

SECURITIES AND EXCHANGE COMMISSION  
(Release No. 34-84879; File No. SR-OCC-2018-014)

December 20, 2018

Self-Regulatory Organizations; The Options Clearing Corporation; Order Approving Proposed Rule Change, 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”) the proposed rule change SR-OCC-2018-014 (“Proposed Rule Change”) pursuant to Section 19(b) of the Securities Exchange Act of 1934 (“Exchange Act”)<sup>1</sup> and Rule 19b-4<sup>2</sup> thereunder 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>3</sup>

On October 30, 2018, OCC filed a partial amendment (“Partial Amendment No. 1”) to the Proposed Rule Change.<sup>4</sup> The Proposed Rule Change, as modified by Partial Amendment No. 1, was published for public comment in the Federal Register on November 8, 2018,<sup>5</sup> and the

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<sup>1</sup> 15 U.S.C. 78s(b)(1).

<sup>2</sup> 17 CFR 240.19b-4.

<sup>3</sup> See Notice of Filing infra note 5, at 83 FR 55918.

<sup>4</sup> In Partial Amendment No. 1, OCC corrected an error in Exhibit 5 without changing the substance of the Proposed Rule Change. References to the Proposed Rule Change from this point forward refer to the Proposed Rule Change, as amended by Partial Amendment No. 1.

<sup>5</sup> Securities Exchange Act Release No. 84524 (Nov. 2, 2018), 83 FR 55918 (Nov. 8, 2018) (SR-OCC-2018-014) (“Notice of Filing”). OCC also filed a related advance notice (SR-OCC-2018-804) (“Advance Notice”) with the Commission 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 and Rule 19b-4(n)(1)(i) under the Act. 12 U.S.C. 5465(e)(1). 15 U.S.C. 78s(b)(1) and 17 CFR

Commission received no comments regarding the Proposed Rule Change. This order approves the Proposed Rule Change.

## 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>6</sup>

As a general matter, 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 price of the option.<sup>7</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

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240.19b-4, respectively. The Advance Notice was published in the Federal Register on November 26, 2018. Securities Exchange Act Release No. 84626 (Nov. 19, 2018), 83 FR 60541 (Nov. 26, 2018) (SR-OCC-2018-804).

<sup>6</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 (Dec. 28, 2015), 81 FR 135 (Jan. 4, 2016) (SR-OCC-2015-016) and Securities Exchange Act Release No. 76548 (Dec. 3, 2015), 80 FR 76602 (Dec. 9, 2015) (SR-OCC-2015-804).

<sup>7</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.

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>8</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, which can at times result in over-reactive margin requirements that OCC believes are unreasonable and procyclical.<sup>9</sup> For example, on February 5, 2018, the Cboe Volatility Index (“VIX”) experienced a large amount of volatility.<sup>10</sup> Based on its review and understanding of OCC’s analysis, the Commission understands that OCC’s Implied Volatility Model forecasted an

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<sup>8</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”).

<sup>9</sup> See Notice of Filing, 83 FR at 55919.

<sup>10</sup> The VIX is a measure of the implied volatility of the of Standard & Poor’s 500 index (“SPX”).

extreme increase in the volatility of implied volatility in response to the increase in the VIX on February 5, 2018.<sup>11</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>12</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>13</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 Proposed Rule Change would modify OCC's Implied Volatility Model by introducing an exponentially weighted moving average<sup>14</sup> for the daily forecasted volatility of implied 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 Proposed Rule Change would change the Implied Volatility Model's sensitivity to large, sudden shocks in market volatility when forecasting the volatility of implied volatility. Specifically, the Proposed Rule Change would result in a more measured initial response to such

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<sup>11</sup> See Notice of Filing, 83 FR at 55919.

<sup>12</sup> See id.

<sup>13</sup> See id. 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 55919, n. 22.

<sup>14</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.

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>15</sup> However, the proposed model would present a more commensurate response to the extreme volatility increases in the market.

### III. DISCUSSION AND COMMISSION FINDINGS

Section 19(b)(2)(C) of the Exchange Act directs the Commission to approve a proposed rule change of a self-regulatory organization if it finds that such proposed rule change is consistent with the requirements of the Exchange Act and the rules and regulations thereunder applicable to such organization.<sup>16</sup> After carefully considering the Proposed Rule Change, the Commission finds the proposal is consistent with the requirements of the Exchange Act and the rules and regulations thereunder applicable to OCC. More specifically, the Commission finds that the proposal is consistent with Section 17A(b)(3)(F) of the Exchange Act<sup>17</sup> and Rule 17Ad-22(e)(6)(i) thereunder.<sup>18</sup>

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

Section 17A(b)(3)(F) of the Exchange Act requires that the rules of a clearing agency be

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<sup>15</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 55920.

<sup>16</sup> 15 U.S.C. 78s(b)(2)(C).

<sup>17</sup> 15 U.S.C. 78q-1(b)(3)(F).

<sup>18</sup> 17 CFR 240.17Ad-22(e)(6)(i).

designed to, among other things, assure the safeguarding of securities and funds which are in the custody or control of the clearing agency or for which it is responsible, and, in general, to protect investors and the public interest.<sup>19</sup> Based on its review of the record, the Commission believes that the proposed changes are designed to assure the safeguarding of securities and funds which are in OCC's custody or control, and, in general, protect investors and the public interest for the reasons set forth below.

First, margin deposits at OCC provide collateral to mitigate the potential default of a Clearing Member. As noted above, OCC uses STANS, including the Implied Volatility Model, 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. The Proposed Rule Change 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. Following implementation of the Proposed Rule Change, OCC's margin methodology would produce a more measured initial response to a sudden, large change in market volatility while maintaining elevated margin requirements following such a shock. As described above, however, the coverage provided by OCC's margin methodology following implementation of the Proposed Rule Change would likely be comparable to the coverage provided currently.<sup>20</sup> Further, 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.

For these reasons, the Commission believes that the Proposed Rule Change would

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<sup>19</sup> 15 U.S.C. 78q-1(b)(3)(F).

<sup>20</sup> See supra note 15.

enhance the Implied Volatility Model by enabling OCC to determine its margin requirements more precisely and to better reflect the risks and particular attributes of the products cleared by OCC, thereby allowing OCC to more effectively cover its credit exposure to its Clearing Members. By more precisely determining OCC's credit exposure to its Clearing Members, the Proposed Rule Change is designed to help ensure that, in the event of a Clearing Member default, OCC's operations would not be disrupted and non-defaulting Clearing Members would not be exposed to losses that they cannot anticipate or control. In this way, the Proposed Rule Change is designed to help assure the safeguarding of securities and funds which are in the custody or control of OCC, or for which it is responsible, consistent with Section 17A(b)(3)(F) of the Exchange Act.

Second, the Proposed Rule Change 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 Rule Change provides for rules designed, in general, to protect investors and the public interest.

Accordingly, and for the reasons stated above, the Commission believes that the Proposed Rule Change is consistent with Section 17A(b)(3)(F) of the Exchange Act.<sup>21</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>22</sup>

The Proposed Rule 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 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 Rule Change to the Implied Volatility Model would reduce the sensitivity of the

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<sup>21</sup> 15 U.S.C. 78q-1(b)(3)(F).

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



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>23</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 Rule Change is consistent with Exchange Act Rule 17Ad-22(e)(6)(i).<sup>24</sup>

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<sup>23</sup> See supra note 15.

<sup>24</sup> 17 CFR 240.17Ad-22(e)(6).

#### IV. CONCLUSION

On the basis of the foregoing, the Commission finds that the Proposed Rule Change is consistent with the requirements of the Exchange Act, and in particular, the requirements of Section 17A of the Exchange Act<sup>25</sup> and the rules and regulations thereunder.

IT IS THEREFORE ORDERED, pursuant to Section 19(b)(2) of the Exchange Act,<sup>26</sup> that the Proposed Rule Change (SR-OCC-2018-014) be, and hereby is, approved.

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.<sup>27</sup>

Brent J. Fields  
Secretary

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<sup>25</sup> In approving this Proposed Rule Change, the Commission has considered the proposed rules' impact on efficiency, competition, and capital formation. See 15 U.S.C. 78c(f).

<sup>26</sup> 15 U.S.C. 78s(b)(2).

<sup>27</sup> 17 CFR 200.30-3(a)(12).