SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-86296; File No. SR-OCC-2019-005)

July 3, 2019

Self-Regulatory Organizations; The Options Clearing Corporation; Notice of Filing of Proposed Rule Change Related to The Options Clearing Corporation's Vanilla Option Model and Smoothing Algorithm

Pursuant to Section 19(b)(1) of the Securities Exchange Act of 1934 ("Exchange Act" or "Act"),[1] and Rule 19b-4 thereunder,[2] notice is hereby given that on June 28, 2019, the Options Clearing Corporation ("OCC") filed with the Securities and Exchange Commission ("Commission") the proposed rule change as described in Items I, II, and III below, which Items have been prepared by OCC. The Commission is publishing this notice to solicit comments on the proposed rule change from interested persons.

I. Clearing Agency's Statement of the Terms of Substance of the Proposed Rule Change

The proposed rule change is filed in connection with proposed changes to formalize and update OCC's models for: (1) generating theoretical values, implied volatilities and certain risk sensitivities for plain vanilla listed options ("Vanilla Option Model") and (2) estimating fair or "smoothed" prices of plain vanilla listed options based on their bid and ask price quotes ("Smoothing Algorithm"). The proposed changes are discussed in detail in Item II below.

The proposed changes to Chapter 17 (Vanilla Option Model) and Chapter 18 (Smoothing Algorithm) of OCC's Margins Methodology are contained in confidential Exhibits 5A and 5B of the filing. Material proposed to be added is marked by underlining and material proposed to be deleted is marked by strikethrough text. OCC

---

1 15 U.S.C. 78s(b)(1).

2 17 CFR 240.19b-4.

also has included backtesting and impact analysis of the proposed model changes in confidential Exhibit 3.

The proposed rule change is available on OCC's website at https://www.theocc.com/about/publications/bylaws.jsp. All terms with initial capitalization that are not otherwise defined herein have the same meaning as set forth in the OCC By-Laws and Rules.[3]

II. Clearing Agency's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In its filing with the Commission, OCC included statements concerning the purpose of and basis for the proposed rule change and discussed any comments it received on the proposed rule change. The text of these statements may be examined at the places specified in Item IV below. OCC has prepared summaries, set forth in sections (A), (B), and (C) below, of the most significant aspects of these statements.

(A) Clearing Agency's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

(1) Purpose

The purpose of the proposed rule change is to introduce enhancements to OCC's Vanilla Option Model, which is used to generate theoretical values, implied volatilities and risk sensitives for plain vanilla listed options, and to the Smoothing Algorithm, which is used to estimate fair prices of listed option contracts cased on their bid and ask price quotes. Specifically, the proposed methodology enhancements to the Vanilla Option Model would include: (1) replacing use of an interest rate yield curve with

---

3 OCC's By-Laws and Rules can be found on OCC's public website: http://optionsclearing.com/about/publications/bylaws.jsp.

constant interest rates; (2) replacing use of the last paid dividends with a schedule of forecasted dividends; (3) using borrowing costs as an input in valuations; (4) replacing the binomial tree used to price American-style options with a binomial tree that has a higher rate of convergence; and (5) using additional "Greeks" as inputs in valuations. Proposed enhancements to the Smoothing Algorithm would include: (1) aligning the binomial tree using in the Vanilla Option Model with the binomial tree used in the Smoothing Algorithm; (2) using basis futures prices which close at the same time as the underlying indices to prevent price discrepancies; (3) capping unacceptably high volatilities in out-of-the-money regions more gradually to make convexity in pricing changes more continuous and eliminate associated arbitrage opportunities; (4) using current market prices of plain vanilla listed options to generate prices for short-dated FLEX options; and (5) using borrowing costs as an independent input in the pricing of plain vanilla listed options.

Background

OCC's margin methodology, the System for Theoretical Analysis and Numerical Simulations ("STANS"), is OCC's proprietary risk management system that calculates Clearing Member margin requirements.[4] STANS utilizes large-scale Monte Carlo simulations to forecast price and volatility movements in determining a Clearing Member's margin requirement.[5] The STANS margin requirement is calculated at the portfolio level of Clearing Member legal entity marginable net positions tier account

---

4 See Securities Exchange Act Release No. 53322 (February 15, 2006), 71 FR 9403 (February 23, 2006) (SR-OCC-2004-20). A detailed description of the STANS methodology is available at http://optionsclearing.com/risk-management/margins/.

5 See OCC Rule 601.

(tiers can be customer, firm, or market marker) and consists of an estimate of a 99% two-day expected shortfall ("99% Expected Shortfall") and an add-on for model risk (the concentration/dependence stress test charge). The STANS methodology is used to measure the exposure of portfolios of options and futures cleared by OCC and cash instruments in margin collateral.

STANS margin requirements are comprised of the sum of several components, each reflecting a different aspect of risk. The base component of the STANS margin requirement for each account is obtained using a risk measure known as 99% Expected Shortfall. Under the 99% Expected Shortfall calculation, an account has a base margin excess (deficit) if its positions in cleared products, plus all existing collateral - whether of types included in the Monte Carlo simulation or of types subjected to traditional "haircuts" — would have a positive (negative) net worth after incurring a loss equal to the average of all losses beyond the 99% value at risk (or "VaR") point. This base component is then adjusted by the addition of a stress test component, which is obtained from consideration of the increases in 99% Expected Shortfall that would arise from market movements that are especially large and/or in which various kinds of risk factors exhibit perfect or zero correlations in place of their correlations estimated from historical data, or from extreme adverse idiosyncratic movements in individual risk factors to which the account is particularly exposed.[6]

Two primary components of STANS are the Vanilla Option Model, which is used to generate theoretical values, implied volatilities and certain risk sensitivities for plain

---

[6] STANS margins may also include other add on charges, which are considerably smaller than the base and stress test components, and many of which affect only a minority of accounts.

vanilla listed options, and the Smoothing Algorithm, which is used to estimate fair prices of listed option contracts based on their bid and ask price quotes. OCC's current Vanilla Option Model and Smoothing Algorithm and proposed changes thereto are discussed in detail below.

<u>Vanilla Option Model</u>

The Vanilla Option Model is OCC's model for generating theoretical values, implied volatilities and certain risk sensitivities for plain vanilla listed options.[7] The theoretical values generated by OCC's Vanilla Option Model are the estimated values (as opposed to current market prices) of plain vanilla options derived from algorithms that use a series of predetermined inputs, such as the price of the stock or index underlying the option, the option's exercise price, the risk-free interest rate, the amount of time until the option's expiration and the volatility of the option. For European options (including FLEX options), the Vanilla Option Model generates theoretical values using a pricing algorithm that is based on the Black-Scholes formula. For American options, the Vanilla Option Model generates theoretical values using a modified Jarrow-Rudd ("JR") binomial tree.[8]

The implied volatility of an option is a measure of the expected future volatility of the option's underlying security at expiration, which is reflected in the current option

---

7 With respect to the Vanilla Option Model, "plain vanilla listed options" are (1) all listed vanilla European and American options on equities, exchange traded funds and exchange traded notes (collectively, "ETPs"), equity indices, futures on equity indices, currencies or commodities, and (2) vanilla flexible exchange options ("vanilla FLEX options"). Collectively, these plain vanilla options account for about 95 percent of the total contracts cleared by OCC.

8 OCC uses a modified JR binomial tree for American options because the algorithm based on the Black-Scholes formula does not work for valuing American options, due to their early exercise feature.

premium in the market. The implied volatilities are used in STANS to generate price scenarios for estimating potential losses of clearing members' portfolios. Given the current market price for a plain vanilla option, the aforementioned pricing algorithms for European and American options will generate the implied volatility of the price of the option's underlying asset.

The risk sensitivities calculated by the Vanilla Option Model are certain values – namely, Delta, Gamma and Vega – that measure the risk of a plain vanilla option in relation to underlying variables.[9]

Smoothing Algorithm

In the absence of OCC's Smoothing Algorithm, the end-of-day "fair price" of a plain vanilla listed option contract would simply be the closing mid-point price (i.e., the mid-point between the bid and ask prices) for such contract. However, there often is a wide difference between the closing bid and ask price quotes for option contracts, which could result in a closing mid-point price that may contain arbitrage opportunities. Closing bid and ask price quotes also tend to be "noisy," meaning that quotes can fluctuate randomly in a way that is not reflective of the contract's fair value, which similarly could result in a closing mid-point price that may contain arbitrage opportunities. Therefore, OCC uses its Smoothing Algorithm in an attempt to minimize the impact of wide and/or noisy closing price quotes on individual plain vanilla listed option contracts, thereby producing a more fair or "smoothed" price. The Smoothing

---

9 "Delta" measures the change in the option value with respect to a change in the price of an underlying asset. "Gamma" measures the change in Delta in response to a 1% change in the price of the underlying asset. "Vega" measures the change in the option value corresponding to a 1% change in the underlying asset's volatility.

Algorithm works by attempting to simultaneously estimate fair values for put and call prices on all plain vanilla listed options included in the Vanilla Option Model, as well as options on non-equity securities,[10] with the same underlying and expiration date.

The Smoothing Algorithm consists of four steps. The first step is a preprocessing procedure, which is used to filter out "bad" price quotes.[11] The second step is an implied forward price calculation, which estimates the forward prices of securities underlying the options by using the prices from the near-the-money options on the same securities at all tenors or expiration dates. The third step[12] performs the smoothing, in which theoretical prices are generated for all plain vanilla listed options at all strikes by using corresponding bid and ask price quotes and forward prices (which were calculated in step two).[13] The fourth step consists of constructing a volatility surface[14] based on linear

---

10 E.g., the Cboe Volatility (VIX) Index.

11 The Smoothing Algorithm filters out certain poor-quality price quotes. The price quotes are excluded from the algorithm if they meet one or more of the following conditions: (i) prices for options that expired or have a remaining maturity of less than a certain number of days, where that number is specified by a control parameter; (ii) prices for options that have only "one-sided contracts" (*i.e.*, contracts for which prices exist only for either the call or the put, but not for both); (iii) prices for options whose ask prices are zero; (iv) prices for options with negative bid and ask spreads; or (v) prices for any American options if the ask price is less than the intrinsic value of the option.

12 The third step as described applies to European options. For American options, the Smoothing Algorithm first extracts the European option prices from the American prices (or "de-Americanizes" the prices) using the Vanilla Option Model, then performs smoothing on the resultant European prices, and finally converts the smoothed European prices into American prices (or "re-Americanizes" the prices) using the Vanilla Option Model.

13 The theoretical prices in step three are generated by solving an optimization problem, which ensures that the theoretical prices generated satisfy both arbitrage-free conditions and bid and ask spread constraints.

14 A "volatility surface" is a three-dimensional graph showing the levels of the implied volatilities for all the options listed on the same underlying security with different strikes or maturity dates.

interpolation[15] of total variance[16] among the smoothed prices and performing any necessary post-processing.[17]

OCC's Smoothing Algorithm is intended to ensure that the option prices generated are smooth, free of arbitrage opportunities and within bid and ask price spreads. The fair value prices that result from the Smoothing Algorithm are used by OCC in calculating margin requirements, risk sensitivities, stress testing and calculation of the Clearing Fund. In addition, the end-of-day fair value prices of options contracts produced by the Smoothing Algorithm are published to all Clearing Members, as well as to other market participants.

Proposed Changes

OCC is proposing to enhance its margin methodology by addressing a series of limitations that presently exist in each of the Vanilla Option Model and the Smoothing Algorithm, as described below.

Vanilla Option Model Proposed Changes

The Vanilla Option Model has five limitations that would be addressed by the proposed changes. First, the Vanilla Option Model uses constant interest rates – the published London Inter-bank Offered Rate ("LIBOR") for maturities up to 12 months and

15 "Linear interpolation" is a mathematical method of curve fitting by using linear polynomials to construct new data points within the range of a discrete set of known data points.

16 The "total variance" of a random variable is defined as the sum of the variances over a given period of time. If the variance is a constant, the total variance is a simple product of its value and length of the time period.

17 Post-processing addresses contracts that are filtered out of the smoothing process during pre-processing due to either bad or missing price quotes. In post-processing, the theoretical prices for these contracts are approximated from the implied volatility data that are already obtained by the smoothing algorithm.

published swap rates from maturities two to ten years – as opposed to an interest rate yield curve.[18] By using constant interest rates, the Vanilla Option Model assumes that interest rates remain constant during the lifetime of an option (i.e., the interest rates remain constant at each time-step or node in the JR binomial tree). To address this limitation, OCC proposes to change the Vanilla Option Model to instead use an interest rate curve generated by using OCC's chosen benchmark rate(s) (currently LIBOR), Eurodollar futures prices and swap rates. The use of an interest rate curve will allow the Vanilla Option Model to assume variable interest rates over the lifetime of an option (i.e., interest rates can vary at each time-step or node in the binomial tree).

Second, the Vanilla Option Model uses either a constant yield (for index options for all tenors) or a constant projection (for single-name stock options for all tenors) determined by the issuer's last paid or announced dividend. However, an issuer's last paid or announced dividend is not always an accurate prediction of an issuer's future dividends, whereas forecasted dividends are the result of a more comprehensive analysis of the issuer's fundamentals, resulting in a dividend projection that is more sensitive to the particular issuer's circumstances. To address this limitation, OCC proposes to change the Vanilla Option Model to use a schedule of forecasted dividends, received from an established industry data service provider, instead of relying on the issuer's last paid or announced dividend.[19]

18 The "swap rate" is the fixed interest rate that a swap counterparty demands in exchange for the uncertainty of having to pay the short-term floating rate over time.

19 In the event the primary data source for these dividends is unavailable, OCC has a backup data provider for forecasted dividends.

Third, the Vanilla Option Model currently does not use borrowing costs,[20] which could allow for potential inconsistencies in implied volatilities for calls and puts in options with the same strike and tenor. To address this limitation, OCC proposes to modify the Vanilla Option Model to use borrowing costs as an input in the valuation of plain vanilla options.[21]

Fourth, as stated above, for pricing American options the Vanilla Option Model is based on a 49-step modified JR binomial tree; however, the fixed number of steps is not large enough for accurately evaluating long-dated options (e.g., FLEX options). To address this limitation, OCC proposes that the Vanilla Option Model instead price American options using a variable number of steps[22] that increases linearly with the expiration of the option. In addition, OCC proposes to replace the JR binomial tree with the Leisen-Reimer ("LR") binomial tree, which has a higher rate of convergence than the JR binomial tree.

Fifth, the Vanilla Option Model only calculates a limited number of risk sensitivities for the price of options (i.e., Delta, Gamma and Vega) with respect to market

[20] Borrowing costs are the costs that may be incurred by an option buyer or seller to borrow the underlying security of the option.

[21] The borrowing costs used by the Vanilla Option Model would be calculate from market prices of options or futures.

[22] The number of LR tree steps would vary between minimum and maximum parameters, depending on an option's tenor. OCC would initially set these minimum and maximum parameters at 51 and 501, respectively, and they would be subject to change based on OCC's determination. OCC would modify the minimum and maximum parameters to achieve a balance between pricing accuracy and speed of pricing calculations. The larger the number of the steps, the more accurate the pricing, but the longer the calculation time. For example, OCC's initial choice of a maximum 1001 steps did not result in an optimal balance between accuracy and speed; therefore, OCC reduced the maximum number of steps to 501.

variables; the model, however, is limited in that it does not calculate Theta and Rho.[23] The proposed enhancements to the Vanilla Option Model would enable the model to calculate Theta and Rho, in addition to Delta, Gamma and Vega.[24]

Smoothing Algorithm Enhancements

Presently, the Smoothing Algorithm has five limitations that would be addressed by the proposed enhancements. First, though the Smoothing Algorithm uses the Vanilla Option Model as a component for generating smoothed prices, the Smoothing Algorithm uses a LR binomial tree, whereas the Vanilla Option Model uses a JR binomial tree. The JR binomial tree used in the current Vanilla Option Model does not account for implied forward prices as generated in the Smoothing Algorithm. This inconsistency in binomial trees allows for unequal put and call volatilities and thus for potential violations of put and call parity in margin calculations. The proposed change to the Vanilla Option Model to use a LR binomial tree, as previously described, would not only enhance the Vanilla Option Model but would eliminate the current inconsistency between the Vanilla Option Model and Smoothing Algorithm by using a LR binomial tree for both models.

Second, the Smoothing Algorithm uses index futures to approximate theoretical spot prices for the plain vanilla listed options on certain indices, but this method suffers

---

23 "Theta" measures the change in the option value for a one day change in the time to expiration of the option. "Rho" measures the change in the option value with respect to a 1 basis point change in the interest rate.

The Vanilla Option Model has a further limitation in that it relies on a perturbation method of calculating Delta and Gamma, which is less efficient than calculating Delta and Gamma from the same tree.

24 The Vanilla Option Model presently calculates Delta and Gamma using the perturbation method. The perturbation method requires the use of two binomial trees, which introduces instability issues. The proposed changes would result in Delta and Gamma being calculated from a single binomial tree, which results in improved stability.

from the absence of synchronization between the futures market and the market for the underlying indices.[25] Trading in the underlying indices closes at 3:00 p.m. Central Time, but trading in the index futures and plain vanilla listed options on those indices closes at 3:15 p.m. The difference in closing times could result in poorly smoothed prices whenever the options trading between 3:00 p.m. and 3:15 p.m. is volatile. Poorly smoothed prices could result in implied volatilities of poorer quality, and this could create problems in OCC's margin and risk calculations. In order to address this limitation, the Smoothing Algorithm would use basis futures on the same indices to approximate theoretical spot prices. Trading in basis futures has the benefit of closing at 3:00 p.m., which would allow OCC to use a reported closing price.[26] Basis futures prices represent the spreads between the futures prices and the underlying price; these spreads are relatively stable throughout the day, including between their closing at 3:00 p.m. and the closing of the index options market at 3:15 p.m., thereby providing a better approximation of the theoretical sport prices in the plain vanilla options at 3:15 p.m.

Third, the Smoothing Algorithm deals with unacceptably high volatilities that are sometimes generated in the out-of-the-money regions by capping these volatilities to a lower value. This leads to a jump in the rate of change of the volatility with respect to the strike and may create negative convexity of the option prices versus strike, i.e., butterfly arbitrage opportunities. The proposed changes to the Smoothing Algorithm would still cap unacceptably high volatilities generated in out-of-the-money regions to a lower value,

---

[25] Using the 3:00 p.m. index futures price suffers from another shortcoming in that the 3:00 p.m. price is not an official closing price, but rather it is the last trade price before 3:00 p.m. (as observed in a manual process by OCC employees).

[26] By using the reported closing price for basis futures, the proposed changes to the Smoothing Algorithm also would eliminates the algorithm's reliance on a manual process to observe pre-close futures prices.

but the capping would be done in a more gradual manner. By capping unacceptable high volatilities in a more gradual manner, changes in the convexity of prices would not be as discontinuous as in the current Smoothing Algorithm, which would eliminate the opportunities for butterfly arbitrage.

Fourth, to generate prices for short-dated FLEX options, the Smoothing Algorithm combines the prices calculated from the prior day's implied volatilities for all FLEX options with current market prices. By combining the prior day's implied volatilities with current market prices, the Smoothing Algorithm may not generate prices that are consistent with then-current market prices.[27] In order to address this limitation, OCC proposes to change the Smoothing Algorithm to use volatilities implied from current market prices of plain vanilla listed options to price short-dated FLEX options.[28]

Fifth, the Smoothing Algorithm currently does not have the ability to use borrowing costs as an independent input.[29] To address this limitation, OCC proposes to modify the Smoothing Algorithm to provide for the ability to use borrowing costs as an independent input in the pricing of plain vanilla listed options. Under the proposed changes, the borrowing costs for each underlying security would be implied from at-the-money (or near at-the-money) options listed on such security.

---

27 The reason that the Smoothing Algorithm uses the prior day's implied volatilities is that the implied volatilities are received from a third-party data service provider; the provider's quotes are delayed by one day.

28 The Smoothing Algorithm for long-dated FLEX options would remain unchanged.

29 The Smoothing Algorithm currently combines borrowing costs and dividends into a single input, referred to as "implied dividends," which is then used to price plain vanilla listed options. However, the combined "implied dividends" input can differ from the actual dividend, and this difference can result in potential mispricing of certain types of options.

Clearing Member Outreach

To inform Clearing Members of the proposed change, OCC has provided overviews of the proposed changes to its Financial Risk Advisory Council[30] and, prior to implementing the proposed rule change, will provide overviews to the OCC Roundtable,[31] as well as through Information Memoranda to all Clearing Members describing the proposed change.

Given that changes in margins are expected,[32] OCC expects to conduct an extended parallel implementation for Clearing Members prior to implementation. Additionally, OCC will perform targeted and direct outreach with Clearing Members that would be most impacted by the proposed change and would work closely with such

---

30 The Financial Risk Advisory Council is a working group comprised of exchanges, Clearing Members and indirect participants of OCC.

31 The OCC Roundtable was established to bring Clearing Members, exchanges and OCC together to discuss industry and operational issues. It is comprised of representatives of the senior OCC staff, participant exchanges and Clearing Members, representing the diversity of OCC's membership in industry segments, OCC-cleared volume, business type, operational structure and geography.

32 OCC expects that the proposed changes, in aggregate, would reduce total margins by a small amount. In particular, margin reductions are expected for Clearing Members who hold risk offsetting positions. However, the ultimate impact on any particular Clearing Member's margin requirements would necessarily vary based on trading strategies and market conditions. More specifically, backtesting results for the period from March 2018 through February 2019 showed small reductions to total margins, in aggregate, with an average difference of 1.3% between the proposed model and the production model. At the Clearing Member level, the difference in margin requirements between the proposed model and the production model for Clearing Members comprising 99% of OCC's total daily margin (such Clearing Members, the "top Clearing Members") on most days of the backtesting period was less than 10%. The largest increase and decrease to daily margin requirements observed within top Clearing Members during the backtesting period was 42% and 30%, respectively. On average, only 5% of the top Clearing Members experienced a daily margin decrease or increase of 10% or greater under the proposed model over the same period.

Clearing Members to coordinate the implementation and associated funding for such Clearing Members resulting from the proposed change.[33]

Implementation Timeframe

OCC expects to implement the proposed changes to the Vanilla Option Model and Smoothing Algorithm no sooner than August 1, 2019 and no later than one hundred eighty (180) days from the date OCC receives all necessary regulatory approvals for the filings. OCC will announce the implementation date of the proposed change by an Information Memo posted to its public website no less than 6 weeks prior to implementation.

(2) Statutory Basis

OCC believes that the proposed rule change is consistent with Section 17A of the Act[34] and the rules thereunder applicable to OCC. Section 17A(b)(3)(F) of Act[35] requires that the rules of a clearing agency be designed to assure the safeguarding of securities and funds which are in the custody or control of the clearing agency or for which it is responsible. The proposed rule change would enhance two of the primary components of OCC's STANS methodology by addressing five limitations of the Vanilla Option Model and five limitations of the Smoothing Algorithm.

With respect to the Vanilla Option Model, the proposed rule change would incorporate interest rate yield curves, forecasted dividends and borrowing costs into the theoretical pricing of plain vanilla listed options. Including these three inputs improves

33 Specifically, OCC will discuss with those Clearing Members how they plan to satisfy any increase in their margin requirements associated with the proposed change.

34 15 U.S.C. 78q-1.

35 15 U.S.C. 78q-1(b)(3)(F).

the Vanilla Option Model's theoretical pricing and helps to preserve the consistency between implied call volatility and implied put volatility in options at the same strike price and same maturity. The proposed rule change also would introduce the LR binomial tree to replace the fixed, 49-step JR binomial tree for pricing of American options. The LR binomial tree would use a variable number of steps that increases linearly with the expiration of an option, to more accurately price long-dated American options. The LR binomial tree also converges at a considerably higher rate than the JR binomial tree. The proposed rule change would also enable OCC to calculate two additional risk sensitivities – namely, Theta and Rho – for plain vanilla listed options.

With respect to the Smoothing Algorithm, the proposed rule change would improve implied volatility smoothing by eliminating the inconsistency between the binomial trees used by the Vanilla Option Model and the Smoothing Algorithm and by eliminating the synchronization issue from using the 3:00 p.m. index futures price to approximate theoretical spot prices for plain vanilla listed options on certain indices. The proposed rule change also would improve the Smoothing Algorithm by more gradually capping unacceptably high volatilities sometimes generated in the out-of-the-money regions, which would eliminate the opportunities for butterfly arbitrage, and by using borrowing costs in the pricing of plain vanilla listed options.

Each of the aforementioned enhancements is expected to produce margin requirements that are more accurate and commensurate with the risks presented by Clearing Members, thereby improving OCC's margins for plain vanilla listed options. Because OCC uses the margin it collects from a defaulting Clearing Member to protect other Clearing Members from losses resulting from the default, OCC believes the proposed rule changed is designed to assure the safeguarding of securities and funds in its custody or control in accordance with Section 17A(b)(3)(F) of the Act.[36]

Rule 17Ad-22(b)(2)[37] requires, in part, that a registered clearing agency that performs central counterparty services establish, implement, maintain and enforce written policies and procedures reasonably designed use margin requirements to limit its credit exposures to participants under normal market conditions and use risk-based models and parameters to set margin requirements. As noted above, OCC uses STANS as its risk-based margin methodology. The proposed rule change would enhance STANS by addressing several limitations in two of the primary components of STANS: the Vanilla Option Model and the Smoothing Algorithm. With respect to the Vanilla Option Model, OCC believes the proposed changes would enable the model to produce more accurate theoretical valuations of plain vanilla listed options, and for American options, would enable the mode to more accurately evaluate long-dates options. With respect to the Smoothing Algorithm, OCC believes the proposed rule change will enhance the model's implied volatility smoothing by improving the approximate theoretical spot prices for plain vanilla listed options on certain indices and by eliminating opportunities for butterfly arbitrage. Accordingly, OCC believes the proposed rule change would improve the methodology used to calculate margin requirements designed to limit OCC's credit exposures to participants under normal market conditions in a manner consistent with Rule 17Ad-22(b)(2).[38]

---

36 Id.

37 17 CFR 240.17Ad-22(b)(2).

38 Id.

Rule 17Ad-22(e)(6)(i) and (iii)[39] further requires OCC to establish, implement, maintain and enforce written policies and procedures reasonably designed to cover its credit exposures to its participants by establishing a risk-based margin system that: (1) considers, and produces margin levels commensurate with, the risks and particular attributes of each relevant product, portfolio, and market and (2) 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. As noted above, the proposed rule change would address certain existing limitations in the Vanilla Option Model and the Smoothing Algorithm, each of which is a primary component of OCC's STANS methodology. By addressing the aforementioned limitations of the Vanilla Option Model, OCC believes that the model will produce more accurate theoretical valuations of plain vanilla listed options, including improved theoretical valuations for long-dated American options. By addressing the aforementioned limitations of the Smoothing Algorithm, OCC believes that the proposed rule change will enhance implied volatility smoothing, improve the approximate theoretical spot prices for plain vanilla listed options on certain indices and eliminate opportunities for butterfly arbitrage. Accordingly, OCC believes the proposed changes are consistent with Rule 17Ad-22(e)(6)(i) and (iii).[40]

The proposed rule changes are not inconsistent with the existing rules of OCC, including any other rules proposed to be amended.

---

39 17 CFR 240.17Ad-22(e)(6)(i) and (iii).

40 Id.

(B) Clearing Agency's Statement on Burden on Competition

Section 17A(b)(3)(I) of the Act requires that the rules of a clearing agency do not impose any burden on competition not necessary or appropriate in furtherance of the purposes of Act.[41] OCC believes that any competitive impact imposed by the proposed model changes would be necessary and appropriate in furtherance of the purposes of Act.[42] The proposed changes are primarily designed to enhance two primary components of OCC's STANS margin methodology. As described above, the proposed model changes are necessary to produce margin results that are more commensurate with the risks associated with clearing plain vanilla listed options. Therefore, any competitive impact imposed by the changes would be necessary in further of the purposes of the Act.

Furthermore, the proposed enhancements to the margin methodology would apply to all Clearing Members clearing plain vanilla listed options at OCC. The overall impact of the proposed rule change on margins will depend on the composition of the portfolio in question, but any fluctuations in margin requirements would be the same for any Clearing Members with identical portfolios. Similarly, the enhancements to the Smoothing Algorithm would result in improved end-of-day fair value prices of options contracts, which would be published to all Clearing Members, as well as to other market participants. Therefore, OCC does not believe that the proposed rule change would unfairly inhibit access to OCC's services or disadvantage or favor any particular user in relationship to another user. Accordingly, OCC believes that any competitive impact would be appropriate in furtherance of the safeguarding of securities and funds which are in the custody or control of OCC or for which it is responsible, and in general, the

---

41 15 U.S.C. 78q-1(b)(3)(I).

42 Id.

protection of investors and the public interest; and, therefore, appropriate in furtherance of the purposes of the Act.

(C) Clearing Agency's Statement on Comments on the Proposed Rule Change Received from Members, Participants or Others

Written comments on the proposed rule change were not and are not intended to be solicited with respect to the proposed rule change and none have been received.

III. Date of Effectiveness of the Proposed Rule Change and Timing for Commission Action

Within 45 days of the date of publication of this notice in the Federal Register or within such longer period up to 90 days (i) as the Commission may designate if it finds such longer period to be appropriate and publishes its reasons for so finding or (ii) as to which the self- regulatory organization consents, the Commission will:

(A) by order approve or disapprove the proposed rule change, or

(B) institute proceedings to determine whether the proposed rule change should be disapproved.

IV. Solicitation of Comments

Interested persons are invited to submit written data, views and arguments concerning the foregoing, including whether the proposed rule change is consistent with the Exchange Act. Comments may be submitted by any of the following methods:

Electronic Comments:

- Use the Commission's Internet comment form (http://www.sec.gov/rules/sro.shtml); or
- Send an e-mail to rule-comments@sec.gov. Please include File Number SR-OCC-2019-005 on the subject line.

Paper Comments:

- Send paper comments in triplicate to Secretary, Securities and Exchange Commission, 100 F Street, NE, Washington, DC 20549-1090.

All submissions should refer to File Number SR-OCC-2019-005. This file number should be included on the subject line if e-mail is used. To help the Commission process and review your comments more efficiently, please use only one method. The Commission will post all comments on the Commission's Internet website (http://www.sec.gov/rules/sro.shtml). Copies of the submission, all subsequent amendments, all written statements with respect to the proposed rule change that are filed with the Commission, and all written communications relating to the proposed rule change between the Commission and any person, other than those that may be withheld from the public in accordance with the provisions of 5 U.S.C. 552, will be available for website viewing and printing in the Commission's Public Reference Room, 100 F Street, NE, Washington, DC 20549, on official business days between the hours of 10:00 a.m. and 3:00 p.m. Copies of such filing also will be available for inspection and copying at the principal office of OCC and on OCC's website at https://www.theocc.com/about/publications/bylaws.jsp.

All comments received will be posted without change. Persons submitting comments are cautioned that we do not redact or edit personal identifying information from comment submissions. You should submit only information that you wish to make available publicly.

All submissions should refer to File Number SR-OCC-2019-005 and should be submitted on or before [insert date 21 days from publication in the Federal Register].

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.[43]

Eduardo A. Aleman
Deputy Secretary

---

[43] 17 CFR 200.30-3(a)(12).