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June 1, 2007

FOIA Confidential Treatment

Requested by CBOE

Ms. Elizabeth King Associate Director Division of Market Regulation Securities and Exchange Commission 100 F Street, N.E. Washington D.C. 20549

Penny Pilot Report

Dear Ms. King:

Re:

The Chicago Board Options Exchange, Incorporated ("CBOE" or "Exchange") is submitting this letter and the attached report which describes the impact of the changes to the minimum increments in the thirteen Penny Pilot classes during the first three months of the Penny Pilot Program.¹ The attached report provides data pertaining to such areas as average spread, average quoted size, average spread at time of trade, total quotes per day (inbound to CBOE and outbound to OPRA), peak quote rates, average daily volume, number of trades and orders, and Linkage traffic. In this letter, CBOE also provides its analysis of the Pilot Program and recommendation relating to the next phase of the Pilot Program.

Notwithstanding the claims by some in the options industry that the Pilot Program has been a resounding "success," CBOE does not believe that quoting thirteen option classes in penny increments over three months provides sufficient data and information to make an informed decision as to the Program's success or a basis to aggressively expand the Pilot Program. Rather, CBOE is concerned that some of the initial trends from the data signal potentially negative consequences for the options industry. For instance, liquidity at the best bid or offer in the Pilot classes has decreased substantially. CBOE also has experienced a reduction in the number of liquidity providers in the Pilot classes, particularly the QQQQs, and believes that trend may continue if the Pilot Program is expanded significantly. Although spreads, as widely reported, have narrowed in the Pilot classes, some of CBOE's liquidity providers have expressed that these narrowed spreads in the penny series are not sustainable and more time is needed to accurately assess the impact on spreads of quoting in penny increments.

400 South LaSalle Street

<sup>&</sup>lt;sup>1</sup> The six-month Penny Pilot Program started on January 26, 2007, with one class (Whole Foods (WFMI)). Two more classes were added to the Pilot Program on February 2, 2007, and the remaining ten classes were added on February 9, 2007.

Much of the data in the attached report varies by option class, with some option classes experiencing significant changes and other classes experiencing less significant changes. The results in two classes, IWM and QQQQ, skew some of the statistics greatly. For example, although trading volume may at first appear to have increased, much of the increase is due to volume increasing 75% in IWM and 34% in QQQQ - already the two most active classes. In fact, excluding IWM & QQQQ, CBOE's volume increased only 10%. Quote traffic increased dramatically in some classes, and decreased in other classes. The practice of payment for order flow in the Pilot classes appears to have been modified, as measured by the reduction in the fee assessed by exchanges,<sup>2</sup> but these changes may have been off-set in the non-Pilot classes. Based on these preliminary results, CBOE cannot conclude that quoting in penny increments in these or additional option classes is a good policy, and CBOE remains very concerned about the impact of quoting in penny increments on market participants, transparency, liquidity, market structure, and quote traffic.

## Possible Expansion

Thus, CBOE believes that the SEC and the exchanges should act cautiously in deciding whether to expand the Pilot Program and, if so, by how much. The impact of a significant expansion of the Pilot Program on the options market structure, as a whole, cannot be predicted. Already, preliminary data and information suggests that the number of liquidity providers will shrink as the Penny Pilot Program is expanded, market transparency and liquidity will continue to be reduced, quote traffic will continue to increase significantly, and transaction fees for customers and others may increase depending on the market model each exchange chooses. The SEC, exchanges, and market participants need to fully understand the impact of aggressively expanding the Pilot Program before a decision is made to do so. At this time, there simply is not enough information and data to evaluate the impact of quoting and trading in penny increments on the options industry.

If a determination is made to expand the Pilot Program, CBOE would recommend that the Pilot Program be expanded by an additional 37 classes, for a total of 50 classes in the Pilot Program. CBOE would propose that each options exchange be allowed to select five additional classes to participate in the Pilot Program, with the SEC selecting seven more option classes. In these 37 additional classes, CBOE would allow penny quoting in series below \$1. The minimum increment for those series priced \$1 and above would be \$.05. The existing thirteen Pilot classes would continue to trade in the existing increments (including the OOOOs remaining quoted only in penny increments). CBOE believes that it would be important as part of this Pilot Program to analyze and compare how quoting in penny increments affects options classes at different breakpoints (either \$1 or \$3), and specifically how different breakpoints impact transparency, liquidity, market structure, and quote traffic in the option classes.<sup>3</sup> Such an expansion would be meaningful as approximately 45% of the volume in most option classes is in series priced below \$1. Thus, CBOE's proposal for expansion would allow for further analysis on a greater scale of quoting in these reduced increments, and provide customers with penny pricing in those series where it is most beneficial, i.e., below \$1. CBOE is very concerned that a more aggressive expansion could have long-term effects and unintended consequences on the options market

<sup>&</sup>lt;sup>2</sup> CBOE recently reduced its marketing fee in the Pilot classes from \$0.25 to \$0.10, effective June 1, 2007. See SR-CBOE-2007-50, filed May 29, 2007.

<sup>&</sup>lt;sup>3</sup> CBOE does not believe having different breakpoints for the Pilot classes would be unduly confusing to investors; but, of course, CBOE would consult with SIFMA as to this point.

structure. CBOE recommends this course of action notwithstanding that the initial trends are favorable to CBOE in terms of maintaining a competitive marketplace in the Pilot classes and CBOE being the exchange of choice among all the options exchanges in the Pilot classes.

## Related Market Structure Issues

The options industry is currently experiencing the latest evolution of its market structure, represented by the Penny Pilot itself, the expansion of portfolio margining, the increasing user base for listed options, the continuing rapid rise of algorithmic trading and the impact of Regulation NMS on our primary underlying markets. In order to ensure the marketplace continues to grow in a harmonious fashion, CBOE believes that several related issues should be addressed in connection with a further expansion of the Pilot Program. These issues include:

- ▶ Linkage. CBOE believes the Linkage Plan and related rules must be updated and revised to provide a process and mechanism for accessing in an expeditious manner the best prices at other markets, similar to the ISO concept in Reg NMS. This may entail creating an entire new Linkage system, which CBOE is currently pursuing with some of the existing participants. Although the Linkage hub appears to be operating effectively in the Pilot classes to date, the statistics reflect a significant increase in Linkage traffic in the thirteen Pilot classes. Prior to an aggressive expansion of the Pilot Program, this issue must be addressed in order to provide an efficient mechanism for market participants to execute large orders.
- ➤ \$1 Strike Pilot Program. CBOE believes that further expansion of the Penny Pilot Program should be done in conjunction with a significant expansion of the \$1 Strike Pilot Program, which enhances the trading alternatives of all options users. CBOE has sought for several years to expand the current \$1 Strike Pilot Program, which currently allows the options exchanges to collectively select 30 option classes to list \$1 strike prices from \$3 to \$20 that are no more than \$5 from the closing price of the underlying security on the preceding day. CBOE's members, including those that represent customer orders, and SIFMA repeatedly have requested that the \$1 Strike Pilot Program be expanded to allow for the inclusion of more classes as well as an increase in the range on which \$1 strike prices may be listed. CBOE requests that the \$1 Strike Pilot Program be expanded to allow each exchange to select up to 40 option classes on which to list \$1 Strikes and that the range on which \$1 Strikes can be listed be expanded from \$20 to \$50.
- Eligible Classes. If the Pilot Program is expanded beyond CBOE's proposal, CBOE believes that further analysis must be done to identify which option classes are good candidates for quoting in penny increments. As the attached report shows, not all Pilot classes were impacted similarly by quoting in penny increments, and there is not sufficient data to predict how quoting in penny increments will impact option classes with highly volatile or high-priced underlyings. CBOE suggests that a uniform set of principles be developed as part of this process that would clearly and objectively distinguish which classes might be eligible for penny increments versus those that should not, to allow both the exchanges and our various market participants some base from which to develop intermediate and long term business plans.

## **Quote Mitigation Efforts**

CBOE implemented several quote mitigation measures in connection with the Penny Pilot Program. Specifically, CBOE adopted a Hybrid electronic quoting fee applicable to all liquidity providers on CBOE; amended the continuous electronic quoting obligation of Market-Makers and Remote Market-Makers to require that Market-Makers and RMMs shall provide continuous electronic quotes in 60% of the series of his/her appointed class that have a time to expiration of less than nine months; and adopted a delisting policy applicable to all equity option classes with national average daily volume ("ADV") of less than 20 contracts. Previously, CBOE had adopted a rule (Rule 6.23A) that allows CBOE to limit the number of messages sent by members accessing CBOE electronically, which protects the integrity of the Hybrid Trading System and mitigates quotes. CBOE also recently filed a proposed rule change (SR-CBOE-2007-45) to implement a "holdback timer" that allows CBOE to systematically delay the dissemination to OPRA of quotations and other changes to CBOE's best bid and offer for no longer than one (1) second, similar to the ISE's and Amex's "holdback timer."

At this time, CBOE cannot accurately quantify the impact of these quote mitigation measures and assess their effectiveness, as most became effective in February 2007. Members are likely continuing to make the necessary systems changes to modify their quoting behavior in response to them. However, based on anecdotal evidence, CBOE believes they have been effective in mitigating quotations and does not believe they have had a negative impact on CBOE's marketplace. Additionally, CBOE is in the process of revising its Hybrid electronic quoting fee in a manner that encourages more efficient and aggressive quoting, by specifically rewarding quotations that improve the market and assessing a fee on those quotations that do not improve the quality of CBOE's disseminated quotations or are otherwise duplicative.

#### Conclusions and Recommendations

The data that has been collected to date covers only thirteen option classes over a three month time period. The data itself varies by option class, with some option classes experiencing significant changes and others classes experiencing less significant changes. As a result, CBOE strongly believes that further analysis must be conducted over a longer period of time before drawing any firm conclusions as to the impact of quoting and trading in these reduced increments, and in order to determine which classes benefit from trading in penny increments versus those that may not.

As stated above, if the SEC determines to expand the Pilot Program, CBOE would recommend that it do so cautiously. CBOE would recommend that the Pilot Program be expanded by an additional 37 classes, for a total of 50 classes in the Pilot Program. Each options exchange would be allowed to select five additional classes to participate in the Pilot Program, with the SEC selecting seven more option classes. In these 37 additional classes, CBOE would allow penny quoting in series below \$1. The minimum increment for those series priced \$1 and above would be \$.05. The existing thirteen Pilot classes would continue to trade in the existing increments. Such a reasonable expansion would allow the SEC and the options exchanges to continue to assess how the trading in these reduced increments affects all market participants (including customers), transparency, liquidity, market structure, and, importantly, quote traffic. It

<sup>&</sup>lt;sup>4</sup> CBOE recently delisted 21 option classes pursuant to its delisting policy.

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would also provide the SEC and the exchanges with the opportunity to implement any other market structure changes that should be pursued.

We look forward to working with the SEC staff on this important issue for the options industry. CBOE will continue to provide leadership in evaluating and making changes to the options market structure. If you have any questions concerning CBOE's report, please feel free to call me.

Sincerely,

Edward J. Joyce

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Attachment

## **CBOE Penny Pilot Report**

(FOIA Confidential Treatment Requested by CBOE)

#### Time Period

All comparisons are done between a 3-month pre-period and an approximately 3-month post period that starts on the day when the class moved into the pilot and ends on April 30, 2007. For Whole Foods (WFMI), the pre-period is from October through December 2006. For the remaining classes the pre-period is from November 2006 through January 2007.

#### **Quote Quality**

The section focuses on CBOE quotes disseminated to OPRA for each of the thirteen pilot classes. The summary covers all quotes sent in all of the series and differentiates between quotes in series that are subject to quoting in penny differentials (penny series) and series that are quoted in nickel differentials (nickel series).

#### 1. Average Spreads

Average spread is calculated as a straight average of the spreads (disseminated offer less disseminated bid) of all quotes disseminated to OPRA. Overall, CBOE's average spreads in penny series decreased by an average of 49% from \$0.09 in the pre-period to \$0.04 in the post-period. Average spreads in the post period ranged from \$0.03 to \$0.06. In nickel series, spreads decreased an average of 29% from \$0.18 to \$0.13. Average spreads in the post period ranged from \$0.09 to \$0.18. For comparison the industry average spreads also decreased substantially – 50% in the penny series and 33% in nickel series. The table below shows CBOE's average spreads in the pre and post periods for each pilot stock for penny series and nickel series. Penny series are all series under \$3, while nickel series are all series \$3 or higher with the exception of QQQQ, where all series are quoted in pennies.

**CBOE Average Spreads** 

	je je	enny Serie	)S	i i i i i	ickel Serie	S	All Series			
	Av	erage Spre	ead	Av	erage Spre	ead	Av	ead		
Class	Pre	Post	% Chg	Pre	Post	% Chg	Pre	Post	% Chg	
A	0.11	0.06	-46%	0.23	0.18	-24%	0.16	0.10	-36%	
AMD	0.09	0.04	-54%	0.18	0.13	-30%	0.13	0.08	-37%	
CAT	0.09	0.05	-47%	0.20	0.15	-24%	0.15	0.11	-27%	
FLEX	0.10	0.05	-50%	0.17	0.13	-26%	0.13	0.09	-34%	
GE	0.07	0.03	-54%	0.17	0.11	-38%	0.11	0.07	-39%	
INTC	0.07	0.03	-53%	0.15	0.10	-33%	0.10	0.06	-39%	
IWM	0.09	0.06	-39%	0.22	0.18	-18%	0.18	0.14	-24%	
MSFT	0.06	0.03	-49%	0.15	0.10	-32%	0.10	0.07	-24%	
QQQQ	0.11	0.06	-45%				0.11	0.06	-45%	
SMH	0.08	0.04	-45%	0.16	0.13	-23%	0.12	0.08	-33%	
SUNW	0.08	0.03	-58%	0.15	0.09	-39%	0.09	0.04	-53%	
TXN	0.08	0.04	-53%	0.17	0.11	-37%	0.12	0.07	-38%	
WFMI	0.10	0.05	-52%	0.25	0.17	-31%	0.20	0.12	-37%	
			İ							
Average	0.09	0.04	-49%	0.18	0.13	-29%	0.13	0.09	-35%	

<sup>&</sup>lt;sup>1</sup> Pre-period information for IWM quote information is from 12/19/06 when it was moved to the Hybrid Trading System.

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## 2. Average Quoted Size

Average quoted size is calculated by averaging both bid sizes and ask sizes disseminated to OPRA. The bid size and the ask sizes are then averaged together on a per series basis. Quoted size has decreased significantly in the post period. CBOE's average sizes are down 83% from 3,837 to 638 in penny series and 47% from 1,184 to 632 in nickel series. The decrease in sizes was very similar in all classes in penny series. QQQQ, for example decreased from an average size of 17,022 to an average size of 2,793. The size decrease at CBOE was similar to the size decrease in the industry where sizes in penny series decreased 81% and sizes in nickel series decreased 44% and 73% overall. The table below shows average size in penny series and nickel series for the pilot classes in the pre and post periods.

**CBOE Average Size** 

	P	enny Serie	is a second		ickel Serie	is and		All Series			
	A	verage Siz	ze	A	verage Siz	ze	Average Size				
Class	Pre	Post	% Chg	Pre	Post	% Chg	Pre	Post	% Chg		
A	249	61	-75%	117	97	-17%	366	158	-57%		
AMD	1,666	318	-81%	825	517	-37%	2,492	835	-66%		
CAT	937	165	-82%	507	255	-50%	1,443	420	-71%		
FLEX	348	93	-73%	275	307	12%	623	400	-36%		
GE	3,641	674	-81%	1,585	830	-48%	5,226	1,505	-71%		
INTC	6,090	743	-88%	2,616	1,329	-49%	8,706	2,072	-76%		
IWM	4,269	1,310	-69%	1,478	1,093	-26%	5,747	2,403	-58%		
MSFT	5,295	709	-87%	2,320	1,180	-49%	7,614	1,889	-75%		
QQQQ	17,022	2,793	-84%				17,022	2,793	-84%		
SMH	5,784	652	-89%	1,940	854	-56%	7,725	1,507	-80%		
SUNW	1,374	359	-74%	1,006	533	-47%	2,380	892	-63%		
TXN	2,628	321	-88%	1,249	464	-63%	3,878	785	-80%		
WFMI	575	98	-83%	294	123	-58%	868	221	-75%		
Average	3,837	638	-83%	1,184	632	-47%	4,930	1,221	-75%		

#### 3. Average Spread at Trade Time

In an attempt to quantify savings to customers, this section provides the average spread in the NBBO at the time of a trade. The data looks at each trade in the pre and post period to calculate the averages. One note, since NBBO was used for this comparison the spread width can be less than the minimum increment due to locked or crossed NBBOs. Average NBBO spread at the time of each trade decreased even more significantly then overall average spreads did. In penny series the average decrease was 65% from \$0.05 in the pre period to \$0.02 in the post period. In nickel series the average decrease was 40% from \$0.12 to \$0.07. The largest decrease in penny series was 77% in GE where the NBBO spread decreased from \$0.05 to \$0.01. The table below shows a pre and post period comparison of average NBBO spreads at the time of a trade for penny series, nickel series and all series.

**NBBO Spread at Time of CBOE Trade** 

	P	enny Serie			ickel Serie	S	All Series			
	Av	erage Spre	ead	Av	Average Spread Average Sp				read	
Class	Pre	Post	% Chg	Pre	Post	% Chg	Pre	Post	% Chg	
Α	0.06	0.03	-56%	0.14	0.10	-25%	0.08	0.04	-55%	
AMD	0.05	0.02	-64%	0.13	0.08	-35%	0.06	0.02	-62%	
CAT	0.06	0.03	-57%	0.12	0.09	-30%	0.08	0.04	-44%	
FLEX	0.06	0.02	-60%	0.12	0.07	-48%	0.06	0.02	-59%	
GE	0.05	0.01	-75%	0.13	0.07	-45%	0.06	0.02	-66%	
INTC	0.05	0.01	-71%	0.12	0.06	-45%	0.06	0.02	-66%	
lWM ¦	0.04	0.02	-54%	0.11	0.08	-31%	0.05	0.03	-47%	
MSFT	0.04	0.01	-67%	0.11	0.06	-46%	0.05	0.02	-64%	
QQQQ	0.05	0.01	-77%				0.05	0.01	-77%	
SMH	0.05	0.01	-71%	0.11	0.06	-46%	0.06	0.02	-66%	
SUNW	0.05	0.02	-72%	0.11	0.05	-54%	0.06	0.02	-72%	
TXN	0.05	0.02	-66%	0.12	0.07	-45%	0.06	0.02	-61%	
WFMI	0.06	0.02	-60%	0.14	0.09	-34%	0.09	0.04	-56%	
Average	0.05	0.02	-65%	0.12	0.07	-40%	0.06	0.02	-60%	

# **Quote Quantity**

This section focuses on the number of quotes that CBOE disseminated to OPRA and the number of quotes that individual quoters sent to CBOE. As described above, the numbers are compared for the pre and post periods.

## 1. Total Quotes per Day Outbound to OPRA

CBOE's total number of quotes per day in the penny series increased 36% from 5.95 million to 8.1 million. In the nickel series CBOE's total number of quotes per day increased 30% from 4.3 million to 5.6 million. In penny series, changes ranged from a decrease of 41% in Whole Foods to an increase of 109% in Flextronics. IWM traffic increased 98% and QQQQ traffic increased 74%. The entire industry experienced a significantly larger quote traffic increase in penny series of 66%. In nickel series, the industry increase was somewhat lower at 25%. The table below compares pre- and post-period quote traffic for each of the penny pilot classes in penny and nickel series.

**CBOE Quotes Disseminated to OPRA** 

	P P	enny Serie	s e		lickel Serie	s	All Series			
	Disse	minated Q	uotes	Disse	minated Q	uotes	Disseminated Quotes			
Class	Pre	Post	% Chg	Pre	Post	% Chg	Pre	Post	% Chg	
A	96,968	132,833	37%	67,912	76,246	12%	164,880	209,078	27%	
AMD	496,385	363,243	-27%	401,890	323,072	-20%	898,275	686,314	-24%	
CAT	423,938	450,676	6%	626,780	792,359	26%	1,050,718	1,243,035	18%	
FLEX	21,798	45,642	109%	22,387	49,751	122%	44,185	95,394	116%	
GE	247,392	272,720	10%	180,931	257,786	42%	428,323	530,506	24%	
INTC	250,646	210,718	-16%	184,622	176,523	-4%	435,269	387,241	-11%	
IWM	787,260	1,562,691	98%	1,513,354	2,714,251	79%	2,300,615	4,276,942	86%	
MSFT	419,059	251,029	-40%	263,325	362,103	38%	682,384	613,132	-10%	
QQQQ	2,279,513	3,969,449	74%				2,279,513	3,969,449	74%	
SMH	243,011	223,714	-8%	185,948	153,544	-17%	428,959	377,258	-12%	
SUNW	34,459	67,539	96%	4,619	11,348	146%	39,078	78,887	102%	
TXN	345,644	379,916	10%	258,786	378,053	46%	604,430	757,969	25%	
WFMI	308,405	182,926	-41%	597,516	288,215	-52%	905,921	471,141	-48%	
1										
Total	5,954,478	8,113,095	36%	4,308,070	5,583,252	30%	10,262,548	13,696,346	33%	

#### 2. Total Quotes per Day Inbound to CBOEdirect

Quotes sent by market makers to CBOEdirect in the penny classes increased by 73% from 12 million per day 20.7 million per day. As is the case with peak quotes, as shown below, inbound quotes increased by significantly more than outbound quotes which increased 35%.

# 3. Inbound and Outbound Peak Quotes per Second

Peak quotes are based on sustained rates over a 1-minute period. All of the quotes in a minute are counted and the total is divided by 60 to determine the quotes per second. For this portion of the analysis, the pre period is from December 1, 2007 through the penny pilot start date for each stock. The post period begins on the start date. Peak rates for quotes inbound to CBOE generally increased, with peaks in TXN increasing 159%, SUNW increasing 77% and A increasing 74%. Two classes saw decreases with FLEX decreasing 38%. Eight of the 13 classes had increases in peak quote rates outbound to OPRA, with the remaining five classes showing decreases. AMD had the biggest increase at 63% and FLEX had the biggest decrease at 55%. The ratio of outbound peak quotes to inbound peak quotes generally decreased substantially with 12 of the 13 stocks showing decreases in the percentage of peak quotes that are disseminated to OPRA. This results in not being on the NBBO as frequently and when on the NBBO, not showing as much size. The table below shows the inbound and outbound peak rates in the pre and post periods for each of the pilot classes.

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## **CBOE Peak Quote Rates**

		Inbound			Outbound			Out% of In		
	F	Peak Quote	s	Peak Quotes			Peak Quotes			
Class	Pre	Post	% Chg	Pre	Post	% Chg	Pre	Post	% Pt. Chg	
Α	218	379	74%	154	216	40%	71%	57%	-20	
AMD	445	557	25%	323	527	63%	73%	95%	30	
CAT	728	944	30%	499	587	17%	69%	62%	-9	
FLEX	211	132	-38%	169	76	-55%	80%	57%	-28	
GE	344	397	15%	238	244	3%	69%	61%	-11	
INTC	341	333	-2%	271	208	-23%	79%	62%	-21	
IWM	857	1,374	60%	700	841	20%	82%	61%	-25	
MSFT	545	634	16%	434	362	-17%	80%	57%	-28	
QQQQ	825	1,257	52%	743	854	15%	90%	68%	-24	
SMH	171	221	30%	151	126	-17%	88%	57%	-36	
SUNW	57	101	77%	48	57	19%	84%	56%	-33	
TXN	285	739	159%	225	322	43%	79%	44%	-45	
WFMI _	600	690	15%	468	340	-27%	78%	49%	-37	

## **Trading Volume**

# 1. Average Daily Volume

Volume in the pilot classes has increased at CBOE. Overall, CBOE's average daily volume has increased 44% from 393,716 contracts to 566,476 contracts. Much of this increase is due to volume increasing 75% in IWM and 34% in QQQQ – already the two most active classes. In fact, without IWM & QQQQ, CBOE's volume was up just 10%. As a comparison, CBOE's exchange-wide average daily volume increased 22% in the post period from February 1, 2007 through April 30, 2007 vs. a pre-period from November 1, 2006 through January 31, 2007. Ten of the thirteen classes showed volume increases. Of the three classes that showed decreases in volume, MSFT was the largest, decreasing 10%. Total industry volume (all classes) was up 10%. Industry volume in the penny classes was up 38%, 7% when IWM and QQQQ are excluded. Customer, Firm and Market Maker average daily volume all increased, although Firm volume increased the least at 16%. Customer, Firm and Market Maker are the trading origin ranges defined by The Options Clearing Corp.

**CBOE Average Daily Volume** 

	ODOL/Wordgo Daily Volume											
	7	otal AD	V -	Cu	Customer ADV			irm AD	V	Mark	et Makei	ADV
Class	Pre	Post	% Chg	Pre	Post	% Chg	Pre	Post	% Chg	Pre	Post	% Chg
A	717	790	10%	318	311	-2%	49	70	43%	351	410	17%
AMD	13,553	17,838	32%	6,299	9,050	44%	1,261	1,597	27%	5,993	7,192	20%
CAT	8,066	7,793	-3%	3,984	3,695	-7%	1,050	1,118	6%	3,031	2,980	-2%
FLEX	499	529	6%	237	237	0%	17	36	119%	245	256	4%
GE	15,769	17,778	13%	6,942	7,929	14%	2,717	1,176	-57%	6,110	8,673	42%
INTC	21,818	24,907	14%	10,713	12,237	14%	2,087	2,322	11%	9,019	10,348	15%
IWM	158,914	277,490	75%	54,545	100,168	84%	39,679	53,851	36%	64,690	123,472	91%
MSFT	24,171	21,683	-10%	11,585	9,665	-17%	3,497	2,090	-40%	9,089	9,927	9%
QQQQ	130,974	175,088	34%	59,327	79,500	34%	17,977	17,564	-2%	53,670	78,024	45%
SMH	7,470	9,006	21%	2,433	3,495	44%	1,117	1,003	-10%	3,920	4,507	15%
SUNW	2,836	2,692	-5%	1,452	1,435	-1%	366	107	-71%	1,019	1,150	13%
TXN	6,319	6,837	8%	2,480	2,589	4%	934	839	-10%	2,905	3,409	17%
WFMI ]	2,611	4,045	55%	1,078	1,867	73%	287	351	22%	1,246	1,827	47%
		ľ										
Total	393,716	566,476	44%	161,393	232,177	44%	71,036	82,123	16%	161,287	252,175	56%

# 2. Total Number of Trades and Trade Size

Average daily trades, defined as OPRA prints, increased 61% from 5,330 to 8,557. This compares to the increase of 44% in volume. Average trade size was basically flat, with an increase of 3%.

# 3. Total Number of Orders

Orders entered at CBOE increased 32% from 17,622 per day to 23,292 per day. The increase came mostly from simple orders which increased 33% compared to complex orders which increased 13%. IWM had the largest increase of 105% and QQQQ was second with a 95% increase. Orders in MSFT decreased 29%. As is shown in the table, total orders per day coming to CBOE are down in 7 of the pilot classes.

**CBOE Orders Per Day** 

	Simple	o Orders p	er Day	Comple	x Orders	per Day	All Orders per Day			
Class	Pre	Post	% Chg	Pre	Post	% Chg_	Pre	Post	% Chg	
Α	72	86	20%	3	3	4%	75	89	19%	
AMD	1,729	1,717	-1%	64	46	-29%	1,793	1,763	-2%	
CAT	730	771	6%	21	35	67%	751	806	7%	
FLEX	53	46	-14%	2	1	-66%	55	47	-16%	
GE	1,162	1,501	29%	50	25	-49%	1,212	1,527	26%	
INTC	2,383	2,021	-15%	45	49	9%	2,428	2,071	-15%	
IWM	901	1,858	106%	50	88	77%	951	1,947	105%	
MSFT	2,510	1,777	-29%	38	32	-16%	2,548	1,809	-29%	
QQQQ	5,616	11,057	97%	85	86	1%	5,701	11,143	95%	
SMH	404	364	-10%	10	21	117%	414	385	-7%	
SUNW	331	296	-11%	9	7	-26%	340	302	-11%	
TXN	770	668	-13%	10	25	140%	780	693	-11%	
WFMI	564	681	21%	10	31	222%	574	712	24%	
Total	17,225	22,843	33%	397	449	13%	17,622	23,292	32%	

# **Linkage**

Linkage order traffic increased much more than overall order traffic. Linkage orders sent to CBOE increased 75% from 189 to 331 orders per day. Linkage orders sent by CBOE to other exchanges increased 155% from 497 to 1,266 orders per day. This is compared to an increase of 32% in CBOE's order traffic.

**CBOE Linkage Orders Per Day** 

	Inboun	d Linkage	(0)(d()(S	Outbou	nd Linkage	o Orders	Inbound + Outbound			
Class	Pre	Post	% Chg	Pre	Post	% Chg	Pre	Post	% Chg	
Α	3	2	-44%	2	6	192%	5	8	61%	
AMD	17	14	-20%	34	28	-18%	51	41	-18%	
CAT	11	11	-3%	5	14	192%	16	25	54%	
FLEX	1	2	97%	2	2	57%	3	4	73%	
GE	12	24	103%	12	29	151%	23	53	127%	
INTC	20	27	36%	52	67	31%	72	95	32%	
IWM	40	17	-57%	7	44	503%	47	61	30%	
MSFT	24	24	3%	80	97	22%	103	122	18%	
	45	188	317%	278	921	231%	323	1,109	243%	
SMH	2	3	59%	12	12	-3%	14	15	7%	
SUNW	2	2	-23%	4	12	247%	6	14	145%	
TXN	6	10	62%	6	14	127%	12	24	96%	
WFMI	6	7	21%	4	18	315%	10	25	145%	
Total	189	331	75%	497	1,266	155%	685	1,596	133%	