Memorandum[1]

TO: Heather Seidel,
FROM: J. Daniel Aromi, OEA
Cc: Amy Edwards, Jim Overdahl
DATE: August 14, 2009
RE: Volume statistics for exchange traded options

At the request of the Division of Trading and Markets, this memo analyzes volume statistics for exchange traded options. The objectives of this analysis are to provide information about the impact of the Options Penny Pilot on volume levels and to examine the percentage of volume in contracts and dollar volume that would trade in pennies under different proposals for expanding the Options Penny Pilot. In addition, this memo supplies statistics on the volume levels of specific option classes at different premium levels.

According to the analysis, the Options Penny Pilot had a positive impact on the volume of option classes included in the Pilot. The difference is significant for one of the periods under analysis. In comparing the proposals, the volume in options covered by pennies under the CBOE proposal would be similar to the volume trading in pennies today (and lower in dollar volume), while the NYSE Arca proposal would significantly expand the volume of trading in pennies. Finally, an important fraction of volume in option classes SPY (SPDR S&P 500 ETF) and IWM (iShares Russell 2000 Index Fund), which are two of the most active options classes, would be included in the penny expansion by the NYSE Arca proposal but not by the CBOE proposal.

Options Penny Pilot and Volume

This section evaluates the impact of the Options Penny Pilot on the affected option classes' volume. According to the analysis, volume increased for these option classes following the switch to pennies. This is consistent with the view that the Penny Pilot results in lower transaction costs that in turn result in higher levels of market activity.

Table 1 shows that, compared to a control group of non-pilot option classes, volume increased for pilot option classes. The control sample approach here assures me that the increase in volume is not due to general market conditions but instead on differences between the groups, including the pilot status of the option class. When comparing the change in contract volume from August-

[1] *This is a memo of the staff of the Office of Economic Analysis. The Commission has expressed no view regarding the analysis, findings or conclusions herein.*

September 2007 through April-May 2008, I find that the average change is 30% higher for pilot stocks. The difference is statistically significant. For the change between May-June 2009 and August-September 2007, I also find that the average change is higher for pilot stocks (63%) but, for this case, the variation is not statistically significant. Despite being a larger number, the second period difference is not significant due to the larger volatility associated with a longer time span and the lower number of option classes in the sample.

Table 1: Change in volume for Pilot and Non-pilot Option Classes

	n	Mean Volume		Mean % change in volume
		Aug07-Sep07	Apr08-May08	
Pilot symbols	49	6.17	7.31	23%
Non-pilot symbols	42	4.19	3.59	-7%
Difference				**30.2%****

	n	Mean Volume		Mean % change in volume
		Aug07-Sep07	May09-Jun09	
Pilot symbols	43	6.17	11.17	61%
Non-pilot symbols	39	4.19	3.72	-2%
Difference				**63%**

** Statistically significant at 5% level.

Notes: I consider option classes that are on the top 100 when ranked by volume on the last two weeks of September 2007. Pilot symbols belong to the group of option classes added after September 28, 2007 and before April 1, 2008. Non-pilot symbols have never been in the option penny pilot. For each option class I calculate the volume for each of the three periods under analysis, August-September 2007, April-May 2008 and May-June 2009. Average option volume numbers are reported in millions of contracts. The second table is based on a lower number of option classes because there were 9 option classes of the original group with no volume data from May 2009 to June 2009.

Volume in pennies under different proposals

This section analyzes how different proposals and the current pilot compare in terms of the fraction of volume and dollar volume in different increments(1, 5 and 10 cents). Volume (in contracts) and dollar volume are different measures of trading activity that are considered below. While contract volume is the most commonly used measure, dollar volume captures an important element of economic significance of trading activity. In addition, there are important differences in the fraction of market activity that would take place at different increments depending which measure is used. The statistics are provided table 2.

Contract volume trading in pennies under different proposals ranges from 44 percent to approximately 70%. Under CBOE proposal, 44% of the total volume would trade in pennies, this is a similar number to what is observed in the current

version of the Options Penny Pilot. Trades in pennies would increase significantly under the NYSE Arca proposal. For example if option classes with average premium above $5 are excluded, 70% of the total volume would be trades in pennies.

Table 2: Fraction of Volume in Different Increments

Proposal	Volume			Dollar Volume		
	1 cent	5 cents	10 cents	1 cent	5 cents	10 cents
Current Penny Pilot	42%	8%	50%	12%	16%	73%
CBOE proposal	44%	49%	7%	6%	50%	43%
NYSEArca proposal ($5 premium threshold)	70%	11%	19%	24%	21%	54%
NYSEArca proposal ($10 premium threshold)	70%	12%	17%	24%	25%	50%
NYSEArca proposal ($50 premium threshold)	72%	17%	12%	25%	69%	6%

Notes:

-The data is from OptionMetrics and the period under analysis is 02/02/2009 through 05/27-2009.

- CBOE proposal includes all equity and ETF options. A threshold of $1 is used to determine which classes quote in 1 cent and 5 cents. Index options XSP and DJX are included in the pilot using the $1 threshold.

- NYSEArca proposal is calculated with three different assumptions about which option classes would be excluded due to high premium values. For the NYSEArca proposal calculation, I include all current pilot option classes. In addition, I include the top 300 option classes by volume, excluding those that belong to the current penny pilot or those that have average premium levels above a certain threshold ($5, $10 or $50). The average premium level calculated is volume weighted. As indicated in the proposal, all contracts for option classes for QQQQ (Power Shares ETF), SPX(SPDR S&P 500 ETF) and IWM (iShares Russell 2000 Index Fund) would quote in 1 cent increments.

Volume data on specific option classes

Under the current Option Penny Pilot, all contract of option class QQQQ are traded with a minimum bid increment of one penny. Under the NYSEArca proposal all contracts of option classes SPY and IWM would also trade in pennies. The tables below show the fraction of the volume that would be trade in one penny under different thresholds. QQQQ data is also included for comparison purposes.

- IWM and SPY

In Tables 3, data corresponding to volume and dollar volume for IWM and SPY option classes are presented. The level of activity associated with each premium level varies significantly with the type of volume analyzed. For contract volume option contracts with premiums above $3 dollars represent around 18% of the activity for IWM and 29% of the activity for SPY. On the other hand, for dollar volume, more than 50% of the market activity corresponds to contracts with premiums higher than $5. The source of the data is OptionMetrics.

Table 3: Volume for options contracts

Volume ('000s contracts)

Midquote	IWM	SPY	IWM	SPY
<$1	10317	47533	40%	33%
($1,$3)	10747	57277	42%	39%
($3,$10)	4264	37277	17%	26%
>$10	248	3662	1%	3%
Total	25576	145749	100%	100%

Dollar Volume (thousand dollars)

Midquote	IWM	SPY	IWM	SPY
<$1	4575	19903	9%	5%
($1,$3)	19634	108583	39%	29%
($3,$10)	20028	187887	40%	50%
>$10	5946	61968	12%	16%

Note: The data is from OptionMetrics and the period under analysis is 02/02/2009 through 05/27-2009.

- *QQQQ*

In Table 4, data corresponding to volume for QQQQ option classes is presented. Option contracts with premiums above $3 dollars represent approximately 5% of the activity and option contracts with premiums below $1 represent 60% of the activity for QQQQ.

Table 4: Volume for QQQQ option class

Midquote	000s contracts	% of total QQQQ volume
<$1	28901	60%
($1,$3)	16596	35%
($3,$10)	2540	5%
>$10	39	0%
Total	48076	100%

Note: The data is from OptionMetrics and the period under analysis is 02/02/2009 through 05/27-2009.