



International Securities Exchange

Penny Pilot Analysis 4

September 2008

Version Final.

Issue date: September 26, 2008

Print date: October 6, 2008

Produced by:

International Securities Exchange, LLC.

60 Broad Street, New York NY 10004

www.ise.com

Table of contents

Chapter 1. Summary	3
1.1. Background	3
1.2. Summary	3
Chapter 2. Quality of Markets	4
2.1. ISE Best Bid Offer Spread	4
2.2. ISE Size at the BBO	5
Chapter 3. Capacity.....	6
3.1. ISE Quotes To OPRA	6
Chapter 4. Trading Activity	7
4.1. Industry Average Daily Volume (ADV)	7
Appendix A: Volume Weighted Spread.....	8
Calculation	8
Appendix B: Explanation of Graphs	9
Time Periods in Graphs	9
Appendix C: Comparable Symbols.....	10
Explanation of Comparable Symbols.....	10

Chapter 1. Summary

1.1. Background

On January 26th, 2007, the U.S. options exchanges commenced a pilot to quote and trade options in pennies. The pilot consisted of options on 13 stocks and ETFs. Symbols in the pilot use trading increments of one-cent for options trading at less than \$3.00, and increments of five-cents for options trading at \$3.00 or more except for options on QQQQ, which trades in one-cent increments at all price levels.

Phase two commenced on September 29, expanding the pilot by an additional 22 symbols, and phase three commenced on March 28, 2008, expanding by an additional 28 symbols.

The International Securities Exchange, LLC ("ISE" or the "Exchange") produced a report of its findings at each stage of the pilot found and they can be found on the ISE's web site.

Phase 1 to April 2007: http://www.ise.com/assets/files/investors/Penny_Report.pdf

Phase 1 to September 2007: http://www.ise.com/assets/files/investors/Penny_Report_2.pdf

Phase 2 to January 2008 http://www.ise.com/assets/files/investors/Penny_Report_3.pdf

Phase 3 to September 2008 http://www.ise.com/assets/files/investors/Penny_Report_4.pdf

1.2. Summary

The Penny Pilot has continued without any operational issues. The quoted spread has tightened, while size available at the BBO has decreased significantly. Trading volumes increased, although there was significant volatility in the market making it impossible to discern the volume increases due to pennies versus general increases in trading volumes.

Trading volumes in the penny pilot symbols have declined slightly since March 2008. To show the impact of the pilot, we have selected 24 Non-penny symbols and show their performance over the same timeframe as the phase 3 symbols. See appendix-C for a list of the non-penny sample symbols.

Both penny quoting and market volatility has contributed to the vast increase in number of quotes that market makers send to ISE. Quote traffic almost doubled during the summer then reduced again in recent months,

Chapter 2. Quality of Markets

2.1. ISE Best Bid Offer Spread

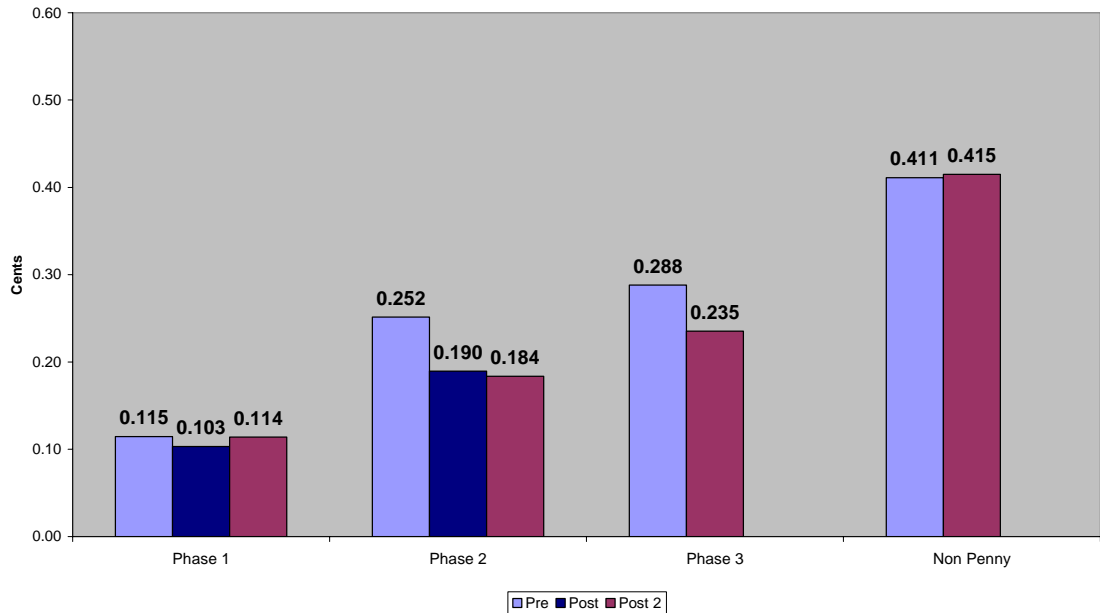
ISE sends its BBO for each option series to the Options Price Reporting Authority ("OPRA"), which disseminates it to the market.

The following graph shows the change in ISE Volume Weighted Spread¹ for the symbols in each phase of the pilot. The light blue bar shows the three months prior to the group of symbols in each phase moving to pennies². While, the dark blue bar is approximately a year post pennies², and the red bar is the most recent five month time period from March to September 2008. These distinctions in time show both the overall and the most recent impact of pennies.

The graph shows how the spreads tightened from the pre-penny period, the year following, and the last five months. On the right is the change in a comparable group of 24 non-penny symbols which did not exhibit the same change³.

It can be seen that the less liquid symbols added in phases two and three have tightened the spread more than the very liquid symbols that were added in phase 1. It can also be seen that the phase 1 symbols have also widened since the other phases have been converted.

ISE Spread Pre vs. Post: All Names (Volume Weighted)



¹ The Volume Weighted Spread takes the volume of each option pre- and post-pilot into account, giving proportional weight to each spread based on the option's volume. Please see Appendix A for an example of the calculation.

² Further explanation of the graphs can be found in Appendix B.

³ Details of comparable symbols can be found in Appendix C.

2.2. ISE Size at the BBO

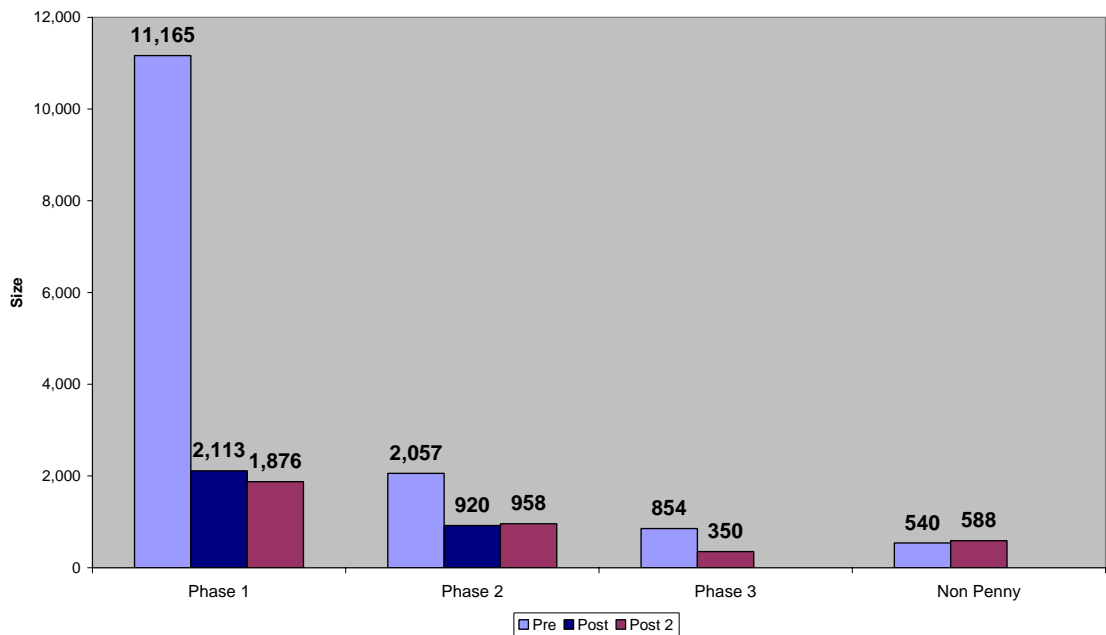
Size is the volume of contracts available at the BBO for each option series as published to OPRA.

The following graph shows the change in ISE Volume Weighted Size for each phase of the pilot.

Size at the BBO reduced dramatically for the liquid phase one symbols and is continuing to decline. The less liquid phase 2 symbols had an initial drop but then showed a small recovery. Phase 3 symbols also had a significant drop in size when converted to pennies.

On the right is a graph of the change in size for our group of 24 comparable non-penny symbols. Their average size did not reduce over the same period as the phase 3 symbols.

ISE Size Pre vs. Post: All Names (Volume Weighted)



Chapter 3. Capacity

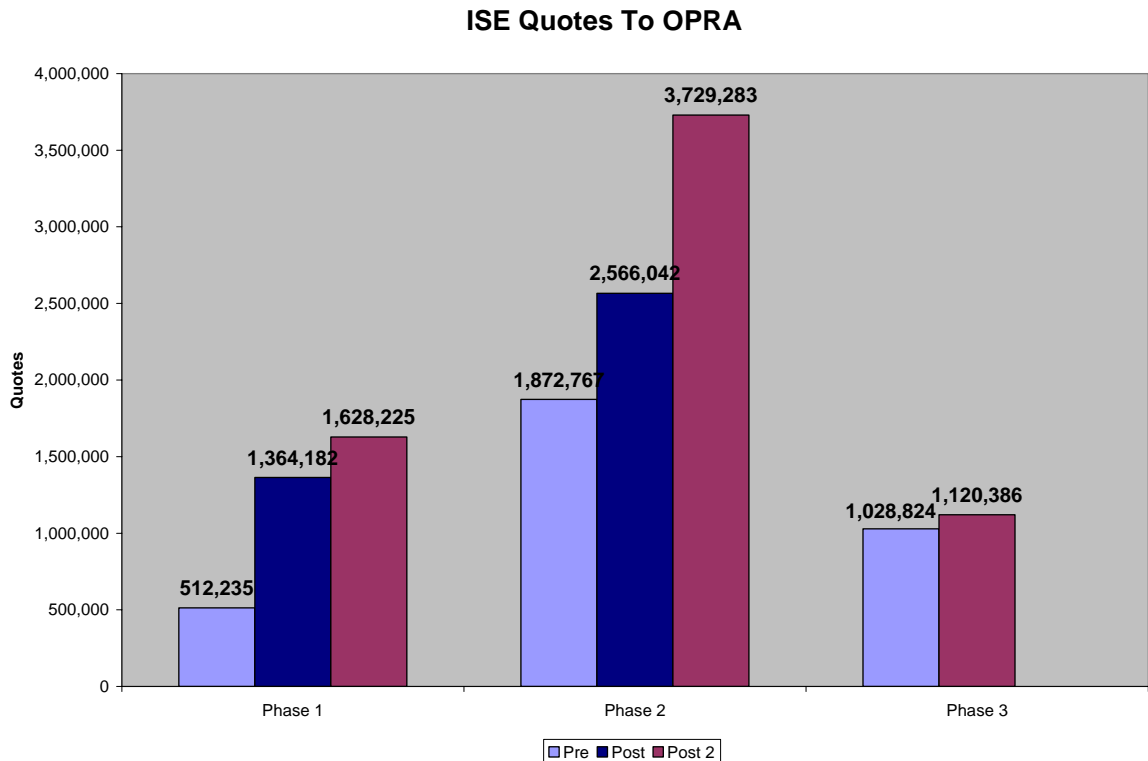
3.1. ISE Quotes To OPRA

The Exchange receives quotes from market makers and orders from all market participants. ISE submits a new quote to OPRA if a market maker quote or an order changes our price or size at the top of the book.

As the number of quotes disseminated to OPRA increases, all industry participants must increase their systems' capacity to process the additional quotes.

The following graph shows the change in ISE quote volumes to OPRA for the three phases over time.

The number of quotes sent to OPRA for Phase 1 symbols continues to increase. The quotes sent to OPRA in Phase 2 symbols have doubled. Yet, quotes sent for Phase 3 symbols have only seen a slight increase.



Chapter 4. Trading Activity

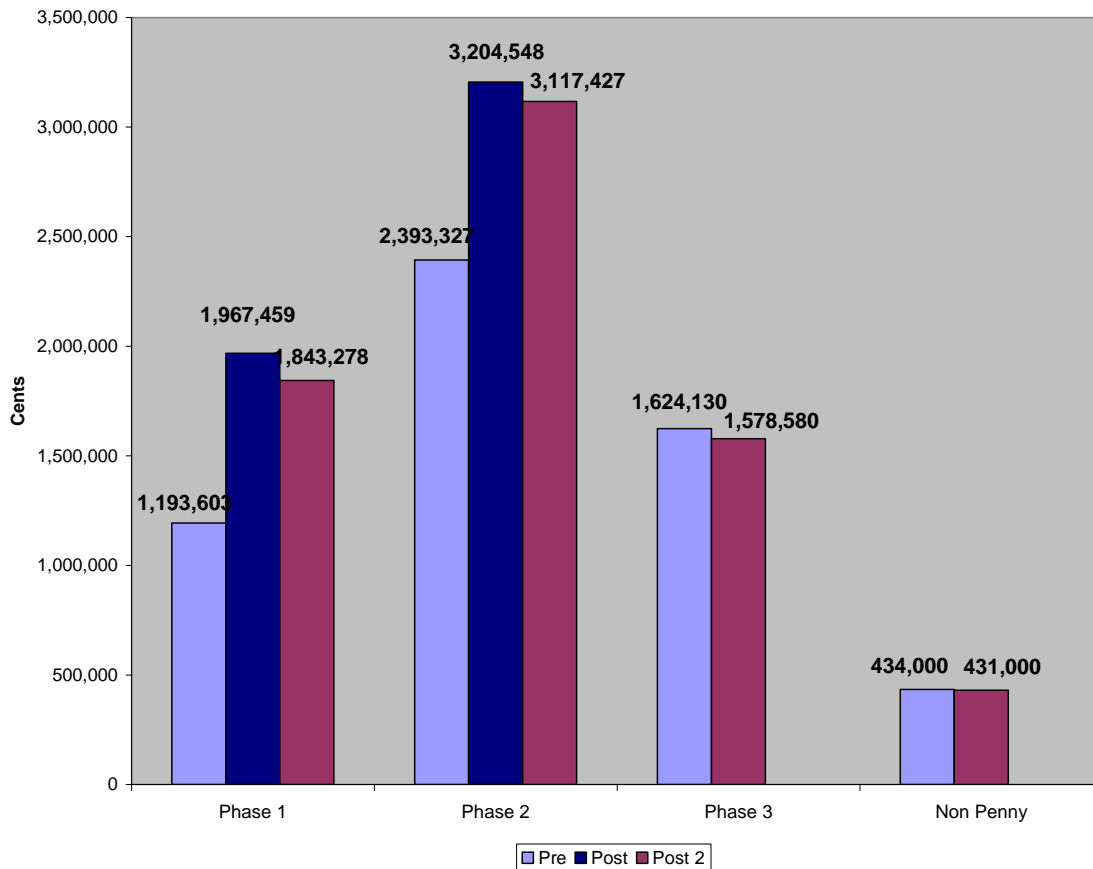
4.1. Industry Average Daily Volume (ADV)

The following table shows the change in industry Average Daily Volume (ADV) for symbols in each phase over time.

The industry ADV increased for both phase 1 and phase 2 symbols with the introduction of pennies. The ADV of the less liquid Phase 3 symbols has reduced slightly with the introduction of pennies, although the ADV of all three groups is down over the latest period. The phase 1 symbols are down by 6.3% while phase 2 and phase 3 are down by 2.7%

On the Right hand side is the change in ADV for our group of 24 comparable non-penny symbols, which only represent 6% of the non-penny volume. Their ADV remained reasonably constant over the same period.

Industry Volume Pre vs. Post: All Names



Appendix A: Volume Weighted Spread

Calculation

The Volume Weighted Spread and Size are calculated by adding proportional weight to each underlying based on volume executed in that underlying when averaging factors.

The Volume Weighted Spread uses the following formula:

$$\frac{\sum_n^i Spread_i * Volume_i}{TotalVolume}$$

If the spreads and adjacent volumes were as follows:

Spread	.26	.38	.26	.23
Volume	98	3,222	3	56

Then, the Volume Weighted Spread would be calculated as below:

$$\frac{(.26 * 98) + (.38 * 3,222) + (.26 * 3) + (.23 * 56)}{3,379}$$
$$\frac{(25.48) + (1,224.36) + (.78) + (12.88)}{3,379}$$
$$.3739$$

The Volume Weighted Size is calculated in a similar fashion.

Appendix B: Explanation of Graphs

Time Periods in Graphs

All graphs in this document show the progress of the symbols in each phase as they have changed over time. Results for the three groups of symbols have been kept distinct as phase 1 included some very liquid, high volume symbols while phase 3 were generally less liquid symbols.

Phase 1 converted 13 symbols, starting on 01/26/07, completed by 02/09/07.

Phase 2 converted 22 symbols on 09/28/07

Phase 3 converted 28 symbols on 03/28/08.

The light blue bar shows the three months prior to pennies.

The dark blue bar shows the year post pennies, as follows:

- Phase 1 symbols, the dark blue bar covers 12 months from 02/09/07 to 02/12/08
- Phase 2 symbols, the dark blue bar covers eleven months from 09/28/07 to 09/03/08

The red bar shows the most recent 5 months, from 03/28/08 to 09/03/08.

Appendix C: Comparable Symbols

Explanation of Comparable Symbols

To assist in showing the impact of the penny pilot, a group of comparable symbols was selected to show change in the non-penny stocks.

For each of the penny Pilot symbols, a comparable symbol was found in the non-penny symbols and used as a reference point.

The following list of 24 symbols was used as a baseline:

ALU, AMX, BHP, CELG, CVX, FXI, HPQ, IWN, IWO, IYR, JNPR, JPM, MDY, MRK, NILE, NMX, NOK, NRMX, PALM, RAI, RTH, TTM, USO, XLB.

The Average Spread, Size at the BBO and ADV were collected for these symbols for the same periods as used for the phase 3 group.

The Pre-period is from December 28, 07 to March 27, 2008 and the Post Period, March 28, 2008 to September 3, 2008.

Note that the results for each symbol were quite mixed. Some improved while others decreased. The statistics would yield different results depending upon the symbols used.