



SPEECHES & TESTIMONY

Remarks of Chairman Timothy Massad before the Conference on the Evolving Structure of the U.S. Treasury Market

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Introduction

Thank you for that introduction.

I'm pleased to be here. And the CFTC is pleased to co-sponsor this conference with the Federal Reserve Board, the New York Federal Reserve Bank, the Securities and Exchange Commission and the Treasury Department. I would also like to thank the New York Fed for hosting again this year.

One year ago, we held this conference following what became known as the “flash rally” in the Treasury market. And one of the things I talked about was that in our markets —the futures markets — we have seen many other events where prices spike up or down quickly, without any apparent catalyst, and then largely retrace. I described a number of the events we have seen over the last few years in some of the most actively traded futures contracts, including the e-mini S&P, WTI crude and even traditional agriculture contracts like corn.

Now we had another event three weeks ago with the British pound sterling. In both the cash and futures market, we saw prices fall rapidly and then recover, though not fully.

So today I would like to talk about that pound event and how it compares to the October 15 event. My focus will not be on the macroeconomic forces and related factors, but rather on the activity observed in the futures market during the event window. And my purpose is to share some of the analysis that our surveillance branch routinely uses to look at market events. This will give you a sense of some of the things we do to monitor markets and analyze trading and liquidity. And following that, I will also say a few words about what we need to do to make sure our regulatory capabilities are as modern as our markets. This will include updating you on our proposed regulation regarding automated trading.

The British pound futures market is very different from the Treasury futures market, in terms of volume and order book depth. But in both cases, the futures markets are different in important, and often similar, respects from the cash markets. I highlighted some of these differences last year.

The futures market is very centralized. British pound futures are listed on the Chicago Mercantile Exchange; Treasury futures are listed on the Chicago Board of Trade. Trading for both takes place on the Globex electronic trading system.

All messages—orders, cancelations, modifications—come to the centralized order book. CFTC rules require open access to all market participants – so orders from banks, proprietary trading firms, hedge funds, asset managers, and end-users can be matched against each other. Market participants can see the top ten price levels and quantities on the limit order book. All trades are reported. We receive daily reporting of all transaction data that identifies participant trading by the millisecond. The exchanges are also very cooperative in providing us message data.

We don't regulate the cash or spot foreign exchange market. Trading activity in spot foreign exchange is much larger than in foreign exchange futures. And trading in the spot market occurs across multiple platforms using a range of execution methods.

The analytical tools I will describe have been built in-house at the CFTC and are some of those we routinely use to oversee the markets. I want to thank the CFTC staff for their hard

work and ingenuity in developing these capabilities.

Order Book Analysis for October 15, 2014 Treasury Event

So let's look at some of the data. Let me also note that for the protection of the proprietary information that we receive, we have fully anonymized the data in this presentation. In addition to not showing the names of any traders, we will not show specific prices and certain other information that could potentially lead to identification of any traders. But the slides you will see are based entirely on actual data.

This first slide shows a reconstruction of the full limit order book for the December Treasury contract on Oct 15, 2014. This static graph shows, at an aggregate level, what transpired between 8:00 and 10:00 am central time.

This graph is a way to look at liquidity. It depicts the state of the limit order book at a number of given points in time, and how it changed throughout that two-hour time period.

The X-axis is the elapsed time. The Y-axis is price. The purple line represents the price path of consummated trades over time. The blue shaded area represents the bids, which are limit buy orders. The red area represents the asks, the limit sell orders. The color also represents quantity. The darker the color, the larger the quantity of orders resting on the book. So the dark red line at the top of the graph, for example, represents one or more limit orders that were placed after the round-trip event ended and remained on the book through 10:00. Market orders would be transacted instantly—and therefore would not be shown.

Now let's take a look at a 15-second animation that will show you the same information as time passes during that two-hour period. This will depict what happens to the order book over time, and therefore it is a way of looking at how market liquidity shifts as the market moves.

Again, where you see a dark, horizontal line, it represents one or more limit orders that have stayed in the book. It would appear to be firm interest in buying or selling at a given price level. If still there when the price falls to that level, then those orders could be — and likely were — executed. But you also can see that available quantities at different price levels are continually changing.

Orders are being cancelled, modified, submitted and executed at very high frequency. These orders, perhaps more sensitive to market movements, were presumably contingent on various conditions that were not met. We know that automated trading facilitates a variety of trading strategies, including ones based on conditions not just in a particular contract but in other contracts and markets. The pattern shown here is similar to what we often see in most other benchmark futures contracts.

So that is how the book evolved over time during the event window on October 15.

Another type of analysis we routinely do is to decompose or deconstruct the order book. Think of the entire limit order book like an onion with many layers. Each layer might be a market participant. We can peel the layers of the onion—and sequentially remove participants in order to see how particular participants affect the book. We can decompose or deconstruct the book in any number of ways—at the participant or firm level, at the account level for firms trading through multiple accounts, or even the trader level, to look at how that particular type of participant affects the overall order book depth.

So let's take a look. Now, this slide is a demonstration of the type of analysis we do when we deconstruct the book — or in other words, when we peel the layers of the onion. In this case, we've done this in a random manner simply to illustrate how we do this type of analysis. The sequence you will see does not reflect removing particular participants.

Obviously, when we do this in our office, we would do it in various ways to isolate the behavior and actions of particular participants.

Order Book Analysis for October 6, 2016 British Pound Event

So that was October 15. Now let's take a look at the recent event with the British pound. As most of you know, the British pound fell six percent against the U.S. dollar in about 30 seconds, before rebounding. I noted earlier that the British pound futures market is much

smaller than Treasury futures; it is also smaller than other currency futures like the euro. British pound futures trading is also much, much thinner than British pound spot trading. Moreover, this movement occurred at a time of day when liquidity was particularly low. It took place after hours in the U.S. and UK markets, and just as Asia was opening. It was 6:00 pm in Chicago, which is midnight in London, 7:00 am in Hong Kong, and 10:00 am in Sydney.

This static graph shows the pound futures contract on October 6, 2016. This represents a 15-second period just after 6:00pm central time, so it shows most of the decline. Again, this data is for the futures market only.

As you can see, the price decline was sudden and dramatic.

On October 15, we saw an event marked by relatively smooth movements. Because of this, no Treasury market halts were triggered that morning. In contrast, during the pound market event, there were a couple of velocity logic pauses and a trading halt. These came after the 15 second period depicted here. Stop orders were present during that event, but they did not play a significant role.

Now let's watch that 15 seconds unfold in real time.

In our market surveillance, in addition to analyzing the data we routinely talk to market participants to understand what is going on. It's our impression that some participants were executing strategies in the futures market that were tied to their positions or strategies in the cash market. As I mentioned earlier, the cash market is much, much larger, and activity is spread across a multitude of platforms. We do not have regular access to data from the cash market, so what we are showing here is only a portion, and perhaps a small portion, of overall pound trade activity during the event. In fact, the data challenges here are similar to those discussed in the joint staff report on the Treasury market.

Now, let's take a quick look at another example of decomposing the book. And again, this is just an illustration — the transition is randomized.

Another measure we look at is the effective spread, which is a different way of analyzing liquidity. This graph shows the 24-hour period around the event for pound futures, and it shows the number of tick levels you must go through in order to execute a market order of a given size. As a simple example, if you wanted to trade a single contract, you could do it at the best bid or offer. But if you wanted to execute a larger trade, this cost can be much higher. If we were able to hypothetically freeze the limit order book at a given point in time, this graph shows how many price levels a 250 lot order in pound futures would need to walk through to get filled.

The yellow space, as you can see, is the one-hour period when the market is closed. And so you can see what a more typical effective spread was prior to the event; how it spiked up during the event, and how it fell back down. We can, of course concentrate on a much smaller time window to look more closely at what happened in the minutes around the event.

Looking Ahead

My purpose today was simply to illustrate some of the ways that we look at the market. And I believe this underscores a number of the lessons we all drew from the October 15 analysis and some of the things we are talking about at this conference.

Obviously this work underscores the importance of good data if you want to analyze market liquidity and trading patterns. And it reminds us of the importance of having the resources and capability to properly analyze it.

The report on October 15 — and the panel that preceded me today — talked about the need for having good data on the Treasury cash market, so we can compare activity in the futures and the underlying cash markets. This is especially true for markets like ours, where the major derivatives participants are often some of the major participants on the cash side as well. The same is true for the foreign exchange market, where the significantly larger cash market does not have any form of consolidated reporting. Given the interconnected nature

of our markets, such gaps hinder our ability to understand trading activity and liquidity, during normal times, and especially during stressed conditions like what we experienced on October 6.

Finally, it also underscores the speed and complexity with which our markets operate today. And that is why we need a regulatory structure that recognizes how our markets have changed. We have gone from the days of pit-based open outcry trading to low latency automated trading in a relatively short amount of time, and our regulatory framework needs to keep up. That is why, among other things, we are working on our “Regulation AT.”

At the last conference, I mentioned this was coming. We issued a proposal shortly thereafter, and we are working to finalize it.

Our proposal is not designed to try to slow things down. You can’t turn the clock back. Instead, the proposed rulemaking is designed to make sure traders and our markets can handle the speed and complexity.

It is designed to reduce the risk of disruption and other operational problems that could be caused by automated trading. It requires certain pre-trade controls and other measures, such as message throttles and maximum order size limits. It requires other measures such as “kill switches,” which facilitate emergency intervention in the case of a malfunctioning algorithm. But it does not prescribe the parameters or limits of such controls, because we know how diverse market participants can be and we believe they are the ones who should determine those specifics.

Many firms already have these controls, and our proposal is intended to codify best practices. It will create a baseline that all firms must follow. And if a disruption or problem occurs, it will allow us to better understand what happened, and why, so that we might take steps to ensure it doesn’t happen again.

We are currently considering a supplemental proposal on Regulation AT. For example, we had originally proposed risk controls at three levels — the exchange, the futures commission merchant (FCM) and the trading firm. A number of commenters told us that this was too burdensome and too complex. Instead, they favored a two-tier structure, which I am willing to support. That is, I would support requiring risk controls at the exchange level, and either the trader or FCM level. A trading firm could have its own controls or opt in to the FCM controls.

Our proposal also had a registration requirement and some felt the proposal as originally drafted was too broad. I believe our focus should be the most active firms and so we are looking at whether to add a volumetric test. Today in our markets, a small number of traders can represent a large percentage of total trading volume, including during these periods of high volatility. For example, the evening after the Brexit vote, the ten most active firms represented approximately 60 percent of trade activity in British pound futures. Without a registration requirement, we cannot make sure that some of the biggest traders in our markets are following the basic risk controls that our proposal calls for.

Automated trading is not the only area where we’re responding to new challenges posed by technological advances. We’re also increasing our efforts with respect to cyber attacks and other technological failures in our markets. Cyber threats are probably the single greatest risk to financial stability today. We were reminded of this risk again last Friday, when large portions of the United States were affected by what is known as a distributed denial-of-service attack.

Last month the Commission finalized rules that focus on making sure that the critical market infrastructure that we oversee — the clearinghouses, exchanges, trading platforms and data repositories — are adequately protecting themselves against these and other types of attacks.

Conclusion

Let me conclude with this. Effective oversight of modern markets requires a number of things. It requires modernizing our regulatory framework by moving forward with proposals like Regulation AT. It requires making emerging threats like cybersecurity a top priority. And,

of course, it requires continuing to enhance our data collection and analytical abilities — as well as our technological capabilities.

That takes resources. You have probably heard me comment about the CFTC's budget constraints. They are serious. As one illustration, we are the sole regulator sponsoring this conference without an independent funding stream. If there were ever another government shut-down, heaven forbid, we are the only regulator that would be completely shut down, but for a handful of people, perhaps.

We have very fast, very technologically sophisticated markets today. They are the envy of the world. But they will remain so only if they operate with integrity, without disruption, and free of fraud and manipulation. For that, we need a modern regulatory regime. Otherwise, we are like police officers on horseback trying to patrol the superhighways.

Thank you so much for your attention. I'd be pleased to take any questions you may have.

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