

EXHIBIT 3SPY Option Position Limit Pilot Program Report

The Exchange previously established a pilot program that eliminated position and exercise limits for physically-settled options on the SPDR S&P 500 ETF (“SPY Pilot Program”).¹ Subsequently, the Exchange filed to extend the SPY Pilot Program, most recently until July 12, 2017.² In connection with extending the SPY Pilot Program, the Exchange stated that it would prepare another Pilot Report in support of a proposal to extend the SPY Pilot Program, adopt the SPY Pilot Program on a permanent basis or terminate the SPY Pilot Program. The Pilot Report would be submitted within thirty (30) days before the end of the extension and would cover the period since the previous extension. The Pilot Report would detail the size and different types of strategies employed with respect to positions established as a result of the elimination of position limits in SPY options. In addition, the Pilot Report would note whether any problems resulted due to the no limit approach and any other information that may be useful in evaluating the effectiveness of the SPY Pilot Program. The Pilot Report would compare the impact of the SPY Pilot Program, if any, on the volumes of SPY options and the volatility in the price of the underlying SPY shares, particularly at expiration. In preparing the report the Exchange would utilize various data elements such as volume

¹ See Securities Exchange Act Release No. 67937 (September 27, 2012), 77 FR 60489 (October 3, 2012) (SR-CBOE-2012-091).

² See Securities Exchange Act Release No. 70878 (November 14, 2013), 78 FR 69737 (November 20, 2013) (SR-CBOE-2013-106). See also Securities Exchange Act Release No. 74149 (January 27, 2015), 80 FR 5606 (February 2, 2015) (SR-CBOE-2015-008). See also Securities Exchange Act Release No. 75381 (July 7, 2015), 80 FR 40111 (July 13, 2015) (SR-CBOE-2015-065). See also Securities Exchange Act Release No. 78131 (June 22, 2016), 81 FR 42011 (June 28, 2016) (SR-CBOE-2016-052).

and open interest. In addition the Exchange would make available to Commission staff data elements relating to the effectiveness of the SPY Pilot Program.

While the below pilot analysis considers various data points in assessing the SPY Pilot Program, it does not identify other market influences that may have impacted the data over time, including without limitation, overall fluctuations in market volatility and price movements in the S&P 500 Index component securities from which SPY is derived.

Impact on SPY volumes and volatility

To assess the impact of the SPY Pilot Program on SPY option volumes, the Exchange compared SPY option monthly volume during January 2013 through December 2013 (the “Pre-Pilot period”) to monthly volume during May 2016 through April 2017 (the “Current Pilot period”) (see Table 1 and Table 2).³ Pre-Pilot Period over Current Pilot Period, average monthly volume in SPY options increased 12.6%.

TABLE 1: Comparison of SPY Options Volume Pre-Pilot vs Pilot

	Pre-Pilot	Current Pilot
Average Monthly Volume	99,383,292	111,935,337
Average Monthly Customer ⁴ Volume	36,277,013	39,929,845

³ The Exchange established the SPY Pilot Program in September 2012; however, not all self-regulatory organizations (“SROs”) had adopted similar rules eliminating position and exercise limits for SPY options when the Exchange sought to renew the SPY Pilot Program in November 2013. It was not until January 2014 that all relevant SROs adopted similar rules eliminating position and exercise limits for SPY options. For this reason, the Exchange is using the time period from January 2013 to December 2013 to assess Pre-Pilot Program activity and the time period from May 2016 through April 2017 to assess SPY Pilot Program activity in this report. The Current Pilot period reflects the one-year period since the previous pilot period addressed in the Exchanges most recent extension filing (see Exhibit 3 to SR-CBOE-2016-052).

⁴ Customer volume as reported by activity clearing in the customer range at The

	Pre-Pilot	Current Pilot
Median Monthly Volume	93,783,943	105,060,528
Median Monthly Customer Volume	33,951,894	38,016,686

TABLE 2: Change in SPY Options Volume Pre-Pilot vs Current Pilot

% Change In Average Monthly Volume Pilot vs Pre-Pilot	12.6 %
% Change in Average Monthly Customer Volume Pilot vs Pre-Pilot	10.1 %
% Change in Median Monthly Volume Pilot vs Pre-Pilot	12.0%
% Change in Median Monthly Customer Volume Pilot vs Pre-Pilot	12.0 %

The Exchange also compared SPY options open interest during the Pilot and Pre-Pilot periods (see Table 3 and Table 4). Average daily open interest of SPY option contracts increased by 10% during the Pilot period.

TABLE 3: Comparison of Daily SPY Options Open Interest Pre-Pilot vs Current Pilot

	Pre-Pilot Period	Current Pilot Period
Average Daily Open Interest	20,969,374	23,059,608
Median Daily Open Interest	20,929,733	23,103,587

TABLE 4: Change in Daily SPY Options Open Interest Pre-Pilot vs Current Pilot

% Change in Average Daily Open Interest Current Pilot vs Pre-Pilot	10.0%
% Change in Median Daily Open Interest Current Pilot vs Pre-Pilot	9.4%

To assess the impact of the SPY Pilot Program on volatility in SPY shares, the Exchange looked at the reported opening and closing prices for SPY during the Pre-Pilot and Current Pilot periods. Using the reported opening and closing prices, the Exchange calculated the maximum and minimum closing prices, daily close-to-close volatility and daily close-to-open volatility for SPY for each period.⁵ The Exchange

⁵ Close-to-close volatility is calculated by taking the standard deviation of daily close-to-close price returns and multiplying that value by the square root of 252.

then grouped the results by the first 3 trading days of each month and the 3 trading days up to and including expiration days. By comparing the different measures of price variability during the Pre-Pilot and Pilot periods for regular trading days and expiration days the data shows an overall increase in volatility during the SPY Pilot Program compared to the Pre-Pilot Period. The data shows a slight decrease in volatility during the Current Pilot Period leading up to and including expiration, compared to the first three days of the month and the entire Current Pilot Period. The Exchange concludes that the increased position limit in SPY options had no impact on the volatility of SPY shares during the Pilot Period. The results are shown in Table 5 and Table 6 below.

TABLE 5: SPY Price Movement

	Pre-Pilot Period	Current Pilot Period	% Change
Max	184.69	239.78	29.83%
Min	145.55	199.60	37.14%
Volatility (close-to-close)	11.10%	9.92%	-10.64%
Volatility (close-to-open)	6.50%	6.12%	-5.84%

TABLE 6: Expiration Day Effects

	Pre-Pilot Period			Current Pilot Period		
	First 3 Days of the Month	3 Days up to Expiration	% Change	First 3 Days of the Month	3 Days up to Expiration	% Change
Volatility (close-to-close)	12.39%	13.75%	10.91%	8.18%	7.65%	-6.47%

Close-to-open volatility is calculated by taking the standard deviation of daily close-to-next day open price returns and multiplying that value by the square root of 252.

Volatility (close-to-open)	7.99%	5.80%	-27.34%	5.16%	4.64%	-10.07%
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Finally, to assess the impact of the SPY Pilot Program on strategy orders traded at the Exchange, the Exchange looked at the Average Number of Complex Trades per Day and the Average Complex Volume per Day in SPY. In both instances the number of trades and volume increased by a substantive percentage, indicating that market participants potentially found greater liquidity and improved price discovery.

TABLE 7: Strategy Orders

	Pre-Pilot	Current Pilot	% Change
Average Number of Trades per Day	1,094	2,293	109.6%
Median Number of Trades per Day	978	2,075	112.7%
Average Volume per Day	99,069	116,458	17.6%
Median Volume per Day	86,454	96,781	11.9%

Conclusion

The Exchange believes that there is evidence to support a continuation of the SPY Pilot Program at this time. The Exchange's study does not reveal any adverse consequences to volatility or changes in open interest due to the SPY Pilot Program. With respect to volume, the SPY Pilot Program has potentially proven to be beneficial to market participants, as demonstrated by the increase in SPY Complex Volume and SPY Complex Trades per Day during the Current Pilot vs Pre-Pilot Period.