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April 24, 2024

The Honorable Rostin Behnam
Chair
Commodity Futures Trading Commission
Three Lafayette Center
Washington, D.C. 20581

Submitted via comments link: https://comments.cftc.gov/PublicComments/ReleasesWithComments.aspx

Request For Comment on the Use of Artificial Intelligence in CFTC-Regulated Markets

Dear Chair Behnam,

On behalf of more than 500,000 members and supporters of Public Citizen, we provide the following response to the Request for Comment from the Commodity Futures Trading Commission (CFTC, Commission, Agency) on the use of Artificial Intelligence (AI) in CFTC-regulated markets.[1]

This request for comment (RFC) follows an Executive Order issued by the White House on Oct. 30, 2023, encouraging federal agencies to "consider using their full range of authorities to protect American consumers from fraud, discrimination and threats to privacy and to address other risks that may arise from the use of AI."[2]

Though there are many questions and concerns regarding the use of AI within and beyond CFTC regulated markets, in this comment, we highlight two basic concerns. First, the nature of AI involves a black box. This means that what happens within the computer model is not easily decipherable, explainable, or replicable by the model's developers or users. The black box presents intrinsic challenges to both market participants and regulators, with respect to accountability, governance, explainability, and many other principles identified by the CFTC and others as essential to managing the use of – or setting limits on the use of - AI.

Second, market participants using AI may become dependent on a few giant computer service firms providing either the training data or the AI models themselves. This market concentration could lead to

[1] *Request for Comment on the Use of Artificial Intelligence in CFTC-Regulated Markets*, COMMODITY FUTURES TRADING COMMISSION (Jan., 25, 2024) https://comments.cftc.gov/PublicComments/ReleasesWithComments.aspx
[2] Executive Office of the President, Executive Order on the Safe, Secure and Trustworthy Development and Use of Artificial Intelligence, Sec. 8a(a), THE WHITE HOUSE (Oct. 30, 2023) https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/

security vulnerabilities due to a cyberattacks. It also promotes herding, where numerous CFTC-overseen market participants may find themselves unwittingly inflating an asset because of model dependence, contributing to volatility or market instability.

The Rise of AI and its role in financial markets

Since the public launch of ChatGPT on Nov 30, 2022, policy makers have joined innovators to elevate attention to the promise and threats of AI in virtually every sector, from health care, the military, education, to elections and finance. This attention is welcome. It has also led to scams and some confusion about the nature of AI. Separate from this RFC, the CFTC highlighted a fraud allegedly involving AI and cryptocurrency. In a consumer advisory titled "AI Won't Turn Trading Bots into Money Machines," the agency described fraudsters highlighting the use of AI leading to high returns in Bitcoin. In fact, little trading occurred, and some 23,000 were defrauded. It was the largest case of its kind at the CFTC. [3]

Computer technology has long dominated decision-making in the commodity futures markets that the CFTC regulates. Even prior to the recent explosion of interest in generative AI models, it is evident that algorithms, machine learning, and other types of 'first-generation' AI have become common in financial trading. A 2017 paper from the Financial Stability Board lists dozens of use cases for AI in the sector.[4] Now, ChatGPT and other large language models can generate text or even long discussions following an otherwise brief prompt. This generative AI implies that the model is "thinking," and producing new, creative results that mimic what a human might conjure.

One example is how large language models may replace humans in the production of analyst reports. Executives at large firms such as Goldman Sachs and Morgan Stanley are considering replacing their "incoming analyst classes." According to one account, these kinds of cuts could lead to hiring as few as a third of the normal first-year employees.[5]

Granular explanations of use cases in trading with AI since the advent of ChatGPT contain very few details to help the public or traders understand how the technology is being utilized . For example, in its 22-page April 2024 report on the use of AI in the banking sector, the Bank Policy Institute (BPI) lists only two use cases. In the first, the BPI notes that banks "are using, or are considering using" AI. The report does not describe in any detail how AI is used. The second is with fraud detection in flagging potentially suspicious activity.[6]

This lack of description of new AI uses may be owing to firm hesitance to reveal proprietary information, a lack of standard definitions that apply across firms, hybrid use of machine and human-driven trading, or, perhaps, the relative lack of use cases or substantive information on use cases. [7] This absence of clearly

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[3] *AI Won't Turn Trading Bots into Money Machines*, COMMODITY FUTURES TRADING COMMISSION (website accessed April 15, 2024) https://www.cftc.gov/LearnAndProtect/AdvisoriesAndArticles/AITradingBots.html

[4] Financial Stability Board, *Artificial Intelligence and Machine Learning in Financial Services,* FINANCIAL STABILITY BOARD p. 18-19 (Nov. 1, 2017) https://www.fsb.org/wp-content/uploads/P011117.pdf

[5]Rob Copeland, *The Worst Part of a Wall Street Career May Be Coming to an End***,** NEW YORK TIMES (April 10, 2024) https://www.nytimes.com/2024/04/10/business/investment-banking-jobs-artificial-intelligence.html?referringSource=articleShare

[6] Bank Policy Institute, *Navigating Artificial Intelligence in Banking*, BPI (April 2024) https://comments.cftc.gov/PublicComments/ViewComment.aspx?id=73424&SearchText=

[7] Financial Stability Board, *Artificial Intelligence and Machine Learning in Financial Services,* FINANCIAL STABILITY BOARD p. 18-19 (Nov. 1, 2017) https://www.fsb.org/wp-content/uploads/P011117.pdf

detailed use cases frustrates an ability to offer critiques or a rubric for improving oversight. In fact, scams account for many of the "use" cases we have information on.

An algorithm is essentially a recipe, a series of pre-programmed steps that respond to data. AI involves the transformation of the algorithm itself. That said, the boundary between algorithms and AI can be imprecise. The CFTC appropriately applies the definition used by the Executive Order, namely, "a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments."[8] [9]

Yet, despite the blurred definition of what constitutes "AI" in the financial services context, the use of such technology has already changed commodities markets. In a recent agribusiness trade magazine article, analysts working on behalf of agriculture clients participating in commodities markets noted that, "Technology gains, coupled with the financialization of commodities have created an environment where prices are as much about macro-economics – like currencies, interest rates, GDP, crude oil demand – as they are about their own supply fundamental of each individual commodity." In that environment, "Al elevates the process of [price discovery by collecting and analyzing data] to a whole new level. It not only augments the speed of the data surveillance but has a learning mechanism to act intelligently based on the conclusions made."[10]

Conventional wisdom suggests that this trend is net positive. More real-time information about a wide variety of potentially relevant datasets can only enhance efforts to accurately capture current market conditions and anticipate future market trends. And, deploying AI to conduct such analysis will only enhance the quality and speed of such analysis, the argument goes.

However, this accelerated level of activity can increase price fluctuations over short periods of time, which can wipe out trading margins and create sudden, dramatic dips in commodity prices (as discussed further below). If and when such mini-crashes occur, while market prices and larger participants might recover quickly, the longer-term impacts on some types of vital commodity production – such as corn or soybeans – could be longer-lasting, which would translate into real world hardship. This suggests that widespread deployment of more sophisticated AI programs runs the risk of increasing speculative market activity, the kind which has already contributed to a move away from these markets' traditional roles, such as assisting in the financing of sustainable and reliable agricultural production.

Or, to put it crudely, it's worth asking the question whether it's appropriate to deploy a generative AI program that, left to its own devices, might count Taylor Swift lyrics or cat memes as relevant data points in a market analysis that determines the price and availability of the world's essential food supply.

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[8] Executive Office of the President, Executive Order on the Safe, Secure and Trustworthy Development and Use of Artificial Intelligence, Sec. 8a(a), Oct. 30, 2023. See also White House Office of Science and Technology Policy, Blueprint for an AI Bill of Rights, Oct. 2022 (providing guidance on the design, development, and deployment of artificial intelligence (AI) and other automated systems so that they protect the rights of the American public.)

[9] Executive Office of the President, Executive Order on the Safe, Secure and Trustworthy Development and Use of Artificial Intelligence, Sec. 8a(a), THE WHITE HOUSE (Oct. 30, 2023) https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/

[10] https://agupdate.com/midwestmessenger/news/markets/artificial-intelligence-factors-into-uncertainty-of-commodities-future/article_406b82ba-db32-11ee-8ed2-53a97a5c10b4.html

The Black Box

Explainability counts among the most important concerns with AI, an issue the CFTC explores.[11] When humans make documented decisions, or apply computers to guide those decisions, overseers can parse the steps in the decision-making process to identify legal compliance or where problems emerge. When the decision-making process involves a black box, where the AI decision tree changes with new data, this can deter oversight, both of regulators and management itself. JP Morgan's experience with its London Whale loss illustrates the problem of management oversight. The bank's London office engaged in a large, complicated and ultimately costly trade. When revealed to the public, JP Morgan's senior management initially dismissed the controversy as a "tempest in a teapot." They did not initially understand what the London office did. Only after months of internal analysis did the firm's management recognize this as an "egregious" mistake. JP Morgan enjoys a reputation as one of the best managed banks. Yet this single trade proved so complicated that management required an extended period to understand what its junior traders concocted. Consider how much more complicated it would be for an outside agency such as the CFTC, which might lack the fullest cooperation of a financial firm, to analyze a complex circumstance with the addition of the use of generative AI. The additional layer of a "black box," where the CFTC might not have access to the model or the model experts (who may well be compensated several times that of government employees), compounds the problem of complexity. At the very least Public Citizen advises that firms deploying AI must be required to show the steps that lead to results.

The 2010 Flash Crash and the role of high frequency trading (HFT) also demonstrates oversight challenges. Public Citizen believes HFT can pervert markets and disadvantages average investors as the users hide behind a proprietary screen. Adding a "black box" to this already opaque sector can leave the CFTC not only unable to anticipate problems, but unable to react and repair markets once a problem has metastasized.

During the afternoon of May 6, 2010, the Dow Jones Industrial Average fell 600 points, only to recover this loss in twenty minutes. Many observers pointed to HFT. After days of analysis, the CME (an exchange), discounted the possibility that HFT caused or exacerbated the problem.[12] A year later, the International Organization of Securities Commissions, however, found that HFT was a "contributing factor."[13] Yet another report pointed to the *lack* of HFT trading as a problem, since this sector might have bought securities as prices initially tumbled.[14] In the years since, there have been numerous other studies, all examining the role of HFT on the Flash Crash happened. However, the fact remains that now, 14 years after the Flash Crash, there is still no authoritative, unquestioned explanation of this market event and the

[11] The CFTC's request consists of a series of questions.
"How do CFTC-regulated entities manage the lack of explainability associated with some AI models? Are there certain AI applications where explainability is more of an issue or concern? Is lack of explainability more likely to be associated with AI procured from a third party? Does procurement of AI from a third party impact the ability to manage the lack of explainability? If SROs are using AI to oversee members, are there particular issues concerning explainability in the context of investigations and enforcement actions? If firms are using AI models to determine obligations or requirements for other parties, such as margin requirements, are there AI-specific transparency issues? Describe any potential transparency concerns that may arise as a result of SROs adopting AI technologies as part of their market oversight responsibilities.

[12] *CME Group Report on the Flash Crash*, SCRIBD ((May 10, 2010) https://www.scribd.com/document/31546905/CME-Group-Report-on-the-Flash-Crash
[13] *Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency*, INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS (July 2011) https://www.iosco.org/library/pubdocs/pdf/IOSCOPD354.pdf
[14] Graham Bowley, *Lone $4.1 Billion Sale Led to 'Flash Crash' in May,* NEW YORK TIMES (Oct. 1, 2010) https://www.nytimes.com/2010/10/02/business/02flash.html?_r=1&scp=1&sq=flash+crash&st=nyt

role of computer driven HFT. And again, layer in AI, where HFT decisions may be even less subject to post-event scrutiny, and the regulators will have even less ability to understand the root problem.

Noted one industry insider, AI "models can also misfire or fail to perform as expected, resulting in a potential market 'flash crash.' . . . Models that are not subject to proper governance, ongoing testing, and controls can drift from their prior performance and begin yielding faulty or flawed results based on changes in the data or underlying model conditions.[15]

In the agency's request for comment, the CFTC asks "Do market participants draw a line between trading based on AI and other automated trading currently in use? If so, where is or should the line be drawn? What criteria should be used to differentiate between AI and other forms of automated trading." Public Citizen believes that market participates that deploy AI for trading must be able to explain the nexus between inputs and outputs, between data entered and trades executed. This must be replicable. That is, with the same inputs, the outputs must be identical.

Third Party Dependence and Market Concentration

AI requires prodigious computer resources. Financial firms may be forced to rely on a relatively few providers for data, computational capacity, or other consolidated services. Public Citizen reiterates its call to extend to Commission's risk management regulations to encompass sizable third-party technology and cloud-service providers that provide order execution, trading, and/or trade processing functions to address cyber risk. One example that illustrates the need for this is how the Commission's own Commitment of Trader reports, along with other critical data reporting, left markets completely in the dark for weeks after the ransomware hack of Ion Markets--a key vendor to exchanges and other market participants that was not subject to direct regulatory oversight by the Commission.[16] With key exchanges such as CME Group recently signing agreements to shift fundamental derivative clearing operations to cloud servers owned and operated by Alphabet, the outsourcing of critical infrastructure to firms outside the Commission's direct regulatory oversight raises risk .[17]

Reliance on one or a few technology providers can lead to herding. Herding involves several individual actors making similar decisions. Reliance on a centralized data set or model leads to herding, as historical incidents within financial markets have demonstrated. For example, extraordinary exposure to the subprime mortgage market led to the financial crash of 2008. Prior to that market collapse, major banks herded into Latin American debt, and savings-and-loan firms herded into the commercial real estate market.[18]

Dependence on generative AI may contribute to or accelerate consolidation within CFTC-regulated markets as market participants seek scale. While the advent of generative AI has focused on the relative ease of use of these models by new entrants or the open-source platforms they are based on, which in theory allows for more differentiated use by a wide set of players, the reality is that, regardless of the

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[15] Daniel Gorfine, *Testimony,* SENATE BANKING COMMITTEE (Sept. 20, 2023) https://www.banking.senate.gov/imo/media/doc/gorfine_testimony_9-20-23.pdf

[16] Ruth Carson and Stephen Stapczynski, *Frustrated Traders Missing Key Piece of Market Jigsaw Puzzle After London Firm Hacked,* BLOOMBERG, (Feb. 21, 2023) www.bloomberg.com/news/articles/2023-02-21/frustrated-traders-missing-key-piece-of-market-jigsaw-puzzle

[17] Public Citizen, *Letter to CFTC re Risk Management* PUBLIC CITIZEN (Sept., 18, 2023) https://www.citizen.org/wp-content/uploads/CFTC-ANPRM_Risk-Management_AFR_2023_Final.pdf

[18] Gary Gensler, Lily Bailey, *Deep Learning and Financial Stability*, MIT (Nov. 1, 2020) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3723132

technological platform, the economics of markets lend themselves to centralization. Market participants seeking additional leverage in an accelerated trading environment have and will invest in technological resources that either increase the speed by which their trades can be made or that expands the scope of data available for market analysis, giving them an edge in trading decisions.

Arguably CFTC has already witnessed this trend in other markets where it has some jurisdiction. The advent of crypto trading and blockchain based financial services models promised the transformation of finance via decentralized and democratized financial systems. In reality, most of these systems have trended towards centralization. As American University Professor Hilary J. Allen points out in an essay describing the illusion of decentralization within crypto markets, "Without mincing words, economists at the Bank for International Settlements [have] concluded that there is a 'decentralization illusion' that is 'due to the inescapable need for centralized governance and the tendency of blockchain consensus mechanisms to concentrate power.'"[19]

This trend towards consolidation/concentration vis a vis AI is already present in financial markets today. As noted by Havard Business School Professor Mihir A. Desai, in reviewing the current use of AI technology in financial markets, "Where AI has been pivotal (i.e., in financial markets), scale and speed appear to be the critical determinants of success. When technology and data come to dominate, winners keep winning and the ability to invest in technology and data is the key differentiator."

With this trend in mind, our fear is that accelerated use of AI technology in CFCTC regulated markets – without deliberate and comprehensive efforts to boost governance structures, oversight mechanisms, enforcement capacity, and accountability measures that can address these and other concerns – will further consolidate and concentrate CFTC regulated markets, which could contribute to greater volatility and instability that will end up harming smaller actors as the expense of larger ones.

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For questions, please contact Bartlett Naylor at bnaylor@citizen.org, Tyson Slocum at tslocum@citizen.org, and/or Richard Anthony at ranthony@citizen.org

Sincerely,

Public Citizen

[19] Hilary Allen, *The Superficial Allure of Crypto*, INTERNATIONAL MONETARY FUND (September 2022) https://www.imf.org/en/Publications/fandd/issues/2022/09/Point-of-View-the-superficial-allure-of-crypto-Hilary-Allen