United States Senate Committee On

HOMELAND SECURITY & GOVERNMENTAL AFFAIRS

Chairman Gary Peters

AI IN THE REAL WORLD

Hedge Funds' Use of Artificial Intelligence in Trading

HSGAC Majority Staff Report

June 2024

Summary: Hedge funds' use of artificial intelligence and machine learning (AI/ML) technologies to inform trading decisions, which has been a practice by many for decades, raises several concerns as this technology evolves, including inadequate disclosures to clients and the potential for increased risks to market stability. Federal regulators have not clarified how existing frameworks apply to the use of these technologies and need to more fully consider potential gaps in existing and proposed regulations.

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I. Executive Summary

Over the last several decades, private sector development and use of artificial intelligence (AI) has increased dramatically. Greater computing power and more data has led to AI use in nearly every sector, including the financial services sector. Sophisticated investors within the financial services sector, such as hedge funds, have long used advancements in technology to aid in trading. Hedge funds are responsible for over $5 trillion in assets under management (AUM) in the U.S. and have experienced near continuous growth since the 1990s with an over $3 trillion increase in AUM in the last ten years. In recent years, however, hedge funds have increasingly used AI to inform key aspects of trading decisions. Increased use and reliance on AI in the financial services sector, and in particular by hedge funds, can lead to increased risks to investors and for financial markets. Regulators have begun to assess these risks. However, this work is in its infancy. While Securities and Exchange Commission (SEC) Chairman Gary Gensler has warned that a financial crisis triggered by AI is "nearly unavoidable" within the next decade, proposed rules by the SEC and others have not yet been finalized and there is no cross-sector applicable baseline standard yet established for use of AI in the financial services sector, and, in particular, to inform trading decisions.

To better understand the risks associated with developing uses of AI, including by hedge funds, U.S. Senator Gary Peters, Chairman of the Senate Homeland Security and Governmental Affairs Committee (HSGAC), directed Majority Committee staff to examine developments in the financial services sector's use of AI and the current regulatory framework. The Committee has held several hearings regarding the increasing role of AI, including the use of AI in federal acquisition and government operations, as well as broader uses and risks associated with AI. Chairman Peters has also led bipartisan efforts to encourage responsible development, use, and oversight of AI. Chairman Peters' *Advancing American AI Act*, *AI Training Act*, and *AI Scholarship for Service Act* each became law in the 117th Congress. Chairman Peters has now introduced, the S. 2293 *AI Leadership to Enable Accountable Deployment (AI LEAD) Act*, S. 1564 *AI Leadership Training Act*, and the S. 1865 *Transparent Automated Governance (TAG) Act*. Together, these laws and this new legislation encourage the responsible development and deployment of AI by the federal government.

As a part of this investigation, Chairman Peters received information from six hedge funds, each with different structures and who utilize AI in different ways: Citadel LLC, Renaissance Technologies, Bridgewater Associates, AI Capital Management, Numerai, and WorldQuant. The Committee also received information from relevant federal regulators, including the SEC, Federal Reserve, Financial Industry Regulatory Authority (FINRA), Commodity Futures Trading Commission (CFTC), and Federal Stability Oversight Counsel (FSOC), as well as from experts in this field.

The report finds that hedge funds' use of AI and machine learning (AI/ML) technologies to assist in trading decisions, which has been a practice by some for years, raises several concerns as this technology evolves, including the risk of inadequate disclosures to clients and the potential for increased threats to market stability. The report also finds that hedge funds and regulators use a variety of non-overlapping and unclear terms to define systems that appear to be, or utilize, AI, which makes it difficult to understand what types of systems are in use and how existing and proposed regulations will apply in various use cases. This may also complicate efforts to audit and assess hedge funds' review processes and human moderation efforts to ensure safety and accuracy. The report also finds that regulators have not yet clarified how existing frameworks apply to the use of these technologies and need to more fully consider potential gaps in existing and proposed regulations. Finally, the report finds that the use of AI for trading purposes amplifies traditional investment industry risks, including, risks associated with triggering uniform movements by significant numbers of investors, also known as herding, which existing risk mitigation measures, such as Limit Up-Limit Down safeguards, may not sufficiently protect against. This report focuses on the use of AI by hedge funds to inform trading decisions. However, the risks identified in this report represent concerns that have the potential to negatively impact individuals and investors across the financial services sector, including, for example, private funds, mutual funds, and other investment advisors. While hedge funds fall under a different regulatory framework than other investment vehicles and financial services entities, recommendations in this report should be considered across the financial services sector.

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AI encompasses many different types of technology, including the subcategory of machine learning (ML), which refers to analyzing and learning from identified patterns. While experts project that "AI could contribute up to $15.7 trillion to the global economy in 2030" and has a growing number of potentially beneficial uses from health care to manufacturing to agriculture, it also has the ability to enhance biases in its programming and distort or disrupt existing structures, including financial markets. In addition, its complex nature makes explaining its decision-making difficult, and at times impossible. As such, depending on its uses, hedge funds may not be able to fully identify or sufficiently disclose to investors or regulators, decisions made by advanced AI systems. In addition, AI use to inform trading decisions may result in inaccurate application of information, and its interconnectivity makes AI systems vulnerable to market manipulation. Together, these amplified risks may lead to market instability. For example, in 2010, technology similar to, but less powerful than, today's AI, such as algorithmic and high frequency trading, caused serious financial market instability, resulting in a "flash crash" that caused the Dow Jones index to lose more than nine percent of its value temporarily wiping out close to a trillion dollars in the span of minutes before stabilizing and closing down three percent.

Investment vehicles, like hedge funds, are regulated by the SEC and the CFTC. Hedge funds that meet specific requirements must register with regulators and disclose information about their funds and practices. These disclosures help investors make informed decisions and allow regulators to assess potentially fraudulent or other prohibited activities and identify systemic risks. SEC and CFTC have recently begun to examine the use of AI by investment vehicles, such as hedge funds, and to identify risks presented by such use. One such example is the recent SEC proposed rule that would require investment advisors to identify and neutralize conflicts of interest that arise when using AI-related technology. Despite these recent steps, regulators have yet to fully clarify how existing regulations apply to hedge funds' use of AI in trading and there are yet to be established baseline standards specifically on the use of AI for trading purposes.

As more hedge funds and other investment vehicles use AI, and as AI's development and potential use cases advance, the risks identified in this report will increase. For example, generative AI (GAI) has the ability to create new content and could be used by hedge funds and other investors to generate trading strategies and advice. This technology enhances the concerns related to traditional AI. AI generated images and information, such as the May 2023 AI generated image of an explosion at the Pentagon that led to a drop in stock market indices, can also pose serious risks to market stability. Congress and regulators need to ensure the public has a better understanding of how current regulations apply to AI technology and establish baseline guardrails applicable to all, to address risks related to the use of AI technology in the financial services sector.

II. Findings of Fact and Recommendations

FINDINGS OF FACT

1. **<u>Hedge funds use different terms to name and define their AI-based systems</u>.** In conversations with Majority Committee staff, hedge funds explained that they utilize AI and ML to help inform several aspects of trading decisions. These uses include conducting research, pattern identification, and portfolio construction. When describing the systems used to help make trading decisions, hedge funds used a variety of terms to name their systems, such as expert systems, algorithmic systems, and optimizers. While the systems used by the hedge funds that Majority Committee staff spoke with all fall under the definition of AI set out by Congress in the National Defense Authorization Act of 2019, several companies told Majority Committee staff they do not consider these technologies to be AI.

2. **<u>Hedge funds do not have uniform requirements or an understanding of when human review is necessary in trading decisions</u>.** All six hedge funds Majority Committee staff spoke with said that humans review their AI systems and trading decisions. However, some hedge funds largely rely on these systems, while others told Majority Committee staff they believe human intuition is required when making trading decisions, and none defined a specific point in time where that intervention must exist.

3. **<u>Existing and proposed regulations concerning AI in the financial sector fail to classify technologies based on their associated risk levels</u>.** Absent such classification, the public lacks clarity on the degree and scope of risks related to AI/ML strategies deployed for specific use cases.

4. **<u>Executive Order 14110 exempts independent regulatory agencies from the EO's definition of agencies.</u>** In October 2023, President Biden issued Executive Order 14110 to guide the establishment of AI safety and security standards. This exemption means that independent regulatory agencies, like the SEC and CFTC, are exempt from requirements within the EO and only "encouraged" to take specific actions. In March 2024, OMB issued final guidance on how to implement the EO, along with other AI legislation and EOs, that includes independent agencies in the definition of agencies. However, this guidance only focuses on how agencies should treat their use of AI rather than how to approach regulating the private sector's use of AI.

5. **<u>Regulators have begun to examine regulations for potential gaps in authority, but have not sufficiently clarified how current regulations apply to hedge funds' use of AI in trading decisions</u>.** Regulators told Majority Committee staff that existing regulations and obligations apply to hedge funds and investment advisers' use of AI. However, it is unclear how the existing framework specifically applies to the use of AI. While regulators have recently begun to examine current regulations for potential gaps and identify areas where current practices are insufficient to properly apply existing regulations to the use of AI, they have only done so in a select few instances. One such

example is SEC's Fall 2023 proposed rule on conflicts of interest and predictive data analytics.

6. **<u>AI's inherent complexity and lack of explainability can frustrate compliance obligations, including the ability to provide adequate disclosures to clients</u>.** AI systems are sometimes referred to as 'black boxes' because their intricate decision-making process is difficult, and at times impossible, to understand or explain. Their complex and opaque nature makes it difficult to ensure that hedge funds are able to fully explain their trading decisions. Under existing statutory and regulatory obligations, qualifying hedge funds must make certain disclosures to regulators and clients about their trading decisions. While companies disclose to investors some information regarding their use of AI technologies, these disclosures are high level and do not include details on how systems are reviewed.

7. **<u>Hedge funds perform accuracy and safety reviews at different points and do not disclose to investors how or when they perform these reviews</u>.** Each company Majority Committee staff spoke with built testing and reviews into their development processes, including reviews for accuracy and effectiveness. However, these reviews occurred at different times, intervals, and with different individuals. While companies disclose to investors some information on their use of AI technologies, these disclosures are limited and may not convey when and how AI technologies are employed, how their systems are developed, or how they test and review their systems for safety and accuracy.

RECOMMENDATIONS

1. **<u>Create common definitions for hedge funds' systems that utilize AI</u>.** SEC and CFTC should define guidelines and standards for how hedge funds name and refer to trading systems that utilize AI. SEC and CFTC should also require hedge funds to identify systems that fall under the FY 2019 National Defense Authorization Act definition of "artificial intelligence."

2. **<u>Create AI operational baselines and establish a system for accountability in AI deployment</u>.** SEC and CFTC should create operational baselines for the use of AI by hedge funds to inform trading decisions. These baselines should address testing and review of AI systems, legal and regulatory compliance, and the role of human moderation. SEC and CFTC should impose best practices and version control frameworks for algorithms and AI technologies that require companies to manage and track changes to deployed technologies.

3. **<u>Require internal risk assessments that identify levels of risk for various use cases</u>.** SEC and CFTC should develop a risk assessment framework, adhering to principles in National Institute of Standards and Technology's *AI Risk Management Framework*, to address risks AI technologies pose to internal operations and larger financial market security. The risk assessment should identify and label the varying levels of risk – high-risk, intermediate-risk, and low-risk – exhibited by such technologies, and SEC and

CFTC should require companies to report AI technologies that correspond with these risk levels. SEC and CFTC should also require that hedge funds verify they have conducted an internal assessment and keep assessment documents on file for a select number of years for auditing purposes.

4. **Codify EO 14110 and OMB Guidance and extend to independent agencies.** Congress should codify EO 14110 to ensure consistent application of AI policy. This should include passing Chairman Peters' *AI LEAD Act*, which would codify the Chief AI Officer position at federal agencies, and the *AI Leadership Training Act*, to ensure agency leadership is appropriately trained to understand the risks of the technology. In codifying EO 14110, Congress should extend the definition of 'agency' to cover independent agencies, like the SEC and CFTC, which would require, rather than encourage, independent regulatory agencies to evaluate how current regulations apply to the use of AI.

5. **Clarify authority of current regulations.** SEC and CFTC should clarify the application of existing regulations to AI related technologies. SEC and CFTC should also continue to examine potential gaps in regulations and propose rules to address unique concerns posed by AI and AI related technologies. These examinations should include risks to both investors and larger financial market impacts.

6. **Disclose necessary information on use and reliability of AI technologies.** Companies should more clearly disclose to their investors what AI technology is used and for what purposes. Disclosures should include how hedge funds review their AI systems, including, but not limited to, what systems are tested for, how frequently they are tested, and the results of such tests. Hedge funds should also continuously monitor their AI systems for safety and accuracy and disclose their monitoring process to clients.

7. **Require standardized audits of AI trading systems and audit trail disclosures for investors**. SEC and CFTC should require hedge funds to audit AI trading systems on a standardized basis and establish clear and specific guidelines for how these audits should be conducted and recorded. Hedge funds should also create and maintain, for a determined period of time, audit trails for trades that utilize AI systems at any point in the trading decision-making process.