

SECURITIES AND EXCHANGE COMMISSION  
(Release No. 34-79915; File No. SR-OCC-2017-801)

February 1, 2017

Self-Regulatory Organizations; The Options Clearing Corporation; Notice of Filing of Advance Notice Concerning The Options Clearing Corporation's Margin Coverage During Times of Increased Volatility

Pursuant to Section 806(e)(1) of Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act, entitled the Payment, Clearing, and Settlement Supervision Act of 2010 ("Payment, Clearing and Settlement Supervision Act")<sup>1</sup> and Rule 19b-4(n)(1)(i) under the Securities Exchange Act of 1934 ("Act"),<sup>2</sup> notice is hereby given that on January 4, 2017, The Options Clearing Corporation ("OCC") filed with the Securities and Exchange Commission ("Commission") an advance notice 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 advance notice from interested persons.

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

This proposed change by OCC would modify the current process for systematically monitoring market conditions and performing adjustments to its margin coverage when current market volatility increases beyond historically observed levels.

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

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<sup>1</sup> 12 U.S.C. 5465(e)(1).

<sup>2</sup> 17 CFR 240.19b-4(n)(1)(i).

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 change and none have been received.

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

**Purpose of the Proposed Change**

OCC's margin methodology, the System for Theoretical Analysis and Numerical Simulations ("STANS"), is OCC's proprietary risk management system that calculates Clearing Members'<sup>3</sup> margin requirements.<sup>4</sup> STANS utilizes large-scale Monte Carlo simulations to forecast price movement and correlations in determining a Clearing Member's margin requirement.<sup>5</sup> The STANS margin requirement is a portfolio calculation at the level of Clearing Member legal entity marginable net positions tier account (tiers can be customer, firm, or market marker) and consists of an estimate of 99% 2-day expected shortfall and an add-on for model risk (the concentration/dependence stress test charge)

The majority of risk factors utilized in the STANS methodology are total returns on individual equity securities. Other risk factors considered include: returns on equity indices; changes in the calibrated coefficients of a model describing the yield curve for U.S. government securities; "returns" on the nearest-to-expiration futures contracts of various kinds; and changes

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<sup>3</sup> See OCC By-Laws Article 1(C)(14).

<sup>4</sup> 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/>.

<sup>5</sup> See OCC Rule 601.

in foreign exchange rates. For the volatility of each risk factor, the Monte Carlo simulations use the greater of: (i) the short-term volatility level predicted by the model; and (ii) an estimate of its longer-run level. In between the monthly re-estimations of all the models, volatilities are automatically re-scaled to the greater of the short-term or the longer-run levels to mitigate pro-cyclicality<sup>6</sup> in the margin levels. (This daily volatility measure is called the “uniform scale factor.”) The uniform scale factor is a multiplier used in connection with STANS calculations to account for, among other things, the difference between short-term and long-term volatility forecasts for equities. It is specifically defined as the ratio of long-run volatility (10Y+) over short-run volatility (2Y). It is used to “scale up” the short-run volatility of the securities (e.g., IBM) that are subject to monthly update, in order to estimate long-run volatility. It is also used to capture data gaps between monthly updates.

An approach employed by OCC to mitigate pro-cyclicality within STANS is to estimate market volatility based on current market conditions (“current market estimate”) and compare this current market estimate to a long-run estimate of market volatility (“long-run market estimate”). This comparison utilizes certain market benchmarks (or factors), which serve as proxies for the overall volatility of an asset class or group of products. If the long-run market estimate for a factor is found to be greater than the current market estimate, the volatility estimates for all products tied to that factor are adjusted (or scaled) up in a manner proportionate to the relationship between the current market volatility and the long-run market volatility for that factor.

Current STANS includes a single factor (“uniform scale factor”), which serves as the proxy for the equity asset class. This uniform scale factor is calibrated based on changes in the

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<sup>6</sup> A quality that is positively correlated with the overall state of the economy is deemed to be pro-cyclical.

volatility of the Standard & Poor's 500® Index ("SPX") and applied to all "equity-based products" in the manner described above. Currently, the uniform scale factor is the only scale factor used in STANS. The proposed change is intended to enhance the STANS margin calculations by providing for the capability to increase the number of scale factors used within STANS in cases where a more appropriate proxy has been identified for a particular asset class or group of products to measure the relationship between current vs. long-run market volatility.

*Summary of the Proposed Change*

OCC proposes a number of enhancements to its STANS margin methodology that are designed to more accurately compute Clearing Member margin requirements to reflect the risk of Clearing Member portfolios. Specifically, OCC proposes to: (1) adjust the longer-run volatility forecast used in OCC's computation of the uniform scale factor so that it would rely only on post-1957 price information (i.e., price information since the introduction of the SPX) in order to more accurately account for the behavior of SPX returns only since the inception of the index; (2) expand the number of scale factors used for equity-based products to more accurately measure the relationship between current and long-run market volatility with proxies that correlate more closely to certain products carried within the equity asset class; (3) apply relevant scale factors to the greater of (i) the estimated variance of 1-day return scenarios or (ii) the historical variance of the daily return scenarios of a particular instrument, as a floor to mitigate procyclicality; and (4) implement processing changes that would update the statistical models for common factors related to Treasury securities on a daily basis. The proposed changes are discussed in more detail below.

OCC believes that the current approach to scale factors in STANS would be improved by providing the functionality to establish multiple scale factors intended to more accurately

measure the relationship between current and long-run market volatility with proxies that correlate more closely to groups of products within an asset class (e.g., Russell 1000 Index and Russell 1000 ETFs), which would enhance the accuracy of the margin requirements in STANS.<sup>7</sup> By incorporating this process to scale margin coverages when current market volatility exceeds historically heightened levels that have been established to mitigate pro-cyclicality, OCC's margin methodology is able to expeditiously respond to severe changes in market volatility and thus better protect the integrity of our financial markets.

#### *Scale Factor for Equity-Based Products*

##### Current Uniform Scale Factor for Equity-Based Products

The uniform scale factor for the SPX roughly represents the ratio of OCC's estimates of the long-run market volatility to the forecast market volatility determined by most recent 24-month daily historical returns.<sup>8</sup> To determine the estimate of current market volatility, OCC relies on daily pricing information for equity securities and exchange-traded funds over a twenty-four month period ending with the last day of the immediately preceding month. To populate this twenty-four month time series, OCC relies on external vendors, with which it maintains redundant relationships for resiliency,<sup>9</sup> to adjust the daily pricing information to account for

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<sup>7</sup> In this case, accuracy is measured against backtesting results. Pursuant to OCC's Model Risk Management Policy, an accurate 99% value-at-risk model should expect exceedances at a rate of 1% per independent trial. If the exceedance rate is too high, the model is missing key risks; if the exceedance rate is too low, the model is not consistent with the organization's risk appetite. To the extent that the conditional variances of not all relevant risk factors move in lock-step to the conditional variance of SPX, multiple scale factors offers the opportunity to be more accurate.

<sup>8</sup> The uniform scale factor has been a part of STANS since it was installed in 2006. *See* Securities Exchange Act Release No. 53322 (February 15, 2006), 71 FR 9403 (February 23, 2006) (SR-OCC-2004-20).

<sup>9</sup> Specifically, OCC maintains both a primary and backup data center that receive live price feeds from multiple price vendors. In the event of service disruption OCC is able to transition to an alternate data center and/or pricing vendor, as applicable.

corporate actions involving these securities. This daily pricing information is received from its vendor(s) after the close of each month, at which time OCC updates its twenty-four month time series adding the new month and dropping the last month of data. This process of updating the time series on a monthly basis is referred to as a “pending” time series due to the batch process used to update the time series. The long-run time series used by the uniform scale factor is updated on a daily basis (i.e., non-pending update) with pricing information for the SPX dating back to January 1, 1946. OCC calculates the uniform scale factor each business day by comparing the current market volatility, using pending price updates to the long-run time series using non-pending, or current, market prices.

The uniform scale factor is applied to all equity products and is used to adjust individual equity current market volatility estimates on a daily basis based on the comparison of the current market volatility and the long-run volatility estimate, which is updated daily. Should it be observed that the current market volatility is less than the long-run volatility, all products tied to the uniform scale factor will be adjusted higher based on the ratio of the long-run volatility estimate to the current market volatility estimate to account for the observed change in volatility. In addition, the uniform scale factor is also used to account for the fact that the distribution of returns for the SPX has a “fat tail”<sup>10</sup> because the scale factor seeks to match estimates of expected margin shortfalls under the scenarios in STANS for a hypothetical long position in the SPX.

The uniform scale factor resulting from the calculations described above is applied as a multiplier to hypothetical returns on a long portfolio of equities produced during the Monte Carlo

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<sup>10</sup> A fat-tailed distribution is a probability distribution that exhibits large skewness or kurtosis. Compared with a standard normal distribution or bell curve, it has a higher probability of occurrence of extreme events.

market scenarios run within STANS. By “scaling up” hypothetical returns in this way, the uniform scale factor relies on an assumption that more recent behavior of SPX returns will provide an appropriate proxy for the volatility in equity price returns that occur between monthly updates of price data for the pending short-run time series. Accordingly, the uniform scale factor helps OCC set margin requirements that account for this proxy to ensure that Clearing Members maintain margin assets that would be sufficient in light of historical volatility of the SPX.

*Proposed Changes to the Uniform Scale Factor for Equity-Based Products*

The average longer-run volatility forecast used in OCC’s computation of the uniform scale factor currently relies on daily pricing information for component securities of the SPX dating back to January of 1946. This time series predates, however, the 1957 introduction of the SPX. To accurately account for the behavior of SPX returns only since the inception of the index, OCC proposes to adjust the longer-run volatility forecast so that it would rely only on the post-1957 information. OCC believes that this approach would reduce model risk<sup>11</sup> and improve the quality of the data by avoiding the need to make assumptions related to the composition of the index before its actual development.<sup>12</sup>

Proposed New Scale Factors for Equity-Based Products

To more accurately measure the relationship between current and long-run market volatility with proxies that correlate more closely to certain products carried within the equity

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<sup>11</sup> OCC defines “model risk” as the potential for adverse consequences of incorrect or misused model outputs and reports.

<sup>12</sup> As defined in OCC’s Model Risk Management Policy, Model Risk, in the sense of material exposure to the consequences of poor assumptions, is reduced by making models adhere accurately to observed phenomena. In this case, by reducing the role of the uniform scale factor as a proxy between monthly updates of univariate models for risk factors and by allowing certain risk factors to bypass the monthly update process, as described below, OCC believes that this proposed change would reduce model risk.

asset class, OCC proposes to expand the number of scale factors to include: (1) Russell 2000® Index (12/29/1978); (2) Dow Jones Industrial Average Index (9/23/1997); (3) NASDAQ-100 Index (2/4/1985) and (4) S&P 100 Index (1/2/1976).<sup>13</sup> While the SPX scale factor will continue to serve as the default scale factor for most equity products, the index options, futures and ETFs which map to these indexes will be assigned to these scale factors and whose current volatility estimates will be adjusted based on the aforementioned methodology.

Consistent with OCC's existing Margin Policy,<sup>14</sup> OCC will evaluate the performance and use of these scale factors and determine if changes to the mapping of products to scale factors or the addition of new scale factors are warranted. Prior to any changes being implemented OCC would present its findings to the Enterprise Risk Management Committee and obtain approval to make the recommended enhancements.

#### Proposed Anti-Procyclical Measure for Equity-Based Scale Factors

In order to mitigate against pro-cyclicality, OCC intends to apply the relevant scale factor to the greater of (i) the estimated variance of the 1-day return scenarios or (ii) the historical variance of the daily return scenarios of a particular instrument, as a floor. OCC believes this floor would mitigate pro-cyclicality in the relevant return scenarios because it would result in a higher estimate of volatility during periods of relatively lower market volatility than if only the estimated variance in (i) above was used.

#### Proposed Daily Statistical Updates for the Treasury Yield Curve Model

In addition to implementing the scale factors described above, OCC is also proposing to implement processing changes that would update the statistical models for common factors

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<sup>13</sup> The dates in parentheses are the dates from which OCC has historical data on the specified index.

<sup>14</sup> OCC's Margin Policy describes OCC's approach to prudently managing market and credit exposures presented by its Clearing Members.

related to Treasury securities on a daily basis. These model changes would allow OCC to monitor and respond to material changes in the volatility of Treasury securities while also mitigating pro-cyclicality without implementing a scale factor specific to Treasury securities. OCC believes that updating its Treasury securities models on a daily basis is a more appropriate way to monitor and respond to material changes in the volatility of Treasury securities while also mitigating pro-cyclicality since the Treasury yield curve model is relatively less complex, with only three factors, and the structure of the Treasuries securities model does not lend itself to a returns-based scale factor (as is used with equity and volatility derivatives, as described above).

Specifically, OCC is proposing to enhance its existing yield curve model that OCC uses to project U.S. Treasury security returns, which is updated monthly. The model contains underlying data set and time series information for Treasury securities, which run from February 4, 2008 (based on available historical data) and, after implementing the proposed enhancements, the model would be updated on a daily basis as new data and time series information becomes available. The proposed enhancements would promote a more accurate approach to margining within STANS, as it relates to Treasury securities, particularly when markets are volatile because the daily statistical updates would prevent the model from becoming stale between monthly updates.

#### *Impact Analysis and Outreach*

Based on simulation testing for the period from January 14, 2015, to March 6, 2015, risk margins (i.e., expected shortfall plus the concentration/dependence add-on) would have been approximately 5.2% higher in aggregate as a consequence of these changes. This is mostly due to higher coverage for the Russell 2000 Index and index ETF products under the new methodology.

In order to inform Clearing Members of the proposed change, OCC provided a general

update at a recent OCC Roundtable<sup>15</sup> meeting and would continue to provide updates at Roundtable meetings on a quarterly basis going forward. In addition, OCC would publish an Information Memorandum to all Clearing Members describing the proposed change and will provide additional periodic Information Memoranda updates prior to the implementation date. OCC would also provide at least thirty days prior notice to Clearing Members before implementing the change. Additionally, OCC would perform targeted and direct outreach with Clearing Members that would be most impacted by the proposed change and OCC would work closely with such Clearing Members to coordinate the implementation and associated funding for such Clearing Members resulting from the proposed change.<sup>16</sup> Finally, OCC would discuss the proposed change with its cross-margin clearing house partners to ensure they are aware of the proposed change.<sup>17</sup>

#### **Consistency with the Payment, Clearing and Settlement Supervision Act**

OCC believes that the proposed change concerning scale factors described above is consistent with Section 805(b)(1) of the Payment, Clearing and Settlement Supervision Act<sup>18</sup> because the proposed change would promote robust risk management.

The proposed model changes described above would enhance the manner in which OCC computes margin requirements for Clearing Members. Specifically, the proposed changes to the

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<sup>15</sup> 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.

<sup>16</sup> Specifically, OCC will discuss with those Clearing Members how they plan to satisfy any increase in their margin requirements associated with the proposed change.

<sup>17</sup> Cross-margin accounts are not uniquely affected by the proposed change and would be affected by the proposed change in the same manner as any other type of OCC account.

<sup>18</sup> 12 U.S.C. 5464(b)(1).

uniform scale factor for equity-based products to rely only on post-1957 information would reduce model risk and improve the quality of data by avoiding unnecessary assumptions related to the composition of the SPX before its inception. The proposed four new scale factors for equity-based products would more accurately measure the relationship between current and long-run market volatility with proxies that are correlated more closely to certain products within the equity asset class. The proposed daily statistical updates for the Treasury yield curve model would allow OCC to monitor and respond to material changes in the volatility of Treasury securities while also mitigating pro-cyclicality. Taken together, the changes to the uniform scale factor, the addition of new equity based scale factors, and the introduction of daily statistical updates for the Treasury yield curve model would cause STANS to more accurately compute Clearing Member margin requirements to reflect the risk of Clearing Member portfolios thereby promoting robust risk management in that the risk that Clearing Member margin assets would be insufficient should OCC need to use such assets to close-out the positions of a defaulted Clearing Member would be reduced. Further, the proposed changes would promote robust risk management by making it less likely that the default of a Clearing Member would stress the financial resources available to OCC, which include mutualized resource funds deposited by non-defaulting Clearing Members as Clearing Fund.

#### **Anticipated Effect on and Management of Risk**

OCC believes that the proposed changes would reduce the nature and level of risk presented to OCC because, in several respects, the modification of the uniform scale factor used in STANS and the introduction of new scale factors would increase the accuracy of OCC's margin calculations. First, OCC would simplify its process for establishing the uniform scale

factor by basing it on the one-day variances<sup>19</sup> of the SPX returns, rather than an approximation of the margin coverage on a hypothetical position in the SPX. OCC believes that this simplified approach would mitigate operational and regulatory risks by making the approach to the uniform scale factor less complex and more readily understood by OCC's staff, regulators and other parties interested in OCC's risk management framework.

For use with certain exchange-traded funds, OCC proposes to implement in STANS four new scale factors that would be based on the Russell 2000® Index, Dow Jones Industrial Average Index, NASDAQ-100 Index and S&P 100 Index. The separately forecasted volatility for each of these indexes would be represented in the resulting scale factor. OCC believes applying a scale factor based on an index to which certain exchange-traded funds are more closely correlated than the SPX would mitigate risk because it would enhance the accuracy of margin requirements in STANS.

Under the proposed change, a floor of the sample variance would be introduced with respect to each scale factor. The sample variance floor would mitigate pro-cyclicality risk in the relevant return scenarios because it would potentially result in the collection of more margin during periods of relatively lower market volatility. In the absence of using the sample variance as a floor, the margin collected could drop significantly during periods of low volatility and then dramatically increase when, between monthly updates to a pending time series, market events cause increases in the variance of the underlying data set for the scale factor.

OCC would also implement processing changes that would update the statistical models for common factors related to Treasury securities on a daily basis. These model changes would

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<sup>19</sup> The one-day conditional variance of a risk factor is the variance of the one-day innovation (typically a log-return) one day into the future in the sense of random variables (i.e. based on an indexed filtration and a probability measure).

allow OCC to monitor and respond to material changes in the volatility of Treasury securities while also mitigating pro-cyclicality. The proposed enhancements would promote a more accurate approach to margining within STANS, as it relates to Treasury securities, particularly when markets are volatile because the daily statistical updates would mitigate the risk that the model would become stale between monthly updates.

For the foregoing reasons, OCC believes that the proposed change would enhance OCC's management of risk and reduce the nature or level of risk presented to OCC.

### 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 or the Board of Governors of the Federal Reserve System 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 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](mailto:rule-comments@sec.gov). Please include File Number SR-OCC-2017-801 on the subject line.

##### Paper Comments:

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

All submissions should refer to File Number SR-OCC-2017-801. 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 advance notice that are filed with the Commission, and all written communications relating to the advance notice 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 the

filing also will be available for inspection and copying at the principal office of OCC and on  
OCC's website at

[http://www.theocc.com/components/docs/legal/rules\\_and\\_bylaws/sr\\_occ\\_17\\_801.pdf](http://www.theocc.com/components/docs/legal/rules_and_bylaws/sr_occ_17_801.pdf).

All comments received will be posted without change; the Commission does not edit personal identifying information from submissions. You should submit only information that you wish to make available publicly.

All submissions should refer to File Number SR-OCC-2017-801 and should be submitted on or before [insert date 21 days from publication in the Federal Register].

By the Commission.

Eduardo A. Aleman  
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