MINUTES OF THE SECOND MEETING OF THE U.S. COMMODITY FUTURES TRADING COMMISSION'S MARKET RISK ADVISORY COMMITTEE JUNE 2, 2015

The Market Risk Advisory Committee ("MRAC" or "Committee") convened for a public meeting on Tuesday, June 2, 2015, at 10:00 a.m., at the U.S. Commodity Futures Trading Commission's ("CFTC" or "Commission") Headquarters Conference Center, located at Three Lafayette Centre, 1155 21st St., NW, Washington, DC. The meeting consisted of two panels. Panel I discussed cybersecurity and the Bank of England's CBEST Program. Panel II discussed liquidity in the derivatives markets.

MRAC Members in Attendance

Dr. Anat Admati, George G.C. Parker Professor of Finance and Economics, Stanford University Graduate School of Business, Better Markets Representative
Gerald Beeson, Chief Operating Officer and Chief Financial Officer, Citadel LLC
Sunil Cutinho, President, CME Clearing, CME Group ("CME")
Andrew Gray, Managing Director, Group Chief Risk Officer, Depository Trust & Clearing Corporation
William Hale, Export Grain Manager, Cargill
Jerry Jeske, Group Chief Compliance Officer, Mercuria Energy, Representing Commodity Market Council
Sebastiaan Koeling, Chief Executive Officer, Optiver, Representing Futures Industry Association's Principal Traders Group
Dr. Andrew Lo, Director, Massachusetts Institute of Technology's Laboratory for Financial Engineering
Glen Mackey, Chief Risk Officer, NRG Energy
Dennis McLaughlin, Group Chief Risk Officer, LCH.Clearnet ("LCH")
Susan McLaughlin, Senior Vice President, Federal Reserve Bank of New York
Richard Miller, General Counsel, Prudential Global Funding
John Nixon, Group Executive Director, Americas for ICAP
Susan O'Flynn, Managing Director and Global Head of CCP Strategy, Governance and Optimization, Morgan Stanley
Marcus Stanley, Policy Director, Americans for Financial Reform
Kristen Walters, Global Chief Operating Officer of Risk and Quantitative Analysis Group, BlackRock
Rana Yared, Managing Director, Goldman Sachs
Luke Zubrod, Director of Risk and Regulatory Advisory Services, Chatham Financial

Invited Speakers in Attendance

Isaac Chang, Global Head of Fixed Income, Currency and Commodities, KCG Holdings, Inc. ("KCG")
Mahi Dontamsetti, Global Head IT Risk and Deputy Chief Information Security Officer, Depository Trust and Clearing Corporation
David Evans, Senior Manager, Cyber Team, Bank of England
Piers Murray, Managing Director, Global Head OTC Derivatives Clearing & Derivative Prime Brokerage, Deutsche Bank

Jerry Perullo, Chief Information Security Officer, Intercontinental Exchange ("ICE")
Joseph Squeri, Chief Information Officer and Chief Technology Officer, Citadel LLC
Thomas Wipf, Managing Director and Global Head of Bank Resource Management, Morgan Stanley

CFTC Commissioners and Staff in Attendance
Timothy G. Massad, Chairman
Sharon Y. Bowen, CFTC Commissioner and MRAC Sponsor
Mark Wetjen, CFTC Commissioner
Petal Walker, Chief Counsel, Office of Commissioner Bowen, and Designated Federal Officer
David Taylor, Associate Director, Division of Market Oversight
Robert Wasserman, Chief Counsel, Division of Clearing and Risk

I. Opening Remarks

Petal Walker called the MRAC meeting to order. Following welcoming remarks by Commissioner Bowen, she turned to Chairman Massad for his opening remarks. The Chairman thanked MRAC members for their participation and Mr. Gray and Ms. McLaughlin for facilitating the discussions. He also thanked Commissioner Bowen and CFTC staff, and noted the importance of the topics at the meeting. Commissioner Wetjen then made his opening remarks and echoed the Chairman in noting the importance of the meeting's topics. Commissioner Bowen thanked Kim Taylor for her service on the MRAC and welcomed Sunil Cutinho to the Committee. She noted that cyber-attacks on U.S. businesses have been alarmingly increasing and it is critical that the financial industry have strong protections in place. She also stated that the first panel will allow the Commission to learn more about the Bank of England's (BoE) CBEST Program and to hear the MRAC members' thoughts. She thanked Mr. Evans and BoE for providing that opportunity. She then noted that the second panel will address an important issue that deals with market structure which is liquidity.

II. Panel I: Cybersecurity—Considering Bank of England's CBEST Program

Mr. Gray facilitated the discussion.

Mr. Evans gave a presentation on the CBEST Program. In providing an overview of the program, he stated that in June 2013, BoE's Financial Policy Committee recommended that Treasury work with regulatory authorities and the core U.K. financial system and infrastructure to implement a program to improve and test resilience to cyber-attacks. After reviewing industry testing, which revealed great variation, he explained that BoE was unable to provide assurance that cybersecurity capabilities were adequate. He also stated that BoE wanted a means to measure and ensure that the core of the U.K. financial system has a high level of protection against cyber-attacks. Further, he noted that BoE recognized the need to build a repeatable and scalable vulnerability testing framework.

Mr. Evans then discussed how CBEST was built on several unwritten principles and that the tests provide an assessment of each firm's current capability versus where it needs to be. Specifically, he explained that : (1) each test should include the same steps, no matter which organization was being tested, and be holistic in nature, ensuring people, processes, and technology were tested; (2) the content of each step should be tailored to each organization being tested; (3) commercial and government intelligence should influence the behavior of the penetration testers, who must

act as threat actors; (4) tests should provide an accurate understanding of the threats faced by each institution (and therefore the core as collective); (5) tests would be conducted in partnership with regulators; and (6) tests would benefit from the involvement of GCHQ, the U.K.'s signal intelligence.

Because of GCCQ's involvement and the government's significant resource commitment, Mr. Evans noted that CBEST is only available to core institutions and that CBEST participation is not mandatory. He also explained that, initially, BoE needed to prove that participation is a good and safe thing to do, and therefore they piloted CBEST on BoE itself. A small working group, which included banks, infrastructure providers, penetration testers, threat intelligence providers, the BoE and government agencies, was then established to take development from the pilot phase to launch. Additionally, he stated that new accreditation standards, including examinations for penetration testers and threat intelligence providers, were created and administered by the Council of Registered Ethical Security Testers ("CREST") on behalf of BoE. Further, he noted that BoE liaises closely with its supervisors and with CREST and seeks feedback from penetration testers, threat intelligence providers, and industry to maintain the program.

Next, Mr. Evans explained that CBEST testing is based on current threat intelligence and the scope is agreed to by the regulators and the financial institutions being tested. He also explained that CBEST looks broadly at functions which, if disrupted, could adversely affect U.K. financial stability and targets the technology systems supporting those functions. Mr. Evans then explained that post-test activity is analyzed at the completion of CBEST testing, which includes the convening of stakeholders to discuss testing activity, and subsequently, a remediation plan to address security gaps, which must be agreed to by both the regulators and the financial institution. Progress under the remediation plan is monitored via routine supervisory engagement, and a retest may be required. Additionally, Mr. Evans stated that each test takes approximately six months from start to finish (including a lengthy procurement process), while CBEST testing itself takes roughly four to six weeks. He then noted that next steps for firms that are not considered "core" are unclear, and that BoE is considering taking the CBEST principles and building something more manageable—smaller and less resource-intensive.

Following the presentation, the MRAC asked Mr. Evans questions about the CBEST Program. Ms. Walters asked Mr. Evans to share some of the findings or performance metrics that he found useful when conducting the tests and analyzing results. Mr. Evans responded that he was unable to share specific results of tests but had received positive feedback about the test as framework. Mr. Miller asked how often a retest should be done to which Mr. Evans responded that definitive timeframes for retesting have yet to be decided, but certain triggers force a retest sooner (*e.g.*, acquisitions of a business outside the U.K., undertaking new lines of business, or organizations targeted by new threat actors).

Mr. Evans also addressed a question regarding the types of entities that participated in the test. He explained that organizations whose potential disruption would impact financial stability were included (*e.g.*, investment banks, retail banks, clearing houses, wholesale banking organizations, exchanges, and settlement systems). Additionally, Mr. Evans was asked for his views on insider versus external threats to which he commented that insider threats have gained plenty of media attention; however, it is BoE's view that the biggest threats to organizations are external actors.

Dr. Admati asked whether testing should be mandatory or voluntary. Mr. Evans responded that over 90 percent of the organizations BoE wanted to undertake the testing, are now fully committed to CBEST. He also commented on the possibility of mandatory testing if the frequency of testing is increased or testing becomes intrusive. Dr. Lo then asked several questions, including the number of firms BoE has accredited, whether BoE tests social engineering as well as technology, and whether the cost of testing will pose issues in the future, particularly if smaller firms participate. Mr. Evans responded that: (1) six penetration testing firms and four threat intelligence providers have been accredited, and that three to five applications were rejected; (2) social engineering has been used in some CBEST engagements, but only if it is used by the threat actors identified; and (3) CBEST testing costs vary depending on the organization and the test's duration, but are in line with what organizations are already spending on penetration testing regimes. Mr. Mackey asked how dynamic CBEST testing is and whether it is exclusively oriented towards penetration testing to which Mr. Evans responded that CBEST is only penetration testing at this time.

Mr. Perullo then commented that ICE has U.K. subsidiaries that participated in CBEST. He commended the program, but shared some challenges that arose from having a regulator "at the table." With regard to the scope of testing, he explained that, with a vulnerability assessment, the targets are scoped, but with penetration testing, you just scope the types of threat actors. Additionally, he noted that if an organization is targeted, the threat may come in through a subsidiary in a different jurisdiction where the regulator does not have jurisdiction, which presents challenges. He also noted that penetration testing is not holistic because it identifies specific issues but is not a complete assessment of a security program. Another issue is whether a regulator should endorse specific private firms to perform testing and accreditation. Finally, he cautioned that test results create a document that lists all of the critical functions, and vulnerabilities, of any given critical infrastructure entity. He described this as a "very high risk asset" that he does not want regulators to have, and questioned whether the CFTC wants to be impregnated with that document.

Mr. Evans agreed that these are valid challenges. He noted that BoE chose CREST after considering several other companies, and is open to working with other companies if they provide a better service. He also stated that CBEST does not provide a full assessment of a company's security capabilities; rather, it looks at the holistic nature of all processes that a threat actor would undergo to carry out an attack from start to finish. He agreed that many global organizations have a weak entry point that could be used as a back door that is not included in the CBEST test, and that BoE can only engage with subsidiaries in jurisdictions where it coordinates with other regulators.

Chairman Massad stated that the U.S. has certain mechanisms for sharing threat intelligence among industry participants (*e.g.*, FS-ISAC and a financial sector body) which are not tied to a specific testing regime. He asked how sharing mechanisms through CBEST differ. Evans replied that the U.K has similar intelligence sharing mechanisms and that CBEST is not trying to undermine or replace any other mechanisms. Mr. Wasserman stated that he believes CBEST is more tailored to the individual organization getting information while FS-ISAC is a broader distribution. Mr. Taylor stated that he thought the two types of intelligence involvement would be mutually beneficial. Mr. Wasserman added that the CFTC is well aware of the security concerns of the critical functions document and of the importance of keeping critical information secure.

(Break)

III. Panel II: Liquidity in the Derivatives Markets

Ms. McLaughlin facilitated the discussion.

She noted that Panel II would focus on understanding the state of liquidity in derivatives markets overseen by the Commission, with a focus on commodity derivatives. Ms. McLaughlin then asked Mr. Murray and Mr. Chang to define market liquidity. Mr. Murray noted that liquidity can generally be defined as the ability to transact in an asset without affecting its price in a public marketplace, but that liquidity is in the eye of the beholder. He also stated that a block trader has a different perspective than someone trading single-size transactions. Further, different definitions are applicable to different markets. Therefore, he explained that it is prudent to define the characteristics of a liquid market instead, including: (1) low friction costs; (2) availability of risk intermediaries to smooth timing differences between buyers and sellers; (3) low barriers to entry; and (4) a market with few pricing constraints that distort impacts (*e.g.*, a limit up or down feature, an intervention, and a zero interest rate boundary).

Next, Mr. Chang addressed metrics that exist to measure or monitor market liquidity, which change based on the market structure of any particular asset class. Given the linkage between underlying and listed futures markets and cleared swaps markets, it is misleading to look at liquidity of these products in isolation. For example, while the U.S. Treasury futures market has a certain market structure for which there is a lot of information, it is strongly affected and influenced by the over-the-counter ("OTC") cash Treasury market where many participants lack publicly available pricing and transaction data. Therefore, he posited that it is potentially impossible to measure and monitor liquidity in the U.S. Treasury markets as a whole.

Mr. Wipf next stated that liquidity as a measure should be considered in the context of infrastructure. Using pricing in the agency mortgage market as an example, he commented on upstream effects in the financing markets or securities financing transaction (SFT) markets and repo and securities lending. Mr. Murray agreed and noted that in the aftermath of the Swiss devaluation, a number of clients reduced risk across multiple assets rather than just in the FX space. He discussed macroeconomic versus microeconomic differences related to dislocations, including the broadening of the spread between CME's prices and interest rate swaps and LCH's prices and interest rate swaps.

Mr. Chang then explained that market makers take the risk of holding transaction until the opposite side appears in the market. He stated that KCG depends on bank financing, and as the cost of capital increases, liquidity has to go up because the returns that a market maker has to generate are constant. He argued that the CME/LCH basis differential is an improvement over what existed pre-central clearings, when every trade was a bespoke instrument. Mr. Wipf agreed and said that the general nature and size and scope of the collateral mismatch have brought real focus to the issue, which will find its way into pricing models.

Ms. Yared noted that liquidity in all markets is not the same. For example, liquidity in the credit market, based on the five year on-the-run index point, has improved over the last year, largely because of the structure of that particular market. However, she also noted that the interest rate markets have true potential for a liquidity crunch based on several factors, including the fact that liquidity is conditional and that executing sizeable thematic trades is a challenge. She then

commented that Goldman's view is that the capital rules–the supplemental leverage ratio and net stable funding ratio–are causing substantial challenges and a liquidity crunch on the executing broker and clearing broker side. She also stated that the treatment of cleared trades is in contravention of G20 clearing goals. Further, Goldman fears that if capital rules remain unchanged, significant hedging that should happen will remain undone, and a significant bifurcation in pricing in cleared and uncleared trades may occur.

Mr. Zubrod introduced the perspective of end users, noting that regulatory issues have had an impact on smaller and mid-size entities. Mr. Nixon stated that banks have lessened their involvement significantly over the past five years, and that although some market makers are stepping in, the market is less liquid than before due to an absence of a major player. He further stated that, in the future, it will be more difficult to hedge and transact when markets move because less people will take the other side of the trade. Mr. Hale commented that in the agriculture market, liquidity is currently adequate, but he is concerned about rules that can affect liquidity of individual markets – *i.e.*, issues in the Futures Commission Merchants ("FCM") market, which Commissioner Giancarlo covered in his June 1, 2015 Statement for MRAC, position limits, and capital regulation of FCMs.

Dr. Lo commented that liquidity is difficult or impossible to measure. He believes that liquidity is misunderstood because it is not a single concept. From an academic perspective, there are three qualities of liquidity– price, time and size. He then noted that a security is liquid if it can be traded quickly, in large size, and without moving prices, and that different definitions of liquidity are required because different markets have different characteristics of price, time and size, but it is not hard to measure. Further, he stated that it is important to understand who provides liquidity and the entity's incentives for providing and withdrawing it, because technology enables liquidity to be moved rapidly.

Ms. McLaughlin asked the group whether liquidity has decreased and whether they see linkages between different segments of markets. Mr. Cutinho noted that some clients are losing access to markets, and that some rules (*e.g.*, the leverage ratio rules) have made it expensive for brokers or intermediaries to provide access. Ms. Walters added that capacity is more of an issue than liquidity, and that her firm is required to transact in smaller lot sizes and has encountered pockets of illiquidity. Additionally, the firm's transaction cost models do not fare well in very illiquid markets and, in turn, capacity is very difficult to quantitatively measure. Further, capacity is a major issue in regard to central counterparty risk, and there has been an impact on clearing members and FCMs from "the capacity perspective of increased increasing regulatory limits" on liquidity, leverage, and risk weighted assets.

Dr. Admati stated that she did not favor liquidity requirements because they potentially distort markets. Mr. Jeske noted the important linkage between listed futures and bilateral swap activities. Mr. Beeson added that liquidity has been impacted by changes in business models and technology. Additionally, he stated that markets are more transparent and new entrants quote tighter spreads; however, liquidity is fragmented, with dealer-to-dealer markets split from dealer-to-customer liquidity pools.

Ms. O'Flynn discussed the CME-LCH basis imbalance in the context of liquidity and capacity. Ms. Yared noted that capacity and liquidity are sisters, and that capacity is a private choice– every bank makes important decisions about how to allocate scarce resources. She also commented that finding capacity has become increasingly challenging, and questioned the

feasibility of creating multiple tiers of market access and a "two-speed economy." Mr. Koelig stated that his firm will not be able to provide the same level of liquidity once markets move.

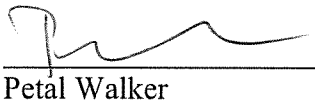
Ms. McLaughlin next asked how market participants have responded to market changes and the implications for market functioning. Ms. Chang suggested that the CFTC focus on increasing pre- and post-trade data to accurately measure and monitor liquidity. He added that liquidity provision is a service that needs to earn an economic rate of return, and the focus should be on increasing the number of smaller liquidity providers. Mr. Murray discussed FCM concentration and the ability of FCMs to support the market access that smaller pools of capital require to be effective. Mr. Wipf then discussed the current impact on collateral markets. Mr. Jeske noted that because of Basel III regulations, clearing costs four to six times more, which means that market participants may need to self-clear, which introduces operational risks. Dr. Lo stated that buy side firms are measuring liquidity and developing algorithms to trade around illiquidity pockets, and stated that liquidity is central to financial stability, which is a public good. Dr. Admati disagreed, stating that she found no connection between liquidity and financial stability. Further, financial stability is about the fragility of the system, and the ability of the system to provide credit to the economy along with appropriate services at appropriate prices.

Ms. McLaughlin asked for suggestions for Commission action. Commissioner Wetjen noted that the CFTC has no control over accessibility as it relates to capital requirements, but based on the discussion the CFTC could focus on: (1) increased transparency; (2) accessibility to trading venues; (3) diversity of liquidity providers; (4) the floor trader exception, and (5) market structure changes for SEFs. Mr. Murray argued for longer implementation periods under Dodd-Frank. Mr. Chang commented that a coherent regulatory approach is needed across all markets because they are interconnected. Mr. Wipf suggested focusing on ways to increase new capacity, and also suggested that industry has not pushed enough on central clearing of SFTs.

IV. Closing Remarks

Commissioner Bowen concluded by thanking everyone for their attendance. Thereafter, Ms. Walker adjourned the meeting at 1:34 p.m.

I hereby certify that the foregoing minutes are accurate:



Petal Walker
Acting Chair, Market Risk Advisory Committee

10/3/17
Date