



September 21, 2023

Christopher J. Kirkpatrick  
Secretary  
Commodity Futures Trading Commission  
Three Lafayette Centre  
1155 21st Street, N.W.  
Washington, D.C. 20581

Re: Cboe Clear Digital, LLC Rule Certification  
Submission Number CCD-2023-03C

Dear Mr. Kirkpatrick:

Cboe Clear Digital, LLC (“CCD” or “Clearinghouse”), a registered derivatives clearing organization (“DCO”) under the Commodity Exchange Act, as amended (“CEA” or the “Act”), hereby submits, pursuant to §40.6(a) of the regulations promulgated by the Commodity Futures Trading Commission (“CFTC” or “Commission”) its **Futures Market Risk Models**, which includes CCD’s **Margin Model** (i.e., margin methodology) and CCD’s **Stress Model**, for margined futures contracts on bitcoin and ether (“Products”). As part of the Commission’s review of CCD’s application to amend its DCO order of registration to clear margin future products,<sup>1</sup> the Commission reviewed a draft of the Futures Market Risk Models, and that draft is unchanged from the Commission’s review. CCD’s Futures Market Risk Models is set forth in a segregated confidential **Exhibit A** to this submission.

The proposed rule change to adopt the Futures Market Risk Model (“Rule Change”) will become effective on or after October 5, 2023, on an implementation date to be announced by the Clearinghouse through the issuance of a Clearing notice (“Effective Date”).

#### Overview of the Futures Market Risk Models

The Futures Market Risk Models includes both CCD’s Margin Model and Stress Model (and therefore, “Futures Market Risk Models”, collectively). CCD will use its Margin Model to set initial margin requirements for its Clearing Members approved to clear the Products. CCD will use its Stress Model to calibrate and test stress scenarios in connection with its credit exposure to Clearing Members under stressed market conditions, from which CCD calculates size of its Default Financial Resource Requirement.<sup>2</sup>

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<sup>1</sup> CCD’s amended DCO order of registration was approved by the Commission on June 5, 2023.

<sup>2</sup> CCD’s Default Financial Resource Requirement is the total required amount of funds to meet or exceed CCD’s Daily Cover 2 Requirement, which is the sum of the two largest Clearing Member Groups where any stress test gains from one Clearing Member Group will not be allowed to offset the stress test losses from another Clearing Member Group.

The Futures Risk Models are based on an analysis of the risk faced by the Clearinghouse due to potential futures price movements between collection of variation margin and an estimated time period in which a Clearing Member's open positions can be liquidated in the event of a default.

Parameters in the Futures Market Risk Models are calibrated using at least five years (or longest available) historical spot digital asset and futures market data to reflect the risk of each Product to ensure that the margin requirements and stress exposure measurement captures the risk characteristics of each Product (and spread, if applicable).

### **Margin Model**

Section 5 of the Futures Market Risk Models sets forth the Margin Model methodology for each Product. The Margin Model is based on a filtered historical simulation method for implementing value-at-risk ("FHS VaR") using a lookback period of five years<sup>3</sup> (or longest available), a risk coverage period<sup>4</sup> of two-day market return,<sup>5</sup> and 99th percentile confidence level<sup>6</sup> (0.5 percent for each tail of the distribution) risk coverage. The FHS VaR approach uses historical changes in spot Bitcoin and Ether price returns to generate historical distribution and does not rely on any assumptions regarding distributional shape or distributional parameters. To prevent tail risk measurements—meaning the measure of the amount of market price movement risk—from falling too low during extended periods of low volatility, a Historical Value-at-Risk ("HVaR") model is used to establish floors to the VaR calculations performed by the FHS VaR. As such, the FHS VaR model adjusts for short-term price volatility allowing the Margin Requirements to adjust to changing market conditions while the HVaR model prevents the Margin Requirement from falling below the long-term estimate of tail risk during extended periods of low market volatility.

A lookback period of 5 years is generally considered appropriate for a full economic cycle to manifest while also capturing changes to the underlying market risk characteristics. The risk coverage period of two business days is intended to give Cboe Clear Digital sufficient time to invoke its Default Management Plan<sup>7</sup> for managing market risk exposure from a defaulting Clearing Member's portfolio, and is above the minimum time requirement set forth in CFTC Rule 39.13(g)(2). Further, the 99<sup>th</sup> percentile confidence level complies with the confidence level

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<sup>3</sup> The FHS VaR model uses 5.5 years of data for calibration. The first 6 months (0.5 years) is used to produce a stable measurement of historical short term volatility using an Exponential Moving Average ("EWMA") model. The remaining 5 years of data is used to calculate the FHS VaR.

<sup>4</sup> Pursuant to the Futures Market Risk Models, "Risk Coverage Period", "Holding Period" or "Liquidation Period" means the length of time that the Clearinghouse believes is sufficient for it to manage exposure arising from open positions of a defaulting Clearing Member through transferring, closing or hedging those positions.

<sup>5</sup> Pursuant to the Futures Market Risk Models, the choice of the Risk Coverage Period of 2 days requires the estimation of 2 days risk statistics using historical data that is typically snapshot at least daily.

<sup>6</sup> Pursuant to the Futures Market Risk Models, "Confidence Level" means Probability with which the estimation of the location of a statistical parameter (e.g. an arithmetic mean) in a sample survey is also true for the population.

<sup>7</sup> In the event a Clearing Member of CCD is in Default, CCD will invoke its Default Management Plan ("DMP") and follow its procedures to handle such an event. The DMP delineates the roles and responsibilities of CCD's management team, Board of Directors, Risk Management committee, and Default Management Committee, and ensures that CCD takes timely action to contain losses and liquidity pressures, and continuing meeting obligations. The DMP will be submitted to the CFTC for self-certification in a separate filing.

requirements in CFTC Rule 39.13(g)(2)(ii)(A). Further, the FHS VaR model scales all historical returns by a ratio of the most recent estimate of short-term volatility to the estimate of short-term volatility at the time the return was observed (i.e., filtered returns). The Margin Model uses the same volatility estimation methodology and parameters for both the most recent and historical short term volatility estimation, resulting in the most recent returns having a volatility scaling factor of approximately one. As such, past returns from different volatility regimes are adjusted appropriately while recent returns incorporate only slight adjustment, which allows the FHS VaR to be responsive to short term volatility clustering while not being extremely volatile due to daily price fluctuations. See Section 5.2 (Volatility Scaling and EWMA) of the Futures Market Risk Models (**Exhibit A**) for the detailed volatility estimates computation.

There is no historical data pertaining to the new margin eligible contracts on Bitcoin (BTC) and Ether (ETH), but CCD's Margin Model uses comparable CME Group ("CME") BTC and ETH historical data<sup>8</sup> to study the risk characteristics of the futures market for these commodities. CCD also uses pricing data from the underlying spot commodities market to study the Cash Basis Risk,<sup>9</sup> and offers the advantage of providing longer time series for better tail risk<sup>10</sup> calibration.

The tail risk measurement calculated by the Margin Model is the maximum absolute value of eight tail statistics for each product. Of the eight, four are calculated using the HVaR model and the other four are calculated using the FHS VaR model.

Pursuant to Sections 6 of the Futures Market Risk Models, CCD reviews results from Backtesting the CCD Margin Model based on parameter configurations of the Model. Backtest results are presented using CoinDesk Indices<sup>11</sup> spot index data and CME Futures front month data. The HVaR Model was reviewed by an independent third party, and such review included a review of the data that was used for Backtesting and the Backtesting results. As more data becomes available, the Model will pick up new data points, which allows for continual improvement of the Model. Backtesting indicates CCD risk within the mandated confidence level, while also limiting dramatic fluctuation due to sudden changes in market conditions.

Section 7 of the Futures Market Risk Models presents results from analysis of Cash Basis Risk<sup>12</sup> between underlying spot commodities indices, CoinDesk Indices bitcoin price index ("XBX") and Ether price index ("ETX"), and the CME front month futures. It also presents results from analysis

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<sup>8</sup> CME Bitcoin futures were launched in December 2017; CME's Ether futures were launched in February 2021.

<sup>9</sup> Cash Basis Risk is the risk characteristics of a portfolio containing equal and opposite notional exposure from a futures contract and the underlying spot commodity.

<sup>10</sup> Tail Risk is the measure of the amount of market price movement risk based on historical data and Clearinghouse requirements for Lookback Period, Risk Coverage Period and Confidence Level.

<sup>11</sup> CoinDesk indices is a third party provider of trading technology and data which calculates and disseminates price index data on a large number of cryptocurrencies

<sup>12</sup> Cash Basis Risk: The risk characteristics of a portfolio containing equal and opposite notional exposure from a futures contract and the underlying spot commodity.

of Calendar Spread<sup>13</sup> risk between CME futures on the same product but different contract months. The results indicate that the risk is in line with acceptable standards.

Section 8 of the Futures Market Risk Models provides the Margin Model Basis Risk Parameters. These parameters include a risk adjustment for longer dated futures, and configuration of the Margin Model pertaining to calendar spreads to charge higher amounts to prevent excessively leveraged spread portfolios.

Section 9 of the Futures Market Risk Models details CCD's publication of an Initial Margin Multiplier ("IMM") which is multiplied by the Maintenance Margin Requirement ("MMR") to calculate the Initial Margin Requirement ("IMR"). The IMM requirement for BTC and ETH is determined based on an analysis of intraday (hourly snapshot) of spot price data. The analysis is based on CoinDesk Indices. CCD has calibrated the IMM to be in the range of the 95<sup>th</sup> percentile risk using a five-year lookback for the absolute close-to-high to close-to-low returns.

Section 10 of the Futures Market Risk Models discusses the Maintenance Margin Calculation and explains the steps for calculating the MMR for Outright Positions<sup>14</sup> and Spread Positions.

Section 11 of the Futures Market Risk Models discusses Concentration Add-On charges, which are a means of managing the liquidity risk of large positions. CCD examines the spot market for Bitcoin and Ether and CME BTC and ETH futures contracts, which are indicative of interest in derivative contracts on Bitcoin and Ether and provide means of hedging risk.

### **Stress Model**

Section 12 of the Futures Market Risk Models sets forth the Stress Model, which leverages the same data and analytics from the calibration and Backtesting of the Margin Model. Similar to the Margin Model, the Stress Model uses a lookback period of five years<sup>15</sup> (or longest available), and a risk coverage period<sup>16</sup> of two-day market return.<sup>17</sup> The Stress Model has a 99.8 percent confidence level<sup>18</sup> (0.1 percent for each tail of the distribution) risk coverage.

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<sup>13</sup> Calendar Spread: A portfolio containing positions in exactly two different futures contracts on the same commodity that expire on different dates. To qualify as Calendar Spread positions, the positions in the two contracts need to be in opposite directions (long and short) and matched in quantity units i.e. same number of contracts in long and short direction.

<sup>14</sup> Outright Positions are futures contracts that are not part of a Spread Portfolio.

<sup>15</sup> The FHS VaR model uses 5.5 years of data for calibration. The first 6 months (0.5 years) is used to produce a stable measurement of historical short term volatility using an Exponential Moving Average ("EWMA") model. The remaining 5 years of data is used to calculate the FHS VaR.

<sup>16</sup> Pursuant to the Futures Market Risk Models, "Risk Coverage Period", "Holding Period" or "Liquidation Period" means the length of time that the Clearinghouse believes is sufficient for it to manage exposure arising from open positions of a defaulting Clearing Member through transferring, closing or hedging those positions.

<sup>17</sup> Pursuant to the Futures Market Risk Models, the choice of the Risk Coverage Period of 2 days requires the estimation of 2 days risk statistics using historical data that is typically snapshot at least daily.

<sup>18</sup> Pursuant to the Futures Market Risk Models, "Confidence Level" means Probability with which the estimation of the location of a statistical parameter (e.g. an arithmetic mean) in a sample survey is also true for the population.

The Stress Model uses historical stress market moves (maximum, minimum, and .999 market move on both the left and right tails); ETH-BTC historical basis risk over a two-day period; and calendar spread/curve stress risk using spot price and first tenor, and longer-dated tenors, as the basis.

### Core Principle Compliance

CCD believes that its Futures Market Risk Models are consistent with the DCO Core Principles as set forth in the CEA and has identified the following DCO Core Principles as potentially being relevant to the above amendments:

- DCO Core Principle D – *Risk Management*: By developing and utilizing these models in line with acceptable market standards, CCD ensures that it possesses the ability to manage the risks associated with discharging its responsibilities through the use of appropriate, tailored tools and procedures. This includes measurement of exposure, limitation of exposure to potential losses from defaults, margin requirements, and requirements regarding models and parameters. The Futures Market Risk Models measures the credit exposure on an intraday basis and limits exposure to potential losses from defaults through specific margin requirements and other risk control mechanisms so that the operations of CCD will not be disrupted in the case of a default. Further, nondefaulting participants will not be exposed to losses connected with margin trading on Cboe Digital’s platform that they cannot anticipate or control. Margin requirements are sufficient to cover potential exposures in normal market conditions, and the models are risk-based and will be reviewed on a regular basis; and
- DCO Core Principle L – *Public Information*: To ensure that market participants have sufficient information enable them to identify and evaluate accurately risks and costs of engagement with CCD, cash margin for each Product is computed on a daily basis and posted daily on the Cboe Digital website. Additionally, the margin requirements for the Products are published daily on the Cboe Digital website, along with the CME SPAN compatible risk parameter files that may be used by market participants for portfolio margin calculations.<sup>19</sup>

### Public Information

A notice and copy of this submission has been concurrently posted on Cboe Digital’s website at <https://www.cboedigital.com/regulation/exchange-notices/> under “CFTC Submissions.”

### Opposing Views

CCD is not aware of any opposing views expressed regarding this Rule Change.

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<sup>19</sup> With this and other disclosures, CCD is ensuring that it meets the requirements of § 39.21 of the regulations promulgated by the Commission.

Certification

CCD hereby certifies to the Commission, pursuant to the procedures set forth in Commission regulation §40.6, that this submission complies with the CEA, as amended, and the regulations promulgated thereunder.

Please contact me if you have any questions or wish to discuss this matter further.

Sincerely,

**/s/ Katherine Kirkpatrick**

Katherine Kirkpatrick  
Chief Legal Officer, Cboe Digital  
[kkirkpatrick@cboe.com](mailto:kkirkpatrick@cboe.com)

**EXHIBIT A**

**[CONFIDENTIAL TREATMENT REQUESTED]**