Memorandum[1]

TO: Heather Seidel,
FROM: J. Daniel Aromi, OEA
Cc: Amy Edwards, Jim Overdahl
DATE: July 24, 2009
RE: Volume and Spreads for Pilot and Non-Pilot Option Classes

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At the request of the Division of Trading and Markets, this memo examines the argument that relative to a five-cent trading and quoting increment, a one-cent increment reduces liquidity and volume for option contracts priced in the $1 to $3 range. Several commenters in CBOE, LiquidPoint, SIFMA and UBS contend that the breakpoint for a change in the increment level should be at $1 instead of the current $3. According to these letters increased quote traffic, decreased liquidity at the best bid/offer and decreased average daily contract volume indicate that option contracts with premiums above $1 should quote in increments of at least a nickel. This memo tests components of the arguments with regard to contract volume using information readily available. The impact of the penny pilot on contract volume and dollar volume across different premium levels is examined using data from February 2 2009 through May 27 2009. In addition, I study closing bid/ask spreads to get an idea of whether trading costs would increase if the increment were a nickel for options with premiums above $1. Bid-ask spreads are a good approximation of the trading cost associated with small trades. To assess the impact of the pilot, we compare statistics across three set of option classes: current penny pilot option classes, all option classes not included in the penny pilot and top 300 option classes not included in the penny pilot (and with premiums below $5) selected by volume.

My preliminary conclusions are that, from the data I inspected, there is nothing special about the $1 to $3 premium levels that would indicate that the break point should be reduced. The penny pilot does not seem to have an evident negative impact on volume of option series with premiums in the $1-$3 range relative to volume in other price ranges. In addition, I find that the penny pilot seems of have an important positive impact on the fraction of total contract volume that occurs in option series with low premiums. Also, spreads are lower for penny pilot options and the breakpoint in minimum increments at $3 has an impact on spreads.

Volume

The focus of this section is to evaluate how the penny pilot affects the relative volume of contracts at different premium levels. The pilot can have positive or negative effect on volume depending on the premium levels being considered. Smaller increments can result in higher volume as a result of a decrease in transaction costs resulting from lower bid/ask spreads. On the other hand, smaller minimum increments can reduce the value of displaying liquidity and facilitate stepping ahead that can discourage trading in larger sizes, potentially lowering volume.

For this analysis I have used data from OptionMetrics. The data reported is daily contract volume for each option series, but does not report the number of trades in a day

I will consider, for each group of option classes, the fraction of contract volume that corresponds to contracts in different premium ranges. This measure has the benefit of showing how the penny

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[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.*

pilot impacts volume of option contracts on a given premium range compared to other ranges. The normalization by total volume cleans for differences in options volume between the three groups. This measure evaluates whether options contracts with premium levels in the $1 to $3 range are affected differently by lower increments than other premium levels. A result indicating that the fraction of volume in the $1 to $3 premium options is lower for options included in the pilot than for other options would suggest that the penny pilot has a negative impact in the contract volume of these contracts.

I did not find clear evidence of this effect. Figure 1 shows, for each group of option classes, the contract volume in a given price range as a fraction of the total volume for that group of option classes. For penny pilot option classes, the values do not present any noticeable difference around the neighborhood of the $3 threshold. The shape of the curve is very similar to what is observed in the two other groups. This suggests that the penny pilot does not seem to have an evident negative impact on volume for option contracts in the $1 to $3 price range. I arrive to a similar conclusion when studying dollar volume for this group of option classes (see figure 2).

On the other hand, I observe a clear positive impact of the penny pilot for option contracts on the low range of option premiums. Compared to non-pilot option classes, the fraction of volume in contracts with low premium levels (premium levels below 50 cents) is clearly higher for pilot option classes. The higher fraction of volume for contracts with low premiums is compensated by slight evenly distributed reductions in the fraction of contracts at higher premium ranges.

I have performed additional analysis in which I consider a subset with the top 100 option classes by volume not included in the penny pilot instead of the top 300. The results are very similar.

Closing Bid-/Ask spreads

Another way to examine liquidity is with bid-ask spreads. I collect option closing bid-ask spreads from 02/02/2009 through 05/27/2009. These bid-ask spreads are collected from OptionMetrics and should not be confused with intraday bid-ask spreads. Intraday bid-ask spreads are a better measure of liquidity. I do not know whether the cross-sectional properties of closing bid-ask spreads compare to those of intraday bid-ask spreads, but I assume that the comparisons between the groups will be roughly the same if I used intraday spreads even if the absolute levels are different. The positive slope of the lines in Figure 3 are in line with what would be expected, this suggests that closing bid-ask spreads are a good approximation of transaction costs.

Figure 3 shows that spreads are markedly lower for pilot option classes. In addition, I find the jump from 1 cent to 5 cents increment at $3 appears to have an impact on average spreads. That is, for pilot option classes, I observe a discontinuity in average spreads as I move from the $2.5-$3 range option contracts to the $3-$3.5 range (see figure 3). The effect is more clear if the jump is measured as a percentage difference (for that purpose figure 4 presents the same graph with a logarithmic scale, this is the appropriate scale to compare proportional variations). This discontinuity suggests that trading costs would increase for options with premiums between $1 and $3 if the minimum increment were to increase from a penny to a nickel.

For spreads, I also performed additional analysis in which I consider a subset with the top 100 option classes by volume not included in the penny pilot instead of the top 300. The results are very similar.

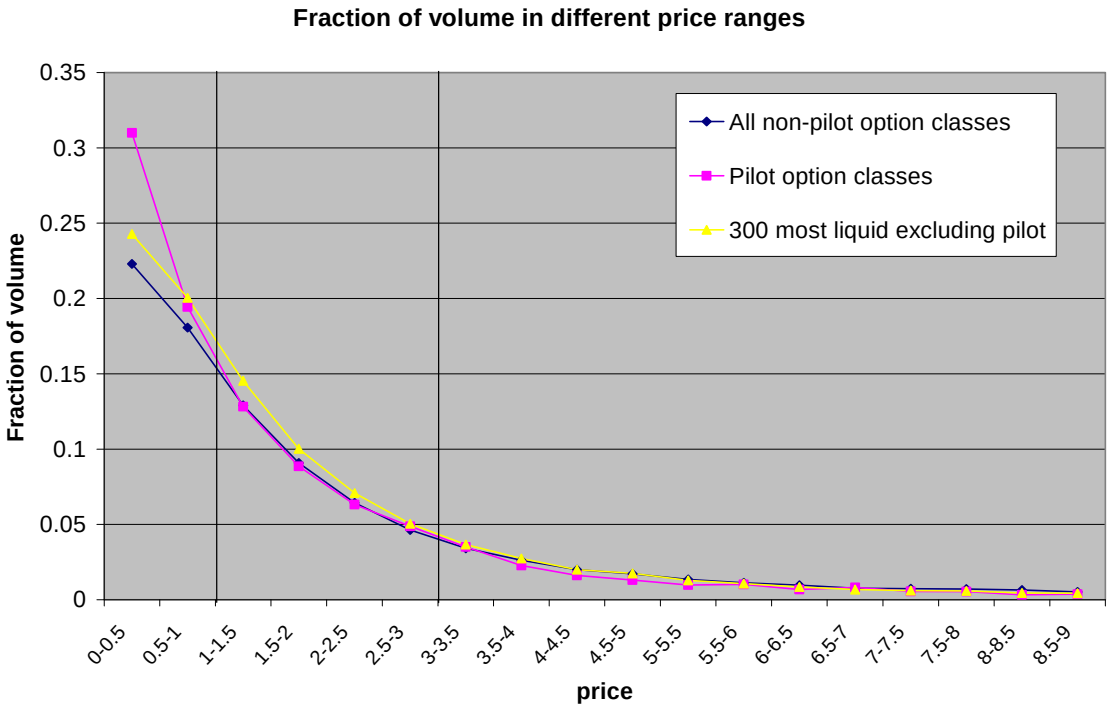

Figure 1: Volume statistics were calculated for three subsets of option classes. The groups are: current penny pilot option classes, all option classes not included in the penny pilot and top 300 option classes by volume. The last group does not included option classes that are part of the penny pilot and option classes with an average premium above $5. The data is from OptionMetrics and the period under analysis is 02/02/2009 through 05/27/2009.

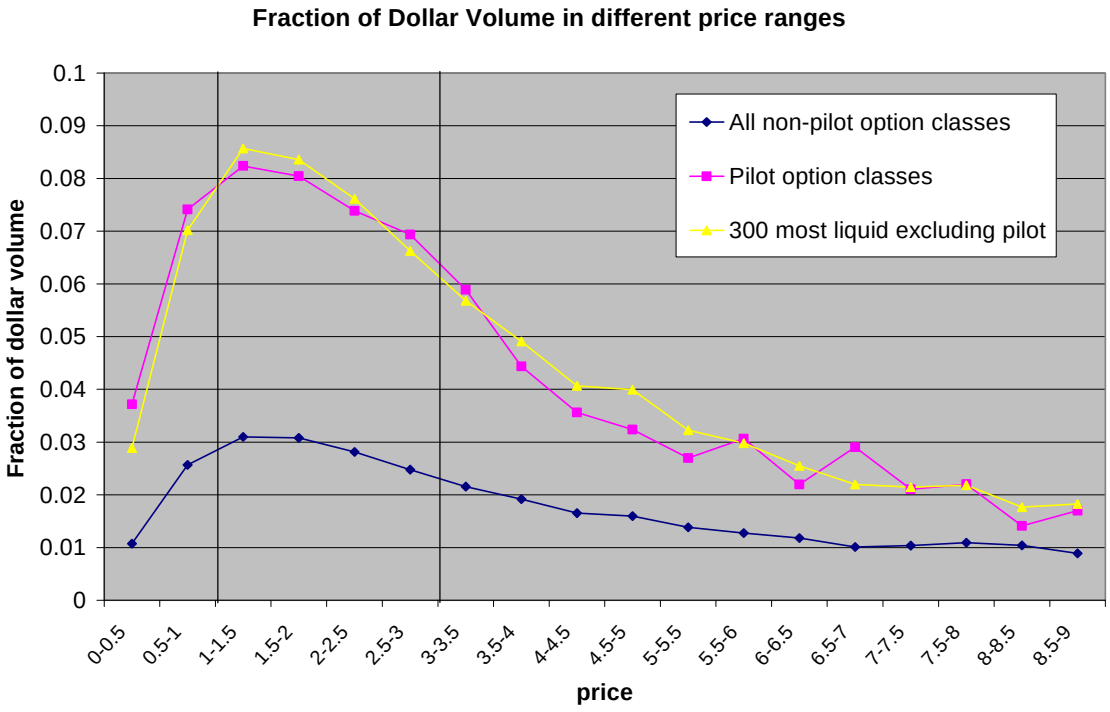

Figure 2: Dollar volume statistics were calculated for three subsets of option classes. The groups are: current penny pilot option classes, all option classes not included in the penny pilot and top 300 option classes by volume. The last group does not included option classes that are part of the penny pilot and option classes with an average premium above $5. The data is from OptionMetrics and the period under analysis is 02/02/2009 through 05/27/2009.

Figure 3: Closing bid and ask spreads statistics were calculated for three subsets of option classes. The groups are: current penny pilot option classes, all option classes not included in the penny pilot and top 300 option classes by volume. The last group does not included option classes that are part of the penny pilot and option classes with an average premium above $5. The data is from OptionMetrics and the period under analysis is 02/02/2009 through 05/27/2009.

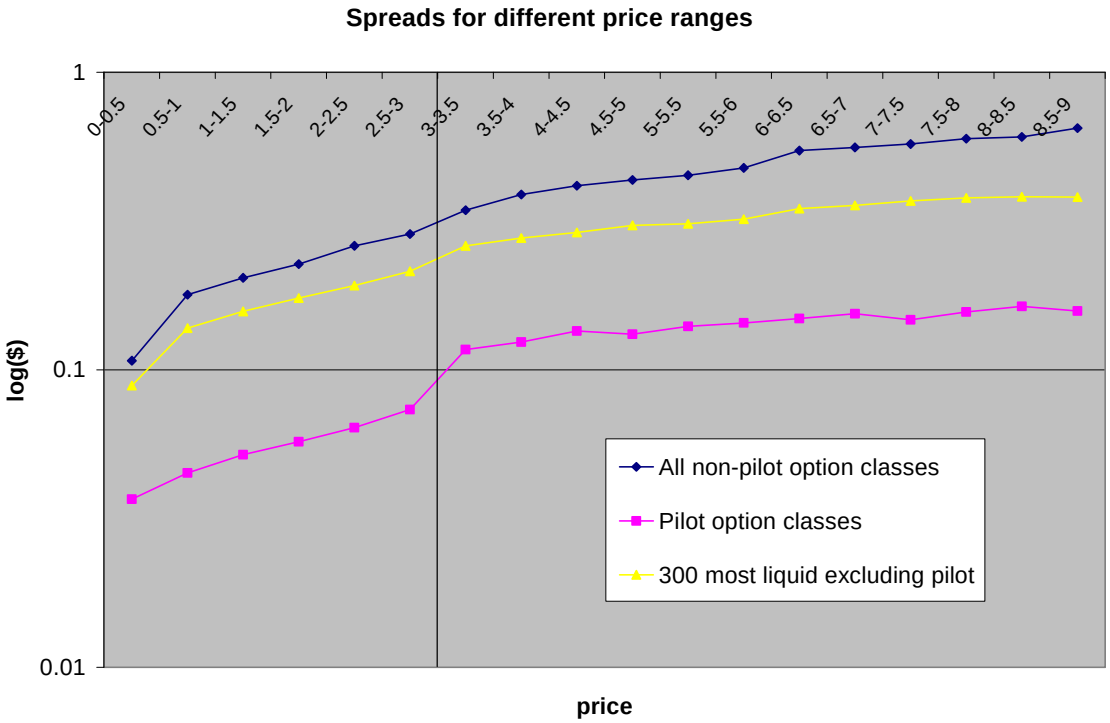

Figure 4: Closing bid and ask spreads statistics were calculated for three subsets of option classes. The groups are: current penny pilot option classes, all option classes not included in the penny pilot and top 300 option classes by volume. The last group does not included option classes that are part of the penny pilot and option classes with an average premium above $5. The data is from OptionMetrics and the period under analysis is 02/02/2009 through 05/27/2009.