

FEDERAL RESERVE BANK  
OF CHICAGO

CHARLES L. EVANS  
President and Chief Executive Officer

December 11, 2013

Ms. Melissa D. Jurgens  
Secretary of the Commission  
Commodity Futures Trading Commission  
Three Lafayette Centre  
1155 21<sup>st</sup> Street N.W.  
Washington, DC 20581

**Re:** CFTC Concept Release on Risk Controls and System Safeguards for Automated Trading Environments RIN 3038-AD52

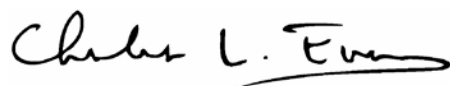
Dear Ms. Jurgens:

The Federal Reserve Bank of Chicago supports the Commodity Futures Trading Commission's efforts to catalogue existing industry practices with regard to risk controls and system safeguards for automated trading environments, determine their efficacy, and evaluate the need for any additional measures that may be necessary to protect the safety and soundness of U.S. derivatives markets in a time of rapid technological change. We wholeheartedly agree with the Commission's observation that traditional risk controls and safeguards that relied on human judgment and human speeds must be re-evaluated in light of new market structures that support automated trading systems (ATSs) and electronic trading platforms.

Our attached letter was prepared by Federal Reserve Bank of Chicago Financial Markets Group (FMG) staff and we hope the Commission finds our comments useful. Our comments build upon FMG's policy research in this area, as noted in the Concept Release. If you have any questions, I invite you to contact Carol Clark at 312-322-6183, John McPartland at 312-322-8118, or Rajeev Ranjan at 312-322-6078.

Once again, we appreciate the Commission's work on these important matters.

Sincerely,



Attachment

## **Comments on Commodity Futures Trading Commission Concept Release – Risk Controls and System Safeguards for Automated Trading Environments (RIN 3038-AD52)**

Prepared by the Staff of the Federal Reserve Bank of Chicago<sup>1</sup>  
December 11, 2013

The Federal Reserve Bank of Chicago provides these comments in response to the Commodity Futures Trading Commission's (CFTC) concept release on Risk Controls and System Safeguards for Automated Trading Environments. We wholeheartedly agree with the Commission's observation that traditional risk controls and safeguards that relied on human judgment and human speeds must be re-evaluated in light of new market structures that support automated trading systems (ATSs) and electronic trading platforms. Our specific comments below relate to: the definition for high frequency trading (HFT); pre-trade risk controls; ATS development, change management and testing; other protections; standardized reporting window for error trades; standardized and simplified order types; and other relevant issues not necessarily covered in the Concept Release.

### **Definition of HFT**

At points, the concept releases poses questions related to the definition of HFT, which the Commission's Technical Advisory Committee (TAC) delineates as a form of automated trading that employs:

- a) algorithms for decision making, order initiation, generation, routing, or execution, for each individual transaction without human direction;
- b) low-latency technology that is designed to minimize response times, including proximity and co-location services;
- c) high speed connections to markets for order entry;
- d) high rates of orders or quotes submitted.

With regard to high rates of orders or quotes submitted, there are three objective methods that could be used to measure message rates, including: (i) cancel-to-fill ratios; (ii) participant-to-market message ratios; or (iii) participant-to-market trade volume ratios. We find such delineations inherently flawed for two reasons. First, we believe it is possible for an algorithm that is designed to submit low rates of orders or quotes to malfunction resulting in the submission of high rates of orders or quotes. Second, it is likely that any attempt to place a quantitative threshold limit in the definition of "high rates of orders or quotes submitted" will likely incent trading firms to design and operate their algorithms specifically to submit orders just below the limit. Yet, doing so does not remove the danger that algorithms can malfunction. Therefore, we believe it would be prudent to require consistent risk controls for ATSs and high frequency trading (HFT) systems due to the speed at which each of these systems can amass large, unintended positions. Finally, a common definition of HFT between the CFTC, Securities Exchange Commission (SEC), and other national authorities would help limit possible opportunities for regulatory arbitrage.

## **Pre-trade Risk Controls**

The following paragraphs are related to discussion of pre-trade risk controls within the concept release and outline the minimum number of risk checks we believe should be performed as well as the levels at which these checks should be placed.

### *Trading Firm/Clearing Firm/Trading Venue Levels*

We believe the following pre-trade risk controls should occur at the trading firm, clearing firm, and trading venue levels. Limits at clearing firms should be set at the account level. We also recommend that regulators and self-regulatory organizations (SROs) assess the methodology trading firms, clearing firms, and trading venues use to set these limits and the reasonableness of the limits set as well as the procedures that are followed when risk limits are breached.

- Maximum Message Rate (Message Throttle)
- Maximum Execution Rate (Execution Throttle)
- Credit Risk Limits
- Maximum Order Size
- Kill Switches
- Selective Working Order Cancellation
- Repeated Automated Execution Throttle

Repeated automated execution throttles should operate when a maximum number of orders are filled *within a specified time frame*, e.g., in excess of 1000 orders within two seconds.

We also recommend that a human being make the decision on whether or not to use kill switch functionality based on internal and market conditions. Automatic kill switches have the potential to worsen a situation by breaking one side of a multi-legged position. Nevertheless, it is also recognized that erroneous positions can build up rapidly, as was the case with Knight Capital, and it is of the utmost importance for the trading firm, clearing BD/FCM, and trading venue to identify, assess, and respond to the problem in the shortest time frame possible.

### *Trading Venue Level*

As the Commission notes, risk controls at trading venues vary. Therefore, we believe it would be beneficial for regulators to require trading venues to implement the following risk controls to prevent spillover effects in the markets and to assist trading and clearing firms in better managing their risks. These include:

- Price Collars
- Trading Pauses
- Order Report (Post-order drop copy)
- Trade Report (Post Trade drop copy)
- Uniform Adjust or Bust
- Standardized Reporting Window for Error Trades
- Auto-Cancel on Disconnect
- System Heartbeats
- ATS or Algorithm Identification

It is hoped that price bands would prevent orders from being executed above or below the upper and lower limits set and preclude the necessity to bust or adjust trades outside such ranges. In the event the price bands do not work as designed for some unforeseen reason, we believe policies to adjust rather than bust trades would be beneficial so as to minimize the impact that could arise if one side of a hedged position(s) was broken. Decisions by the trading venue to bust or adjust trades need to be made in the shortest time frame possible so as to reduce uncertainties in the marketplace. While it may be impossible for a trading venue to notify market participants of a potential adjust or bust situation *immediately*, such notification should occur *without delay*.

Trading venues should establish maximum periods during which market participants must report error trades. Trading venues must inform market participants of these time periods in writing in order to foster an environment of fairness, transparency and predictability.

In terms of ATS or algorithm identification, we agree that each algorithm should have a unique identifier that is tagged by the trading firm and sent to the trading venue. Implementing such identifiers will also enable the trading firm to better manage wash-trades/self-trades. We do not, however, believe the Commission should be involved in the assignment, registration, or warehousing of unique identifiers for algorithms.

### **ATS Development, Change Management and Testing**

As the Commission is well aware, there have been a number of high profile events in recent years that arose due to insufficient operational controls at trading firms and trading venues. Some of these have even caused market disruptions. While we recognize we do not live in an ideal world and there will never be a 100 percent error free trading environment, we do believe there is a need to develop quality standards related to the development, testing and deployment of ATSs and their components.

Furthermore, many industries rely on standards setting bodies like the IEEE Standards Association and ANSI (American National Standards Institute) under ISO (International Organization for Standardization) to facilitate standards development yet there is no such corollary for the development of ATSs within a HFT environment. Therefore, we believe that market participants and the Commission's Technical Advisory Committee (TAC) should work together to formulate standards or guidelines for HFT that will help mitigate the impact of operational risks.

We also note that many industry and regulatory groups have devised best practices for HFT. Nevertheless, many firms do not fully implement these best practices because they are not required to do so. We believe it would be beneficial for the Commission to work with the industry to define best practices for HFT and to communicate penalties for non-compliance with those best practices. We also believe disseminating information related to best practices could potentially reduce costs within the industry as firms learn through information sharing to avoid mistakes their peers have encountered. Finally, we believe the Commission should periodically engage with the industry to review and revise these best practices, as industry participants are generally the first to observe disruptive market events and to understand rapidly evolving technology.

## **Other Protections**

We believe it is imperative the CFTC and SEC coordinate market surveillance activities to the highest extent possible as HFT firms typically trade correlated products across asset classes and markets. Further, many such firms trade globally, which points to the need for coordination with international regulators as well. Harmonization of rules related to HFT would help minimize regulatory arbitrage. We also believe it is essential regulators employ automated surveillance systems that use a common methodology for identifying HFT firms such as the legal entity identifier (LEI). Moreover, firms with direct market access (DMA) should be required to identify themselves to the trading venues on which they are active. Such registration would aid in the identification of a firm with a large, unintended position, if such a circumstance were to arise.

Finally, to the extent possible, we believe existing, uncoordinated market controls such as circuit breakers may not provide the necessary market protections in equities, equity options, futures, options on futures, and OTC derivatives markets. Applying consistent controls such as trading pauses across markets, regardless of asset class, would prevent issues that surfaced during the May 6, 2010 Flash Crash and would further strengthen coordination between the CFTC and SEC during times of crisis.

## **Standardized Reporting Window for Error Trades**

Trading venues should establish maximum periods during which market participants must report error trades. This information must be made available to market participants in order to foster an environment of fairness, transparency and predictability. Trading venues are in the best position to determine the maximum time during which a market participant must report a clearly erroneous trade rather than the Commission.

## **Standardized and Simplified Order Types**

Regulators should review usage of all order types to determine if an order type provides undue advantages to one class of market participants over others. If such a determination can definitively be made, regulators should have the authority to take appropriate action that best serves the public interest.

## **Other Relevant Issues:**

Following are comments we have on various issues that may not necessarily be addressed in the concept release:

### *Order Cancellations*

Under no circumstances should any market participant be allowed to cancel an order before they obtain an acknowledgement from the trading venue that the original order was received. We can envision no legitimate trading strategy where this practice would be necessary and any number of intentionally deceptive trading strategies where it would.

### *Regulators' Evaluation of Risk Controls*

If they do not already do so, regulators should evaluate the adequacy of trading firms, clearing firms, exchanges, and clearing houses' access controls to source code, trading systems, and trading limits to ensure unauthorized staff cannot access/modify/deploy trading algorithms or adjust trading limits.

### *Best Practice for Non-Clearing DMA Firms*

Non-Clearing firms with DMA should be encouraged to reconcile their trading activity using data from three sources: trading venue(s), clearing member(s) and the trading firm's internal databases.

### *Risk Controls at Clearing Member Level*

When the Federal Reserve Bank of Chicago Financial Markets Group conducted interviews with market participants to determine controls that were in place to manage the risk of high speed trading, staff noted that clearing firms generally conducted credit reviews for HFT customers with DMA but many did not subject these firms to additional screening.<sup>2</sup> As clearing members are financially responsible for the trades of these customers, it is recommended that they review the adequacy of DMA clients' risk controls and procedures during the customer onboarding process and during subsequent periodic reviews. These include access controls, change management procedures and pre and post trade risk controls.

It is also recommended clearing members obtain a high level understanding of their DMA customer's trading strategies during the onboarding process and monitor on an ongoing basis whether DMA customers' trades are consistent with or divergent from these declared strategies. For example, if a DMA firm indicates it engages in statistical arbitrage and later begins to mass quote in options, the risk profile for the clearing member would be significantly different than originally anticipated and it may be appropriate to request additional collateral from the DMA client.

### *Risk Controls at Designated Clearing Organization (DCO) Level*

FMG staff also recommends the following for clearing organizations:<sup>3</sup>

- Assess the frequency with which clearing members' portfolios are monitored throughout the day to determine if it is adequate for a HFT trading environment.
- Assess margin surcharges on concentrated positions and on positions in less liquid products to protect against the potential losses that could arise if it were to take an extended period of time to liquidate such positions.
- Monitor open positions at the customer account level at clearing organization with vertical clearing structures, even if the customer clears through multiple clearing members. Margin surcharges on large positions should apply to all clearing members where that customer has open positions.
- Consider including executed and cleared volumes in calculations for guarantee fund contributions to better manage exposures to clearing members which may have high volume levels but low margin requirements because they hold positions for short durations of time.

These comments are submitted in the interest of forming the most effective public policy on these important matters.

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<sup>1</sup> This commentary was prepared by Carol Clark, Richard Heckinger, John McPartland, and Rajeev Ranjan.

<sup>2</sup> See Clark, Carol and Rajeev Ranjan (2012), "How Do Broker-Dealers/Futures Commission Merchants Control the Risks of High Speed Trading?" Federal Reserve Bank of Chicago Markets Working Papers, June. No. 2012-3.

<sup>3</sup> See Clark, Carol and John McPartland (2012), "How Do Clearing Organizations Control the Risks of High Speed Trading?" Federal Reserve Bank of Chicago Markets Working Papers, June. No. 2012-2.