SECURITIES AND EXCHANGE COMMISSION

Self-Regulatory Organizations: The Options Clearing Corporation; Notice of Filing of Advance Notice, as Modified by Partial Amendment No. 1, Related to The Options Clearing Corporation’s Margin Methodology for Incorporating Variations in Implied Volatility

November 19, 2018.

Pursuant to Section 806(e)(1) of Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act, entitled Payment, Clearing and Settlement Supervision Act of 2010 (“Clearing Supervision Act”)1 and Rule 19b–4(n)(1)(i)2 under the Securities Exchange Act of 1934 (“Exchange Act” or “Act”),3 notice is hereby given that on October 22, 2018, The Options Clearing Corporation (“OCC”)4 filed with the Securities and Exchange Commission (“Commission”) an advance notice as described in Items I, II and III below, which Items have been prepared by OCC. On October 30, 2018, OCC filed Partial Amendment No. 1 to the advance notice.4 The Commission is publishing this notice to solicit comments on the advance notice from interested persons.

I. Clearing Agency’s Statement of the Terms of Substance of the Advance Notice

This advance notice is filed in connection with proposed changes to enhance OCC’s model for incorporating variations in implied volatility within OCC’s margin methodology (“Implied Volatility Model”), the System for Theoretical Analysis and Numerical Simulations (“STANS”),5 The proposed changes to OCC’s Margins Methodology document are contained in confidential Exhibit 5 of the filing. Material proposed to be added is marked by underlining and material proposed to be deleted is marked by strikethrough text. The proposed changes are described in detail in Item 10 below. The proposed changes do not require any changes to the text of OCC’s By-Laws or Rules. The advance notice 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.6

II. Clearing Agency’s Statement of the Purpose of, and Statutory Basis for, the Advance Notice

In its filing with the Commission, OCC included statements concerning the purpose of and basis for the advance notice and discussed any comments it received on the advance notice. 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 and B below, of the most significant aspects of these statements.

(A) Clearing Agency’s Statement on Comments on the Advance Notice Received From Members, Participants or Others

Written comments were not and are not intended to be solicited with respect to the proposed rule change and none have been received. OCC will notify the Commission of any written comments received by OCC.

(B) Advance Notices Filed Pursuant to Section 806(e) of the Payment, Clearing, and Settlement Supervision Act

Description of the Proposed Change

Background

STANS Overview

STANS is OCC’s proprietary risk management system for calculating Clearing Member margin requirements.7 The STANS methodology utilizes large-scale Monte Carlo simulations to forecast price and volatility movements in determining a Clearing Member’s margin requirement.8 STANS margin requirements are calculated at the portfolio level of Clearing Member accounts with positions in marginable securities and consists of an estimate of two primary components: A base component and a stress test add-on component. The base component is an estimate of a 99% expected shortfall9 over a two-day time horizon.

1. OCC’s By-Laws and Rules can be found on OCC’s public website: http://optionsclearing.com/about/publications/bylaws.jsp.
4. The expected shortfall component is established as the estimated average of potential losses higher than the 99% value at risk threshold. The term “value at risk” or “VaR” refers to a statistical technique that, generally speaking, is used in risk management to measure the potential risk of loss for a given set of assets over a particular time horizon.
5. OCC also has filed a proposed rule change with the Commission in connection with the proposed changes. See SR–OCC–2018–014.
6. The proposed changes are described in Exhibit 5 of the filing. Material material is used to estimate and simulate the risk for an associated product. The majority of risk factors utilized in the STANS methodology are the returns on individual equity securities; however, a number of other risk factors may be considered, including, among other things, returns on implied volatility risk factors.11

Current Implied Volatility Model in STANS

Generally speaking, 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 premium in the market. Using the Black-Scholes options pricing model, the implied volatility is the standard deviation of the underlying asset price necessary to arrive at the market price of an option on a given strike, time to maturity, underlying asset price and the current risk-free rate. In effect, the implied volatility is

9 The expected shortfall is the average of losses larger than the 99% VaR over a given time horizon.


responsible for that portion of the premium that cannot be explained by the then-current intrinsic value of the option (i.e., the difference between the price of the underlying and the exercise price of the option), discounted to reflect its time value. OCC considers variations in implied volatility within STANS to ensure that the anticipated cost of liquidating options positions in an account recognizes the possibility that implied volatility could change during the two-business day liquidation time horizon and lead to corresponding changes in the market prices of the options.

OCC models the variations in implied volatility used to re-price options within STANS for substantially all option contracts available to be cleared by OCC that have a residual term of less than three years (“Shorter Tenor Options”).

To address variations in implied volatility, OCC models a volatility surface for Shorter Tenor Options by incorporating into the econometric models underlying STANS certain risk factors (i.e., implied volatility pivot points) based on a range of tenors and option deltas. Currently, these implied volatility pivot points consist of three tenors of one month, three months and one year, and three deltas of 0.25, 0.5, and 0.75, resulting in nine implied volatility risk factors. These pivot points are chosen such that their combination allows the model to capture changes in level, skew, convexity and term structure of the implied volatility surface. OCC uses a benchmark to forecast the volatility for each implied volatility risk factor at the nine pivot points.

For each Shorter Tenor Option in the account of a Clearing Member, changes in its implied volatility are simulated using forecasts obtained from daily implied volatility market data according to the corresponding pivot point and the price of the option is computed to determine the amount of profit or loss in the account under the particular STANS price simulation. Additionally, OCC uses simulated closing prices for the assets underlying the options in the account of a Clearing Member that are scheduled to expire within the liquidation time horizon of two business days to compute the options’ intrinsic value and uses those values to help calculate the profit or loss in the account.

OCC performed a number of analyses of its current Implied Volatility Model and to support development of the proposed model changes, including backtesting and impact analysis of the proposed model enhancements as well as comparison of OCC’s current model performance against certain industry benchmarks.

OCC’s analysis demonstrated that one attribute of the current model is that the volatility changes forecasted by the GARCH model are extremely sensitive to sudden spikes in volatility, which can at times result in over reactive margin requirements that OCC believes are unreasonable and procyclical.

For example, on February 5, 2018, the market experienced extreme levels of volatility, with the Cboe Volatility Index (“VIX”) moving from 17% up to 37%, representing a relative move of 116% (which is the largest relative daily jump in the history of the index). Under OCC’s current model, OCC observed that the GARCH forecast SPX volatility for at-the-money implied volatility for a one-month tenor was approximately 4 times larger than the comparable market index, the Cboe VIX Index, which is a volatility of volatility measure in that it represents the expected volatility of the 30-day forward price of the VIX. As a result, aggregated STANS margins jumped more than 80% overnight due to the GARCH model and margin requirements for certain individual Clearing Members increased by a factor of 10.

In addition, volatility tends to be mean reverting; that is, volatility will quickly revert to its long-run mean or average from an elevated level, so it is unlikely that volatility would continue to make big jumps immediately following a drastic increase. For example, based on the VIX history from 1990–2018, VIX levels jumped above 35 (about the level observed on February 5, 2018) for approximately 233 days (i.e., 4% of the sample period). From the level of 35 or higher, the range of daily change on the VIX index was between 27% and -35%. However, the largest daily changes on one-month at-the-money SPX implied volatility forecasted by OCC’s current GARCH model on February 5, 2018, were far in excess of those historical realized amounts, which points to extreme procyclical issues that need to be addressed in the current model.

OCC also performed backtesting of the current model and proposed model enhancements to evaluate and compare the performance of each model from a margin coverage perspective. OCC’s backtesting demonstrated that exceedance counts and overall coverage levels over the backtesting period using the proposed model enhancements were substantially similar to the results obtained from the current production model. As a result, OCC believes the current model tends to

17The acronym “GARCH” refers to an econometric model that can be used to estimate volatility based on historical data. See generally Tim Bollerslev, “Generalized Autoregressive Conditional Heteroskedasticity,” Journal of Econometrics, 31(3), 307–327 (1986).

18STANS relies on 10,000 price simulation scenarios that are based generally on a historical data period of 500 business days, which are updated daily to keep model results from becoming stale.

19For such Shorter Tenor Options that are scheduled to expire on the open of the market rather than the close, OCC uses the relevant opening price for the underlying assets.

20OCC has provided results of these analyses to the Commission in confidential Exhibit 3 of the filing.

21A quality that is positively correlated with the overall state of the market is deemed to be “procyclical.” For example, procyclical may be evidenced by increasing margin requirements in times of stressed market conditions and low margin requirements when markets are calm. Hence, anti-procyclical features in a model are measures intended to prevent risk-based models from fluctuating too drastically in response to changing market conditions.

22The VIX is an index designed to measure the 30-day expected volatility of the Standard & Poor’s 500 index (“SPX”).
be overly conservative/reactive, and the proposed model is more appropriately commensurate with the risks presented by changes in implied volatility.

OCC believes that the sudden, extreme and unreasonable increases in margin requirements that may be experienced under its current Implied Volatility Model may stress certain Clearing Members’ ability to obtain sufficient liquidity to meet these significantly increased margin requirements, particularly in periods of sudden, extreme volatility. OCC therefore is proposing changes to its Implied Volatility Model to limit procyclicality and produce margin requirements that OCC believes are more reasonable and are also commensurate with the risks presented by its cleared options products.

Proposed Changes

OCC proposes to modify its Implied Volatility Model by introducing an exponentially weighted moving average for the daily forecasted volatility for implied volatility risk factors calculated using the GARCH model. Specifically, when forecasting the volatility for each implied volatility risk factor at each of the nine pivot points, OCC would use an exponentially weighted moving average of forecasted volatilities over a specified look-back period rather than using raw daily forecasted volatilities. The exponentially weighted moving average would involve the selection of a look-back period over which the data would be averaged and a decay factor (or weighting factor), which is a positive number between zero and one, that represents the weighting factor for the most recent data point.26 The look-back period and decay factor would be model parameters subject to monthly review, along with other model parameters that are reviewed by OCC’s Model Risk Working Group (“MRWG”) in accordance with OCC’s internal procedure for margin model parameter review and sensitivity analysis, and these parameters would be subject to change upon approval of the MRWG.

The proposed changes are intended to reduce the oversensitivity of the current Implied Volatility Model to large, sudden shocks in market volatility and therefore result in margin requirements that are more stable and that remain commensurate with the risks presented during periods of sudden, extreme volatility. The proposed changes are expected to produce margin requirements that are very similar to those generated using OCC’s existing model during quiet, less volatile market periods; however, during more volatile periods, the proposed changes would result in a more measured initial response to increases in the volatility of volatility with margin requirements that may remain elevated for a longer period of time after the shock subsides than experienced under OCC’s current model. The proposed changes are intended to reduce procyclicality in OCC’s margin methodology across volatile market periods while continuing to capture changes in implied volatility and produce margin requirements that are commensurate with the risks presented by OCC’s cleared options products. The proposed changes therefore would reduce the risk that a sudden, extreme increase in margin requirements may stress Clearing Members’ ability to obtain liquidity to meet such increased requirements, particularly in periods of extreme volatility.

Implementation Timeframe

OCC expects to implement the proposed changes within thirty (30) days after the date that OCC receives all necessary regulatory approvals for the proposed changes. OCC will announce the implementation date of the proposed change by an Information Memorandum posted to its public website at least 2 weeks prior to implementation.

Anticipated Effect on, and Management of, Risk

The volatility changes forecasted by OCC’s current Implied Volatility Model are extremely sensitive to large, sudden spikes in volatility, which can at times result in over reactive margin requirements that OCC believes are unreasonable and procyclical (for the reasons set forth above). Such sudden, unreasonable increases in margin requirements may stress certain Clearing Members’ ability to obtain liquidity to meet those requirements, particularly in periods of extreme volatility, and could result in a Clearing Member being delayed in meeting, or ultimately failing to meet, its daily settlement obligations to OCC. OCC notes that the proposed changes are expected to produce margin requirements that are very similar to those generated using OCC’s existing model during quiet, less volatile market periods. The proposed changes would, however, result in a more measured initial response to increases in the volatility of volatility with margin requirements that may remain elevated for a longer period after the shock subsides than experienced under OCC’s current model. The proposed changes would therefore reduce the likelihood that OCC’s Implied Volatility Model would produce extreme, over reactive margin requirements that could strain the ability of certain Clearing Members to meet their daily margin requirements at OCC by reducing procyclicality in OCC’s margin methodology and ensuring more stable and appropriate changes in margin requirements across volatile market periods while continuing to capture changes in implied volatility and produce margin requirements that are commensurate with the risks presented.

Consistency With the Payment, Clearing and Settlement Supervision Act

The stated purpose of the Clearing Supervision Act is to mitigate systemic risk in the financial system and promote financial stability by, among other things, promoting uniform risk management standards for systemically important financial market utilities and strengthening the liquidity of systemically important financial market utilities.32 Section 805(a)(2) of the Clearing Supervision Act also authorizes the Commission to prescribe risk management standards for the payment, clearing and settlement activities of designated clearing entities, like OCC, for which the Commission is the supervisory agency. Section 805(b) of the Clearing Supervision Act33 states that the objectives and principles for

---

26 An exponentially weighted moving average is a statistical method that averages data in a way that gives more weight to the most recent observations using an exponential scheme. The lower the number the more weight is attributed to the more recent data (e.g., if the value is set to one, the exponentially weighted moving average becomes a simple average).

27 OCC initially would use a look-back period of 22 days and an initial decay factor of 0.94 for the exponentially weighted moving average. OCC believes the 22-day look-back is an appropriate initial parameter setting as it would allow for close to monthly updates of the GARCH parameters used in the model. The decay factor value of 0.94 was selected based on the factor initially proposed by JP Morgan’s RiskMetrics methodology [see JPMorgan/Reuters, 1996, “RiskMetrics—Technical Document”, Fourth edition].

28 The MRWG is responsible for assisting OCC’s Management Committee in overseeing and governing OCC’s model-related risk issues and includes representatives from OCC’s Financial Risk Management department, Quantitative Risk Management department, Model Validation Group, and Enterprise Risk Management department.

29 As noted above, OCC has performed analysis of the impact of the proposed changes, and OCC’s backtesting of the proposed model demonstrates comparable exceedance counts and coverage levels to the current model during the most recent volatile period.


33 12 U.S.C. 5464(b).
risk management standards prescribed under Section 805(a) shall be to:

- Promote robust risk management;
- Promote safety and soundness;
- Reduce systemic risks; and
- Support the stability of the broader financial system.

OCC believes that the proposed changes described herein would enhance its margin methodology in a manner consistent with the objectives and principles of Section 805(b) of the Clearing Supervision Act and the risk management standards adopted by the Commission in Rule 17Ad–22 under the Act for the reasons set forth below. OCC believes the proposed changes are consistent with the objectives and principles of Section 805(b) of the Clearing Supervision Act in that they would promote robust risk management and safety and soundness while reducing systemic risks and supporting the stability of the broader financial system. As discussed above, the volatility changes forecasted by OCC’s current Implied Volatility Model are extremely sensitive to large, sudden spikes in volatility, which can at times result in over reactive margin requirements that OCC believes are unreasonable and procyclical. Such sudden, unreasonable increases in margin requirements may stress certain Clearing Members’ ability to obtain liquidity to meet those requirements, particularly in periods of extreme volatility, and could result in a Clearing Member being delayed in meeting, or ultimately failing to meet, its daily settlement obligations to OCC. OCC notes that the proposed changes are expected to produce margin requirements that are very similar to those generated using OCC’s existing model during quiet, less volatile market periods. The proposed changes would, however, result in a more measured initial response to increases in the volatility of volatility with margin requirements that may remain elevated for a longer period after the shock subsides than experienced under OCC’s current model. The proposed changes would therefore reduce the likelihood that OCC’s Implied Volatility Model would produce extreme, over reactive margin requirements by reducing procyclicality in OCC’s margin methodology and ensuring more stable and appropriate changes in margin requirements across volatile market periods while continuing to provide for robust management of the risks presented by the implied volatility of OCC’s cleared options products. Accordingly, OCC believes the proposed changes would promote robust risk management and safety and soundness while reducing systemic risks and supporting the stability of the broader financial system.

Rules 17Ad–22(e)(6)(i) and (v) require a covered clearing agency that provides central counterparty services 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) uses an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products. As noted above, OCC’s current model for implied volatility demonstrates extreme sensitivity to sudden spikes in volatility, which can at times result in over reactive margin requirements that OCC believes are unreasonable and procyclical. The proposed changes are designed to reduce the oversensitivity of the model and produce margin requirements that are commensurate with the risks presented during periods of sudden, extreme volatility. The proposed model enhancements are expected to produce margin requirements that are very similar to those generated using OCC’s existing model during quiet, less volatile market periods; however, the proposed changes would result in a more measured initial response to increases in the volatility of volatility with margin requirements that may remain elevated for a longer period of time after the shock subsides than experienced under OCC’s current model. The proposed changes are designed to reduce procyclicality in OCC’s margin methodology and ensure more stable changes in margin requirements across volatile market periods while continuing to capture changes in implied volatility and produce margin requirements that are commensurate with the risks presented by OCC’s cleared options. As a result, OCC believes that the proposed changes are reasonably designed to consider, and produce margin levels commensurate with, the risk presented by the implied volatility of OCC’s cleared options and use an appropriate method for measuring credit exposure that accounts for this product risk factor (i.e., implied volatility) in a manner consistent with Rules 17Ad–22(e)(6)(i) and (v).38

III. Date of Effectiveness of the Advance Notice and Timing for Commission Action

The proposed change may be implemented if the Commission does not object to the proposed change within 60 days of the later of (i) the date the proposed change was filed with the Commission or (ii) the date any additional information requested by the Commission is received. OCC shall not implement the proposed change if the Commission has any objection to the proposed change.

The Commission may extend the period for review by an additional 60 days if the proposed change raises novel or complex issues, subject to the Commission providing the clearing agency with prompt written notice of the extension. A proposed change may be implemented in less than 60 days from the date the advance notice is filed, or the date further information requested by the Commission is received, if the Commission notifies the clearing agency in writing that it does not object to the proposed change and authorizes the clearing agency to implement the proposed change on an earlier date, subject to any conditions imposed by the Commission. OCC shall post notice on its website of proposed changes that are implemented.

The proposal shall not take effect until all regulatory actions required with respect to the proposal are completed.

IV. Solicitation of Comments

Interested persons are invited to submit written data, views and arguments concerning the foregoing, including whether the advance notice is consistent with the Clearing Supervision 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 email to rule-comments@sec.gov. Please include File Number SR–OCC–2018–804 on the subject line.

34 Id.


37 17 CFR 240.17Ad–2(e)(6)(i) and (v).

38 Id.
SECURITIES AND EXCHANGE COMMISSION


Self-Regulatory Organizations; The Nasdaq Stock Market LLC; Notice of Filing and Immediate Effectiveness of Proposed Rule Change to Nasdaq Rule 5615(b)(4) To Change the Threshold for Qualifying as a Smaller Reporting Company To Qualify for Certain Exemptions From the Compensation Committee Requirements

November 20, 2018.

Pursuant to Section 19(b)(1) of the Securities Exchange Act of 1934 ("Act") and Rule 19b–4 thereunder, notice is hereby given that on November 14, 2018, The Nasdaq Stock Market LLC ("Nasdaq" or the "Exchange") filed with the Securities and Exchange Commission ("SEC" or "Commission") the proposed rule change as described in Items I and II below, which items have been prepared by the Exchange. The Commission is publishing this notice to solicit comments on the proposed rule change from interested persons.

I. Self-Regulatory Organization’s Statement of the Terms of Substance of the Proposed Rule Change

The Exchange proposes to amend Nasdaq Rule 5615(b)(4) to change the threshold for listed companies that are eligible to benefit from the exemptions from the Exchange’s compensation committee requirements applicable to smaller reporting companies so that all companies that qualify for smaller reporting company status under the revised SEC definition will qualify for the Exchange’s exemptions.

The SEC recently adopted amendments to the definition of “smaller reporting company” set forth in Item 10(f)(1) of Regulation S–K, Rule 12b–2 under the Act and Rule 405 under the Securities Act of 1933. The amendments raise the smaller reporting company cap from less than $75 million in public float to less than $250 million and also include as smaller reporting companies issuers with less than $100 million in annual revenues if they also have either no public float or a public float that is less than $700 million. The amendments became effective on September 10, 2018. As a result of the SEC rule changes, an expanded number of registrants, and hence, of listed companies, will qualify for smaller reporting company status than was previously the case. Smaller reporting companies are entitled to avail themselves of certain exemptions from Nasdaq’s compensation committee requirements.

II. Self-Regulatory Organization’s Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In its filing with the Commission, the Exchange 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. The Exchange has prepared summaries, set forth in sections A, B, and C below, of the most significant aspects of such statements.

A. Self-Regulatory Organization’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 amend Rule 5615(b)(4) to change the threshold for listed companies that are eligible to benefit from the exemptions from the Exchange’s compensation committee requirements applicable to smaller reporting companies so that all companies that qualify for smaller reporting company status under the revised SEC definition will qualify for the Exchange’s exemptions.

The SEC recently adopted amendments to the definition of “smaller reporting company” set forth in Item 10(f)(1) of Regulation S–K, Rule 12b–2 under the Act and Rule 405 under the Securities Act of 1933. The amendments raise the smaller reporting company cap from less than $75 million in public float to less than $250 million and also include as smaller reporting companies issuers with less than $100 million in annual revenues if they also have either no public float or a public float that is less than $700 million. The amendments became effective on September 10, 2018. As a result of the SEC rule changes, an expanded number of registrants, and hence, of listed companies, will qualify for smaller reporting company status than was previously the case. Smaller reporting companies are entitled to avail themselves of certain exemptions from Nasdaq’s compensation committee requirements.

2. Statutory Basis


4. See the Adopting Release.

5. Specifically, pursuant to Rule 5605(d)(5), a listed company that satisfies the definition of smaller reporting company is not required to comply with: (i) The additional requirements with respect to the independence of compensation committee members set forth in Rule 5605(d)(2)(A); (ii) the requirements with respect to the specific compensation committee responsibilities and authority set forth in Rule 5605(d)(3) and the requirement to include such responsibilities and authority in its compensation committee charter as set forth in Rule 5605(d)(1)(D); or (iii) the requirement with respect to the compensation committee’s responsibility to review and reassess the adequacy of its compensation committee charter on an annual basis. A listed smaller reporting company must comply with all other applicable Exchange corporate governance requirements.