

Report In Support of Extending the SPY Position Limit Pilot Program

NYSE Arca, Inc. (the “Exchange”) received approval to adopt unlimited position and exercise limits for options on the SPDR® S&P 500® ETF (“SPY”) as part of a pilot program (“Pilot”).¹ Subsequently, the Exchange filed to extend the Pilot, originally scheduled to end on October 15, 2013, until December 15, 2014,² and extended the Pilot again through July 12, 2015,³ and again through July 12, 2016.⁴ As part of the Pilot, the Exchange stated, “that if it were to propose an extension, permanent approval or termination of the program, the Exchange would submit another Pilot Report covering the period since the previous extension.”⁵ 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. 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 Pilot. The Pilot Report would compare the impact of the Pilot, 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 and open interest.

Impact on SPY volumes and volatility

To assess the impact of the Pilot on SPY volumes, the Exchange compared SPY monthly volume and open interest during January 2013 to December 2013 (the “Pre-Pilot period”) to monthly volume and open interest during May 2015 through May 2016 (the “Pilot period”) (see Table 1). Additionally the Exchange examined S&P 500 cash index (“SPX”) monthly volumes and open interest during the same time periods. In comparing median and average monthly volume of SPY and SPX during the Pre-Pilot and Pilot periods, SPY volumes increased, as measured by average monthly customer volumes,

¹ See Exchange Act Release No. 68001 (October 5, 2012), 77 FR 62303 (October 12, 2012) (SR-NYSEArca-2012-112).

² See Exchange Act Release No. 70968 (December 3, 2013), 78 FR 73899 (December 9, 2013) (SR-NYSEArca-2013-130).

³ See Exchange Act Release No. 74029 (January 9, 2015), 80 FR 2161 (January 15, 2015) (SR-NYSEArca-2014-151).

⁴ See Exchange Act Release No. 75415 (July 9, 2015) 80 FR 41541 (July 15, 2015) (SR-NYSEArca-2015-61).

⁵ Id.

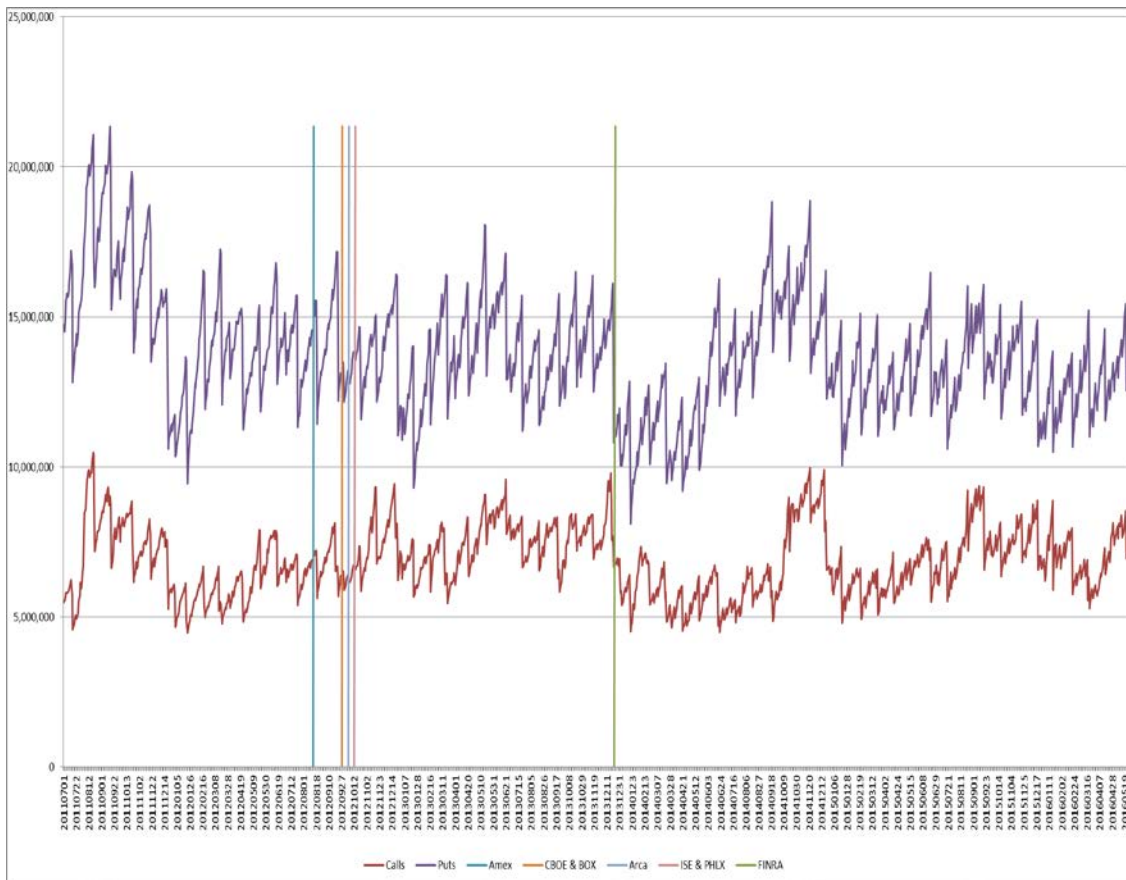
while median volumes also increased during the Pilot, as compared to SPX volumes, which significantly decreased on an average basis, with a similar median movement. The Exchange also compared SPY and SPX during the Pre-Pilot and Pilot periods and found that open interest declined for SPY and increased for SPX over the relevant time period (see Table 2).

| TABLE 1: Comparison of SPX and SPY Options Volume | | |
|---|-------------|------------|
| | SPY | SPX |
| Average Monthly Volume Pre-Pilot | 99,384,071 | 34,581,490 |
| Average Monthly Volume Pilot | 113,203,701 | 20,666,285 |
| | | |
| Average Monthly Customer Volume Pre-Pilot ¹ | 36,277,165 | 12,558,874 |
| Average Monthly Customer Volume Pilot ¹ | 41,409,648 | 6,890,646 |
| | | |
| Median Monthly Volume Pre-Pilot | 93,784,130 | 33,354,738 |
| Median Monthly Volume Pilot | 112,426,476 | 20,430,038 |
| | | |
| Median Monthly Customer Volume Pre-Pilot ¹ | 33,354,738 | 12,295,442 |
| Median Monthly Customer Volume Pilot ¹ | 42,171,308 | 6,880,355 |
| | | |
| % Change In Average Monthly Volume Pilot vs Pre-Pilot | 14% | -40% |
| % Change in Average Monthly Customer Volume Pilot vs Pre-Pilot ¹ | 14% | -45% |
| | | |
| % Change in Median Monthly Volume Pilot vs Pre-Pilot | 20% | -39% |
| % Change in Median Monthly Customer Volume Pilot vs Pre-Pilot ¹ | 26% | -44% |

1. Customer volume as reported by activity clearing in the customer range at the Options Clearing Corporation

| TABLE 2: Comparison of SPX and SPY Options Open Interest | SPY | SPX |
|--|------------|------------|
| Average Open Interest Pre-Pilot | 20,712,064 | 11,465,990 |
| Average Open Interest Pilot | 20,064,095 | 12,774,708 |
| Median Open Interest Pre-Pilot | 20,691,166 | 11,719,178 |
| Median Open Interest Pilot | 20,014,473 | 12,991,308 |
| % Change in Average Open Interest Pilot vs Pre-Pilot | -3.12% | 11.4% |
| % Change in Median Open Interest Pilot vs Pre-Pilot | -3.27% | 10.8% |

The chart below shows open interest at the time the Exchange adopted the unlimited position limit for SPY options. There is no discernible impact of the introduction of unlimited position limits on open interest.



To assess the impact of the Pilot on volatility in SPY shares, the Exchange looked at the reported opening and closing prices for both SPY and SPX during the Pre-Pilot and Pilot periods. Using the opening and closing price reported, the Exchange calculated the variance for both SPY and SPX for each day.⁶ The Exchange then grouped the results by regular trading days and expiration days.⁷ By comparing the average and median variance for both SPY and SPX during the Pre-Pilot and Pilot periods for regular trading days and expiration days the Exchange was able to ascertain that there was no discernible impact on volatility as a result of the Pilot.

The results are shown in Table 3 below.

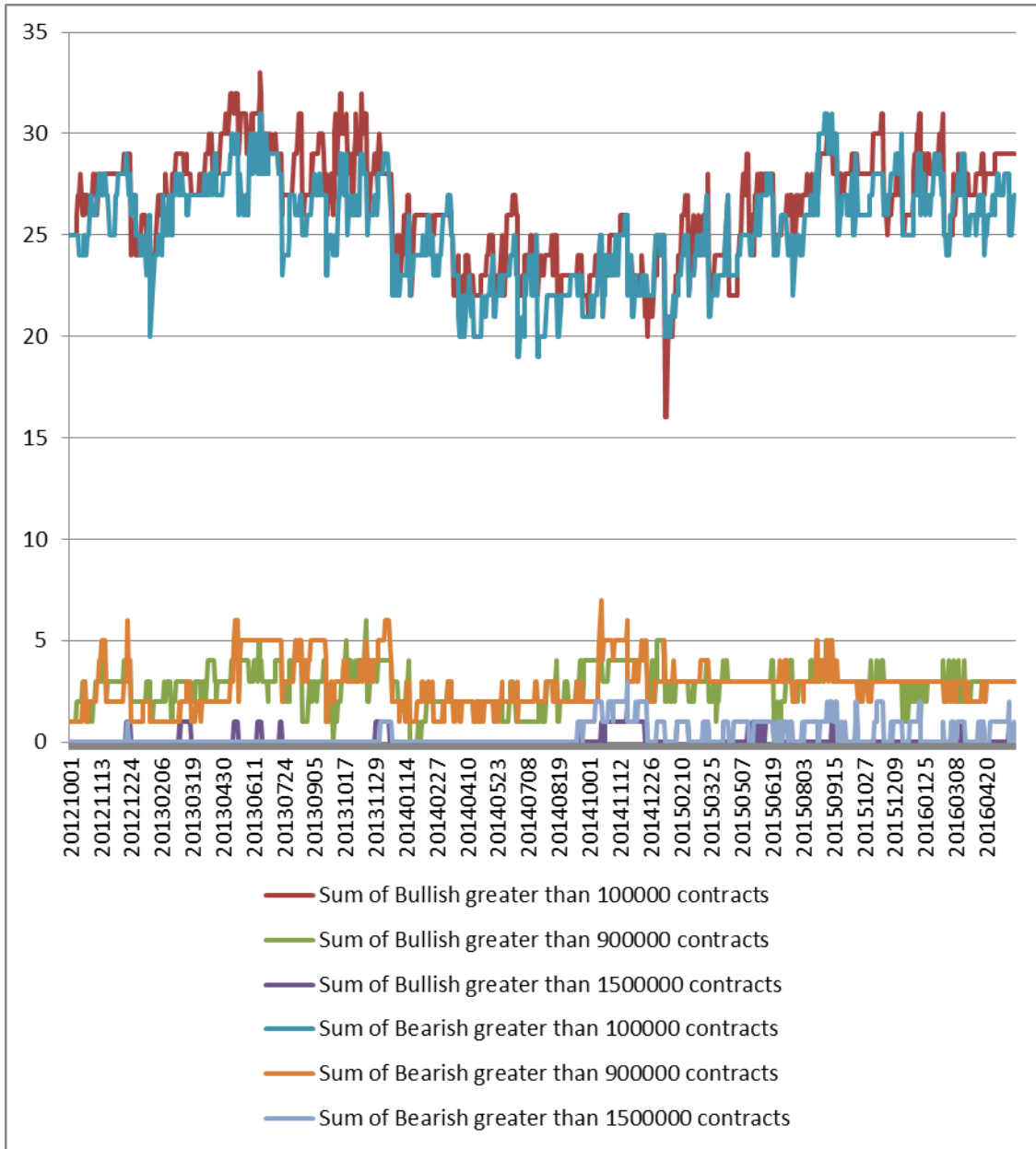
| TABLE 3: Variance of S&P 500 Index vs SPY on regular trading days and expiration days | | | |
|---|---------------|----------|------------|
| | S&P 500 Index | SPY | SPX vs SPY |
| Average Variance Pre-Pilot Regular Trading Day | 0.000047 | 0.000033 | 0.000014 |
| Average Variance Pre-Pilot Expiration Day | 0.000032 | 0.000022 | 0.000010 |
| | | | |
| Average Variance Pilot Regular Trading Day | 0.000086 | 0.000054 | 0.000032 |
| Average Variance Pilot Expiration Day | 0.000012 | 0.000068 | (0.000056) |
| | | | |
| Median Variance Pre-Pilot Regular Trading Day | 0.000016 | 0.000016 | 0.000000 |
| Median Variance Pre-Pilot Expiration Day | 0.000015 | 0.000012 | 0.000003 |
| | | | |
| Median Variance Pilot Regular Trading Day | 0.000026 | 0.000020 | 0.000006 |

⁶ Variance is calculated using this formula $(\text{Closing Price} - \text{Opening Price}) / (\text{Opening Price})^2$

⁷ An expiration day is defined as any Friday, except for those that are exchange holidays in which case expiration day is Thursday. As both SPY and SPX have weekly expirations, the Exchange believes it is appropriate to consider any Friday an expiration day.

| | | | |
|--|------------|----------|------------|
| Median Variance Pilot Expiration Day | 0.000024 | 0.000015 | 0.000009 |
| | | | |
| Change in Average Variance Pilot vs Pre-Pilot Regular Day | 0.000039 | 0.000021 | 0.000018 |
| Change in Average Variance Pilot vs Pre-Pilot Expiration Day | (0.000020) | 0.000046 | (0.000066) |
| | | | |
| Change in Median Variance Pilot vs Pre-Pilot Regular Day | 0.000010 | 0.000001 | 0.000009 |
| Change in Median Variance Pilot vs Pre-Pilot Expiration Day | 0.000009 | 0.000003 | 0.000006 |

Lastly, the Exchange looked at bullish and bearish positions, as required under Exchange Rule 6.6 – Reporting of Option Positions. The chart below highlights the trend for bullish positions and bearish positions that exceed 100,000 contracts, 900,000 contracts and 1,500,000 contracts beginning in October 2012. There is no discernible trend evidenced.



Conclusion

The Exchange's study described above, does not reveal that the Pilot resulted in any adverse consequences in terms of increased volatility, changes in open interest, or increases in large bullish or large bearish positions. With respect to volume, the Pilot has potentially proven to be beneficial to those participants who clear in the customer range at OCC, as the increase in SPY customer volume during the Pilot has been greater than the increase in SPX customer volume as compared to the Pre-Pilot period.

The Exchange believes that there is ample evidence to support a continuation of the Pilot at this time.