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To whom it may concern,

We are Duke students excited about the opportunity to provide comments to the Commodity Futures Trading Commission ("CFTC") and the Securities and Exchange Commission's ("SEC") October 11, 2022, request for information regarding the proposal to amend cryptocurrency ("crypto") reporting rules for large hedge funds. Our intent is to assist the CFTC and SEC by stating our opinions on the importance of hedge funds reporting their crypto exposure through the anonymous Form PF.

Our background as Economics and Computer Science students has given us the opportunity to learn more about cryptocurrency and financial markets. By taking multiple economics classes like Macroeconomics, Microeconomics, and Corporate Finance, we have become interested in how financial markets and new financial products, like crypto, interact. Our letter aims to apply the lessons we have learned to the RFI and examine the benefits of having stricter regulations regarding cryptocurrencies and hedge funds.

As students exploring the causes and effects of the Great Recession, we know that managing hedge fund risk is a critical part of a healthy financial system. In a plethora of post-crisis analyses,[1] hedge funds have been found to introduce at least some level of systemic risk into markets. Even though there is a high minimum investment for clients, hedge funds are another creative method of investing because they have the ability to pursue risky strategies with little regulation, past a nebulous "fiduciary responsibility" set by the SEC that requires hedge fund managers to act in the best interests of their principals.[2] As members of a generation deemed 'risk averse,'[3] we find it fascinating that hedge funds will intentionally pursue higher-risk strategies that can possibly lead to their collapse. Consider the example of Credit Suisse, a titan of the global financial sector that is now restructuring in no small part due to the large losses caused by the collapse of a single family office.

We believe that it is logical to assume that, when you combine a risky asset with a high-risk, high-reward investment vehicle, risk in the broader market will increase. As hedge funds continue to explore cryptocurrency and investments in the overarching digital assets landscape, we firmly believe that regulation must mitigate risks to the financial sector to best protect it from cryptocurrency's volatility. We appreciate the opportunity to present our comments on the proposal the CFTC and SEC put forth because it represents the eminent path to increasing oversight, perhaps without decreasing the available profit from these burgeoning investments. As we segue into our analysis of the RFI, we would like to highlight that this is a particularly broad

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[1] Wulf A. Kaal, Timothy A. Krause, "Hedge Funds and Systemic Risk," (August 2017), https://academic.oup.com/book/25365/chapter/192452711#310118510

[2] Commodity Futures Trading Commission, and Securities and Exchange Commission, "Form PF; Reporting Requirements for All Filers and Large Hedge Fund Advisers," (October 11, 2022), https://www.sec.gov/rules/proposed/2022/ia-6083.pdf

[3] Rick Steves, "Gen Z is most risk-averse generation, according to Futu whitepaper," (July 26, 2022), https://financefeeds.com/gen-z-is-most-risk-averse-generation-according-to-futu-whitepaper/

RFI, and as such, we aim to focus our recommendations on how Form PF can better be structured to evaluate the market risk to which cryptocurrencies contribute, specifically when these cryptocurrency assets are held by hedge funds.

Why is Hedge Fund Regulation Important?

Hedge funds have long lost their connotation of risk "hedging"[4]; instead, many hedge funds now pursue a high-risk, high-return investment pattern based on the latest investment theories and market manipulation techniques, making full use of the leverage of financial products. Moreover, under current U.S. regulations, hedge funds have the flexibility to invest in crypto assets.

Hedge funds face far less regulation than other private market investment vehicles.[5] They are allowed to participate in risky behavior that adds risk to financial markets. Hedge funds “can be highly leveraged and can be vulnerable to pressure to liquidate assets quickly if they sustain significant losses.”[6] A hedge fund’s leverage, a term that describes assets purchased using money borrowed from another source using a minimum level of firm capital as collateral, is the primary aspect of hedge funds that endanger the broader market. Historically, notorious hedge fund Long Term Capital Management (“LTCM”) had a leverage ratio of more than 25 to 1[7], compared to 2019 where the average hedge fund leverage ratio was 9 to 1[8]. In 1998, LTCM had

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[4] D. Quinn Mills, “The Problem with Hedge Funds,” (October 6, 2003), https://hbswk.hbs.edu/item/the-problem-with-hedge-funds

[5] U.S. Securities and Exchange Commission, “Private Investment Funds: Hedge Funds,” https://www.investor.gov/introduction-investing/investing-basics/investment-products/private-investment-funds/hedge-funds

[6] Timothy Geither, “Hedge Funds and Their Implications for the Financial System,” (November 17, 2004), https://www.newyorkfed.org/newsevents/speeches/2004/gei041117

[7] Lee Reiners, “Do Hedge Funds Threaten Financial Stability?” (January 26, 2017), https://sites.duke.edu/thefinregblog/2017/01/26/do-hedge-funds-threaten-financial-stability/

[8] Board of Governors of the Federal Reserve System, “Financial Stability Report,” (November 2020), https://www.federalreserve.gov/publications/2020-november-financial-stability-report-leverage.htm

significant assets in Russian debt, but this became particularly dangerous when Russia defaulted on its debt in 1998 and LTCM collapsed due to a Russian halt on the trading of the ruble.[9] Being highly leveraged, LTCM required a bailout under the supervision of the Federal Reserve[10] to prevent a spread of contagion to LTCM's creditors and counterparties.

Another example of how private funds can indirectly affect investors can be found in the Archegos-Credit Suisse relationship. Credit Suisse was a major counterparty to the family office Archegos Capital Management. A family office performs the same functions as a hedge fund since they serve high net-worth clients, but a family office manages the assets of a family instead of a pool of assets of individuals and institutional investors[11] like a hedge fund. When Archegos collapsed in 2021 due to their failure to meet margin calls[12], Credit Suisse lost a total of $5.5 billion, the largest loss suffered by Archegos' prime brokers.[13] Their loss left a large dent on their balance sheet, and there were rumors earlier this year about the bank's health and long-term future as they still have not fully recovered. Hedge fund regulation is necessary, as shown by the LTCM and Archegos examples, because it can help prevent market crises and protect institutional investors.

The Destabilizing Role of Cryptocurrencies and Hedge Funds

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[9] Matthieu Benavoli, "LTCM crisis timeline", https://extreme-events-finance.net/resources/ltcm-crisis/

[10] Joe Fahmy, "Why Hedge Funds Are More Likely to Cause a Market Crisis Than Robinhood's GameStop Traders," (February 1, 2021), https://www.yahoo.com/now/hedge-funds-are-more-likely-to-cause-a-market-crisis-than-robinhoods-game-stop-traders-171726802.html

[11] Cope Corrales, "Family Office vs. Hedge Fund: What's the Difference?," (February 3, 2022), https://copecorrales.com/articles/family-office-vs-hedge-fund

[12] Hayley McDowell, "The Collapse of Archegos Capital Management," (July 16, 2021), https://www.thetradenews.com/the-collapse-of-archegos-capital-management/

[13] Hayley McDowell, "The Collapse of Archegos Capital Management," (July 16, 2021), https://www.thetradenews.com/the-collapse-of-archegos-capital-management/

We would like to express our sincerest gratitude towards the SEC and the Commission for their regulations over crypto assets during the past decade, and we especially appreciate their efforts in enforcement actions and regulatory updates. That said, we must acknowledge the increasingly disruptive role cryptocurrencies are playing in the financial system. Although cryptocurrencies arguably entered the mainstream in 2009 when Satoshi Nakamoto first published his article *Bitcoin: A Peer-to-Peer Electronic Cash System*[14], this type of new financial instrument has been growing at a phenomenal pace since. The destabilizing effect of cryptocurrencies can be seen in the following aspects:

1. Their aggregate market capitalization, always-open transaction hours, and decentralized, permissionless nature may potentially give rise to a "too big to fail" scenario.
2. Numerous regulatory issues involving environmental, security, and technical concerns arise with the growth of cryptocurrencies, as warned by the International Monetary Fund (“IMF”)[15];
3. The pricing mechanism of cryptocurrencies is more in line with the characteristics of "commodities" than "currencies", as it depends solely on supply-demand relationship.

Hedge Funds’ Increasing Exposure to Crypto Sub-Assets

Notably, hedge funds now have many ways to access crypto investment exposure that are not strictly dedicated to crypto trading per se. The SEC and the Commission proposed to add

[14] Satoshi Nakamoto, “Bitcoin: A Peer-to-Peer Electronic Cash System,” (October 31, 2008), https://bitcoin.org/bitcoin.pdf

[15] International Monetary Fund, “Global Financial Stability Report: Shockwaves from the War in Ukraine Test the Financial System’s Resilience,” (April 2022), https://www.imf.org/en/Publications/GFSR/Issues/2022/04/19/global-financial-stability-report-april-2022

consideration of sub-asset classes to Section 2b of Form PF[16], which would require hedge funds to additionally summarize their exposure to sub-assets pertaining to cryptocurrency investments in the report. This amendment is intended to account for the "adjusted exposure" to crypto-related assets of hedge funds. Apart from crypto trading, hedge funds' adjusted exposure can also be achieved through financial instruments including but not confined to:

1. Centralized Exchanges (CEX) and Decentralized Exchanges (DEX).

   In 2017, the Chicago Board Options Exchange (CBOE) and the Chicago Mercantile Exchange (CME) launched the initial listing of crypto futures contracts.[17] This event indicated that mainstream institutions were beginning to show interest in crypto derivatives trading, and hedge funds could be gaining exposure to crypto assets more indirectly through this approach. Annual crypto derivatives trading volumes hit an all-time high in 2021: Centralized Exchanges (CEX) reached a trading volume of $14 trillion, up 689% from $1.8 trillion; Decentralized Exchanges (DEX) rose from $115 billion to $1 trillion, with an 858% increase in trading volume.[18] As crypto market capitalization continues to increase, hedge funds see a promising future for crypto derivatives and synthetic assets. In addition to the successful centralized derivative exchanges, many emerging DeFi derivative projects have also emerged, including futures

[16] Commodity Futures Trading Commission, and Securities and Exchange Commission, "Form PF; Reporting Requirements for All Filers and Large Hedge Fund Advisers," (October 11, 2022), https://www.sec.gov/rules/proposed/2022/ia-6083.pdf

[17] CME Group, "CME Group Self-Certifies Bitcoin Futures to Launch Dec. 18," (December 1, 2017), https://www.cmegroup.com/media-room/press-releases/2017/12/01/cme_group_self-certifiesbitcoinfuturestolaunchdec18.html

[18] Lawrence Wintermeyer, "Crypto Trading Will Grow In 2022 As dFMI Matures and Drives Efficiencies," (March 25, 2022), https://www.forbes.com/sites/lawrencewintermeyer/2022/03/25/crypto-trading-will-grow-in-2022-as-dfmi-matures-and-drives-efficiencies/?sh=235704697953

trading platforms such as dYdX, Injective and Perpetual, and options trading platforms such as Hegic, Lyra and Opyn.

2. Blockchain companies

   In 2012, Coinbase was founded as the largest global crypto exchange platform until the establishment of Binance in 2017. International Business Machines ("NYSE: IBM") also in part runs as a blockchain service enterprise. Some of the company's offerings in the crypto industry include supply chain solutions, identity information administration and digital asset management. This has attracted bullish interest from several hedge funds, and Arrowstreet Capital is one of its major shareholders, with a stake worth $580 million.[19] In recent months, the growing market capitalization of cryptocurrencies, combined with the Russian-Ukrainian geopolitical "black swan" event and the unprecedented inflation risks, has greatly changed Wall Street's attitude towards cryptocurrencies. More and more hedge funds are getting involved in investment of blockchain companies as an indirect exposure to crypto.

3. Pooled investments

   Pooled investments have been developing in the crypto industry for many years, from the rise of private funds around 2014, followed by private equity, to the establishment of the first US bitcoin (BTC) exchange-traded fund (ETF), "BITO", in 2021.[20] The cumulative value of assets under management (AUM) of crypto funds exceeded $4.1 billion in 2021,

[19] ETF Daily News, "AlphaCrest Capital Management LLC Has $625,000 Holdings in International Business Machines Co. (NYSE: IBM)," (December 1, 2022), https://www.etfdailynews.com/2022/12/01/alphacrest-capital-management-llc-has-625000-holdings-in-international-business-machines-co-nyseibm/

[20] Karamfil Todorov, "Launch of the first US bitcoin ETF: mechanics, impact, and risks," (December 6, 2021), https://www.bis.org/publ/qtrpdf/r_qt2112t.htm

up 8% from the year prior.[21] In the meanwhile, more and more traditional financial institutions are getting into the pooled investments and re-allocating their crypto-related assets. For instance, over the past decade, traditional venture capital firms have set up crypto funds, dedicated to investing in crypto projects. Pooled investments point to another way for hedge funds to have indirect exposure to crypto investments, steering clear of possible cash or physical exposure.

When the risks from cryptocurrencies and hedge funds alike are tallied up, they may have a multiplicative impact on the volatility of the crypto market and the hedge fund itself. A single decline or collapse could trigger a devastating domino situation.

Why is Crypto Valuable to the Financial Services Industry?

To process electronic payments, the majority of online transactions depend on traditional financial institutions as reliable third parties. Yet with the additional expense, such mediations have raised transaction costs, put a cap on the transaction sizes, and eliminated the possibility of casual transactions. Therefore, there has been significant interest in cryptocurrencies in no small part because a primary advantage of crypto is that it fosters trustless, decentralized connections during the transaction process. This brand-new metric helps conduct transactions completely independent of financial intermediaries. The characteristics of cryptocurrency are comparable to those of physical currencies, but this internet-based form of trade allows for instantaneous transactions as well as ownership transfers across borders, albeit with its own flaws. The blockchain, at the moment, can process only roughly 4.6 transactions per second, which is

[21] PwC, Elwood, and AIMA, "4th Annual Global Crypto Hedge Fund Report 2022," (2022), https://www.pwc.com/gx/en/financial-services/pdf/4th-annual-global-crypto-hedge-fund-report-june-2022.pdf

significantly less than the average transaction rate of conventional payment mechanisms - approximately 1,700 transactions per second. [22]

Crypto in the Broader Finance World

Pantera launched the first US cryptocurrency-geared fund in 2013 and is among the largest crypto hedge funds in the world with $4.5BN AUM today.[23] In May 2022, Andreesen Horowitz launched a *singular* crypto fund worth $4.5BN.[24] Hedge funds appear to continue on this trajectory of investments. Andreesen Horowitz recently noted that "[w]e think we are now entering the golden era of Web3" [a catch-all term for the innovations that have sprung from the underlying technology of cryptocurrencies][25] and that sentiment is broadly corroborated by the entrance of major venture capital players, including Sequoia, into the space. More traditional hedge funds like Brevan Howard have created substantial crypto focused funds as well. PWC estimates, based on responses to a broadly distributed survey, 43 percent of traditional hedge funds have more than 1 percent of their AUM invested in digital assets, and from 2021 to 2022, the proportion of surveyed traditional hedge funds who invested in crypto rose from 21 percent to 38 percent.[26] Of those surveyed that currently invest in digital assets, over half use leverage to trade these assets.

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22 Adam Rowe, "Blockchain Statistics – Why Blockchain Matters in 2022," (August 2021), https://tech.co/accounting-software/blockchain-statistics

23 Pantera, "A history of firsts," (2022), https://panteracapital.com/

24 Mensholong Lepcha, and Jekaterina Drozdovica, "Crypto hedge funds: Who are the most influential firms investing in crypto?," (November 3, 2022), https://capital.com/crypto-hedge-funds

25 Thomas Stackpole, "What Is Web3? Your guide to (what could be) the future of the internet.," (May 10, 2022), https://hbr.org/2022/05/what-is-web3

26 PwC, Elwood, and AIMA, "4th Annual Global Crypto Hedge Fund Report 2022," (2022), https://www.pwc.com/gx/en/financial-services/pdf/4th-annual-global-crypto-hedge-fund-report-june-2022.pdf

Crypto's reach does not end with private investment platforms. In 2021, JP Morgan, helmed by outspoken crypto skeptic Jamie Dimon, came out with its first crypto fund offerings for private banking clients. JP Morgan partnered with NYDIG, an audited crypto asset broker, which has come to underlie funds for many major banks on Wall Street.[27] Perhaps more importantly, in 2021, the SEC approved the first Bitcoin-related ETF, BITO, which tracks the price of Bitcoin futures. ETFs are commonly thought to be a liquid investment vehicle, and the SEC approving an ETF tracking a cryptocurrency was a momentous change in policy.[28] As the technology that underlies much of the cryptocurrency innovation occurring today continues to mature, investment opportunities in the space continue to materialize; investors pumped in $33B into crypto and blockchain startups in 2021, and another $14B in H1 2022.[29] It is clear that crypto ventures are a popular investment opportunity, and as benefits from this technology begin to materialize in earnest, the World Economic Forum notes that 53 percent of Americans surveyed see crypto as the future of finance.[30]

Crypto Winter

To be sure, crypto and digital assets have seen something of an explosion in the last five years. However, crypto is known to be extremely volatile and the Harvard Business Review concludes that the unique nature of cryptocurrencies, where liquidity is often generated upfront

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[27] Hugh Son, "JPMorgan, led by bitcoin skeptic Jamie Dimon, quietly unveils access to a half-dozen crypto funds," (August 5, 2021), https://www.cnbc.com/2021/08/05/bitcoin-jpmorgan-led-by-jamie-dimon-quietly-unveils-access-to-a-half-dozen-crypto-funds.html

[28] Nikhilesh De, and Danny Nelson, "SEC Approves Bitcoin Futures ETF, Opening Crypto to Wider Investor Base," (October 15, 2021), https://www.coindesk.com/policy/2021/10/15/sec-approves-bitcoin-etf-opening-crypto-to-wider-investor-base/

[29] Jacquelyn Melinek, "Report: VCs Invested $33B in Crypto and Blockchain Startups in 2021," (January 5, 2022), https://blockworks.co/news/report-vcs-invested-33b-in-crypto-and-blockchain-startups-in-2021/

[30] Michael Sonnenshein, "Is cryptocurrency the future of finance? Here's what a new study shows," (November 11, 2022), https://www.weforum.org/agenda/2022/11/cryptocurrency-us-midterms/

and an easing of friction in the creation of cryptocurrencies has catalyzed a reality where there is "a lack of curation… which means more garbage, too."[31] As world events catalyzed layoffs in the tech sector, and the Federal Reserve sharply increased interest rates, cryptocurrencies entered the 'crypto winter,' defined in particular by a "steep sell-off from an all-time high in the price of Bitcoin." And this sell-off was indeed steep; Bitcoin itself has lost more than 70 percent of its value, plummeting from a high of $60k to a relatively stable $20k[32]. The effects of crypto winter are far-reaching; past Bitcoin, the total market cap of cryptocurrencies has fallen from a bit over $3TN to less than $1TN.[33] The unprecedented growth of cryptocurrencies in 2021 has a host of unclear factors, one of which remains the injection of money into the United States economy. As that money ran out, it appears so too did the stomach for volatility in the cryptocurrency markets.

It is yet unclear what this crypto winter means for the sector. Investments into cryptocurrency and Web3 have not completely ceased, yet the massive swing displayed by a relatively new asset raises a host of concerns over regulation and volatility. In part, this is among the few crypto events that have caused a spillover into the broader financial markets. Regulators were wary of linking volatile cryptocurrencies and digital assets to the financial sector. However, even before the approval of ProShare's BITO, crypto hedge funds were en vogue. Because of crypto winter, many of these funds have failed. Well-known crypto hedge fund 3 Arrows Capital (3AC) recently went into liquidation. Notably, 3AC's investment strategy relied heavily on

[31] Omid Malekan, "What Skeptics Get Wrong About Crypto's Volatility," (July 6, 2022), https://hbr.org/2022/07/what-skeptics-get-wrong-about-cryptos-volatility

[32] Yun Li, "Bitcoin Briefly Drops below $20,000 to Lowest Level since Mid-July as Investors Dump Risk Assets," (August 29, 2022), https://www.cnbc.com/2022/08/29/bitcoin-drops-below-20000-to-lowest-level-since-mid-july-as-investors-dump-risk-assets.html.

[33] Omid Malekan, "What Skeptics Get Wrong About Crypto's Volatility," (July 6, 2022), https://hbr.org/2022/07/what-skeptics-get-wrong-about-cryptos-volatility

leverage, dealing particularly with extremely early-stage blockchain projects.[34] Leveraged investments are particularly dangerous when considering the speculatory nature of cryptocurrency. Because great losses can occur rapidly with a cryptocurrency, both the lender and borrower can lose the entirety of their significant investment without adequate time to prepare for a liquidity spiral. As 3AC entered liquidation, it owed $3.7 billion to 27 different creditors.[35] In the case of this particular collapse, the interconnected nature of the firms with which 3AC had a relationship exacerbated the damage its liquidation caused.[36] As such, the far-reaching effects of 3AC's collapse serve as a stark reminder to the dangers crypto holds; even after liquidation, at minimum, five distinct blockchain focused firms that had invested into 3AC suffered hundreds of millions of dollars in losses, sending reverberations through the cryptocurrency-finance world.[37]

Aside from the recent struggles faced by crypto hedge funds, a small group of quantitative hedge funds, many of which are not necessarily crypto-focused, have gained profit through short-selling cryptocurrencies after projecting a sharp decline among several assets using their own algorithms. KPTL Arbitrage Management, a quantitative hedge fund based in the Cayman Islands, has realized 20 percent profit in the first five months of 2022, whereas other

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[34] MacKenzie Sigalos, "From $10 billion to zero: How a crypto hedge fund collapsed and dragged many investors down with it," (July 11, 2022), https://www.cnbc.com/2022/07/11/how-the-fall-of-three-arrows-or-3ac-dragged-down-crypto-investors.html

[35] Decrypt / Kate Irwin, "Bankrupt Three Arrows Capital Owes $3.5B to Creditors, Including $2.3B to Genesis," (July 19, 2022), https://decrypt.co/105416/bankrupt-three-arrows-capital-owes-3-5b-to-creditors-including-2-3b-to-genesis

[36]The Financial Stability Oversight Council, "Fact Sheet Report on Digital Asset Financial Stability Risks and Regulation," (October 3, 2022), https://home.treasury.gov/system/files/261/Fact-Sheet-Report-on-Digital-Asset-Financial-Stability-Risks-and-Regulation.pdf

[37] MacKenzie Sigalos, "From $10 billion to zero: How a crypto hedge fund collapsed and dragged many investors down with it," (July 11, 2022), https://www.cnbc.com/2022/07/11/how-the-fall-of-three-arrows-or-3ac-dragged-down-crypto-investors.html

hedge funds, on average, have lost 2.9 percent within the same time frame.[38] While the performance of these hedge funds may be seen as outliers to the current market trend, their activities evidence that hedge funds, regardless of strategies, have increased their level of exposure and applied complex trading strategies to cryptocurrencies in recent years.

More recently, the collapse of crypto exchange FTX demonstrates the dangers that a crypto collapse can pose for the financial sector. FTX, a cryptocurrency exchange run by Sam Bankman-Freed, ran into severe liquidity issues in early November. FTX's collapse significantly impacted a number of key crypto players, including the Ontario Pension Fund and tech investment giant Sequoia.[39] Notably, FTX's collapse prompted comment from US Treasury Secretary Janet Yellen, noting the industry needs "very careful regulation."[40] Indeed, the crypto winter has had significant negative effects for retail investors. Under executive order, US agencies are investigating and designing regulation surrounding cryptocurrencies, and FTX's collapse may be the impetus to enact real change in crypto asset regulation.[41]

Hedge Funds Should Report Data Every Quarter, Instead of Annually

The crypto market is characterized by its 24/7 open window as well as a short settlement time[42]. While this enables easier and faster cross-border transactions, it raises concerns about

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38 Laurence Fletcher, "Quant Hedge Funds Profit from Cryptocurrency Turmoil," (June 23, 2022), https://www.ft.com/content/da6183cb-357b-46d6-906b-379b76312e3b.

39 Divya Rajagopal, "Ontario Pension Says Any Loss from FTX Investment to Have Limited Impact," (November 10, 2022), https://www.reuters.com/technology/ontario-pension-says-any-loss-ftx-investment-have-limited-impact-2022-11-10/.

40 Sandali Handagam, "FTX Collapse Exposed 'Weaknesses' in Crypto, Janet Yellen Says: Report," (November 14, 2022), https://www.coindesk.com/policy/2022/11/14/ftx-collapse-exposed-weaknesses-in-crypto-janet-yellen-says-report/

41 The White House, "FACT SHEET: President Biden to Sign Executive Order on Ensuring Responsible Development of Digital Assets," (March 9, 2022), https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/09/fact-sheet-president-biden-to-sign-executive-order-on-ensuring-responsible-innovation-in-digital-assets/

42 Forex, "Cryptocurrency market hours: what time of day are cryptos most traded?," https://www.forex.com/ie/markets-to-trade/cryptocurrency-trading/cryptocurrency-market-hours/

overall regulation. For instance, illegal users have taken advantage of this technology "to facilitate fraud, theft, money laundering, and terrorist financing, amongst other crimes"[43]. Also, the crypto pricing mechanism based entirely on supply and demand also points to its volatility, as a single black swan may trigger a drastic chain reaction in the market.

Due to the high volatility and rapidly approaching interconnectedness with the global market, we recommend hedge funds, and especially those that invest in risky assets such as crypto, report their investment data every quarter instead of yearly. While some hedge funds already report their investment data quarterly, current designations only require this schedule for hedge funds that manage assets greater than $1.5BN. This threshold is high, and as volatile crypto assets enter the mainstream; risk must be observed periodically in aggregate. The SEC should set a reporting deadline for each quarter and the form should be submitted no later than 10-15 days after the end of the quarter, as enumerated in Form PF. Both sides must keep full integrity, which means no leaking or data fraud. It is essential, with more granular data, that the government entities handling proprietary financial data be trusted to be diligent custodians. Quarterly reporting "reduces information asymmetry and improves contracting and monitoring"[44]. Thus, the increased transparency gives insights into the stability of the hedge fund. This would allow regulators to oversee the firm-specific risk, and step in in time to detect and prevent a potential failure. Even though many financial institutions like hedge funds have a large and interconnected global presence, they are exempted from regulatory rules such as

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[43] Nadine Schwarz, Ke Chen, Kristel Poh, Grace Jackson, Kathleen Kao, Francisca Fernando, and Maksym Markevych, "Virtual Assets and Anti-Money Laundering and Combating the Financing of Terrorism (1) Some Legal and Practical Considerations," (October 2021) https://www.imf.org/en/Publications/fintech-notes/Issues/2021/10/14/Virtual-Assets-and-Anti-Money-Laundering-and-Combating-the-Financing-of-Terrorism-1-463654

[44] Catherine Shakespeare, "Reporting Matters: The Real Effects of Financial Reporting on Investing and Financing Decisions," (June 2020), https://www.tandfonline.com/doi/full/10.1080/00014788.2020.1770928

performance reporting. This freedom allows these financial institutions to exhibit risk-seeking investment strategies that disturb the crypto market. For instance, the recent unexpected crash of FTX has renewed public concerns about regulation of the crypto market, with some commenters even calling for bank-like regulation of the industry under the "same risk, same rule" principle.[45] Thus, requiring quarterly reporting hands more control over to regulators and maintains market order - and we believe that reporting on assets related to cryptocurrencies is a first step in contributing to a more stable financial system. If the reporting mechanism progresses smoothly, we shall not rule out the possibility of encouraging hedge funds to incorporate other assets in their quarterly reports.

We believe that quarterly financial reporting, even for smaller funds, helps regulators oversee hedge fund exposure risks to crypto. The main cost with this proposal would be the cost of compliance incurred by hedge funds. For record-keeping, hedge funds will spend more on accountants to prepare their financial documents. The additional costs are likely to be pushed onto their clients on top of the original high, industry-standard fees. Moreover, with a greater influx of data, there is an additional burden placed on the SEC as they attempt to do justice to the analysis of the data they have collected.

Despite the extra toll on hedge funds and the SEC, the regulation brings several major benefits. Our recommendation provides regulators with better overall data to prevent the collapse of a hedge fund. Compared to annual reporting, quarterly reporting comes with both quantitative and qualitative advantages, which substantially eliminates ambiguity. The regulatory institutions

[45] Rob Nichols and Dennis Kelleher, "Op-Ed: FTX Crash Shows Cryptocurrency Market Needs Bank-like Regulation," (December 5, 2022), https://www.cnbc.com/2022/12/05/op-ed-ftx-crash-shows-cryptocurrency-market-needs-bank-like-regulation.html

can look at more frequent snapshots of the hedge fund's investment strategies and better assess its financial stability. With more frequent reporting, the SEC can better manage sectoral risk based on the performance of hedge fund assets, preventing another Archegos or LTCM ideally well before it occurs.

In general, there are three major alternatives to our recommendation. The first approach is to maintain the status quo with annual reporting. The second alternative is to eliminate the reporting mechanism altogether. The third alternative, which offers a salient compromise, would be to report investment data twice a year. The first two alternatives would give rise to ineffective data that will hinder regulation in the crypto market, adding risk to the overall market. The third alternative, reporting twice a year, reduces burden from our original proposition, while giving some of the same benefits. However, in a financial system where quarterly reporting is standard, assessing firm health after each quarterly report would allow regulators to identify risk issues in hedge fund positions before they become manifest, rather than after. Indeed, keeping form PF's annual reporting would only let regulators take ex-post measures in face of a crisis. Our recommendation, in comparison, can help the market prepare swiftly for a crash in crypto, among other assets. In addition, the quarterly data presented is more up-to-date and precise. Having a clear notion of the stability of the hedge fund helps regulators prevent additional idiosyncratic and systematic risks.

Hedge Funds Should Disclose Digital Assets in Greater Detail

Question No. 74[46] in the request for comment in short asks whether specific disclosure of digital assets is necessary in Form PF, and provides a broad list of specific, example concerns

[46] Securities and Exchange Commission, "Form PF; Reporting Requirements for All Filers and Large Hedge Fund Advisers," (October 11, 2022), https://www.sec.gov/rules/proposed/2022/ia-6083.pdf

that the SEC has regarding delineations of digital assets. To be sure, the definition of digital asset as noted in the proposed amendment to Form PF is far too broad to stand as a blanket term, especially if the intention of increasing stringency in Form PF disclosure has the aim of providing more data to the SEC regarding systemic risk that hedge funds and other pursuant institutions could hold against the broader financial system. A reform of the reporting requirements in Form PF is a move supported by the Financial Stability Oversight Council (FSOC), which enumerated that "gaps exist in the availability of data related to hedge funds, and Council member agencies are taking steps to address these gaps"[47]. Pursuant to FSOC's October 2022 report[48] on the risks that cryptocurrencies carry in private markets, there are four major risk-carrying features of cryptocurrencies that require reevaluation in the context of regulation; (1) a lack of basic risk controls to help ensure leverage is not excessive, (2) a high degree of speculative activity, (3) crypto asset firms often have low visibility into their operations, (4) a concentration of "key services" of distributed ledger technology carries operational risk to the asset itself. Addressing these four declared concerns is first priority when understanding how to structure Form PF in the context of digital assets.

As stated in the RFI, the definition of digital asset the SEC wishes to adopt at a minimum describes digital assets "as an asset that is issued and/or transferred using distributed ledger or blockchain technology"[49] and goes on to specify that crypto assets are under this umbrella term and definition. This change brings the definition for digital assets in Form PF in line with the

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[47] U.S. Department of Treasury, "Financial Stability Oversight Council Statement on Nonbank Financial Intermediation February 4, 2022," (February 4, 2022), https://home.treasury.gov/news/press-releases/jy0587

[48] The Financial Stability Oversight Council, "Fact Sheet Report on Digital Asset Financial Stability Risks and Regulation," (October 3, 2022), https://home.treasury.gov/system/files/261/Fact-Sheet-Report-on-Digital-Asset-Financial-Stability-Risks-and-Regulation.pdf

[49] Securities and Exchange Commission, "Conformed to Federal Register Version - SEC," (October 11, 2022), https://www.sec.gov/rules/proposed/2022/ia-6083.pdf

established SEC standard and is "designed to help ensure that advisers report digital assets accurately."[50] However, in the question for which the SEC requests comment, there are an incredible number of unresolved hypothetical questions regarding how assets should be delineated. To this end, an annual report by PwC[51] notes the proportion of crypto-trading hedge funds that trade altcoins, or a general term that encapsulates the cryptocurrencies that are not Bitcoin, has increased to about 40 percent. The same report notes at least 10 broad categories of cryptocurrencies outside stores of value like Bitcoin and Litecoin are appreciably traded by hedge funds surveyed. This implies that crypto hedge funds are investing into unproven, complex cryptocurrencies with complex and numerous ways of generating returns, and as such, markedly different risk profiles than established cryptocurrencies and the stablecoins that act as a store of value.

The importance of Form PF is as a measuring stick to understand what individual and aggregate risk looks like in the financial markets. It is therefore critical regulators have a clear understanding of the possible consequences digital asset volatility can have on the larger market in the event of another 'crypto winter' scenario. Echoing comments by Alexis Goldstein of the Open Markets Institute remarked to the House Committee on Financial Services[52] "should a substantial portion of the hedge fund market move into cryptocurrency, extreme volatility in crypto could spread to other financial markets." The IMF issued a paper in January, 2022 that

[50] Bill Myers, "SEC Offers First Crypto Definition," (February 22, 2022), https://www.regcompliancewatch.com/sec-offers-first-crypto-definition/

[51] PwC, Elwood, and AIMA, "4th Annual Global Crypto Hedge Fund Report 2022," (2022), https://www.pwc.com/gx/en/financial-services/pdf/4th-annual-global-crypto-hedge-fund-report-june-2022.pdf

[52] Open Markets Institute, "New Open Markets Financial Policy Director, Alexis Goldstein, to Testify Tomorrow on Systemic Risks of Cryptocurrency at House Subcommittee Hearing," (June 29, 2021),. https://www.openmarketsinstitute.org/publications/new-open-markets-financial-policy-director-alexis-goldstein-to-testify-tomorrow-on-systemic-risks-of-cryptocurrency-at-house-subcommittee-hearing

held to the same effect, noting "spillovers [from cryptocurrency]… suggest that close monitoring of crypto asset markets and the adoption of appropriate regulatory policies are warranted to mitigate potential financial stability risks."[53] This is in close complement to statements released by the Financial Stability Oversight Council (FSOC), in which the Council notes a lack of action in taking "other available steps that would address the financial stability risks of their[hedge funds'] activities."[54]

To inform policies that mitigate the risk posed by cryptocurrencies, it is therefore essential to have requisite data that can inform exposure to digital assets, but also paint a clearer picture regarding overlap in investment by sizable hedge funds that invest in crypto assets. Indeed, an International Monetary Fund ("IMF") paper[55] that drew a comparison between the pre- and post-pandemic spillover between crypto's effects on the S&P and vice versa, suggests Bitcoin alone explains one-sixth of the volatility in key equity indices. Notably, before the first quarter of 2020, crypto *as a whole* explained less than 1% of the volatility in US equity markets. This is particularly notable for hedge funds, as literature would therefore indicate that the volatility spillover present in their sovereign crypto holdings could adversely impact the other equities the firm holds, not to mention the risk present to the broader market with this demonstrated correlation.

[53] U.S. Department of Treasury, "PRESS RELEASE: Financial Stability Oversight Council Releases Report on Digital Asset Financial Stability Risks and Regulation," (October 3, 2022), https://home.treasury.gov/news/press-releases/jy0986.
[54]U.S. Department of Treasury, "Fact Sheet Report on Digital Asset Financial Stability Risks and Regulation," (October 3, 2022), https://home.treasury.gov/system/files/261/Fact-Sheet-Report-on-Digital-Asset-Financial-Stability-Risks-and-Regulation.pdf
[55] Tobias Adrian, Tara Iyer, and Mahvash S. Qureshi, "Crypto Prices Move More in Sync With Stocks, Posing New Risks," (January 11, 2022), https://www.imf.org/en/Blogs/Articles/2022/01/11/crypto-prices-move-more-in-sync-with-stocks-posing-new-risks

To gain an accurate picture of what a hedge fund's crypto exposure looks like and address the FSOC comments outlined above, supervisors should work to establish a set of minimum questions. Chief among the concerns Form PF should have for crypto-carrying hedge funds is the full list of digital currencies they trade, and as mentioned above, the crypto sub-assets they hold; it should no longer be sufficient to consider all digital assets under one umbrella. The IMF paper mentioned above draws comparisons between Bitcoin and far smaller stablecoin Tether and finds yet that Tether explains a nonsignificant portion of US equities volatility as well. Because of the impact even low market cap cryptos can have on stability, hedge funds should be asked to disclose each crypto or digital asset they trade. Moreover, hedge funds should be asked if their digital securities are leveraged. It is far more difficult to understand broader market risk without knowing exactly what assets or financial promises have been made surrounding an already nebulous investment vehicle. Understanding how cryptocurrency positions are leveraged will help regulators untangle the tangled relationships illustrated in the collapse of 3AC and clarify what entities face what levels of risk. Finally, to round out a minimum level of inquiry, hedge funds should be asked whether they use any auxiliary functions of their held digital assets, such as staking. Staking, or using a pool of cryptocurrency to generate rewards by performing functions for the currency, holds a key risk that poses a threat to the integrity of a fund. Staking incurs significant liquidity risk.[56] Because you 'lock up' your currency, and often there are 'slashing' punishments for extricating your assets too early, this strategy prevents a fund from selling quickly in a downturn if executed improperly.

[56] Alex Lielacher, "Top 7 Risks of Staking Crypto," (April 30, 2022), https://trustwallet.com/blog/top-7-risks-of-staking-crypto

These three points of inquiry are proposed as a *minimum* as Form PF begins to explore digital assets in a more concerted manner. It is our recommendation that Form PF work to gather the most data regarding cryptocurrency investments, taking guidance from academic research into the stability risks of cryptocurrency to guide their data. Alternatives to this guidance are present; there are two worlds that exist outside our recommendation. First, regulators could continue their current path and ignore more stringent reporting requirements. Second, regulators could dive deeper by asking questions about crypto strategy and outlook for a fund. Because cryptocurrency and digital assets are still in an infancy stage, asking questions about crypto strategy may not yet be a concern, or a question funds can answer as they explore this new investment vehicle. To that effect, it is ignorant to continue on as broad a path as is being taken now; research by the IMF and the Basel Committee suggests in no uncertain terms that regulators need to begin supervising crypto[57] [58]. These points of inquiry serve as a strong launchpad for changes to Form PF as digital assets and crypto continue to evolve in coming years. As data is gathered, regulators will be able to issue guidance to firms regarding cryptocurrency exposure. The more granular the data, the better the recommendations[59]. A clearer picture of the risks cryptocurrency in hedge funds poses to the broader financial services industry is essential as the market cap and spillover of crypto increases.

Conclusion

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[57] Aditya Narain, and Marina Moretti, "Regulating Crypto," (September 2022), https://www.imf.org/en/Publications/fandd/issues/2022/09/Regulating-crypto-Narain-Moretti
[58] Parma Bains et al., "PDF," (September 26, 2022), https://www.imf.org/en/Publications/fintech-notes/Issues/2022/09/26/Regulating-the-Crypto-Ecosystem-The-Case-of-Unbacked-Crypto-Assets-523715
[59] Scott Bauguess, "SEC.Gov | The Role of Big Data, Machine Learning, and AI in Assessing Risks: A Regulatory Perspective," (June 21, 2017), https://www.sec.gov/news/speech/bauguess-big-data-ai.

To summarize, we support amending procedures in regard to hedge funds disclosing their exposures to cryptocurrency, with a few recommendations for improving reporting measures. Due to the high rates of fluctuation within the crypto market, we suggest that hedge funds should be required to report their investment data on a quarterly basis, as higher reporting frequency would provide better performance insight, reduce ambiguity, and allow more control and interventions by regulators in case of a potential failure. To gain a fully accurate picture of hedge funds' exposure to cryptocurrency, we believe that form PF should include a set of questions, which at minimum, should ask hedge funds to list all digital currencies involved in their transactions, as the properties and market impacts of cryptocurrencies may vary. To further understand the hedge funds' activities, the questions should also require funds to specify if their held currencies are leveraged, and whether they have utilized any auxiliary functions of these currencies.

We thank the SEC and CFTC for the opportunity to share our views on this policy change.

Respectfully submitted,

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Bibliography

Adrian, Tobias, Tara Iyer, and Mahvash S. Qureshi. "Crypto Prices Move More in Sync with Stocks, Posing New Risks." January 11, 2022. https://www.imf.org/en/Blogs/Articles/2022/01/11/crypto-prices-move-more-in-sync-with-stocks-posing-new-risks

Bains, Parma, Arif Ismail, Fabiana Melo, and Nobuyasu Sugimoto. "Regulating the Crypto Ecosystem: The Case of Unbacked Crypto Assets." September 26, 2022. https://www.imf.org/en/Publications/fintech-notes/Issues/2022/09/26/Regulating-the-Crypto-Ecosystem-The-Case-of-Unbacked-Crypto-Assets-523715

Bauguess, Scott. "The Role of Big Data, Machine Learning, and AI in Assessing Risks: A Regulatory Perspective." June 21, 2017. https://www.sec.gov/news/speech/bauguess-big-data-ai

Benavoli, Matthieu. "LTCM crisis timeline." https://extreme-events-finance.net/resources/ltcm-crisis/

BIS, Innovation Hub Other. "Central bank digital currencies - executive summary." September 30, 2021. https://www.bis.org/publ/othp42.htm

Board of Governors of the Federal Reserve System. "Financial Stability Report." November 2020. https://www.federalreserve.gov/publications/2020-november-financial-stability-report-leverage.htm

CME Group. "CME Group Self-Certifies Bitcoin Futures to Launch Dec. 18," December 1, 2017. https://www.cmegroup.com/media-room/press-releases/2017/12/01/cme_group_self-certifiesbitcoinfuturestolaunchdec18.html

Coingecko. "Global Cryptocurrency Market Cap Charts." November 14, 2022. https://www.coingecko.com/en/global-charts

Commodities Futures Trading Commission, and Securities and Exchange Commission. "Form PF; Reporting Requirements for All Filers and Large Hedge Fund Advisers." October 1, 2022. https://www.sec.gov/rules/proposed/2022/ia-6083.pdf

Corrales, Cope. "Family Office vs. Hedge Fund: What's the Difference?." February 3, 2022. https://copecorrales.com/articles/family-office-vs-hedge-fund

De, Nikhilesh, and Danny Nelson. "SEC Approves Bitcoin Futures ETF, Opening Crypto to Wider Investor Base." October 15, 2021. https://www.coindesk.com/policy/2021/10/15/sec-approves-bitcoin-etf-opening-crypto-to-wider-investor-base/

ETF Daily News. “AlphaCrest Capital Management LLC Has $625,000 Holdings in International Business Machines Co. (NYSE: IBM).” December 1, 2022. https://www.etfdailynews.com/2022/12/01/alphacrest-capital-management-llc-has-625000-holdings-in-international-business-machines-co-nyseibm/

Fahmy, Joe. “Why Hedge Funds Are More Likely to Cause a Market Crisis Than Robinhood’s GameStop Traders.” February 1, 2021. https://www.yahoo.com/now/hedge-funds-are-more-likely-to-cause-a-market-crisis-than-robinhoods-game-stop-traders-171726802.html

Fletcher, Laurence. “Quant Hedge Funds Profit from Cryptocurrency Turmoil.” June 23, 2022. https://www.ft.com/content/da6183cb-357b-46d6-906b-379b76312e3b.

Forex. “Cryptocurrency market hours: what time of day are cryptos most traded?.” https://www.forex.com/ie/markets-to-trade/cryptocurrency-trading/cryptocurrency-market-hours/

Geither, Timothy. “Hedge Funds and Their Implications for the Financial System.” November 17, 2004. https://www.newyorkfed.org/newsevents/speeches/2004/gei041117

Handagam, Sandali. “FTX Collapse Exposed 'Weaknesses' in Crypto, Janet Yellen Says: Report.” November 14, 2022. https://www.coindesk.com/policy/2022/11/14/ftx-collapse-exposed-weaknesses-in-crypto-janet-yellen-says-report/

International Monetary Fund. “Global Financial Stability Report: Shockwaves from the War in Ukraine Test the Financial System’s Resilience.” April 2022. https://www.imf.org/en/Publications/GFSR/Issues/2022/04/19/global-financial-stability-report-april-2022

Irwin, Decrypt / Kate. “Bankrupt Three Arrows Capital Owes $3.5B to Creditors, Including $2.3B to Genesis.” July 19, 2022. https://decrypt.co/105416/bankrupt-three-arrows-capital-owes-3-5b-to-creditors-including-2-3b-to-genesis.

Kaal, Wulf, and Timothy A. Krause. “Hedge Funds and Systemic Risk.” August 2017. https://academic.oup.com/book/25365/chapter/192452711#310118510

Lepcha, Mensholong, and Jekaterina Drozdovica. “Crypto hedge funds: Who are the most influential firms investing in crypto?.” November 3, 2022. https://capital.com/crypto-hedge-funds

Li, Yun. “Bitcoin Briefly Drops below $20,000 to Lowest Level since Mid-July as Investors Dump Risk Assets.” August 29, 2022. https://www.cnbc.com/2022/08/29/bitcoin-drops-below-20000-to-lowest-level-since-mid-july-as-investors-dump-risk-assets.html.

Lielacher, Alex. “Top 7 Risks of Staking Crypto.” April 30, 2022. https://trustwallet.com/blog/top-7-risks-of-staking-crypto

Malekan, Omid. “What Skeptics Get Wrong About Crypto’s Volatility.” July 6, 2022. https://hbr.org/2022/07/what-skeptics-get-wrong-about-cryptos-volatility

McDowell, Hayley. “The Collapse of Archegos Capital Management.” July 16, 2021. https://www.thetradenews.com/the-collapse-of-archegos-capital-management/

Melinek, Jacquelyn. “Report: VCs Invested $33B in Crypto and Blockchain Startups in 2021.” January 5, 2022. https://blockworks.co/news/report-vcs-invested-33b-in-crypto-and-blockchain-startups-in-2021/

Mills, Quinn. “The Problem with Hedge Funds.” October 6, 2003. https://hbswk.hbs.edu/item/the-problem-with-hedge-funds

Myers, Bill. “SEC Offers First Crypto Definition.” February 22, 2022. https://www.regcompliancewatch.com/sec-offers-first-crypto-definition/.

Nakamoto, Satoshi. “Bitcoin: A Peer-to-Peer Electronic Cash System.” October 31, 2008. https://bitcoin.org/bitcoin.pdf

Narain, Aditya, and Marina Moretti. “Regulating Crypto.” September 2022. https://www.imf.org/en/Publications/fandd/issues/2022/09/Regulating-crypto-Narain-Moretti

Nichols, Rob, and Dennis Kelleher. “Op-Ed: FTX Crash Shows Cryptocurrency Market Needs Bank-like Regulation.” December 5, 2022. https://www.cnbc.com/2022/12/05/op-ed-ftx-crash-shows-cryptocurrency-market-needs-bank-like-regulation.html.

Open Markets Institute. “New Open Markets Financial Policy Director, Alexis Goldstein, to Testify Tomorrow on Systemic Risks of Cryptocurrency at House Subcommittee Hearing.” June 29, 2021. https://www.openmarketsinstitute.org/publications/new-open-markets-financial-policy-director-alexis-goldstein-to-testify-tomorrow-on-systemic-risks-of-cryptocurrency-at-house-subcommittee-hearing

Pantera. “A history of firsts.” 2022. https://panteracapital.com/

PwC, Elwood, and AIMA. “4th Annual Global Crypto Hedge Fund Report 2022.” 2022. https://www.pwc.com/gx/en/financial-services/pdf/4th-annual-global-crypto-hedge-fund-report-june-2022.pdf

Reiners, Lee. “Do Hedge Funds Threaten Financial Stability?.” January 26, 2017. https://sites.duke.edu/thefinregblog/2017/01/26/do-hedge-funds-threaten-financial-stability/

Schwarz, Nadine, Ke Chen, Kristel Poh, Grace Jackson, Kathleen Kao, Francisca Fernando, and Maksym Markevych. “Virtual Assets and Anti-Money Laundering and Combating the

Financing of Terrorism (1) Some Legal and Practical Considerations," October 1, 2021. https://www.imf.org/en/Publications/fintech-notes/Issues/2021/10/14/Virtual-Assets-and-Anti-Money-Laundering-and-Combating-the-Financing-of-Terrorism-1-463654

Securities and Exchange Commission. "Conformed to Federal Register Version - SEC." October 11, 2022. https://www.sec.gov/rules/proposed/2022/ia-6083.pdf

Securities and Exchange Commission. "Private Investment Funds: Hedge Funds." https://www.investor.gov/introduction-investing/investing-basics/investment-products/private-investment-funds/hedge-funds

Shakespeare, Catherine. "Reporting Matters: The Real Effects of Financial Reporting on Investing and Financing Decisions." June 2020. https://www.tandfonline.com/doi/full/10.1080/00014788.2020.1770928

Sigalos, MacKenzie. "From $10 billion to zero: How a crypto hedge fund collapsed and dragged many investors down with it." July 11, 2022. https://www.cnbc.com/2022/07/11/how-the-fall-of-three-arrows-or-3ac-dragged-down-crypto-investors.html

Son, Hugh. "JPMorgan, led by bitcoin skeptic Jamie Dimon, quietly unveils access to a half-dozen crypto funds." August 5, 2021. https://www.cnbc.com/2021/08/05/bitcoin-jpmorgan-led-by-jamie-dimon-quietly-unveils-access-to-a-half-dozen-crypto-funds.html

Sonnenshein, Michael. "Is cryptocurrency the future of finance? Here's what a new study shows." November 11, 2022. https://www.weforum.org/agenda/2022/11/cryptocurrency-us-midterms/

Stackpole, Thomas. "What Is Web3? Your guide to (what could be) the future of the internet." May 10, 2022. https://hbr.org/2022/05/what-is-web3

Steves, Rick. "Gen Z is most risk-averse generation, according to Futu whitepaper." July 26, 2022. https://financefeeds.com/gen-z-is-most-risk-averse-generation-according-to-futu-whitepaper/

Rajagopal, Divya. "Ontario Pension Says Any Loss from FTX Investment to Have Limited Impact." November 10, 2022. https://www.reuters.com/technology/ontario-pension-says-any-loss-ftx-investment-have-limited-impact-2022-11-10/.

Rowe, Adam. "Blockchain Statistics – Why Blockchain Matters in 2022." August 2021. https://tech.co/accounting-software/blockchain-statistics

The Financial Stability Oversight Council. "Fact Sheet Report on Digital Asset Financial Stability Risks and Regulation." October 3, 2022. https://home.treasury.gov/system/files/261/Fact-Sheet-Report-on-Digital-Asset-Financial-Stability-Risks-and-Regulation.pdf

The White House. “FACT SHEET: President Biden to Sign Executive Order on Ensuring Responsible Development of Digital Assets.” March 9, 2022. https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/09/fact-sheet-president-biden-to-sign-executive-order-on-ensuring-responsible-innovation-in-digital-assets/.

Todorov, Karamfil. “Launch of the first US bitcoin ETF: mechanics, impact, and risks.” December 6, 2021. https://www.bis.org/publ/qtrpdf/r_qt2112t.htm

U.S. Department of the Treasury. “Financial Stability Oversight Council Statement on Nonbank Financial Intermediation.” February 4, 2022. https://home.treasury.gov/news/press-releases/jy0587

U.S. Department of the Treasury. “PRESS RELEASE: Financial Stability Oversight Council Releases Report on Digital Asset Financial Stability Risks and Regulation.” October 3, 2022. https://home.treasury.gov/news/press-releases/jy0986

Wintermeyer, Lawrence. “Crypto Trading Will Grow In 2022 As dFMI Matures and Drives Efficiencies.” March 25, 2022. https://www.forbes.com/sites/lawrencewintermeyer/2022/03/25/crypto-trading-will-grow-in-2022-as-dfmi-matures-and-drives-efficiencies/?sh=235704697953