

SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-91079; File No. SR-OCC-2020-016)

February 8, 2021

Self-Regulatory Organizations; The Options Clearing Corporation; Order Approving Proposed Rule Change to Concerning The Options Clearing Corporation's System for Theoretical Analysis and Numerical Simulation ("STANS") Methodology Documentation

I. INTRODUCTION

On December 9, 2020, the Options Clearing Corporation ("OCC") filed with the Securities and Exchange Commission ("Commission") the proposed rule change SR-OCC-2020-016 ("Proposed Rule Change") pursuant to Section 19(b) of the Securities Exchange Act of 1934 ("Exchange Act")¹ and Rule 19b-4² thereunder to adopt a new document describing OCC's system for calculating daily and intra-day margin requirements for its Clearing Members.³ The Proposed Rule Change was published for public comment in the Federal Register on December 29, 2020.⁴ The Commission has received no comments regarding the Proposed Rule Change. This order approves the Proposed Rule Change.

II. BACKGROUND

To manage the credit risk posed by its Clearing Members, OCC collects margin collateral both daily and intraday. OCC uses its System for Theoretical Analysis and Numerical Simulation ("STANS") to set risk-based margin requirements for its Clearing Members. The

¹ 15 U.S.C. 78s(b)(1).

² 17 CFR 240.19b-4.

³ See Notice of Filing infra note 4, 85 Fed. Reg. at 85788.

⁴ Securities Exchange Act Release No. 34-90763 (Dec. 21, 2020), 85 Fed. Reg. 85788 (Dec. 29, 2020) (File No. SR-OCC-2020-016) ("Notice of Filing").

margin requirements calculated using STANS consist of an estimate of a 99 percent expected shortfall (“ES”) over a two-day time horizon with additional charges for model risk, stress tests, liquidation costs, and various add-ons.

OCC maintains technical documentation that describes how the various quantitative components of STANS were developed and operate, including the various parameters and assumptions contained within those components⁵ and the mathematical theories underlying the selection of those quantitative methods (“Model Whitepapers”). The Model Whitepapers are currently synthesized in a single document, the Margins Methodology, describing how STANS operates from end to end. Pursuant to section 19(b) of the Exchange Act and Rule 19b-4 thereunder,⁶ OCC has filed, and the Commission has approved, sections of OCC’s Margins Methodology as rules in the past.⁷ OCC has not, however, filed the Margins Methodology in its

⁵ See Securities Exchange Act Release No. 82473 (Jan. 9, 2018), 83 Fed. Reg. 2271 (Jan. 16, 2018) (File No. SR-OCC-2017-011), which describes how OCC periodically reviews the parameters and assumptions used by STANS pursuant to its Model Risk Management Policy and in accordance with 17 CFR 240.17Ad-22(e)(6).

⁶ 15 U.S.C. 78s(b)(1) and 17 CFR 240.19b-4.

⁷ See Securities Exchange Act Release No. 74966 (May 14, 2015), 80 Fed. Reg. 29784 (May 22, 2015) (File No. SR- OCC-2015-010); Securities Exchange Act Release No. 76128 (Dec. 28, 2015), 81 Fed. Reg. 135 (Jan. 4, 2016) (File No. SR-OCC-2015-016); Securities Exchange Act Release No. 79818 (Jan. 18, 2017), 82 Fed. Reg. 8455 (Jan. 25, 2017) (File No. SR-OCC-2017-001); Securities Exchange Act Release No. 82161 (Nov. 28, 2017), 82 Fed. Reg. 57306 (Dec. 4, 2017) (File No. SR-OCC-2017-022); Securities Exchange Act Release No. 84524 (Nov. 2, 2018), 83 Fed. Reg. 55918 (Nov. 8, 2018) (File No. SR-OCC-2018-014); Securities Exchange Act Release No. 85440 (Mar. 28, 2019), 84 Fed. Reg. 13082 (Apr. 3, 2019) (File No. SR-OCC-2019-002); Securities Exchange Act Release No. 85755 (Apr. 30, 2019), 87 Fed. Reg. 19815 (May 6, 2019) (File No. SR-OCC-2019-004); Securities Exchange Act Release No. 86296 (Jul. 3, 2019), 84 Fed. Reg. 32816 (Jul. 9, 2019) (File No. SR-OCC-2019-005); Securities Exchange Act Release No. 87387 (Oct. 23, 2019), 84 Fed. Reg. 57890 (Oct. 29, 2019) (File No. SR-OCC-2019-010); Securities Exchange Act Release No. 89392 (Jul. 24, 2020), 85 Fed. Reg. 45938 (Jul. 30,2020) (File No. SR-OCC-2020-007); Securities Exchange Act

entirety. Additionally, OCC has requested confidential treatment for those sections of the Margins Methodology that it has filed with the Commission.⁸

OCC now proposes to replace the Margins Methodology in its entirety (both sections that have and have not been filed as rules) with a description of OCC's system for calculating daily and intra-day margin requirements for its Clearing Members (the "STANS Methodology Description").⁹ OCC stated that the proposed STANS Methodology Description includes the material aspects of OCC's risk-based margin system.¹⁰ OCC intends to make the proposed STANS Methodology Description available to Clearing Members.¹¹

The proposed STANS Methodology Description would include substantially the same information as the Margins Methodology with the exception of various details, described below, that OCC does not believe would be appropriately included in the STANS Methodology Description.¹² OCC stated that the purpose of the STANS Methodology Description would be to enable an informed reader to understand OCC's modeling choices and the interconnectedness of STANS model components in producing OCC margin requirements, and that the portions of the

Release No. 90139 (Oct. 8, 2020), 85 Fed. Reg. 65886 (Oct. 16, 2020) (File No. SR-OCC-2020-012).

⁸ See id.

⁹ OCC also proposes conforming changes to its Margin Policy.

¹⁰ See Notice of Filing, 85 Fed. Reg. at 85789.

¹¹ See Notice of Filing, 85 Fed. Reg. at 85790.

¹² OCC does not propose to change its margin methodology as part of the Proposed Rule Change.

Margins Methodology not carried forward in the STANS Methodology Description are extraneous to this purpose.¹³

Proposed STANS Methodology Description

As noted above, the proposed STANS Methodology Description covers OCC's system for calculating daily and intra-day margin requirements for its Clearing Members. The proposed document includes three sections with various subsections as described below and in greater detail in the Notice of Filing. The STANS Methodology Description begins with an executive summary. The executive summary would state that the purpose of STANS is to determine margin requirements for OCC's Clearing Members, and would describe the types of positions and collateral modeled through STANS. The executive summary would also briefly describe OCC's procedures related to both model monitoring and price editing.

Model components. The bulk of the STANS Methodology Description covers the model components in STANS, including model and econometric calibration, copula construction, implied volatility smoothing and options pricing, and the application of the theoretical derivatives prices to actual positions in Clearing Members' accounts to calculate margin requirements through the aggregation of various component charges. The sub-sections related to model and econometric calibration cover the use of (i) returns on equity securities that are based on current market prices to create econometric parameters and for pricing; (ii) implied volatility risk factors to measure the expected future volatility of an option's underlying security at expiration; (iii) Nelson-Siegel framework to price treasury securities; (iv) a generic futures model to price linear derivatives with limited term structures; (v) a specialized factor model to price variance futures; (vi) a synthetic futures model to price specified products such as volatility

¹³ See Notice of Filing, 85 Fed. Reg. at 85790.

index-based futures (e.g., VIX futures); and (vii) econometric parameters related to volatility forecasts and marginal distributions, and calibrates these parameters using ten-year histories of the foregoing data inputs.

The sub-sections related to copula construction describes the use of a copula to quantify the joint behavior and dependence structure of the risk factors used by STANS.¹⁴ The STANS Methodology Description covers OCC's process for estimating the copula as well as simulating price movements based on random draws from the multivariate Student's t-distribution described by the copula. The document also describes OCC's process for identifying and separately processing risk factors with incomplete data sets that lack sufficient data to estimate the copula. Specifically, the STANS Methodology Description addresses the application of conditional and default simulations to estimate correlations for risk factors excluded from the copula simulation in STANS due to a lack of data.

The sub-sections related to implied volatility smoothing and options pricing describe how OCC uses the inputs and outputs described in the subsections on model and econometric calibration and copula construction. Specifically, the STANS Methodology Description discusses OCC's processing for performing implied volatility smoothing as well as pricing

¹⁴ A copula is a mathematical construct used in probability theory to calculate the cumulative distribution of a set of random variables.

European-style options, American-style options, Asian FLEX options,¹⁵ and Cliquet options.¹⁶ The document also discusses how STANS can also be used to price forward start options.¹⁷

The sub-sections related to the aggregation of various component charges discuss a based margin charge, error compensation charge, liquidation cost charge, and positive risk reversal charge. The base margin charge consists of an ES calculation with the addition of Extreme Value Theory loss modeling and a stress test component. The error compensation charge is designed to compensate for the estimation error inherent in ES calculations. The liquidation cost charge is designed to cover the costs of selling long positions at the current bid price and covering short positions at the current ask price following the default of a Clearing Member. The positive risk reversal charge ensures that total calculated margin requirement is at least equal to the estimated liquidation cost, even in the event a position is liquidated at the current market price.

Model utilities. The final substantive section of the STANS Methodology Description addresses several model utilities that OCC applies at various points in the STANS methodology, to incorporate various market and operational factors that affect options pricing and thereby produce model results which more accurately reflect current and potential market conditions.

¹⁵ Asian options are European-style options for which the settlement price is determined based on the difference between the aggregate exercise price and the aggregate current underlying interest value, which is based on the average of twelve monthly price observations. See Securities Exchange Release No. 74966 (May 14, 2015), 80 Fed. Reg. 29784 (May 22, 2015) (File No. SR-OCC-2015-010).

¹⁶ Cliquet options are European-style options for which the settlement price is determined based on the (positive) sum of capped returns of an index on pre-determined dates over a specified period of time. See id., n. 9.

¹⁷ Forward start options are options for which the strike price in dollars is unknown prior to the determination date of the strike shortly before expiration. See Notice of Filing, 85 Fed. Reg. at 85796.

Such utilities include the incorporation of expected cash dividends on a stock into options pricing in STANS. The STANS Methodology Description also addresses OCC's processes for obtaining relevant risk factors for both the most recent opening price and the most recent closing price to include a joint distribution of both overnight and daily returns on relevant risk factors within the copula described above. Further, the STANS Methodology Description discusses OCC's process for addressing option expirations occurring during the period in which OCC closes out a defaulted Clearing Member's portfolio. Finally, the document describes the portfolio specific haircut model that OCC uses to haircut values for withdrawals or deposits of collateral made throughout the day.

Additional details

As noted above, STANS Methodology Description would not include details from the Margins Methodology that OCC believes are extraneous to the purpose of enabling an informed reader to understand OCC's modeling choices and the interconnectedness of STANS model components in producing OCC margin requirements. As described below, and in greater detail in the Notice of Filing, the details in the Margins Methodology that would not be included in the STANS Methodology Description fall thematically into eight categories.¹⁸

First, the STANS Methodology Description would not describe historical modeling practices and potential future enhancements that do not describe how a model currently functions. For example, the STANS Methodology Description would not include background on OCC's decision to incorporate implied volatility modeling into STANS. Similarly, the STANS Methodology Description would not summarize historical changes OCC has made to the manner in which STANS calculates a total margin charge.

¹⁸ See Notice of Filing, 85 Fed. Reg. at 85790.

Second, the STANS Methodology Description would not describe the set of current products to which each STANS component applies. For example, the STANS Methodology Description would list products eligible for implied volatility scenarios modeling in STANS.

Third, the STANS Methodology Description would not describe OCC's model configuration choices. Such configuration choices include a list of control parameters of the Newton-Raphson method OCC uses to calculate implied volatilities for vanilla options. Similarly, the STANS Methodology Description would not describe the parameters that OCC uses to calibrate liquidation grids when calculating its liquidation cost charge.

Fourth, the STANS Methodology Description would not describe model testing results and supporting rationale. Such testing results would include model testing and validation results for OCC's implied volatility model. Similarly, the STANS Methodology Description would not describe the mathematical rationale for the cumulative distribution function, inverse cumulative distribution function, and degrees of freedom for the Student's t-distribution used by the GARCH model for implied volatility risk factors.

Fifth, the STANS Methodology Description would not describe standard mathematical and economic theories and techniques that are well-known in quantitative finance, readily found in public sources, and do not include OCC-specific modifications or applications. For example, the STANS Methodology Description would not describe the standard Glaston-Jagannathan-Runkle GARCH model and the use of a Student's t-distribution. Similarly, the STANS Methodology Description would not describe the Vega-weighted least squares calculation performed during the first round of optimization to produce arbitrage-free options prices for European options.

Sixth, the STANS Methodology Description would not include redundant descriptions of a model component appearing in multiple chapters. For example, the Executive Summary of the STANS Methodology Description would not include details of the STANS methodology also found in the main body of the document. Similarly, the section of the proposed STANS Methodology Description discussing conditional and default simulations would not include introductory text restating the use of time series in STANS, which is described elsewhere in the document.

Seventh, the STANS Methodology Description would not describe OCC's implementation of a model in its internal technology systems. Such details include detailed steps for a linear interpolation / extrapolation used to construct a volatility surface from smoothed volatilities. Similarly, the STANS Methodology Description would not include discussion of the processes OCC uses to operationalize the STANS methodology in its systems.

Finally, the STANS Methodology Description would not describe manual margin adjustments and add-ons that OCC employs pursuant to OCC rules, policies, or procedures outside of STANS. Such adjustments include additional margin charges related to cross-margin accounts established under OCC's Rule 704. Similarly, the STANS Methodology Description would not describe "derived scenarios," which are a special case of conditional simulations related to exchange rate risk factors addressed elsewhere in OCC's procedures.

Changes to Margin Policy

OCC also proposes conforming changes to its Margin Policy to reflect the adoption of the STANS Methodology Description and the retirement of the Margins Methodology.

Additionally, OCC proposes to make other non-substantive changes to the Margin Policy to

correct typographical errors, update references to other related internal OCC policies and procedures, and conform the policy to OCC's current internal policy template.

III. DISCUSSION AND COMMISSION'S FINDINGS

Section 19(b)(2)(C) of the Exchange Act directs the Commission to approve a proposed rule change of a self-regulatory organization if it finds that such proposed rule change is consistent with the requirements of the Exchange Act and the rules and regulations thereunder applicable to such organization.¹⁹ After carefully considering the Proposed Rule Change, the Commission finds that the proposal is consistent with the requirements of the Exchange Act and the rules and regulations thereunder applicable to OCC. More specifically, the Commission finds that the proposal is consistent with Section 17A(b)(3)(F) of the Exchange Act,²⁰ Rule 17Ad-22(e)(6)²¹ thereunder, as described in detail below.

A. Consistency with Section 17A(b)(3)(F) of the Exchange Act

Section 17A(b)(3)(F) of the Exchange Act requires, among other things, that the rules of a clearing agency be designed to assure the safeguarding of securities and funds which are in its custody or control or for which it is responsible.²² OCC uses STANS to set risk-based margin requirements for its Clearing Members. OCC proposes to describe its modeling choices and the interconnectedness of STANS model components in producing such margin requirements within its rules by adopting the STANS Methodology Description. The aspects of STANS described in the STANS Methodology Description directly relate to OCC's ability to accurately risk manage

¹⁹ 15 U.S.C. 78s(b)(2)(C).

²⁰ 15 U.S.C. 78q-1(b)(3)(F).

²¹ 17 CFR 240.17Ad-22(e)(6).

²² 15 U.S.C. 78q-1(b)(3)(F).

Clearing Member portfolios by calculating and collecting an appropriate amount of collateral. The Commission notes that only some of the aspects of STANS addressed in the STANS Methodology Description are currently addressed in the portions of the Margins Methodology that OCC has filed with the Commission.

The Commission believes that, even with the removal of the additional details from the Margins Methodology described above, the proposed STANS Methodology Description is designed to help ensure that OCC's margin methodology calculates and collects margin sufficient to mitigate OCC's credit exposure to a Clearing Member default. The Commission also believes that accurate calculation of margin is necessary to help ensure that OCC is able to risk manage the default of a Clearing Member without recourse to the assets of non-defaulting Clearing Members, which supports the safeguarding of securities and funds in OCC's custody. Accordingly, the Commission believes that the replacement of the Margins Methodology with the STANS Margin Description is consistent with the requirements of Section 17A(b)(3)(F) of the Exchange Act.²³

B. Consistency with Rule 17Ad-22(e)(6) under the Exchange Act

Rules 17Ad-22(e)(6) generally requires each covered clearing agency that provides central counterparty services to establish, implement, maintain, and enforce written policies and procedures reasonably designed to cover its credit exposure to its participants by establishing a risk-based margin system that meets certain standards.²⁴ As described above, the STANS Methodology Description addresses OCC's modeling choices and the interconnectedness of STANS model components in producing risk-based margin requirements.

²³ 15 U.S.C. 78q-1(b)(3)(F).

²⁴ 17 CFR 240.17Ad-22(e)(6).

Section (i) under Rule 17Ad-22(e)(6) requires that the policies and procedures required pursuant to Rule 17Ad-22(e)(6) describe a risk-based margin system that considers and produces margin levels commensurate with the risks and particular attributes of each relevant product, portfolio, and market.²⁵ As described above, the STANS Methodology Description covers various components of STANS designed to address the particular attributes of the products that OCC clears (e.g., American-style options, European-style options, Asian FLEX options, Cliquet options) as well as the risks presented by a specific portfolio (e.g., liquidation cost charges). Further, the STANS Methodology Description also describes OCC's process addressing the entrance of new products into the markets for which it clears (identifying and separately processing risk factors with incomplete data sets that lack sufficient data to estimate the copula).

Section (iii) under Rule 17Ad-22(e)(6) requires that the policies and procedures required pursuant to Rule 17Ad-22(e)(6) describe a risk-based margin system that calculates margin sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default.²⁶ As described above, the STANS Methodology Description discusses various model utilities that pertain to events occurring between the collection of margin and closing out of a defaulted Clearing Member's portfolio (e.g., cash dividend payments, option expiration, and changes to portfolio specific haircuts due to the withdrawal or deposit of collateral).

Section (v) under Rule 17Ad-22(e)(6) requires that the policies and procedures required pursuant to Rule 17Ad-22(e)(6) describe a risk-based margin system that uses an appropriate

²⁵ 17 CFR 240.17Ad-22(e)(6)(i).

²⁶ 17 CFR 240.17Ad-22(e)(6)(iii).

method for measuring credit exposure to accounts for relevant product risk factors and portfolio effects across products.²⁷ As discussed above, the STANS Methodology Description covers the various STANS components that provide the inputs and outputs necessary for OCC to conduct implied volatility smoothing and options pricing (e.g., model components addressing derivatives based on equities and treasuries as well as generic futures, variance futures, and volatility index-based futures) as well as the implied volatility smoothing and options pricing themselves.

Based on the foregoing, the Commission believes that the replacement of the Margins Methodology with the STANS Margin Description is consistent with the requirements of Rule 17Ad-22(e)(6) under the Exchange Act.²⁸

²⁷ 17 CFR 240.17Ad-22(e)(6)(v).

²⁸ 17 CFR 240.17Ad-22(e)(6).

IV. CONCLUSION

On the basis of the foregoing, the Commission finds that the Proposed Rule Change is consistent with the requirements of the Exchange Act, and in particular, the requirements of Section 17A of the Exchange Act²⁹ and the rules and regulations thereunder.

IT IS THEREFORE ORDERED, pursuant to Section 19(b)(2) of the Exchange Act,³⁰ that the Proposed Rule Change (SR-OCC-2020-016) be, and hereby is, approved.

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.³¹

J. Matthew DeLesDernier
Assistant Secretary

²⁹ In approving this Proposed Rule Change, the Commission has considered the proposed rules' impact on efficiency, competition, and capital formation. See 15 U.S.C. 78c(f).

³⁰ 15 U.S.C. 78s(b)(2).

³¹ 17 CFR 200.30-3(a)(12).