

SECURITIES AND EXCHANGE COMMISSION  
(Release No. 34-84838; File No. SR-OCC-2018-804)

December 19, 2018

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

**I. INTRODUCTION**

On October 22, 2018, The Options Clearing Corporation ("OCC") filed with the Securities and Exchange Commission ("Commission") advance notice SR-OCC-2018-804 ("Advance Notice") 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")<sup>1</sup> and Rule 19b-4(n)(1)(i)<sup>2</sup> under the Securities Exchange Act of 1934 ("Exchange Act")<sup>3</sup> to propose changes to OCC's model for incorporating variations in implied volatility within OCC's margin methodology, the System for Theoretical Analysis and Numerical Simulations.<sup>4</sup>

On October 30, 2018, OCC filed a partial amendment ("Partial Amendment No. 1") to modify the Advance Notice.<sup>5</sup> The Advance Notice, as modified by Partial Amendment No. 1,

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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).

<sup>3</sup> 15 U.S.C. 78a et seq.

<sup>4</sup> See Notice of Filing infra note 6, at 83 FR 60541.

<sup>5</sup> In Partial Amendment No. 1, OCC corrected an error in Exhibit 5 without changing the substance of the Advance Notice. References to the Advance Notice from this point forward refer to the Advance Notice, as amended by Partial Amendment No. 1.

was published for public comment in the Federal Register on November 26, 2018,<sup>6</sup> and the Commission received no comments regarding the proposal contained in the Advance Notice.<sup>7</sup> This publication serves as notice of no objection to the Advance Notice.

## II. BACKGROUND

The System for Theoretical Analysis and Numerical Simulations (“STANS”) is OCC’s methodology for calculating margin. STANS includes econometric models that incorporate a number of risk factors. OCC defines a risk factor in STANS as a product or attribute whose historical data is used to estimate and simulate the risk for an associated product. The majority of risk factors utilized in STANS 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.<sup>8</sup>

As a general matter, the implied volatility of an option is a measure of the expected future

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<sup>6</sup> Securities Exchange Act Release No. 84626 (November 19, 2018), 83 FR 60541 (November 26, 2018) (SR-OCC-2018-804) (“Notice of Filing”). On October 22, 2018, OCC also filed a related proposed rule change (SR-OCC-2018-014) with the Commission pursuant to Section 19(b)(1) of the Exchange Act and Rule 19b-4 thereunder, seeking approval of changes to its rules necessary to implement the Advance Notice (“Proposed Rule Change”). 15 U.S.C. 78s(b)(1) and 17 CFR 240.19b-4, respectively. The Proposed Rule Change was published in the Federal Register on November 8, 2018. Securities Exchange Act Release No. 84524 (Nov. 2, 2018), 83 FR 55918 (Nov. 8, 2018) (SR-OCC-2018-014).

<sup>7</sup> Since the proposal contained in the Advance Notice was also filed as a proposed rule change, all public comments received on the proposal are considered regardless of whether the comments are submitted on the proposed rule change or the Advance Notice.

<sup>8</sup> In December 2015, the Commission approved a proposed rule change and issued a Notice of No Objection to an advance notice filing by OCC to its modify margin methodology by more broadly incorporating variations in implied volatility within STANS. See Securities Exchange Act Release No. 76781 (December 28, 2015), 81 FR 135 (January 4, 2016) (SR-OCC-2015-016) and Securities Exchange Act Release No. 76548 (December 3, 2015), 80 FR 76602 (December 9, 2015) (SR-OCC-2015-804).

volatility of the option's underlying security at expiration, which is reflected in the price of the option.<sup>9</sup> Changes in implied volatility, therefore, result in changes to an option's value. In effect, the implied volatility is responsible for that portion of the premium that cannot be attributed to 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.

STANS includes a model that simulates variations in implied volatility for most of the option contracts that OCC clears ("Implied Volatility Model").<sup>10</sup> The purpose of OCC's Implied Volatility Model is 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, in turn, uses such anticipated costs to determine and collect the amount of margin necessary to collateralize the exposure that OCC could face in the event of a Clearing Member default.

One component of the Implied Volatility Model is a forecast of the volatility of implied volatility. In the process of performing backtesting and impact analyses as well as comparing the Implied Volatility Model to industry benchmarks, OCC determined that its process for forecasting the volatility of implied volatility is extremely sensitive to sudden spikes in volatility,

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<sup>9</sup> 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 of a given strike, time to maturity, underlying asset price and the current risk-free rate.

<sup>10</sup> OCC's Implied Volatility Model excludes: (i) binary options, (ii) options on commodity futures, (iii) options on U.S. Treasury securities, and (iv) Asians and Cliquets. These products were relatively new products at the time that OCC completed its last implied volatility margin methodology changes, and OCC had de minimus open interest in those options. OCC uses its Implied Volatility Model specifically for options that have a residual tenor of less than three years ("Shorter Tenor Options").

which can at times result in over-reactive margin requirements that OCC believes are unreasonable and procyclical.<sup>11</sup> For example, on February 5, 2018, the Cboe Volatility Index (“VIX”) experienced a large amount of volatility.<sup>12</sup> Based on its review and understanding of OCC’s analysis, the Commission understands that OCC’s Implied Volatility Model forecasted an extreme increase in the volatility of implied volatility in response to the increase in the VIX on February 5, 2018.<sup>13</sup> Specifically, the Implied Volatility Model forecasted a volatility of implied volatility for an at-the-money, one-month tenor SPX position that was approximately 4 times larger than the comparable market index.<sup>14</sup> This forecast caused aggregate margin requirements at OCC to jump more than 80 percent overnight due to the Implied Volatility Model, and margin requirements for certain individual Clearing Members increased by a factor of 10.<sup>15</sup> Due in large part to the over-reaction of the Implied Volatility Model’s to the rise in the VIX, a future shock to the VIX during a time of market stress could result in an increase in margin requirements that likely would impose additional stresses on Clearing Members.

The Advance Notice proposes to modify OCC’s Implied Volatility Model by introducing an exponentially weighted moving average<sup>16</sup> for the daily forecasted volatility of implied

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<sup>11</sup> See Notice of Filing, 83 FR at 60542.

<sup>12</sup> The VIX is a measure of the implied volatility of the of Standard & Poor’s 500 index (“SPX”).

<sup>13</sup> See Notice of Filing, 83 FR at 60542.

<sup>14</sup> See Notice of Filing, 83 FR at 60542.

<sup>15</sup> See Notice of Filing, 83 FR at 60542. For example, the total margin requirements for one Clearing Member would have increased from \$120 million on February 2, 2018 to \$1.78 billion on February 5, 2018. See Notice of Filing, 83 FR at 60542, n. 22.

<sup>16</sup> An exponentially weighted moving average is a statistical method that averages data in a way that gives more weight to the most recent observations.

volatility risk factors. Specifically, when forecasting the volatility for each implied volatility risk factor, OCC would use an exponentially weighted moving average of forecasted volatilities over a specified look-back period rather than using unweighted daily forecasted volatilities. The proposal would change the Implied Volatility Model's sensitivity to large, sudden shocks in market volatility when forecasting the volatility of implied volatility. Specifically, the proposal would result in a more measured initial response to such shocks while producing margin requirements that may remain elevated for a longer period of time following a market shock. Based on its analysis of data provided by OCC, the Commission understands that the margin requirements calculated with the current and proposed models would be very similar during less volatile periods, and that the likelihood that OCC would have sufficient margin to cover its exposures under normal market conditions would not decrease under the proposed model.<sup>17</sup> However, the proposed model would present a more commensurate response to the extreme volatility increases in the market.

### **III. DISCUSSION AND COMMISSION FINDINGS**

Although the Clearing Supervision Act does not specify a standard of review for an advance notice, the stated purpose of the Clearing Supervision Act is instructive: 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 ("SIFMUs") and strengthening the liquidity of SIFMUs.<sup>18</sup>

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<sup>17</sup> OCC's backtesting, which the Commission has reviewed and analyzed, demonstrated that coverage levels using the proposed model were substantially similar to the results obtained from the current model. See Notice, 83 FR at 60542.

<sup>18</sup> See 12 U.S.C. 5461(b).

Section 805(a)(2) of the Clearing Supervision Act<sup>19</sup> authorizes the Commission to prescribe regulations containing risk-management standards for the payment, clearing, and settlement activities of designated clearing entities engaged in designated activities for which the Commission is the supervisory agency. Section 805(b) of the Clearing Supervision Act<sup>20</sup> provides the following objectives and principles for the Commission’s risk-management standards prescribed under Section 805(a):

- to promote robust risk management;
- to promote safety and soundness;
- to reduce systemic risks; and
- to support the stability of the broader financial system.

Section 805(c) provides, in addition, that the Commission’s risk-management standards may address such areas as risk-management and default policies and procedures, among others areas.<sup>21</sup>

The Commission has adopted risk-management standards under Section 805(a)(2) of the Clearing Supervision Act and Section 17A of the Exchange Act (the “Clearing Agency Rules”).<sup>22</sup> The Clearing Agency Rules require, among other things, each covered clearing agency to establish, implement, maintain, and enforce written policies and procedures that are

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<sup>19</sup> 12 U.S.C. 5464(a)(2).

<sup>20</sup> 12 U.S.C. 5464(b).

<sup>21</sup> 12 U.S.C. 5464(c).

<sup>22</sup> 17 CFR 240.17Ad-22. See Securities Exchange Act Release No. 68080 (October 22, 2012), 77 FR 66220 (November 2, 2012) (S7-08-11). See also Securities Exchange Act Release No. 78961 (September 28, 2016), 81 FR 70786 (October 13, 2016) (S7-03-14) (“Covered Clearing Agency Standards”). The Commission established an effective date of December 12, 2016, and a compliance date of April 11, 2017, for the Covered Clearing Agency Standards. OCC is a “covered clearing agency” as defined in Rule 17Ad-22(a)(5).

reasonably designed to meet certain minimum requirements for its operations and risk-management practices on an ongoing basis.<sup>23</sup> As such, it is appropriate for the Commission to review advance notices against the Clearing Agency Rules and the objectives and principles of these risk management standards as described in Section 805(b) of the Clearing Supervision Act. As discussed below, the Commission believes the proposal in the Advance Notice is consistent with the objectives and principles described in Section 805(b) of the Clearing Supervision Act,<sup>24</sup> and in the Clearing Agency Rules, in particular Rule 17Ad-22(e)(6)(i).<sup>25</sup>

**A. Consistency with Section 805(b) of the Clearing Supervision Act**

The Commission believes that the proposal contained in the Advance Notice is consistent with the stated objectives and principles of Section 805(b) of the Clearing Supervision Act. OCC manages its credit exposure to Clearing Members, in part, through the collection of collateral based on OCC's margin methodology. As noted above, however, the imposition of margin requirements resulting from a model that overreacts to increases in implied volatility may impose stresses on OCC's Clearing Members. Clearing Members, particularly large Clearing Members or their affiliates, are active in various markets. A large, unexpected margin call at OCC could affect a Clearing Member's ability to meet its obligations to other counterparties, including other SIMFUs. As a consequence, the imposition of margin requirements resulting from a model overreaction could have implications for the broader financial system. As discussed below, the Commission believes that the changes to OCC's margin methodology proposed in the Advance Notice could enhance OCC's management of credit risk while reducing

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<sup>23</sup> 17 CFR 240.17Ad-22.

<sup>24</sup> 12 U.S.C. 5464(b).

<sup>25</sup> 17 CFR 240.17Ad-22(e)(6)(i).

potential systemic risk.

First, the proposal would change the Implied Volatility Model's response to sudden, large changes in market volatility. As noted above, the margin requirements produced by the current model appear to be overly responsive to sudden, large shocks. The proposed change would result in a more measured initial response to a sudden, large change in market volatility while maintaining elevated margin requirements following such a shock. Although the initial reduction in sensitivity would result in the collection of less margin than under the current model, backtesting results demonstrate that margin requirements produced under the proposed model would provide as consistent a level of coverage as margin requirements produced under the proposed model. In addition, the proposal would result in margin requirements that remain elevated for a longer period of time following a market shock, which could provide further support for OCC's ability to cover its potential future exposure to risk. Therefore, the Commission believes that the consistent level of coverage, taken together with the potential for extended elevation of margin requirements after a market shock, is consistent with the promotion of both robust risk management and safety and soundness.

Second, the proposal could reduce the likelihood that OCC's margin requirements impose sudden and excessive stress on Clearing Members during times of broader market stress. As described above, the current Implied Volatility Model could result in dramatic increases in Clearing Member margin requirements in response to a sudden, large shock in market volatility. Based on its review of OCC's data comparing margin requirements to market data on February 5, 2018, the Commission understands that the size of such an increase would not necessarily be commensurate with the risk of the Clearing Member's portfolio because, as described above, the volatility of implied volatility forecasted by the current model on that day was 4 times the size of

a comparable market index, resulting in margin requirements for some Clearing Members that rose by a factor of 10. Imposing a large, unexpected increase in margin requirements could impose a large, unexpected stress on a Clearing Member during a period of high volatility. The Commission believes that reducing the likelihood of unnecessarily large and unexpected stresses on Clearing Members could help to lessen the risk of Clearing Member defaults. Reducing the risk of Clearing Member defaults could also reduce the likelihood of contagion during times of market stress because Clearing Members, particularly large Clearing Members, tend to be active participants in multiple asset markets. Therefore, the Commission believes that the proposed change is consistent with the reduction of systemic risk and supporting the stability of the broader financial system.

Accordingly, and for the reasons stated, the Commission believes the changes proposed in the Advance Notice are consistent with Section 805(b) of the Clearing Supervision Act.<sup>26</sup>

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

Rule 17Ad-22(e)(6)(i) under the Exchange Act requires that a covered clearing agency establish, implement, maintain, and enforce written policies and procedures reasonably designed to cover, if the covered clearing agency provides central counterparty services, its credit exposures to its participants by establishing a risk-based margin system that, among other things, considers, and produces margin levels commensurate with, the risks and particular attributes of each relevant product, portfolio, and market.<sup>27</sup>

The proposed change is designed to better align the margin requirements produced by OCC's margin methodology with the level of risk posed by changes in market volatility. The

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<sup>26</sup> 12 U.S.C. 5464(b).

<sup>27</sup> 17 CFR 240.17Ad-22(e)(6)(i).

component of the current Implied Volatility Model that forecasts the volatility of implied volatility is very sensitive to sudden, large changes in market volatility, as evidenced by the model's reaction to the large, sudden spike in market volatility observed on February 5, 2018 discussed above which produced dramatic increases in Clearing Member margin requirements. The proposed change to the Implied Volatility Model would reduce the sensitivity of the model to sudden, large changes in market volatility, and, as demonstrated by OCC's backtesting, would be unlikely to reduce the level of coverage.<sup>28</sup>

The Commission believes that revising the Implied Volatility Model could produce margin requirements that are more precise and better reflect the risks and particular attributes of the products cleared by OCC. The Commission further believes that such changes could produce margin levels that are commensurate with the risks of the products being cleared. Accordingly, based on the foregoing, the Commission believes that the proposed change to the Implied Volatility Model is consistent with Exchange Act Rule 17Ad-22(e)(6)(i).<sup>29</sup>

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<sup>28</sup> See supra note 17.

<sup>29</sup> 17 CFR 240.17Ad-22(e)(6).

#### **IV. CONCLUSION**

IT IS THEREFORE NOTICED, pursuant to Section 806(e)(1)(I) of the Clearing Supervision Act, that the Commission DOES NOT OBJECT to the Advance Notice (SR-OCC-2018-804) and that OCC is AUTHORIZED to implement the proposed change as of the date of this notice or the date of an order by the Commission approving proposed rule change SR-OCC-2018-014, as modified by Partial Amendment No. 1, whichever is later.

By the Commission.

Brent J. Fields  
Secretary