFT specialists that engage in liquidity-taking strategies certainly increase volatility over short term horizons.

HFT specialists have certainly become an important component of liquidity provision in the U.S. Treasury market. It is unclear and possibly worthwhile to determine whether these firms have filled a liquidity void, or rather supplanted liquidity traditionally provided by bank-dealers. Bank-dealer activity in the inter-dealer markets now accounts for "a significantly smaller share of market intermediation than in the past, perhaps reflecting increasing costs and competitive pressures associated with market-making activities in the Treasury market."³⁶ We believe competition is healthy. However, we also believe there should be a level playing field for all participants.

Risk Mitigation

PTFs now account for a majority of trading activity in the inter-dealer cash and futures markets. Meanwhile, the market share of bank-dealers has declined. Given this structural evolution, we believe it is important to examine current risk mitigation mechanisms in this changed environment. Risk mitigation mechanisms in U.S. Treasuries are primarily position-based. These mechanisms were set up at a time when bank-dealers dominated the U.S. Treasury market and most transactions were conducted over the phone. Today, a concentrated number of PTFs now account for the "majority of trading" as well as the "vast majority of market depth" in the U.S. Treasury market.³⁷ And yet, a defining characteristic of PTFs is that they carry "little to no overnight inventory."³⁸ Despite settlement risk in every transaction, HFT

32 JSR p. 53

33 <http://www.nasdaqomx.com/technology/thoughtleadership/marketview-magazine/viewarticle?contentId=38762>

34 RFI p. 6

35 JSR p. 39

36 JSR p. 6

37 JSR p. 6

38 JSR p. 25

specialists are treated as if they pose no risk. The JSR acknowledges that there may be shortcomings in current risk mitigation measures:

The speed of trade execution might make critical risk mitigation devices, such as trade and position monitoring systems or margin, less effective. For example, margin could be insufficient if an exposure grew faster than margin could be collected.³⁹

We believe PTFs that engage in HFT pose risk to the system from possible catastrophic “system errors” that might lead to failure of a firm or group of firms. If a “Knight Capital” type event⁴⁰ occurred in the U.S. Treasury market, it is unclear how such risk would be contained. Many PTFs are more thinly capitalized than typical broker-dealers.⁴¹ They have also remained outside of the FICC membership.⁴² Is it possible other firms are being forced to subsidize this potential risk?

We believe it is important that an evolution in market structure does not bring new risks into the U.S. Treasury market. It is significant that a majority of firms present on the “Risk.net List” are not members of the FICC. This information combined with the participant--level detail contained within the JSR enables one to reasonably conclude that currently *some of the largest participants in the U.S. Treasury market are not participating in safeguarding the system.* We believe this fact to be punitive to FICC members for two major reasons:

- HFT specialists profit from the safety and efficiency that the FICC brings to the system without contributing to it. These firms may expose FICC membership to default risk without contributing to loss mutualization themselves.
- Pre--netting of trades executed on intra-dealer platforms increase the cost basis for FICC members who report all of their transactions. HFT specialists are thus beneficiaries of an “unlevel playing field” which brings significant cost advantages.

Is it possible that HFT specialists have grown market share simply because of a difference in costs? To be fair, HFT is a type of trading activity. It is not limited to PTFs. However, firms that are members of the FICC pay transactional fees associated with their trading activity regardless of whether this activity is high-frequency or not. Over time, these fees help offset the potential costs associated with catastrophic “system errors.” While this type of risk mitigation is not perfect, at least transactional fees help defray some costs for those members that do not engage in HFT.

Inter-dealer Brokers

This shift in transactional volume away from the FICC poses a number of new asymmetrical risks. One such risk pertains specifically to inter-dealer brokers (IDBs). Historically, IDBs facilitated anonymous trading between FICC members. Because all trades were cleared by the FICC, IDBs functioned as true intermediaries, not taking on any risk themselves. This contrasts with the situation today, where IDBs also support trading by non-members. Due to the increased volume of non-members, IDBs now present significant asymmetrical risk to the FICC.

39 JSR p. 55

40 <http://www.bloomberg.com/bw/articles/2012-08-02/knight-shows-how-to-lose-440-million-in-30-minutes>

41 JSR p. 38

42 JSR p. 55

IDBs serve the important function of blind-brokering trades between U.S. Treasury market participants. When an IDB facilitates anonymous trading between two FICC members, there is offsetting risk and the two transactions are netted. Thus, the IDB functions as a true intermediary and is not required to post margin to the FICC. This is not the case when an IDB facilitates a transaction between a FICC member and a non-member. The IDB no longer serves as a true intermediary and is required to post margin to the FICC. Given both the FICC and the IDBs are meant to serve strictly as intermediaries, this need by IDBs to post margin to the FICC appears symptomatic of a circumvention of risk mitigation mechanisms. IDBs are assuming the credit risk of non-member PTFs in order to facilitate these transactions despite the fact that:

PTFs are privately held and generally face lighter regulation than registered broker-dealers, limited financial information is available about many PTFs, including about their financial linkages - and thus their potential to transmit risk - to traditional financial institutions.⁴³

IDBs are in a difficult position. Volume from non-member firms now outpaces volume from FICC members. Competition for fee income ensures that IDBs will continue to support trading outside of the FICC clearing membership. We believe there is risk in this situation - specifically there is risk that a "Knight Capital" event in the inter-dealer cash markets could present asymmetrical risk to an IDB or even to FICC and its membership. It is our opinion that risk mitigation measures and safeguards have not evolved sufficiently to counteract this new threat.

CME

The RFI makes it clear that futures and options contracts that transact at the Chicago Mercantile Exchange (CME) play a critical part in liquidity provision within the U.S. Treasury market. In fact, cross-market activity between the futures and cash markets show that "futures usually lead cash" although "the reverse is also often true."⁴⁴ It is not surprising or at all unusual for a derivative product to enhance or even dominate its underlying in terms of price discovery. CME interest rate futures have a number of advantages with respect to the price discovery process when compared with cash markets. Futures regulations mandate that "all trading in a futures contract occur on, or, in the case of blocks, get reported to, the trading platform operated by the futures exchange where the contract is listed."⁴⁵ This is a distinct advantage for market participants with respect to the price discovery process in futures. On the other hand, the cash markets are both opaque and fragmented. The JSR also denotes that there is a "greater variety of futures market participants."⁴⁶ This fact might lead one to logically conclude that the futures market is more truly representative of demand within the U.S. Treasury market. We also believe futures are more accessible and cost effective as a hedging instrument.

The CME also provides comparative advantages in terms of risk mitigation and official sector reporting. All futures and options transactions are reported and cleared through a CCP (CME Clearing). Problems associated with the lack of transparency that currently hinder the cash markets do not apply. Risk mitigation and mutualization measures are more effective since CME Clearing has a complete picture of counterparty risk for all products that trade at the CME. Of course, the CME is often criticized for being a "monopoly" despite the fact that there have been many attempts to compete over the years. We believe

43 JSR p. 55

44 <http://libertystreeteconomics.newyorkfed.org/2015/08/high-frequency-cross-market-trading-in-us-treasury-markets.html#.Vt2ndlQrKUK>

45 JSR p. 12

46 JSR p. 21

the benefits of the single exchange model far outweigh any negatives and we assume regulatory oversight will ensure that “monopoly power” is not abused.

While a single exchange model would certainly benefit the price discovery process in U.S. Treasuries, we certainly understand the importance of allowing market forces to fairly decide winners and losers. However, *we do believe that the Treasury Department should mandate that all transactions in U.S. Treasuries be centrally cleared.* We are not suggesting that the FICC be handed a “monopoly” in clearing. Competition can certainly be beneficial for market participants. But we strongly believe that CCP clearing would bring efficiencies as well as enhanced risk mitigation to all market participants. The official sector would also benefit from transparent and comprehensive reporting. Unfortunately, regulatory pressures seem to be encouraging the growth of the bilateral market at the expense of centralized clearing in cash markets. We believe this is a negative trend for both liquidity and transparency in the U.S. Treasury market.

In terms of benefitting liquidity provision, we do believe the CME and the FICC should work together to improve the existing cross-margin framework. This framework is currently outdated and broken. While HFT specialists recognize interest rate futures and U.S. Treasuries as “close substitutes” at the microsecond level, the cross-margin system currently in place for overnight positions is not even synchronized to the same day. In fact, a hedged position in both products (which adds liquidity to the market) often causes higher margin requirements than a completely speculative portfolio of the same size due to timing differences. This inefficiency certainly discourages liquidity provision for market participants willing to hold overnight inventory.

Dealer-to-Customer Market

The RFI states that “bank-dealers still account for a majority of secondary cash market trading overall” when including dealer-to-customer (DtC) trading.⁴⁷ This is despite declining participation by bank-dealers in the inter-dealer cash markets. In many cases, the DtC markets have become increasingly electronic, but trading is facilitated “primarily through request for quote (RFQ) systems.”⁴⁸ In general, the RFQ model is not compatible with automated trading. We tend to think of RFQ-based trading as a more efficient evolution of a market for U.S. Treasuries that is still often conducted over the phone. Despite the fact that some may view the dealer-to-customer market as technically archaic, it still serves an important role in liquidity provision for off-the-runs and other less liquid securities.

The DtC markets are opaque and thus extremely difficult to analyze. All interactions are customer-specific. We have experienced a decline in liquidity provision in the DtC markets. Dealers seem less willing to transact. RFQ queries are responded to less aggressively both in terms of price and size (when they are responded to at all). However, our experience may not reflect the experiences of all market participants given the subjective nature of the DtC markets.

As mentioned previously, market participants depend on this DtC infrastructure (both credit-facing and technological) to provide liquidity for less liquid securities. Primary dealers, in particular, are critically important for liquidity provision in most U.S. government debt. This liquidity is generally provided through the DtC markets. Unfortunately, a lack of diversity among primary dealers means regulation targeting the “too big to fail” problem has a negative impact on the DtC markets. If dealers are reducing participation in the DtC markets, we have serious concerns for liquidity in off-the-runs and other less liquid U.S.

47 RFI p. 2

48 RFII p. 3

government debt. Hopefully regulatory leverage ratios aren't encouraging bank-dealers to forgo trading in the U.S. Treasury market in order to utilize balance sheet for riskier endeavors.

As mentioned in the RFI, bank-dealers might be internalizing more flow now than in the past. But it is unclear to what extent this is occurring given the lack of data.⁴⁹ There is certainly risk in implementing new regulatory policy without an ability to analyze the effects. As stated previously, we believe the most direct method for improving transparency in the market is through mandating centralized clearing for all U.S. Treasuries.

Centralized Clearing

We strongly believe centralized clearing is the solution to a lack of transparency within the U.S. Treasury market. CCPs also provide protection against "fire sale" risk and enable better management of default risk through loss mutualization. Generally, we believe CCPs enhance risk mitigation and are economically beneficial to the U.S. Financial System.

That being said, we understand some participants may believe that centralized clearing is negative for liquidity. Our opinion is that such statements are expressed more from a desire to avoid fees associated with CCP membership versus an actual belief that liquidity in the U.S. Treasury market would be negatively impacted. Certainly some market participants benefit today from avoiding fees associated with centralized clearing. However, it is quite likely that many of these same participants willingly transact at the CME despite the fact that all futures and options are centrally cleared. We don't believe the CME has suffered a decline in volume due to mandated centralized clearing. In fact, as mentioned previously, the CME has a broader range of market participants. The CME also seems to lead the cash markets more often than it lags in terms of price discovery. Additionally, most costs associated with clearing are fixed. Increases in volume under CCP oversight should decrease transactional costs. We believe mandating centralized clearing for U.S. Treasuries would level the playing field for all participants.

Centralized clearing also provides benefits with respect to reporting. Not only would centralized clearing ensure that the official sector had access to the data it needs to examine trading activity in the U.S. Treasury market, but smaller firms would greatly benefit from avoiding costs associated with increased reporting requirements. One of the major drawbacks of decentralized data submission is the disproportionate burden such requests pose on smaller firms. We believe it is important to ensure that regulatory reporting requirements are not so burdensome as to create barriers to entry. Reporting systems scale. Given this fact, it seems more efficient and fair for exchanges, other trading venues, and CCPs to be responsible for reporting the data required by regulators. Cost of development could then be recouped from individual firms on a transactional basis. We believe this method of acquiring data seems much less wasteful and certainly easier for the official sector to manage efficiently.

Conclusion

We believe the structure of liquidity provision in the secondary market for U.S. Treasuries has changed. Both technology and regulation have played a major part in effecting this change. We believe regulation has impacted liquidity provision, particularly with respect to the ability of firms to hold inventory. New regulation is likely to continue this trend. The CCLF may force smaller and mid-sized firms to give up their FICC membership and exit the business or return to the bilateral shadows. Other new potential regulation

⁴⁹ RFI p. 4

may institute leverage ratios for all firms (not just those determined to be systemically important) and make it uneconomical to hold inventory in U.S. Treasuries. HFT specialist firms, which don't hold inventory by design, may be the only liquidity providers unaffected by such regulation.

We don't believe there is moral hazard associated with providing liquidity for U.S. government debt. Forcing smaller and mid-sized firms out of the FICC and into the bilateral shadows does not improve market stability or enhance liquidity. We believe CCPs should be supported and strengthened. We believe mandating centralized clearing for U.S. Treasuries will make the U.S. Financial System more resilient and promote transparency. This in turn will improve access to data and enable the official sector to enact policy that is data-driven.

We believe risk mitigation has not likely kept up with technological innovation. There is settlement risk in every transaction. If HFT is not desirable, it should be regulated directly. Restricting access based on capitalization or posing other arbitrary requirements would only shift HFT to another group of market participants. We believe U.S. Treasuries are special and care needs to be taken to ensure that liquidity is not compromised. Without decreasing debt issuance, diminishing liquidity has the potential to negatively impact the U.S. taxpayer.

Specific Questions

I. Further study of the evolution of the U.S. Treasury market and the implications for market structure and liquidity

1.1 Have there been changes in the nature of liquidity provision, or demand for liquidity, in the U.S. Treasury market? If so, are these trends different in the futures, dealer-to-customer, or inter-dealer broker ("IDB") market, or in the "on-the-run" and "off-the-run" sectors, or across different types of Treasury securities (e.g. bills, nominal fixed rate coupon securities, nominal floating rate securities, and inflation-indexed securities)? Which factors have been responsible for any observed trends in liquidity provision and/or demand? In addressing those questions, please consider the dealer-to-customer market, trading on IDB platforms, and in the futures market, as applicable, and please provide or refer to data and/or analysis that support your conclusion.

The private sector has a limited ability to make any inferences about the nature of liquidity provision. It is possible to analyze market microstructure for the most liquid securities in the U.S. Treasury market (on-the-runs, futures, etc.). However, the absence of participant-level details ensures that such analysis is general to the observable market. Any observations of the DtC market, which critically provides liquidity for off-the-runs and other less liquid securities, are subjective and relatively infrequent. The JSR provided significant new insight into a market that has historically been opaque and fragmented. We commend the Joint Staffs for undertaking this detailed analysis and making the results available to the public.

Our opening statement expounds on various factors we believe are responsible for changes in liquidity provision. Our assertions regarding structural changes in the U.S. Treasury market are derived from our own personal experiences, the JSR, and other industry research. We believe both technology and regulation have caused structural changes in the U.S. Treasury market. The influence and interaction of these two factors are still ongoing.

Issuance in U.S. government debt markets has certainly increased. This fact would seem to back an increase in demand for liquidity. Unfortunately, cash markets can only be examined in limited form due to a lack of data. Futures markets (specifically the CME) show both volume and open interest to be at record or near-record levels for most interest rate contracts. Futures demand has finally recovered from the decline experienced following our last financial crisis.⁵⁰ Thus, in observable markets we can conclude that liquidity demand is at record levels. However, this assertion may be invalid due to the fragmented and opaque nature of cash markets.

a. How do you define liquidity? How do you define liquidity provision?

Any definition of liquidity is subjective. During the course of trading we will often make statements about liquidity being “good” or “bad” or use other more technical qualifiers. These characterizations of liquidity are made through the lens of our own internal trading strategies. Our view of liquidity in the U.S. Treasury market is certain to be different from that of an HFT specialist or a large fund manager. At the same moment in time, liquidity provision may be exceptional in the inter-dealer cash markets and poor in the DtC markets. In summary, our internal definition of liquidity and liquidity provision is both subjective and circumstantial.

We believe both the inter-dealer markets for on-the-runs and exchange-traded interest rate futures (especially those that trade at the CME) are critical for price discovery. Prices in these liquid markets dictate pricing in the DtC markets as well as other illiquid products in the inter-dealer markets. Many quotes in these products are auto-generated as spreads to on-the-runs or futures. Therefore, it is especially critical to understand liquidity provision in the most heavily-traded securities.

b. Which measures are most indicative of the degree of liquidity? How might these measures be refined or expanded, if you were not limited by the availability of data?

This is certainly a hypothetical question for much of the U.S. Treasury market. Liquidity can be measured in a number of ways depending on the degree to which data is available. Central limit order books (CLOBs) provide the most transparency with respect to resting liquidity available at any given moment in time. In contrast, the DtC markets are opaque in most forms. Most dealers that operate DtC platforms support RFQ-based liquidity provisioning. Liquidity measures for both these types of trading models are briefly discussed below.

The DtC markets are opaque. RFQ-based liquidity provision is customer-specific by design. In fact, liquidity provision can even be trader-specific - traders at the same firm may simultaneously see different quotes from the same dealer for the same security. This is part of the flexible nature of the RFQ design. RFQ responses are indicative and the dealer reserves the right to reject an accepted quote. Therefore, the customer is unlikely to derive any useful information regarding liquidity in the DtC markets. The dealer, on the other hand, can certainly derive some indication of demand for a given security. But this information is limited by the depth and breadth of each individual dealer’s customer base.

The CLOB model is much more transparent. Both the inside market and market depth are visible to market participants. This visibility enables an observer to construct various statistical liquidity models. These models are imperfect for a wide variety of reasons (hidden orders, “spoofing”, etc.), but these

⁵⁰ The decline in open interest and volumes in the futures markets following the last financial crisis is not surprising. The U.S. Treasury market serves as an effective hedge for interest rate risk. The collapse of the mortgage market and contraction of credit markets certainly resulted in declining demand for interest rate hedges.

measures can be useful for market participants in terms of formulating efficient execution strategies. Trading venues that support the CLOB model also typically report every single transaction that occurs. Trade record information is also useful in terms of evaluating liquidity provision.

Most firms tend to regard their liquidity measures as proprietary. These measures are constructed with a particular strategy in mind. Time horizon is certainly an important variable and some trading venues have idiosyncratic features which must also be considered. There is additional complexity associated with market fragmentation and naturally every firm deals with informational latency in their own unique way.

Imagine a hypothetical scenario where a single exchange controls and regulates all trading for the entire U.S. Treasury market (cash, futures, options, etc.). Frequent-batch auctions⁵¹ or some other “fair” matching algorithm is utilized. Spoofing, layering, and other bad behavior is made uneconomic. Hidden orders and other complex order types are forbidden. Latency arbitrage is eliminated. Would this hypothetical exchange provide a bona fide measure of liquidity in the market? Generally, simplicity leads to clarity and complexity tends to obscure. Some market participants would certainly approve of a simplification of market structure and the resultant improvements in transparency for both price discovery and liquidity. However, there are many other market participants that thrive off complexity and fragmentation. We certainly believe that the availability (or lack) of data affects the ability of market participants to construct accurate liquidity measures. However, care needs to be taken that transparency does not benefit one segment of the market to the disadvantage of others.

c. How do different indicators provide information on different aspects of liquidity, and in what ways?

As mentioned in the previous subsection, there are a wide variety of different liquidity measures or indicators. These measures can convey information spanning a range which includes macro level trends all the way down to microstructure analysis. Generally speaking, this information is proprietary in nature. Perhaps the academic community or the general public will have some relevant commentary worth disclosing.

d. Which measures best represent the resilience of liquidity, or the relationships between liquidity and volatility?

The relationship between liquidity and volatility is complex and interdependent. Certainly a decrease in measurable liquidity can lead to greater volatility. Likewise, an increase in volatility can influence the behavior of market participants (both manual and automated) and lead to a decline in liquidity. A lot of analysis in both the public and private sector focuses on observable markets - typically microstructure data from a CLOB. While such analysis can explain the resilience of liquidity during most market conditions, certainly it is difficult to quantify resilience under extreme market stress.

The market is quite comfortable with both the increase of volatility and decline of liquidity that occurs around “known” events.⁵² It is only unexpected volatility (such as that experienced on Oct 15, 2014) that seems to concern the official sector and the market as a whole. These types of events are extremely rare and difficult to analyze. Most market participants react in predictable ways during most conditions. We assume government researchers were able to utilize participant-level data to draw conclusions regarding

51 <http://faculty.chicagobooth.edu/eric.budish/research/hft-frequentbatchauctions.pdf>

52 <http://libertystreeteconomics.newyorkfed.org/2016/02/high-frequency-cross-market-trading-and-market-volatility.html#.VuXnylQrKUK>

how individual market participants reacted to extreme volatility when compared with control days. We also assume the reactions of these individual market participants were unpredictable and the result of unique risk optimization functions pertinent to each firm or trading group. We believe the combination of all these individual optimization functions dictates how the market will react under extreme stress.

The private and public sector does not have participant-level detail. This makes it more challenging to model the relationship between liquidity and volatility during periods of extreme stress. That being said, the reaction of any market participant to extreme market stress is individual in nature. We believe it is critical for the official sector to have the data needed to conduct thorough post-mortem analysis of such events to try and determine if current market structure makes such events more likely.

e. To what extent are these measures of liquidity and the resilience of liquidity different from measures used in other markets that have witnessed similar market structure changes? What are the idiosyncratic factors unique to Treasury cash markets that may cause these measures to differ?

The U.S. Treasury market bears some resemblance to other markets, particularly with respect to market microstructure. When the inter-dealer cash markets began supporting electronic protocols commonly used by other exchange and trading venues, the ability for HFT specialists to easily compete in the U.S. Treasury market was assured. There are some idiosyncratic differences in the intra-dealer cash markets which require specialized treatment - specifically the presence of a “workup” trading state.⁵³ That being said, we believe it is logical to conclude that automated responses to extreme market stress in the U.S. Treasury market will be similar to responses that would occur in other asset classes. For most HFT specialists, U.S. Treasuries are just another product, much like oil futures or Krispy Kreme common stock. This is not meant to disparage the liquidity provided by HFT. We are merely pointing out that there are obvious limitations to the amount of risk that HFT specialists are willing to accept given the inability or unwillingness to hold overnight inventory.

Despite similarities in market microstructure, we believe the value of U.S. Treasuries as a risk-free investment and as an effective hedge ensures that any major decline in liquidity and increase in volatility is temporary. There is undeniable value in U.S. Treasuries due to its risk-free qualities. We believe lack of “true” liquidity in U.S. Treasuries will always be found to be asymmetric. We can envision demand pressure to be so strong during periods of uncertainty that there might be a lack of sellers to offset buying pressure. This is exactly the type of scenario that occurred on Oct 15, 2014.⁵⁴ However, we believe any extreme movement to the downside would most likely be caused by technical issues or minor microstructure “flash events”. Market participants willing to hold inventory would quickly recognize such an event as an opportunity. This type of downward “flash move” might concern the official sector, but we believe this type of event is only a symptom of market microstructure and in no way reflects a “true” decline in the value of U.S. Treasuries. Today, market participants are quite comfortable that there is still value in the 30-year bond despite the absence of any bids in the market prior to some important economic release. We believe investors in U.S. Treasuries understand that temporary volatility linked to market microstructure in no way detracts from the value of the product. Of course, our views regarding permanent loss of liquidity in the U.S. Treasury market are made known in our opening statement.

⁵³<http://libertystreeteconomics.newyorkfed.org/2016/02/the-workup-technology-and-price-discovery-in-the-interdealer-market-for-us-treasury-securities.html#.VuWmpZwrK00>

⁵⁴ If extreme demand for U.S. Treasuries concerns the official sector, perhaps the U.S. Treasury Department or Federal Reserve could intervene and provide liquidity in a premeditated way.

f. What changes, if any, have you observed in these measures over recent years? Over recent months?

We have witnessed a number of changes in liquidity measures in recent years. Leverage ratios have forced many bank-dealers to retreat from the public markets and prioritize internalization of flow. Bank-dealers are less aggressive when quoting in the DtC markets. Repo trading is more difficult, particularly when volatility is high. Latency arbitrage now occurs between the cash and futures markets at nearly the speed of light. This “winner take all” environment results in concentration. Reasons for these changes are described in detail in our opening statement.

g. What microstructure features of the U.S. Treasury futures and cash markets, including both IDB venues and dealer-to-customer markets, have affected the functioning, liquidity, efficiency and participation in these markets? What features have affected the functioning of the Treasury market as a whole?

The RFI states that trading in the inter-dealer cash markets bears “some resemblance to other highly liquid markets, including equities and foreign exchange markets, where PTFs and dealers transact in automated fashion, sometimes in large volumes and at high speed.”⁵⁵ We believe this resemblance is not coincidental. The technology that enables electronic trading in the U.S. Treasury market is exactly the same as the technology underlying many other liquid markets. At the microsecond level it does not matter what is being traded. As long as a given security has a perfect or close substitute trading on another electronic platform, latency arbitrage can thrive.

HFT is a controversial topic. There are disagreements regarding whether HFT is negative or beneficial for liquidity. Despite differences in opinion, it is clear that HFT exerts a major influence on the U.S. Treasury market. It is our opinion that this influence will continue to grow due to continued technology innovation and growing regulatory pressure on position taking. If the current evolution in market structure is not a desirable result, we believe changes are required.

It is our belief that electronic trading and automation has brought many positives to the US Treasury market. As is true in most industries, technology has made markets more efficient. The manpower costs of doing business have decreased. Price discovery is more transparent and bid-ask spreads have tightened. However, it is our opinion that high-frequency trading (HFT) - particularly its continued evolution in a race to zero latency - has been more disruptive rather than constructive for the Treasury market as a whole.

There is a detailed paper from Eric Budish, Peter Cramton, and John Shim entitled "The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response" in which the authors describe high-frequency trading and the "race to zero" as a symptom of flawed market design. The following quote from this paper summarizing previous research done by others is particularly relevant:

The empirical record is unambiguous that, overall, IT has improved liquidity—see especially Hendershott, Jones, and Menkveld (2011), which uses a natural experiment to show that the transition from human-based liquidity provision to computer-based liquidity provision enhanced liquidity. This makes intuitive economic sense, as IT has lowered costs in numerous sectors throughout the economy. However, there is little support for the proposition that the speed race

per se has improved liquidity. Moreover, in the time series of both bid-ask spreads over time (Virtu 2014, p. 103) and the cost of executing large trades over time (Angel, Harris and Spatt 2015, p. 23; Frazzini, Israel, and Moskowitz 2012, table IV), it appears that most of the improvements in liquidity associated with the rise of IT were realized in the late 1990s and early to mid-2000s, well before the millisecond and microsecond-level speed race.⁵⁶

Budish, Cramton and Shim are critical of latency arbitrage - they use the term “sniping” to describe the process of trading against resting orders that are informationally disadvantaged. This “sniping” behavior results in the capture of an “arbitrage rent” - the profit acquired via latency arbitrage. This is negative for liquidity:

These arbitrage rents increase the cost of liquidity provision. In a competitive market, trading firms providing liquidity incorporate the cost of getting sniped into the bid-ask spread that they charge; so there is a positive bid-ask spread even without asymmetric information about fundamentals. Similarly, sniping causes the continuous limit order book market to be thin...⁵⁷

Informational arbitrage would still exist even if HFT was somehow outlawed. It is our opinion, however, that latency arbitrage conducted at the speed of light has negative consequences for market liquidity without providing any discernable value. Is price discovery at the microsecond level of granularity necessary in order to make an economic decision concerning the purchase of the U.S. Treasury 10-year note? As Budish, Cramton, and Shim summarize:

We emphasize that our results do not imply that on net HFT has been negative for liquidity or social welfare. Our results say that sniping is negative for liquidity and that the speed race is socially wasteful.⁵⁸

Focusing specifically on microstructure changes in the U.S. Treasury market, we believe it is appropriate to discuss a specific technical change that was implemented in the cash intra-dealer markets - the introduction of ITCH and OUCH exchange protocols. ITCH and OUCH protocols are characterized as “binary low latency options well-suited for high frequency trading.”⁵⁹ Not only are these protocols low latency, but ITCH enables full order book transparency - every single resting order is viewable. We believe this “improvement” is not useful for any market participants other than those engaged in HFT.

John McPartland, senior policy advisor at the Federal Reserve Bank of Chicago, published a paper making nine recommendations that he believes would restore “fairness and balance to market participants.”⁶⁰ McPartland summarizes his sixth recommendation as follows:

Visibility into the order book should be no more granular than aggregate size at each price point. Market participants should not be able to view the size of individual orders or any other identifiers of any orders of others. This more granular information is not information that any market participant needs to make a fully informed economic decision as to the instantaneous value of the financial instrument being traded.⁶¹

56 <http://faculty.chicagobooth.edu/eric.budish/research/hft-frequentbatchauctions.pdf> pp. 1593

57 <http://faculty.chicagobooth.edu/eric.budish/research/hft-frequentbatchauctions.pdf> pp. 1554

58 <http://faculty.chicagobooth.edu/eric.budish/research/hft-frequentbatchauctions.pdf> p. 1594

59 <http://www.nasdaqomx.com/technology/thoughtleadership/marketview-magazine/viewarticle?contentId=38762>

60 <https://www.chicagofed.org/publications/policy-discussion-papers/2013/pdp-1>

61 <https://www.chicagofed.org/publications/policy-discussion-papers/2013/pdp-1> p. 2

McPartland further qualifies the impact to liquidity:

It should become obvious that displaying both the order sizes and the time stamps of all other orders in the order book can only have a detrimental impact on market liquidity. The granularity of order book information currently being provided has now exceeded all bounds of propriety, confidentiality, and common sense.⁶²

We agree that such detailed order book information isn't required for making economic decisions. That being said, ITCH and OUCH are clearly beneficial for HFT specialists given the added expense associated with obtaining access to these protocols.

One final observation about microstructure in the U.S. Treasury market relates to the consequences of HFT dominance in the market. HFT is incredibly competitive. There are massive advantages to being the fastest and diminishing returns for all others. This tends to promote concentration. One of the reasons we believe there will be an increase in "rare but severe bouts of volatility" is due to concentration in the market - particularly among liquidity providers. HFT specialists carry little to no overnight inventory. If such firms also dominate liquidity provision in the U.S. Treasury market, we believe volatility shocks similar to Oct 15, 2014 will become increasingly more common. We believe continuous latency arbitrage has greatly reduced the diversity of firms providing liquidity in the U.S. Treasury market. This could prove to be detrimental for liquidity provision during periods of extreme stress.

1.2 What changes, if any, have you made or observed in investment, hedging, and trading practices in response to shifts in Treasury market structure?

We have reduced our participation in the U.S. Treasury market in terms of providing short-term liquidity. Our involvement in longer term liquidity provision has remained relatively constant - driven by basis and relative value opportunities. We have made a cognizant decision in the U.S. Treasury market not to compete in the high-frequency "race to zero." Over time as the investment required to continue to compete in HFT became more specialized and more expensive, we decided the risks and expense outweighed the reward with respect to the trading strategies we prioritize. As a result, we tend to react more slowly to market shocks in order to minimize the negative effects of latency arbitrageurs. We have participated in the U.S. Treasury market for over twenty years, and this is not the first time we have needed to adapt to changing market conditions. More concerning for us is the decline in primary dealer participation in the DtC markets. Most market participants rely on infrastructure set up by primary dealers to provide liquidity in securities that are less liquid. This observation and others related to the evolution of Treasury market structure are discussed in detail in our opening statement.

1.3 How does the way in which you transact in or provide liquidity to the U.S. Treasury market change during periods of stress?

Our trading strategies within the U.S. Fixed Income market would be best characterized as relative value and basis trading. Market stress can often lead to opportunities. As a general rule, we would be more likely to provide liquidity during periods of stress when opportunities more easily overcome the negative effects of latency arbitrage.

1.4 Looking forward, do you anticipate significant changes in the structure of the U.S. Treasury market absent further regulatory changes? What would be the key benefits and/or risks

⁶² <https://www.chicagofed.org/publications/policy-discussion-papers/2013/pdp-1> p. 27

of these changes in market structure? What key factors are likely to drive these changes? What changes are you planning to your firm's investment and trading policies, strategies, and practices?

We believe the "race to zero" will continue. There isn't anything unique about the U.S. Treasury market that either encourages or discourages this trend. We believe the cash markets in U.S. Treasuries will fragment further and price discovery will become more difficult as primary dealers retreat from the liquid markets and prioritize internalization of flow. The bilateral market will grow at the expense of centralized clearing. Many of these trends and others are discussed in our opening statement.

It is hard to interpret the phrase "absent further regulatory changes" in the context of regulatory changes that are currently under review or being formulated. In general, we have a fear that regulatory changes will force our firm out of the U.S. Treasury market. "One size fits all" regulation runs the risk of making trading in the U.S. Treasury market uneconomical for many participants that hold overnight inventory. We hope the official sector takes care not to unintentionally punish smaller firms that pose no risk to the U.S. Financial System. Many of these firms had nothing to do with the last financial crisis (nor did they receive any government assistance). We believe such an outcome would be both a counterintuitive and unjust response to the financial crisis.

It is a fact that primary dealers (and other bank and non-bank dealers) provide an economically beneficial service to the U.S. Financial System with regards to providing liquidity in the primary and secondary markets for U.S. government debt. Care needs to be taken not to harm the U.S. taxpayer by damaging liquidity provision. If regulation encourages firms to be less involved in providing liquidity for U.S. government debt in order to pursue riskier strategies, it is possible such regulation actually does the U.S. taxpayer a disservice.

1.5 What changes to the U.S. Treasury market structure, whether through public or private sector initiatives, might be advisable given the recent and expected future evolution? What role should the public sector play in driving or facilitating these changes?

Our opening statement comments extensively on technological and regulatory changes and their effects on liquidity provision. We believe U.S. Treasuries are special. Any threat to the liquidity premium of U.S. Treasuries risks harming the U.S. taxpayer. We believe care needs to be taken to ensure primary dealers are not prevented from serving as the credit-facing intermediary the market requires. Otherwise, FICC or some other entity (not engaged in risk-taking) needs to be strengthened to support customer-to-customer trading between cash and collateral providers in the U.S. Treasury market.

We believe mandating centralized clearing for U.S. Treasuries increases safety, levels the playing field for all participants, and provides greater transparency for the official sector. We believe the continued "race to zero" no longer benefits any market participants other than those engaged in latency arbitrage.

We believe hedged position taking benefits liquidity. Liquidity provision would be enhanced by correcting current inefficiencies in margin relief between cash and futures. Regulation focusing on settlement risk (like the CCLF) punishes hedged position taking. We also believe CCPs should be more transparent with respect to their risk models. This would allow firms to be more proactive rather than reactive to changes in margin.

Finally, we believe the public sector (especially the media and our elected government officials) could play a decisive role in reshaping our regulatory response to the last financial crisis. Providing liquidity for

U.S. government debt should not be characterized as a “bailout.” We believe this characterization does more harm than good to the U.S. taxpayer. We believe loss of liquidity in U.S. Treasuries assures a higher debt burden for all.

1.6 What are the benefits and risks from the increased speed with which secondary market transactions take place? Do these benefits and risks differ across individual products (e.g. on-the-run versus off-the-run securities)? How have market participants and trading venues responded to, or facilitated, improvements in speed, and how, if at all, should policy makers respond?

When analyzing the effects of increased speed in the secondary market, we believe it is appropriate to focus on the intra-dealer cash markets for on-the-runs. The vast majority of transactions in the secondary market occur in these securities. More seasoned securities (off-the-runs) are much less liquid and are generally quoted as a spread to on-the-runs. Any benefits or risks that increased speed brings to these less liquid securities and markets (like the DtC markets) are derived from an increase in speed in the intra-dealer cash markets where volume in on-the-runs is dominant.

As mentioned previously, we believe electronic trading and automation have brought many positives to the U.S. Treasury market. Price discovery is more transparent and efficient. Bid-ask spreads have tightened. Automation has led to improvements in efficiency and overall cost reduction. However, we believe the continued “race to zero” (highlighted by the introduction of ITCH and OUCH) is only beneficial to HFT and brings a number of specific risks into the system. Given the resemblance of the intra-dealer cash markets to other highly liquid markets, it is worthwhile to discuss some of the general risks associated with transacting at a high rate of speed. Budish, Cramton and Shim describe one of these risks:

In the continuous market, trading algorithms are incentivized to react as fast as possible whenever they receive a new piece of information. This means, first, that trading algorithms are incentivized to trade off “smarts” for speed, that is, to make trading decisions based on only partial information and with only simple economic logic, since incorporating additional information and using more complicated economic logic each take time. And, second, that trading algorithms are incentivized to trade off error and risk checking for speed, because error and risk checking each take time and even tiny speed advantages can matter.⁶³

This is a purposeful design decision by participants in the “latency race” that runs completely contrary to the recommended best practices. Other risks to liquidity associated with increased speed include bad behavior such as *spoofing*, *layering*, and *quote stuffing*. To be fair, spoofing is not unique to HFT. But as McPartland states, HFT allows these techniques “to be taken to new levels.” The SEC and FINRA have found firms liable for not properly detecting and reporting such behavior. However, it can be difficult to detect such conduct because “intent” can be a tricky thing to determine. Liquidity providers engaged in HFT submit countless orders while striving to improve queue position. It can be difficult to distinguish between legitimate market making and manipulative behavior, particularly if a firm is intent on disguising such behavior. McPartland states:

It is truly astonishing with all of the human intellect and sophisticated technology that this industry has marshalled, that individual algorithms to this day are not individually identified at

63 <http://faculty.chicagobooth.edu/eric.budish/research/hft-frequentbatchauctions.pdf> p. 1615

most trading venues.⁶⁴

Without the ability to uniquely identify algorithmic orders, it is difficult to infer intent. Combined with market fragmentation, post-mortem analysis is extremely difficult, if not impossible. By improving the ability of the official sector to detect bad behavior, we believe spoofing, layering, and quote stuffing may become self-limiting. However, before this activity becomes self-limiting the credible threat of detection needs to exist. At the very least, we believe the official sector should take whatever steps are necessary to improve the audit trail so that there is a reasonable chance that bad behavior is detected.

Exchanges and other electronic trading venues (including the intra-dealer cash markets) are also challenged by the need to handle orders as quickly as possible due to the serial nature of continuous matching. Budish, Cramton, and Shim state:

While processing any single order is computationally trivial, even a trivial operation takes strictly positive computational time, which implies that during surges of activity there will be backlog and processing delay. This backlog can lead to confusion for trading algorithms, which are temporarily left uncertain about the state of their own orders and the state of the limit order book. Moreover, backlog is most severe at times of especially high market activity, when reliance on low-latency information is also at its highest.⁶⁵

This is exactly one of the findings of the JSR pertaining to October 15, 2014. High message rates associated with cancellations of a very large number of limit orders increased latency on the trading platforms and may have resulted in “behavior adjustments” for liquidity providers.⁶⁶ Isn’t this the very definition of *quote stuffing*?

It seems logical that the trading venues, being a centralized access point, would be in an ideal position to prevent automated algorithms from malfunctioning. But the trading venues are also computationally challenged by the continuous-time market, so only cursory risk limits can be enforced real-time. Undesired behavior is usually only identified after the fact via post-mortem analysis. Unfortunately, the current rules enforcement model is certainly more reactive than proactive.

1.7 To what extent have changes in Treasury financing markets affected liquidity in cash Treasury markets, and what is the best evidence of those effects? Looking forward, do you anticipate major changes in the Treasury financing markets and how would this impact the functioning of the cash Treasury markets? How have firms modified their trading strategies in response to, or in anticipation of, these changes? What changes in Treasury financing markets could improve market efficiency? What are the potential benefits and risks to the Treasury market of increased access to central clearing of Treasury repurchase agreement (“repo”) transactions?

A lot of detail pertaining to this question can be found in our opening statement. It is self-evident that changes in the financing markets affect liquidity in the cash markets for market participants that hold overnight inventory. We believe liquidity in the repo market has declined for reasons related to the current infrastructure of our financing markets. Currently, financing markets are largely reliant on G-SIBs (and other large bank-dealers) to serve as credit-facing intermediaries. The lack of diversity in firms serving this credit-facing role means that regulation addressing the “too big to fail” problem reduces liquidity in

64 <https://www.chicagofed.org/publications/policy-discussion-papers/2013/pdp-1> p. 28

65 <http://faculty.chicagobooth.edu/eric.budish/research/hft-frequentbatchauctions.pdf> p. 1615

66 JSR p. 31

both the financing markets and the cash markets. As stated previously, our opinions on this topic are addressed extensively in our opening statement.

We are major proponents of extending access to centralized clearing. We believe CCPs can effectively serve as the credit-facing intermediaries the U.S. Treasury market requires. If transparency and greater market efficiency are desired goals, centralized clearing should be strengthened. Unfortunately, we believe concerns regarding CCPs and systemic risk associated with U.S. government debt (the CCLF being a perfect example) will thwart this evolution and push the market back into a bilateral existence. It is our opinion that the official sector should either recognize the critical role that our largest banks serve as credit-facing intermediaries, or they should strengthen and encourage CCPs to serve as the conduit for “customer-to-customer” trading. Illiquidity in the financing markets harms liquidity provision in the cash markets - particularly for hedged position taking. Perhaps there is a belief that HFT can fill this liquidity gap. However, we believe liquidity provision in less liquid securities (other than on-the-runs) is dependent on holding overnight positions. Holding overnight inventory requires access to cost effective financing, which HFT specialist firms are ill equipped and not likely incentivized to pursue. We believe dysfunction in the financing markets has already damaged liquidity in the U.S. Treasury market. This negative trend seems likely to continue unless steps are taken.

CCPs are in a perfect position to replace the G-SIBs as the credit-facing intermediary the U.S. Treasury market requires. CCPs do not take on market risk. This difference should make a CCP a much safer counterparty for a cash investor than a G-SIB or another risk-taking firm. Thus, CCPs should be encouraged to serve as the credit-facing intermediary between collateral providers and cash investors. Growing centralized clearing in the financing markets would seem to improve market resiliency in a crisis as well as enhance liquidity. Why has this not occurred?

Inertia is a powerful force. Many cash investors such as Money Market Funds (MMFs) have historically relied on banks rather than CCPs to serve as credit-facing intermediaries. Rather than join a CCP, cash investors rely mostly on bilateral agreements with banks. These banks in turn invest this cash however they see fit - risk taking, prime brokerage, repo, etc.

The Federal Reserve Bank of New York (FRBNY) has gone as far as to acknowledge this inefficiency by instituting the overnight RRP program.⁶⁷ In fact, to some degree the overnight RRP program has encouraged many cash investors to keep the status quo. During periods when banks are less willing participants in the bilateral repo market (quarter-ends for example), cash investors will utilize RRP with the FRBNY. Thus a major point of positive differentiation between banks and CCPs (that have no calendar-based constraints) is lost.

Relying on bilateral agreements with banks versus joining a CCP is clearly an active choice being made by cash investors (MMFs) today. Clearly the value proposition of joining a CCP needs to improve in order to encourage cash investors to join CCPs. Otherwise, we have concerns for liquidity in the financing markets. This lack of liquidity will certainly spill over into the cash markets.

1.8 What share of trading (in the case of dealers, your own trading) is internalized? To what extent does it vary depending on security type (e.g., on-the-run, off-the-run)? How has this changed over time and how do you expect it to develop? What implications for the Treasury market, if any, do you see as a result of these developments?

⁶⁷ https://www.newyorkfed.org/markets/rrp_faq.html

We don't internalize any flow. We only engage in proprietary trading and don't have any customers.

We certainly understand the incentive to internalize flow. Regulatory pressure has likely incentivized G-SIBs and other firms subject to leverage ratios to match customer flow internally and avoid holding illiquid inventory. There is also an incentive to keep information about customer demand out of the public arena given the relative dominance of HFT in the inter-dealer markets. Obviously internalization leads to less transparency and reduced liquidity in both the DtC and inter-dealer markets. We believe this is a negative trend for liquidity provision in the U.S. Treasury market.

II. Continued monitoring of trading and risk management practices across the U.S. Treasury market and a review of the current regulatory requirements applicable to the government securities market and its participants

2.1 Are the risk management controls currently in place at U.S. Treasury cash and futures trading venues, as well as firms transacting in those venues, properly calibrated to support the health of the U.S. Treasury market? Why or why not? Please list the types of controls that are employed, as well as planned changes or improvements. In addressing these questions, please consider the dealer-to-customer market, trading on IDB platforms, and the futures market, as applicable.

We comment on a number of these risks in our opening statement. Risks specifically associated with the increased speed of trading are also discussed in previous questions. Generically, we believe there are two basic types of risk management controls employed at trading venues: position-based and transaction-based. Current risk management tools are effective to a degree, but we believe the shortcomings are fairly obvious. Position-based controls are limited to the counterparty exposure that a trading venue can see. Fragmentation hinders this ability. Transaction-based risk measures can be difficult to employ at the trading venue level because of a lack of knowledge regarding individual strategy function. Heuristics could potentially be developed to stop strategies from acting "abnormally." However, we believe this would be incredibly difficult to achieve in practice due to the demands already placed on trading venues - they are already constrained by the serial nature of continuous matching. The reality is that comprehensive transaction-based controls are impossible to deploy in a market that is "racing to zero."

The DtC markets rely primarily on RFQ-based trading. This type of trading is not well suited for HFT. Errors could certainly still occur with respect to risk management. But the relatively slower speeds at which transactions occur within the RFQ model ensure that it would be more difficult for a catastrophic error to occur. Such an error would also be more limited in scope, because the DtC markets only support transactions between two parties - dealer and customer. There is risk in every transaction - there is also risk in conducting a trade over the phone. In general, the risks associated with the DtC markets are related more to risks associated with a lack of transparency rather than a risk associated with the use of technology.

Individual firms are already incentivized not to lose money. There is likely a large disparity in the type and effectiveness of risk control measures deployed across firms. Some firms may even consider some of these measures part of their strategic proprietary competitive advantage. In fact, some high-frequency strategies likely consider the avoidance of risk management controls as necessary in order to effectively compete in latency arbitrage. We believe speed and risk management are largely incompatible. Without changing the underlying technical infrastructure of the U.S. Treasury market, this incompatibility will continue to result in undesirable effects.

a. What policies and risk management practices at U.S. Treasury cash and futures trading venues, as well as at firms transacting in those venues, could be improved or developed to mitigate potential risks associated with increased automation, speed, and order complexity? Please consider the risks posed by trading, risk transfer, and clearing and settlement.

We comment on this topic quite extensively within our opening statement as well as in previous questions. We believe centralized clearing would benefit the U.S. Treasury market tremendously and help mitigate both clearing and settlement risks. We also point out the asymmetrical risks currently facing FICC and the IDBs from pre-netting conducted outside of the FICC membership.

With respect to increased automation, speed, and order complexity, we generally believe such “improvements” benefit HFT and do little to improve market liquidity or stability. The need for more complex and timelier risk mitigation measures is a direct consequence of this evolution. The following analogy is probably appropriate - just because we have the technology to build a self-driving car that can travel at speeds in excess of 200 mph doesn’t mean that our public infrastructure can safely interoperate with such innovation. At some point it becomes necessary to consider the public good.

b. To what extent should venue-level risk management practices be uniform across Treasury cash and futures trading venues? For example, should there be trading halts in the Treasury cash market and should they be coordinated between Treasury cash and futures markets, and if so, how? Should Treasury cash, futures, options, and/or swaps venues coordinate intraday risk monitoring, and if so, at what frequency? If there were trading halts, how should they be implemented for bilateral trading activity in the Treasury cash market? What would be the primary challenges in implementing such trading halts, particularly given that trading in the U.S. Treasury cash market is over-the-counter, global in nature, and conducted on a 24-hour basis?

Some risk mitigation concepts can be theoretically pleasing, but impractical to implement. We generally believe it is better to do nothing than implement a complex half-solution that won’t actually achieve a desired result. We will discuss both the coordination of intraday risk as well as the concept of trading halts in turn.

Coordinating intraday risk between trading venues would be extremely difficult, if not impossible, in a trading environment perpetuating the “race to zero.” Trading venues currently struggle to match orders efficiently during periods of increased message transmission. Adding external dependencies with respect to risk management doesn’t seem practical - at least with respect to limiting risk associated with HFT. Latency arbitrage generates profitability through the process of “sniping” stale quotes. The speeds at which HFT transactions occur ensures that any external risk-related data is stale by definition. It certainly might be possible to coordinate risk management on a longer intraday time horizon. However, the existence of a thriving bilateral market likely ensures that position-based information is inaccurate. Without implementing centralized clearing or some other reporting mechanism for all transactions in the U.S. Treasury market (including bilateral transactions), we believe the coordination of intraday risk management among trading venues only serves a very limited purpose.

With respect to trading halts, it certainly seems difficult to enforce a trading halt for securities that trade over-the-counter. Assuming this characteristic of U.S. Treasuries doesn’t preclude a trading halt or render it impotent, we believe it is important to consider whether trading halts in the U.S. Treasury market would do more harm than good. We certainly understand that many trading venues and exchanges have instituted rules-based trading halts. However, we question whether a trading halt in U.S. Treasuries actually guarantees a desirable outcome. Ignoring practical considerations associated with

implementation, would it have been beneficial for the market to have halted trading in U.S. Treasuries on Oct 15, 2014? Should there have been a halt after the initial rally? Would there have been a second halt needed when the market declined (the completion of the “round trip”)? If neither of these conditions justified a market halt, under what conditions would a market halt be warranted? Given the superior liquidity of U.S. Treasuries, we believe it is best not to interfere with market functioning. We make this statement without even considering the difficulty of enforcing a trading halt in U.S. Treasuries.

Despite our belief that trading halts are unnecessary, we understand the incredible pressure the official sector would be under if some violent unexpected move in the U.S. Treasury market were to occur. Naturally there would be a tremendous amount of criticism of the official sector after the fact.⁶⁸ Despite the difficulties involved, we would certainly understand if the official sector decided trading halts were necessary in order to provide market stability. If such an effort is undertaken, we only hope that a rules-based differentiation can be made between “unexpected” volatility and other market moves that are simply the result of policy changes, economic data, or global events.

c. To what extent should U.S. Treasury cash market platforms be responsible for monitoring, identifying, and/or reporting suspicious trading activity?

Electronic trading platforms are in a difficult position because there can be a conflict of interest associated with identifying bad behavior. It is only natural that trading platform operators would be reluctant to examine the trading activity of their best customers.⁶⁹ We believe the official sector should take ownership of this task and eliminate this conflict of interest. As pointed out earlier, we believe identifying suspicious trading behavior would be made easier by requiring every individual algorithm to maintain a unique identifier.⁷⁰ Regulators have a difficult time today trying to infer intent. By making the audit trail less ambiguous, we believe the official sector will strengthen its ability to identify suspicious behavior. The credible threat of identification may even preempt bad behavior.

2.2 What internal risk controls are commonly employed by firms using automated, including algorithmic, trading strategies in the Treasury cash market? Are these different or similar to those used in the Treasury futures markets, and what are the reasons for any differences? How are such controls designed and triggered? How frequently are they triggered? What internal process controls commonly govern the implementation and modifications of trading algorithms?

Risk control mechanisms are proprietary. There is likely great similarity across firms in terms of function, but large diversity in terms of implementation. All automated strategies share some common characteristics and basic risk control goals are likely to be homogeneous across most firms. However, more complex strategy-specific risk controls are required in many cases. Comprehensive understanding of the strategy is important in order to effectively implement appropriate controls. By definition, more complex strategies usually require more complicated risk control mechanisms. Generally, we don't believe basic risk control mechanisms for cash markets are substantially different than those for other products. Any diversity in risk control mechanisms is more likely to be driven by specific strategy requirements. Some firms have centralized technology and strategy groups that deal exclusively with trading algorithms. Other firms are decentralized and give individual trading groups autonomy to develop their own algorithms. We suspect most firms have procedures in place for handling changes to trading

⁶⁸ It is likely some chart of U.S. Treasury prices would be constructed after the fact showing the exact moment a trading halt should have occurred.

⁶⁹ We are not implying that any trading platform operators are willingly ignoring or underreporting suspicious behavior. We are merely pointing out that there is a potential conflict of interest.

⁷⁰ McPartland recommendation #8: <https://www.chicagofed.org/publications/policy-discussion-papers/2013/pdp-1>

algorithms. However, adherence to these procedures is likely left in the hands of those responsible for development and implementation.

It is obvious that firms are incentivized not to lose money. But wherever there is complexity, errors can certainly occur. It is also important to emphasize that real-time risk checking mechanisms slow down high-frequency algorithms. The “race to zero” incentivizes minimizing, preapproving, or even eliminating these risk checks altogether. Budish, Cramton and Shim describe the quandary HFT algorithms face in the continuous market: “...trading algorithms are incentivized to trade off error and risk checking for speed, because error and risk checking each take time and even tiny speed advantages can matter.”⁷¹ In other words, some trading strategies are incentivized to eliminate risk controls in order to achieve a competitive advantage. This is certainly a major risk with the current “race to zero” that is not unique to the U.S. Treasury market.

2.3 What types of algorithmic trading strategies are commonly used by participants in the U.S. Treasury market? What features do those strategies have in common, and what features differ across strategies? What are the potential benefits and risks to an effective U.S. Treasury market functioning resulting from certain algorithmic trading strategies, certain order types, and/or particular trading venue policies or practices?

The TMPG published a white paper entitled “Automated Trading in Treasury Markets” which provides details regarding different types of algorithmic strategies used by participants in the U.S. Treasury market.⁷² We believe this white paper does a good job describing the different kinds of automated strategies that are commonly deployed.

We have previously stated our opinion that the “race to zero” is not beneficial for liquidity or market stability. We believe a wide variety of order types only adds complexity to the system and hinders transparency. We agree with Budish, Cramton and Shim that spoofing, layering, and particularly quote stuffing are “symptoms of a flawed market design.” That being said, we do understand that trading venues are certainly incentivized to maximize profits. They are not nonprofit entities run by the members, for the members. Nor are they public utilities. HFT generates massive profits for trading venues. Trading volumes are higher which increases fees. Because “sniping” is very profitable for latency arbitrageurs, trading venues can charge a premium for “low latency” feeds and co-location. If trading venues could generate these same profits in some other way that was universally viewed as being beneficial for the markets - trading venues would certainly pursue such a strategy. Ultimately, it is the responsibility of the official sector to decide if the public good is being served. To be fair, our opinions are certainly biased by the fact that we aren’t currently profiting from latency arbitrage in the U.S. Treasury market.

2.4 How are best practices used in evaluating, and updating, risk management systems at a given firm? How does your firm make use of TMPG’s best practices (referenced above) for operations in the Treasury cash market? How can best practice recommendations be utilized in order to reinforce market integrity? What are the benefits and limitations of best practice recommendations?

The TMPG best practice recommendations are definitely useful as a guideline. Firms that follow these recommendations are certain to benefit internally from safer process and control mechanisms. By

71 <http://faculty.chicagobooth.edu/eric.budish/research/hft-frequentbatchauctions.pdf> p. 1615

72 https://www.newyorkfed.org/medialibrary/microsites/tmpg/files/TMPG_June%202015_automated%20trading_white%20paper.pdf

prioritizing risk mitigation as a major goal across all business areas, a firm should be able to minimize internal errors and avoid compromising market liquidity and integrity.

Firms are already incentivized not to lose money. Given this assumption, most firms (including ours) are already implementing most, if not all, of the TMPG best practice recommendations. In cases where best practices are not being followed, there is likely an economic incentive for not doing so. To be clear, we agree fully with the best practice recommendations. However, we believe two recommendations in particular are worth further discussion. The first of which is:

- Market participants employing trading strategies that involve high trading volume or quoting activity should be mindful of whether a sudden change in these strategies could adversely affect liquidity in the Treasury, agency, or agency MBS markets, and should seek to avoid changes likely to cause such disruptions.⁷³

This recommendation is well intentioned but impractical. In a market where massive technical improvements are measured in microseconds, trading algorithms are incentivized to trade off “smarts” for speed.⁷⁴ Profits alone drive these mechanical high-frequency algorithms. Internally, most liquidity-providing high-frequency algorithms have very well defined position and loss limits. Unexpected latency or volatility in the market will cause these systems to behave in atypical ways, potentially even shutting down. This is reasonable given the objective of most high-frequency liquidity-providing algorithms: capturing the bid-ask spread through active queue position management. These algorithms are certainly not programmed to consider any wider effects they may have on market liquidity. As the JSR states quite bluntly:

Most PTFs do not trade on behalf of clients and instead restrict their trading activity to proprietary positions. As a result, these firms make trading decisions, including liquidity provision decisions, primarily on the basis of immediate profitability and the level of market risk, rather than as a service offered in the context of existing customer relationships that are intended to be profitable over time.⁷⁵

The second recommendation on which we would like to comment is:

- Market participants and trading venues should ensure that they employ a robust change control process for designing, testing, and introducing new trading technologies, algorithms, order types, or other potentially impactful system features or capabilities.⁷⁶

This recommendation is quite reasonable and most firms are already likely adhering to it as part of their internal best practices. However, despite best intentions, errors will still occur. That is the nature of complexity. Logical errors in complex systems are impossible to prevent. It is important to acknowledge the certainty of “system errors” and ensure that appropriate procedures are in place to mitigate these effects. It is certain that exchanges and trading venues are quite diligent about internal controls and thorough testing. And yet, these technical glitches and operational errors continue to occur.⁷⁷ We believe the “race to zero” makes these types of errors much more likely and increases the chance that such errors may lead to market instability. Despite our opinion that “system errors”

73 https://www.newyorkfed.org/medialibrary/microsites/tmpg/files/TMPG_June%202015_automated%20trading_white%20paper.pdf

74 <http://faculty.chicagobooth.edu/eric.budish/research/hft-frequentbatchauctions.pdf> p. 1615

75 JSR p. 38-39

76 https://www.newyorkfed.org/medialibrary/microsites/tmpg/files/TMPG_June%202015_automated%20trading_white%20paper.pdf

77 <http://blogs.wsj.com/moneybeat/2015/05/06/list-of-operational-issues-for-markets-since-the-flash-crash/>

are inevitable, we believe it is still important to try and prevent such errors through proper process and control. But we hope the official sector at least acknowledges that “system errors” will still occur.

2.5 What are the benefits and risks associated with the current structure for clearing and settling Treasury securities transactions in the dealer-to-customer market and on IDB platforms, as applicable?

We discuss this topic in our opening statement. In summary, we believe there are clearing and settlement risks that are not currently being accounted for, especially with respect to HFT. Despite settlement risk in every transaction, HFT specialists are treated as if they pose no risk.

a. Are intraday margining practices in the Treasury cash market for both cleared and non-cleared transactions currently sufficient to protect against counterparty risk, especially in light of the speed at which positions can be accumulated? What options are available to improve margining practices? Should the maximum potential intraday exposure of firms be calibrated relative to their level of capital? If so, how should it be calibrated? Are alternative measures of potential exposure more meaningful for automated trading strategies, and if so, which type of measures?

This question is discussed in our opening statement. In summary, we believe risk mitigation has not kept up with the increased speed of HFT. Position-based margin systems in the U.S. Treasury market have been in place for many years. Unfortunately, the current position-based margin framework does not account well for intraday risk (a “Knight Capital” type event being a prime example of potential risk). If the risk profile of HFT is undesirable for the official sector, we believe HFT should be regulated directly. Restricting access based on capitalization or posing other arbitrary requirements would only shift HFT to another group of market participants. We believe the safest form of risk mitigation is to mandate centralized clearing for the U.S. Treasury market. Transactional fees paid over time would help offset any risk that HFT brings to the system. This would help level the playing field for all market participants and ensure that the ability to engage in HFT is not just transferred to the well-capitalized few.

b. Currently, there are no statutory requirements that require participants to centrally clear cash Treasury transactions. Should such a requirement apply to any participants, particularly those with large trading activity or large positions? Would the secondary market for cash Treasury securities benefit from broader participation in centralized clearing? Why or why not?

This is also discussed in our opening statement. We believe centralized clearing would be greatly beneficial for both liquidity and market stability.

2.6 Many of the standards applicable to U.S. securities, commodities, and derivatives markets are not applicable to the U.S. Treasury cash market. Which differences, if any, should be addressed and how should standards be aligned? How will these affect the cost of accessing or participating in these markets, as well as of transacting in these markets? Would there be any implications to U.S. federal government borrowing costs? In addressing these questions, please consider the dealer-to-customer market, trading on IDB platforms, and the futures market, as applicable.

In our opening statement, we comment briefly on differences that exist between trading and clearing in the cash markets when compared with the futures markets (specifically the CME). We believe the futures market has many advantages when compared with the cash markets. Lack of fragmentation is certainly a

major advantage - particularly with respect to its effect on price discovery. But the biggest differentiator, in our opinion, is the fact that all transactions are reported and cleared through a CCP. By definition, this leads to greater transparency and improved risk mitigation. CCPs ensure that standards associated with clearing and settlement are consistently applied. This results in greater safety and ensures a level playing field for all market participants.

As mentioned in our opening statement, we don't believe centralized clearing and improved standards would be negative for liquidity in the cash markets. And thus, we don't believe there would be any negative consequences associated with U.S. federal government borrowing costs. The futures market has a broader range of market participants. The argument could be made that liquidity is comparatively more robust in the futures market. Despite enhanced standards in futures, we actually believe it is more cost effective to hold a position in futures than an equivalent position in cash. This is a separate issue. Effective regulatory capital rules for U.S. Treasuries have existed for many years. The financial crisis did not show these rules to be lacking. If anything, we believe the cross-margin framework between cash and futures should be made more effective. This would enhance standardization between the two products and have the important side effect of increasing liquidity provision.

a. What implications would a registration requirement for firms conducting certain types of automated trading, or certain volume of trading, in the U.S. Treasury market have on market structure and efficiency, investor protection, and oversight?

In our opinion, this seems like a reasonable request. Our only concern is if a registration requirement also comes with increased costs or time-consuming reporting requirements. As long as care is taken by the official sector not to place asymmetrical burdens on smaller companies that lack economies of scale with respect to personnel, we believe such an initiative has merit. We're not sure such a requirement would have any positive or negative effect on market structure or efficiency. But if this somehow improves investor protection and official sector oversight, we are certainly in favor.

b. Should firms that conduct certain types of automated trading, or certain volume of trading, in the U.S. Treasury market be subject to capital requirements, examinations and supervision, conduct rules, and/or other standards? What would be the implications of each?

We believe care needs to be taken in terms of mandating arbitrary requirements associated with "certain" types of automated trading or a "certain" volume of trading. That being said, we believe it is clear that current position-based risk mitigation measures do not adequately provide protection from catastrophic HFT errors. We have repeatedly stated our opinion that we believe centralized clearing is the best solution for mitigating these risks in a fair and non-arbitrary manner.

We again want to emphasize that care should be taken not to enact requirements that benefit larger firms to the disadvantage of smaller firms. If HFT is not desirable, it should be regulated directly. We certainly believe it is anticompetitive to restrict access to the market or outlaw certain types of trading behavior based on capital requirements or some other arbitrary determination. Doing so will promote concentration, create barriers to entry, and certainly impair liquidity. We believe mandating centralized clearing is the most efficient and fair way to level the playing field and not create advantages for either large well-capitalized firms or smaller less-capitalized firms.

2.7 Should self-trading be expressly prohibited in the cash Treasuries market? Does self-trading provide any benefits to the markets? Are there risk management tools, either at trading

firms or at trading platforms, which can effectively reduce levels of self-trading and improve trading efficiencies?

The JSR identifies numerous incidents of self-trading. This is not necessarily insidious behavior. In most instances it is probably the result of different strategies within the same firm independently transacting in the continuous-time market. The problem with the audit trail of today is that it is impossible to infer intent. Spoofing, layering, and wash trades could all be presented as behaviors of legitimate independent strategies - when in fact there may be intent to manipulate the market through coordination. Rather than attempting to regulate intent, doesn't it make sense to eliminate any economic benefit stemming from such behavior?

Checking against self-trading is punitive in the current world of microsecond based trading. No firm engaged in HFT would willingly initiate a "speed bump" in order to prevent self-trading internally. The problem with the current definition of self-trading is that it is dependent on the definition of "self" - is "self" defined by firm, trader, login, algorithm, or tag? We believe it is likely that trading venues will implement different definitions of "self" which may lead to confusion as well as continued manipulative behavior.

III. An assessment of the data available to the official sector on U.S. Treasury cash securities markets

We certainly agree that there is a need for more comprehensive official sector access to data within the U.S. Treasury market. It is important for the official sector to be able to conduct the type of exhaustive analysis that led to the publication of the JSR. To some, it was probably surprising that the official sector did not have the capability to thoroughly analyze the U.S. Treasury market. It is our belief that an improvement in capability that will come with more comprehensive data will enable the official sector to better understand and monitor the structure of the market. We also hope that the official sector will be able to more readily identify and correct suspicious behavior that occurs - particularly spoofing, layering, and quote stuffing.

Our views concerning data collection are predominately influenced by two major objectives. First, we agree that it is important for the official sector to have the data it needs to effectively monitor and provide for the safety and efficiency of the U.S. Treasury market. However, we also believe care is needed not to impose requirements with respect to data reporting that place a competitive burden on smaller firms. In other words, we are hoping the data acquisition process doesn't become a general data grab. We believe the process should be driven by specific goals and objectives, which in turn will determine the source and form of data that is needed.

As an example, we believe the official sector is likely interested in identifying suspicious behavior like spoofing and layering. To successfully identify this behavior it seems clear that granular order book data is needed. Is there enough information in the participant-level intra-dealer order book to identify spoofing and layering? We again point out one of John McPartland's recommendations:

Each automated trading system (each individual algorithm) that has the capacity to generate, modify, or cancel orders without human intervention should have a unique identifier. That unique identifier must be known to every trading venue where the trading system can direct, modify, or cancel an order. Trading venues must ascribe the unique identifier as a critical information element of all relevant orders and matched trades throughout the audit trail.⁷⁸

78 <https://www.chicagofed.org/publications/policy-discussion-papers/2013/pdp-1>

We generally believe it is important to ensure that the data being collected has the information needed to properly identify suspicious behavior. More detailed information in the audit trail would also likely help the official sector analyze individual algorithmic responses to unexpected market reactions – October 15, 2014 is a perfect example. We believe it would be hard for market participants to make an argument against uniquely identifying every algorithmically generated order. We believe the official sector certainly needs such identifiers in order to identify suspicious behavior.

We believe the DtC markets are generally self-monitoring. If a dealer behaves badly, customers will leave. Likewise, if a customer behaves badly, the dealer will terminate the relationship. One of the main reasons suspicious behavior can occur on inter-dealer platforms and on futures exchanges is the fact that it is anonymous. Anonymity is generally not a feature of the DtC markets – it is generally associated with trading in the intra-dealer markets. There is tremendous value in anonymity on the inter-dealer platforms – anonymous trading was the guiding principle behind the establishment of IDBs. We believe it is unfortunate that the “race to zero” combined with anonymity makes it economically beneficial to engage in suspicious activity.

With respect to reporting individual transactions in the U.S. Treasury market, we believe centralized clearing provides the simplest and most cost effective solution to the current lack of official sector data. CME Clearing has every single transaction in interest rate futures. In addition to all the other benefits associated with centralized clearing, we believe mandating centralized clearing for U.S. Treasuries would vastly improve market transparency and simplify the role of data collection in the official sector.

Finally, we believe it is much more efficient and fair for data to be reported from centralized sources: exchanges, intra-dealer brokers, and CCPs. We don't believe there is a lot of value in “double reporting” data that trading venues and centralized counterparties are already reporting. Costs associated with reporting scale. We believe it is important that regulatory reporting does not grow so burdensome that it creates an unlevel playing field for smaller firms as well as a barrier to entry.

IV. An assessment of the data available to the public on U.S. Treasury cash securities markets

We certainly agree that there is likely a need for more comprehensive public sector reporting. We understand such reporting is likely difficult given the fragmented nature of the market. Generally, we believe transparency is a redeeming quality with respect to perceptions of fairness as well as market efficiency. That being said, market fragmentation ensures that prices may in fact be inconsistent at the same moment in time for the same security. Reconciling that fact with public expectations for a single “fair” price might be difficult given current market structure. We don't have any particular view on whether it is critical to solve this inconsistency.

Sincerely,

Mike Zolik
Nate Kalich
Larry Magargal

Ronin Capital, LLC