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February 25, 2022

Ms. Vanessa Countryman, Secretary
Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549-1090

RE: File Number SR-NYSEArca-2021-89

Bitwise Asset Management, Inc. (collectively and with its affiliates, "Bitwise") submits this letter in response to the Securities and Exchange Commission's Release No. 34-94126, File No. SR-NYSEArca-2021-89.

Dear Commissioners and Staff,

Thank you for the detailed review of NYSE Arca's proposed rule change to list and trade shares of the Bitwise Bitcoin ETF Trust (the "Trust"). We deeply appreciate the time, care, and thoughtfulness with which the Commission has approached both this application specifically and the broader question of how U.S. investors can safely access the bitcoin market.

We particularly appreciate the fact that the Staff of Trading and Markets, the Division of Economic and Risk Analysis, and other divisions of the SEC have deeply engaged with Bitwise over the past 15 months as we looked to develop research that would satisfy the concerns the Commission has raised regarding prior bitcoin ETF applications. The Staff's feedback was integral in developing the over 130 pages of research Bitwise submitted in support of our application, which is available in white paper format on the Bitwise website,[1,2] and which was also heavily referenced in NYSE Arca's rule change proposal.

In Release No 34-94126 (the "Release"), the Commission solicits public comment on two questions regarding NYSE Arca's proposed rule change that specifically pertains to our research. While we believe our research stands on its own, there have been important developments since NYSE Arca filed its proposed rule change on October 14, 2021, that have direct bearing on the questions raised in the Release. We believe it will be useful for the

[1] Hougan, M., Kim, H., Pal, S. (2021). Price Discovery in the Modern Bitcoin Market: Examining Lead-Lag Relationships Between the Bitcoin Spot and Bitcoin Futures Market. Bitwise Asset Management. https://static.bitwiseinvestments.com/Bitwise-Bitcoin-ETP-White-Paper-1.pdf.
[2] Hougan, M., Kim, H., Pal, S. (2021). Is It Likely That a US Bitcoin ETP, If Approved, Will Become the Predominant Influence on Prices in the CME Bitcoin Futures Market? Bitwise Asset Management. https://static.bitwiseinvestments.com/Bitwise-Bitcoin-ETP-White-Paper-2.pdf

Commission to consider these developments as it continues to evaluate NYSE Arca's proposed rule change. We have summarized those developments below.

Development #1: New Third-Party Research on Price Discovery in the Bitcoin Market

One question in the Release solicits public comment on various aspects of the analysis we conducted demonstrating that the CME bitcoin futures market led price discovery compared to both bitcoin spot trading venues and unregulated bitcoin derivative trading venues during the period of our study (December 2017–September 2020). The question specifically solicits comment on our methodology, our analysis of past historical papers, our "two-dimensional, pairwise results," and our conclusion that our findings demonstrate that a would-be manipulator of the proposed ETP would have to trade on the CME bitcoin futures market to successfully manipulate the proposed ETP.

While we believe our white paper addresses these questions directly, we appreciate the SEC's desire for third-party input on this complex topic. Fortunately, a significant new paper has been published on the source of price discovery in the bitcoin market since we submitted our research. This new paper directly addresses the questions the SEC raises in its Release and provides strong third-party corroboration of our findings.

This new paper is titled "Suitable Price Discovery Measurement of Bitcoin Spot and Futures Markets." It was written by Kevin Robertson and Jiani Zhang and published to the Social Science Research Network (SSRN) on January 12, 2022.[3] Robertson and Zhang are members of the Department of Quantitative Research and Investments at Fidelity Investments, Inc., and are not affiliated with Bitwise. The paper is available to the public for free download.

Robertson and Zhang examine 20 bitcoin spot markets and 26 bitcoin futures markets and evaluate where price discovery occurred between those markets using tick-level trade data over a period ranging from January 1, 2019, through March 31, 2021. The paper concludes that "CME bitcoin futures have consistently led price formation" compared to all other markets.[4] This finding aligns with our research, which examined a similar time period.

Importantly, Robertson and Zhang add key context and analysis that addresses (with nuance) many of the specific questions raised about our research in the SEC's Release. Among those items:

- **Prior Academic Literature**

  Our research included a survey of the prior academic literature that examined the source of price discovery in the bitcoin market. We identified 10 papers and showed that a majority (7 of 10) found that the CME bitcoin futures market led price discovery

[3] Robertson, K. & Zhang, J. (2022). Suitable Price Discovery Measurement of Bitcoin Spot and Futures Markets. Social Science Research Network. Available from: https://dx.doi.org/10.2139/ssrn.4012165
[4] Robertson and Zhang (2022), p.1.

compared to the bitcoin spot market. In our study, 2 papers found that the spot market led price discovery, while 1 showed a mixed result. Our paper included a discussion of the methodological challenges surrounding these three out-of-consensus papers.

Robertson and Zhang conduct a similar survey and arrive at a similar conclusion. The authors identify 13 papers in their survey, and show that a majority of those papers (8 of 13) find that regulated bitcoin futures markets lead spot bitcoin trading venues from a price discovery perspective. The authors note, however, that the record is mixed, with 4 papers showing that spot markets lead and 1 paper showing a mixed result.

Importantly, Robertson and Zhang deepen their analysis by demonstrating why the academic record is mixed. The authors note that classic price discovery metrics like Information Share (IS) and Component Share (CS) "face difficulties based on the model assumptions of VECM [the Vector Error Correction Model] when the prices under consideration are asynchronous and/or infrequent."[5] Citing Buccheri et al. (2019),[6] they note that "when prices have a high level of sparsity, the VECM is clearly misspecified and the estimates are potentially biased."[7]

The authors note that "the conclusions of Buccheri (2019) are of high importance when analyzing price discovery within bitcoin markets."[8] With this in mind, they demonstrate that there is a high level of sparsity in bitcoin data, and helpfully show how sparsity can impact classic measures of price discovery like IS and CS. The paper does an exceptional job using hypothetical data to show how this effect is achieved.

Bitwise agrees with the authors' generalized critique of IS and CS analysis, and discussed the challenges of applying this type of analysis to the bitcoin spot and bitcoin futures markets in a meeting with the SEC Staff on September 1, 2020. The limitations of classic IS and CS analysis informed Bitwise's specific methodological approach to IS and CS analysis, and are a key reason why any full analysis of price discovery in the bitcoin market must look at other techniques as well (as both we and Robertson and Zhang do).

- **Hayashi-Yoshida Lead-Lag Analysis**

  Noting the challenge with classic versions of IS and CS analysis, Robertson and Zhang choose to conduct their own price discovery research using the Hayashi-Yoshida approach to time-shift lead-lag analysis. The authors note that Hayashi-Yoshida "allows us to use asynchronous time series price data and avoid biases associated with imputation and zero returns passed through traditional methodologies."

[5] Robertson and Zhang (2022), p.12-13.
[6] Buccheri, G., Bormetti, G., Corsi, F., & Lillo, F. (2019). Comment on: Price Discovery at High Resolution. Social Science Research Network. Available from: https://dx.doi.org/10.2139/ssrn.3334860
[7] Robertson and Zhang (2022), p.13.
[8] Robertson and Zhang (2022), p.13.

We arrived at a similar conclusion in our own research, and used the Hayashi-Yoshida approach to time-shift lead-lag analysis as one of our two primary approaches to analyzing where price discovery occurs in the bitcoin market.

Bitwise and Roberston/Zhang arrive at nearly identical conclusions when applying the Hayashi-Yoshida technique, finding that the CME bitcoin futures market leads all other markets, and that the relationship between the CME bitcoin futures markets and other markets has tightened over time. The similarity of these two independent findings is noteworthy.

- **Comprehensive Analysis**

  Robertson and Zhang compare the CME bitcoin futures market to 20 spot markets and 25 other futures markets. Their analysis, like our own, includes both USD and USDT (Tether) pairs, and both traditional futures and "perpetual futures." The authors find, as we did, that the CME bitcoin futures market leads all markets over the duration of the study. In fact, it notes that there is "no deterioration in the strength of the CME USD futures (market's contribution to price discovery) and even a slight increase in strength during the last three quarters in our analysis."

- **Key Finding: The CME Leading Price Discovery Would Make It Difficult To Manipulate the Price of Bitcoin Without Interacting With the CME Market**

  The authors of the paper tackle the question of the relationship between the CME market and the broader bitcoin market directly, noting in the concluding paragraph of the paper:

  "Our finding that a regulated market (CME) consistently leads in bitcoin price discovery highlights difficulties bad actors would encounter if they were to attempt to manipulate the bitcoin price. Arbitrage between the CME USD futures market and unregulated markets would tend to counter an attempt to manipulate an unregulated market alone. Our finding that a futures market (CME) consistently leads in bitcoin price discovery highlights efficiency as futures markets typically lead in efficient markets. This market efficiency and general resistance to manipulation underscores the maturity of bitcoin as an asset."

In summary, the findings of the Robertson and Zhang paper echo and deepen our own findings, offering an independent, third-party analysis demonstrating that the CME bitcoin futures market leads price discovery compared to all other markets. The paper also notes the significance of this finding in terms of market manipulation and the ability of bad actors to successfully manipulate the price of bitcoin without interacting with the regulated CME market.

Development #2: New and Extended Information on Flows in Bitcoin Investment Products

The fourth question of the Release focuses on the so-called "second prong" of the Winklevoss Standard, which asks whether it is likely that the proposed ETF will become the predominant influence on prices in the market.

Among other items, this question asks for public comment on our estimate that a newly approved bitcoin ETP could attract up to $4.7 billion in first-year flows, which we deemed an "aggressive estimate."

We deemed $4.7 billion "aggressive" because it would: 1) make the proposed ETP by far the most successful commodity ETP launch of all time, surpassing SPDR Gold Shares (GLD), which attracted $3.0 billion in its first-year on the market; and 2) match the highest-ever yearly flows into the Grayscale Bitcoin Trust (ticker: GBTC), which occurred in a year when bitcoin itself rose by more than 300%, and do so even as the new ETP competes with GBTC itself in the market.

While we believe this analysis stands on its own, one important development has occurred since NYSE Arca filed its proposed rule change: The debut on October 18, 2021, of the first-ever bitcoin-linked ETF in the U.S., the ProShares Bitcoin Strategy ETF (ticker: BITO).

The new ETF — and two subsequently launched competitor ETFs from Valkyrie (ticker: BTF) and VanEck (ticker: XBTF) — hold CME bitcoin futures contracts and offer returns that are highly correlated with the price of bitcoin.

These new funds are relevant to our analysis for two reasons:

1. They offer directly relevant experience for the likely flows into novel bitcoin-linked ETPs in the U.S.;
2. They create a new competitor to any proposed spot bitcoin ETP.

On point 1: Since its debut, BITO has attracted $1.68 billion in net flows, BTF has gathered $63 million and XBTF has gathered $23 million. Together, this brings total flows into the bitcoin-linked ETP complex to $1.77 billion over a roughly four-month period.[9]

Importantly, however, these flows have not been equally distributed over time: The three ETFs took in $1.55 billion in their first month on the market, and have taken in just $216 million since. At the current rate, the bitcoin futures complex will end their first year with somewhere between $2.0 and $2.5 billion in flows.

This finding strengthens our belief that our estimate of $4.7 billion in first-year flows into a spot

[9] Source: ETF.com. Data from 10/17/21 through 2/20/22.

bitcoin ETP is an aggressive estimate. Despite strong first-to-market advantages, the approved bitcoin futures ETFs are tracking to gather only half of that amount.

On point 2: The bitcoin market is incredibly and increasingly crowded with options for investors. Investors today can buy bitcoin on crypto trading apps like Coinbase, finance apps like PayPal, through OTC-traded trusts like GBTC, via bitcoin futures ETFs like BITO, and in many other ways.

A spot bitcoin ETP would now be the fourth bitcoin-linked ETP to come to market, and would face steep competition from the already liquid and highly correlated bitcoin futures-based competitors.

We can find no historical precedent or data-driven reason to suggest that a spot bitcoin ETF will exceed our estimate. The experience of BITO and its peers in the market strengthens our conviction that our $4.7 billion estimate is appropriately aggressive.

Conclusion

Bitwise is committed to creating a bitcoin ETP in order to provide all investors with the ability to access spot bitcoin in a regulated and familiar fund format with the transparent and robust disclosures afforded by the federal securities laws.

We believe such an ETP would add material protections for the millions of U.S. investors who currently use other less protected and transparent avenues to access the bitcoin market, as well as for any future investors who may choose to do so.

We have worked diligently over the past 15 plus months to provide research and data in response to the Commission's thoughtful questions. We have also expressed a willingness to voluntarily agree to include additional investor protections associated with exchange traded investments registered under the Investment Company Act of 1940, and would welcome a discussion of this with the Commission.

We firmly believe the rules of the exchange can and should be designed to satisfy the concerns the Commission has raised, and we believe the time has come to make this product available to investors.

Thank you for your consideration.

Best regards,

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