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A Policymaker's View of Financial Stability

Remarks by

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at

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Psaros Center for Financial Markets and Policy

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Thank you, Reena. It is an honor to be back at Georgetown and at the Psaros Center.[1] I have spent a significant amount of time on and around this campus, including when I served as a congressional intern early in my career. Perhaps in fate's way of foreshadowing, one of the topics I researched that summer was the Glass-Steagall Act. Turns out that it was handy to learn about at a young age.

Financial stability is a focal point of my attention at the Board of Governors, since I serve as chair of the Board's Committee on Financial Stability. Allow me to start by saying that the financial system remains resilient, supported by strong balance sheets among households and businesses and high capital levels across the banking system. Earlier this month, the Fed issued the most recent version of our semiannual Financial Stability Report. That report affirmed the system is resilient, while also noting some of the same risks and vulnerabilities we have seen in recent reports.

My remarks will center on three areas of vulnerabilities: asset valuations; the structural shift in lending to private companies, away from traditional bank loans and toward private credit arrangements; and the growing role of hedge funds as investors in the U.S. Treasury market. Finally, I will turn to a longer-term issue—the potential for the use of generative artificial intelligence (AI) in financial market trading that could both increase and decrease financial stability.

Let's begin by putting financial-system vulnerabilities into context. The Federal Reserve promotes financial stability in order to support the achievement of its dual mandate of promoting maximum employment and price stability. That is, achieving maximum employment and price stability depends on a stable financial system. We

[1] The views expressed here are my own and are not necessarily those of my colleagues on the Federal Reserve Board or the Federal Open Market Committee.

know from history, whether from the distant past—the Great Depression—or from the recent past—the Great Financial Crisis or the Great Recession—that financial crises typically lead to large job losses and high unemployment.[2] However, given the complexity of the financial system, it is sometimes hard to see the connection between the system and everyday life.

Living and teaching in Michigan during the Great Recession, I saw firsthand how the financial system's fragility contributed directly to job losses. One example is how the default of Lehman Brothers contributed, via a chain of events, to declines in employment in Michigan. Lehman's failure in September 2008 led a money market fund to "break the buck"—the fall in the value of its assets meant it could no longer redeem shares for the $1 that investors expected to receive—prompting a run on the funds. In turn, the funds pulled back from riskier assets, including asset-backed commercial paper. But the major auto finance companies depended on that commercial paper to finance loans to consumers; hence, they came under stress.[3] With less credit available, auto sales plummeted, and Michigan was hit very hard. Many people—including some of my family members, my students' and colleagues' family members, friends, and neighbors—lost their jobs and experienced significant hardship. The Michigan unemployment rate

[2] Financial crises can also lead to deflation, which can have further feedback on the financial system due to deflation leading to increases in the real burden of debt that can, in turn, prompt business (and household) bankruptcies, reducing their spending and production. This reduced economic activity can then lead to layoffs and further declines in prices—that is, a deflationary spiral. This process occurred in the U.S. in the 1930s after the Great Depression and also occurred in Japan in the 1990s after their banking crisis. For summaries of these two episodes, see John C. Williams (2009), "The Risk of Deflation," FRBSF Economic Letter 2009-12 (San Francisco: Federal Reserve Bank of San Francisco, March), https://www.frbsf.org/research-and-insights/publications/economic-letter/2009/03/risk-deflation/.

[3] See Ralf R. Meisenzahl (2017), "Auto Financing During and After the Great Recession," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, June 22), https://www.federalreserve.gov/econres/notes/feds-notes/auto-financing-during-and-after-the-great-recession-20170622.html

exceeded 14 percent in 2009, while the national unemployment rate peaked at 10 percent in 2009. Correspondingly, foreclosures more than tripled in Michigan between 2006 and 2010, and home values in Michigan sank 33 percent over the same period.

I tell this story, not because I fear we are on the brink of a financial crisis, but because I think it is worth emphasizing why resilience of the financial system matters for the real economy—a point I have made since writing my dissertation—and for everyday Americans' lives. A stable and resilient financial system supports employment and stable prices and ensures families and businesses can function effectively in the economy. That is why policymakers work diligently to understand the functioning of the financial system and is one reason we publish a financial stability report twice a year. And, of course, the story emphasizes the need to maintain resilience in the financial system.

Asset Valuations

With that background, allow me to turn to the financial system vulnerabilities I consider to be most salient currently, beginning with asset valuations. When we evaluate asset valuations, we do not look at the actual levels of asset prices. Rather, we look at their levels relative to fundamentals and whether their levels relative to fundamentals are high by historical standards.[4]

As noted in the Financial Stability Report, our assessment of asset valuations is that they are, on the whole, elevated relative to historical benchmarks in a number of markets, including equity markets, corporate bond markets, leveraged loan markets, and housing markets.

[4] See Tobias Adrian, Daniel Covitz, and Nellie Liang (2015), "Financial Stability Monitoring," *Annual Review of Financial Economics*, vol. 7 (December), pp. 357–95.

To be sure, this is not investment advice. Indeed, it is neither my role nor my desire to offer any comment on the merits of different asset valuations. Our role at the Fed is to simply observe that expected compensation for risk is low relative to history—and that might revert, stay low, or even go lower. And situations of elevated valuations are quite common. Asset valuations have been stretched many times since the 2009 trough.

I consider any potential financial system vulnerability through the lens of how it might constrain the Federal Reserve's ability to attain its dual-mandate goals of maximum employment and price stability. Currently, my impression is that there is an increased likelihood of outsized asset price declines. However, given the system's overall resilience, I do not see the kinds of weaknesses that played out so painfully in the Great Recession, and, thus, I do not see potential asset price declines as posing risks to the financial system.

Private Credit

Another potential vulnerability worth watching is the growth of private credit. Fed staff estimate that, over the past five years, private credit has roughly doubled. Whenever we observe such rapid growth in credit over such a short period of time, it draws our attention. I use the term private credit to describe loans to *privately held* businesses that originate from *nonbank entities*. Privately held businesses are companies without publicly traded stock that generally lack access to public capital markets for debt or equity finance. The growth in nonbank lending to privately held businesses has increased credit access. As a result, private businesses that have difficulty securing a

loan from a bank can continue to grow their businesses with loans from private credit providers.

In one of its simplest forms, private credit involves a straightforward intermediation chain. Investors with very long investment horizons and no particular need for liquidity invest in a private credit vehicle, such as a private credit fund or business development company (BDC), which then extends loans to private businesses. Such investments are usually locked up or ineligible for redemption for five to seven years, or even longer. At its best, private credit vehicles conduct due diligence and monitor the loans on behalf of the investors. Private credit vehicles tend to have a strong incentive to monitor these loans and can flexibly respond to emerging distress. This careful monitoring is important, because private businesses are not subject to the same public scrutiny—auditing and disclosure standards—as their public counterparts. This model has the potential to enhance financial stability and expand economic growth, since it matches longer-maturity loans with longer-term funding and allows firms to get the financing they need on favorable terms. Default rates have also been low and returns high.

Nonetheless, we should expand the lens and inspect this funding vehicle more closely. We have also seen more complex intermediation chains involving more leveraged players, such as banks and insurance companies, emerge in recent years.[5] Some private firms may also have multiple sources of funding.

[5] See Jose Berrospide, Fang Cai, Siddhartha Lewis-Hayre, and Filip Zikes (2025), "Bank Lending to Private Credit: Size, Characteristics, and Financial Stability Implications," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, May 23),https://www.federalreserve.gov/econres/notes/feds-notes/bank-lending-to-private-credit-size-characteristics-and-financial-stability-implications-20250523.html; and Sydney Carlino, Nathan Foley-Fisher, Nathan Heinrich, and Stéphane Verani (2025), "Life Insurers' Role in the Intermediation Chain of Public and Private Credit to Risky Firms," FEDS Notes (Washington: Board of Governors of the Federal

The increased complexity and the interconnections with leveraged financial entities create more channels through which unexpected losses in private credit could spread to the broader financial system. What do recent trends in the sector suggest about the potential for such losses and financial stability risks? I do not currently see the potential for private credit to contribute to an unexpected credit crunch in the same way that the asset-backed commercial paper market did in 2008.

However, it is well worth keeping a close eye on developments here. Default rates remain low, but they are a backward-looking measure and could also reflect increased usage of payment-in-kind arrangements, or PIKs; loan amendments; and distressed exchanges. Recent private business bankruptcies in the auto sector also revealed unexpected losses and exposure across a broad range of financial entities, including banks, hedge funds, and specialty finance companies.

Should we expect to see more? There are some reasons to interpret the recent failures as outliers. I do not assess the current risks from private credit to be a threat to financial stability. The businesses that failed recently may have been more exposed to changes in trade and immigration policy, made more use of off-balance sheet financing, or been of poorer credit quality than other private businesses. Therefore, it is difficult to infer general lessons from these specific cases.

Yet, history teaches us a lesson here. The likelihood of observing additional cases like those recently in the news increases when size of exposure and level of complexity in these arrangements are not transparent, when a sector experiences periods of rapid growth, and when these arrangements have not been through a full credit cycle (boom

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Reserve System, March 21), https://www.federalreserve.gov/econres/notes/feds-notes/life-insurers-role-in-the-intermediation-chain-of-public-and-private-credit-to-risky-firms-20250321.html.

and bust). Accordingly, I will continue to focus on ensuring that we understand developments in this sector and how these lending arrangements are evolving over time.

Hedge Fund Footprint in Treasury Markets

Another vulnerability I am following carefully is the footprint of hedge funds in the U.S. Treasury market. This footprint has grown substantially over the past few years and recently just exceeded its previous, pre-pandemic peak. My focus relates to the potential for transmitting stress to the U.S. Treasury market, which is critical to the functioning of our financial system. The U.S. Treasury market is the largest and most liquid financial market in the world. Treasury securities, by serving as a source of safe and liquid assets, enable the efficient and stable flow of capital across the global financial system. The Treasury market averages around $900 billion in transactions per day, with transactions on high-volume days around $1.5 trillion per day in recent years.[6] The smooth operation of U.S. Treasury markets is also critical for the transmission and implementation of monetary policy.

Hedge funds' holdings of Treasury cash securities—that is, Treasury bills, notes, and bonds—have increased from representing about 4.6 percent of total Treasury securities outstanding in the first quarter of 2021 to representing 10.3 percent in the first quarter of this year, just above its pre-pandemic peak of 9.4 percent.[7] This represents significant growth in the scale of liquidations that could result, if hedge funds were to sharply reduce their Treasury positions because of changing market conditions. We

[6] Financial Industry Regulatory Authority (2025), "Treasury Daily Aggregate Statistics" https://www.finra.org/finra-data/browse-catalog/about-treasury/daily-data (accessed November 17, 2025).
[7] Hedge funds' Treasury holdings data can be found on the Board's website: https://www.federalreserve.gov/releases/efa/efa-hedge-funds.htm. The market value of privately held Treasury debt can be found at https://www.dallasfed.org/research/econdata/govdebt.

witnessed such an episode at the start of the pandemic during the "dash for cash" when sales of Treasuries by a broad range of market participants increased dramatically and all at once.[8]

The sensitivity of hedge fund Treasury positions to shifting market conditions depends on the Treasury trading strategies that hedge funds are pursuing. Staff analysis suggests that the vast majority of hedge fund Treasury positions involve relative value trading strategies, of which there are many types. These trades exploit relative price differences between related securities—pairs or combinations of Treasury cash securities, Treasury derivatives, or interest rate derivatives. To be sure, outside of episodes of stress, relative value trades substantially improve the efficiency and liquidity of Treasury securities and related markets. Yet, during episodes of stress, the unwinding of crowded positions in such trades could magnify instability in these markets.

Relative value trading strategies typically share key features that create potential Treasury market vulnerabilities.[9] For example, relative value trades are highly leveraged to amplify returns from small price differentials, with these trades generally funded with repo that is shorter term than the maturity of the trade, resulting in maturity mismatch. As a result, these strategies are exposed to significant funding risks that could arise from

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[8] See Daniel Barth and R. Jay Kahn (2025), "Hedge Funds and the Treasury Cash-Futures Basis Trade," *Journal of Monetary Economics*, vol. 155 (October), 103823; Mathias S. Kruttli, Phillip J. Monin, Lubomir Petrasek, and Sumudu W. Watugala (2025), "LTCM Redux? Hedge Fund Treasury Trading, Funding Fragility, and Risk Constraints," *Journal of Financial Economics*, vol. 169 (July), 104017; and Andreas Schrimpf, Hyun Song Shin, and Vladyslav Sushko (2020), "Leverage and Margin Spirals in Fixed Income Markets during the Covid-19 Crisis," BIS Bulletin 2 (Basel, Switzerland: Bank for International Settlements, April).

[9] See Emil N. Siriwardane, Adi Sunderam, and Jonathan Wallen (2025), "Segmented Arbitrage," *The Journal of Finance*, vol. 80 (5), pp. 2543–90; and Jefferson Duarte, Francis A. Longstaff, and Fan Yu (2007), "Risk and Return in Fixed-Income Arbitrage: Nickels in Front of a Steamroller?" *The Review of Financial Studies*, vol. 20 (3), pp. 769–811. See also Ayelen Banegas and Phillip Monin (2023), "Hedge Fund Treasury Exposures, Repo, and Margining," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, September 8) https://doi.org/10.17016/2380-7172.3377.

instability in repo markets. Relative value trades that involve derivative contracts—such as the cash-futures basis trade and the swap-spread trade—are further exposed to margin calls when additional liquidity is required to satisfy increased minimum margin requirements. Such adverse funding shocks can result from episodes of market volatility or from moves in relative prices that are disadvantageous to the trade. Sudden funding shocks can then prompt an unwinding of hedge fund positions, resulting in significant Treasury security sales and the potential for market liquidity strains. Increased volatility and losses due to changes in relative prices can also lead hedge funds to choose to exit trades for risk-management reasons, also resulting in large Treasury security sales.[10] All of these features of relative value strategies can make Treasury market liquidity conditions—and, in the extreme, market functioning—more vulnerable to stress.

Note that it is not inevitable that episodes of market volatility will induce an unwinding of relative value trades and, indeed, instances of one of these trades unwinding are rare. As you know, the swap-spread trade—a relative value trade between Treasury securities and interest rate swaps—experienced an unwinding during April's heightened market volatility, because the relative prices of securities at the core of the trade moved in ways that became unfavorable to the trade. Nonetheless, other relative value trades remained fully intact. This was especially notable for the cash-futures basis trade, reflecting the fact that conditions in repo markets remained orderly throughout the episode.[11] Notwithstanding, the paucity of sizable relative value trade unwindings remains a potential impetus for market liquidity strains.

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[10] See Kruttli, Monin, Petrasek, and Watugala, "LTCM Redux? Hedge Fund Treasury Trading, Funding Fragility, and Risk Constraints"(see note 8).

[11] See Roberto Perli (2025) "Recent Developments in Treasury Market Liquidity and Funding Conditions," remarks at the 8th Short-Term Funding Markets Conference, Washington, May 9.

AI Use in Financial Services

The potential implications of rapid advancements in AI for financial stability constitute my final topic today. Just as the scientific revolutions in chemistry and biology brought both life-saving medicines and more potent weapons, the recent advancements in AI have prompted forecasts that run the gamut from utopia to doomsday. How do theory and limited evidence inform us thus far about the potential impact of AI on financial stability? To structure our thinking, I would like to briefly consider one aspect of this question: the use of AI in algorithmic trading in financial markets and the implications for financial stability.

Certainly, sophisticated computer-driven trading algorithms are not new. Traders have been using machine learning and other advanced statistical tools for decades. Trading in many important financial markets is now heavily reliant on algorithms.[12] But the adoption of generative AI in trading is different and brings new challenges. Unlike pre-programmed algorithms with limited flexibility, generative AI is able to quickly review large amounts of data and then autonomously deploy trading strategies that could be opaque to humans. Used without careful testing and human oversight, generative AI may create risks that are difficult to monitor or mitigate. The use of generative AI in trading may also improve on current algorithmic trading activity, especially if the less rigid models prove able to adjust in ways that stabilize rather than destabilize prices. There is early evidence for both.

[12] See Andrei A. Kirilenko and Andrew W. Lo (2013), "Moore's Law versus Murphy's Law: Algorithmic Trading and Its Discontents," *Journal of Economic Perspectives*, vol. 27 (2), pp. 51–72; and Maureen O'Hara (2015), "High Frequency Market Microstructure," *Journal of Financial Economics*, vol. 116 (2), pp. 257–70.

Correlated trading and herding

Researchers are only starting to study whether the use of generative AI in trading leads to more or less correlated trading. Nonetheless, research so far offers some useful insights. Theory and empirical evidence show that independent but simultaneous actions by high-frequency trading (HFT) algorithms in response to a common signal can indeed generate excess volatility and mispricing, thereby reducing market efficiency.[13] Not all algorithms are created equal. Studies have also shown instances when correlated trading by HFTs improved price discovery without increasing volatility.[14] Research also shows widespread use of popular arbitrage strategies helped eliminate mispricing across fragmented markets.[15] In other words, correlated trading by algorithms can, at times, also benefit market quality and efficiency.

A recent experimental study by Fed economists demonstrates that algorithmic strategies relying on generative AI may also be less prone to herding behavior—by which I mean ignoring private information and imitating others—than human traders. In this experiment, the AI agents were less influenced by the cognitive biases that sometimes drive human investment decisions.[16]

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[13] See Robert A. Jarrow and Philip Protter (2012), "A Dysfunctional Role of High Frequency Trading in Electronic Markets," *International Journal of Theoretical and Applied Finance*, vol. 15 (3), 1250022.
[14] See Alain P. Chaboud, Benjamin Chiquoine, Erik Hjalmarsson, and Clara Vega (2014), "Rise of the Machines: Algorithmic Trading in the Foreign Exchange Market," *Journal of Finance*, vol. 69 (5), pp. 2045–84; and Evangelos Benos, James Brugler, Erik Hjalmarsson, and Filip Zikes (2017), "Interactions Among High-Frequency Traders," *Journal of Financial and Quantitative Analysis*, vol. 52 (4), pp. 1375–402.
[15] See Albert Menkveld and Bart Zhou Yueshen (2019), "The Flash Crash: A Cautionary Tale about Highly Fragmented Markets," *Management Science*, vol. 65 (10), pp. 4470–88; and Dobrislav Dobrev and Ernst Schaumburg (2016), "High-Frequency Cross-Market Trading and Market Volatility," Federal Reserve Bank of New York, *Liberty Street Economics* (blog), February 17, https://libertystreeteconomics.newyorkfed.org/2016/02/high-frequency-cross-market-trading-and-market-volatility/.

[16] See Anne Lundgaard Hansen and Seung Jung Lee (2025), "Financial Stability Implications of Generative AI: Taming the Animal Spirits," Finance and Economics Discussion Series 2025-090 (Washington: Board of Governors of the Federal Reserve System, September), https://doi.org/10.17016/FEDS.2025.090.

Collusion, market manipulation, and concentration

Researchers have also pointed to the risk that generative AI could engage in collusion and market manipulation, rigging the system to favor those employing the technology. Recent theoretical studies find that some AI-driven trading algorithms can indeed learn to collude without explicit coordination or intent, potentially impairing competition and market efficiency.[17] However, others observe that the possibility of collusion rests on the assumption that all traders use very similar algorithms. They argue that algorithmic traders have strong incentives to differentiate their trading strategies, because noncollusion can be highly profitable when others collude.[18] Thus, according to these views, the likelihood of tacit algorithmic collusion arising in real-world financial markets is very small.

Beyond collusion, there is also the troubling possibility that AI trading systems could learn to manipulate markets. A recent theoretical study shows that self-learning, profit-maximizing algorithms can unintentionally discover spoofing strategies—that is, placing large orders they never intend to execute just to create false impressions of market demand.[19] Potentially, some new AI systems could operate with greater opacity, execute more complex trades, and better hide manipulative intent than old-fashioned dishonest human traders. Additionally, there are growing concerns that results obtained

[17] See Álvaro Cartea, Patrick Chang, Mateusz Mroczka, and Roel Oomen (2022), "AI Liquidity Provision in OTC Markets," *Quantitative Finance*, vol. 22 (12), pp. 2171–204; and Winston Wei Dou, Italy Goldstein, and Yan Li (2025), "AI-Powered Trading, Algorithmic Collusion, and Price Efficiency," NBER Working Paper Series 34054 (Cambridge, Mass.: National Bureau of Economic Research, July), https://www.nber.org/papers/w34054.

[18] See Laura Veldkamp (2024), "Discussion of 'AI-Powered Trading, Algorithmic Collusion, and Price Efficiency,'" NBER Summer Institute 2024: Asset Pricing, Cambridge, Mass., July 11–12, https://www.nber.org/conferences/si-2024-asset-pricing).

[19] See Álvaro Cartea, Patrick Chang, and Gabriel García-Arenas (2025), "Spoofing and Manipulating Order Books with Learning Algorithms," available at: https://ssrn.com/abstract=4639959.

from complex AI models may be difficult to explain or rationalize by human experts—the "black box" problem.[20] The inability to fully audit trades executed by algorithms makes surveillance by trading venues and regulators more challenging.

The good news here is that major electronic trading platforms are also rapidly adopting advanced machine learning techniques to detect market manipulation and collusive behavior.[21] Thanks to improving surveillance capabilities, AI technology could ultimately strengthen market integrity and enhance market liquidity. Trading venues are also taking steps to mitigate the risk stemming from the "black box" problem associated with AI-enabled trading algorithms. For example, the Chicago Mercantile Exchange (CME) recently reminded its members that they must be able to fully explain and reproduce any decisions or actions taken by their algorithms on the CME market.[22] Such initiatives may limit the deployment of generative AI and other stochastic algorithms for direct trade execution on major trading venues.

Last but not least, the debate is also growing as to whether the adoption of generative AI in trading algorithms may increase concentration due to high investment barriers (as seen with one liquidity provider using 25,000 GPUs and building billion-

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[20] See Alessio Azzuti, Wolf-Georg Ringe, and H. Siegfried Stiel (2022), "Machine Learning, Market Manipulation and Collusion on Capital Markets: Why the 'Black Box' Matters," *University of Pennsylvania Journal of International Law*, vol. 43 (1), pp. 79–135.

[21] See Pedro Gurrola-Perez and Kaitao Lin (2024), "An Analysis of Market Manipulation Definitions round the World," working paper (London: World Federation of Exchanges, June).

[22] See the CME Group's "Market Regulation Advisory Notice" at https://www.cmegroup.com/content/dam/cmegroup/notices/market-regulation/2024/07/CME-Group-RA2403-5.pdf.

dollar infrastructure) or decrease concentration by democratizing access to sophisticated capabilities previously limited to large institutions.[23]

Taken together, areas to watch carefully have emerged, as well as potential ways we will benefit from this new technology.

Conclusion

Back to my broader themes, the financial system remains resilient. Yet, vulnerabilities from elevated asset values, growth and complexity in private credit markets, and the potential for hedge fund activity to contribute to Treasury market dislocation warrant attention. These emerging vulnerabilities also occur against a backdrop of very significant technological change. These innovations may ultimately improve financial stability but also involve transitions and potential challenges that may require thoughtful and deliberate navigation. My focus going forward will be on working with my colleagues to navigate these opportunities and vulnerabilities to ensure the financial system remains strong and resilient.

Thank you.

[23] See Anna Irrera and Justina Lee (2025), "Billionaire Trader Alex Gerko's XTX to Build €1 Billion Data Hub," Bloomberg, January 22.