

MEMORANDUM

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TO: File No. S7-10-04

FROM: Heather Seidel
Division of Market Regulation

DATE: August 24, 2004

SUBJECT: Meeting with Representatives of Hudson River Trading LLC

On August 16, 2004, staff of the Division of Market Regulation and Susan Ameal, Counsel to Commissioner Atkins, met with Jason Carroll, Suhas Daftuar, and Alex Morcos of Hudson River Trading LLC. The representatives of Hudson River Trading discussed their views on proposed Regulation NMS as outlined in their August 13, 2004 comment letter on proposed Regulation NMS.

**Hudson River Trading
SEC Meeting
Monday August 16, 2004**

- Automated market exception is insufficient
 - No provision for quote-through
 - All automated markets are not equivalent
- Enforcement and monitoring of quote-throughs and trade-throughs is very difficult
 - Variety of data sources could be used and different participants will have different information
 - Significant percentage are false positives
- Self interest of market participants makes a trade-through rule unnecessary
 - Liquidity providers do not need protection for their limit orders
 - Trade-throughs are usually executed for valid reasons which we should continue to allow for instance inaccessibility of a quote
- Sub-penny quoting and trading improves the market place
 - There is ample evidence that this is not used just for stepping ahead.
 - The Commission should not be making the determination of an economically significant amount.
 - Sub-penny trading can increase liquidity and reduce trading cost.
- ECN access fees should not be limited except by competition
- Customer orders through brokers should receive fair treatment, but this should not be enforced with a trade-through rule

Compliance with 6/14 quote-through ruling

On June 14, 2004, an SEC rule preventing market centers from publishing locking or crossing quotations in the ETFs QQQ, SPY, and DIA took effect. Using CQS data, we measured compliance with this ruling.

We looked at all instances where a market center displayed a quote that locked or crossed the market. Since small timing discrepancies cause a large number of these incidents, we focused on a stricter definition that we call a violation. These types of violations should be completely avoidable.

We counted a violation for each market center whenever it entered a quote that initiated a locked/crossed market and:

1. The market had been unlocked and uncrossed for at least 1 second.
2. There was at least one >100 share quote that was at least 1 second old being locked/crossed.
3. The lock/cross lasted for at least 1 second.

We compiled, for both QQQ and SPY, the average number of these per day for each of the market centers before and after the rule change. This data is for 5/1/2004 through 7/30/2004.

We also counted 5-second violations: locks/crosses that occur when the market had been unlocked and uncrossed for at least 5 seconds, and there was at least one >100 share quote at least 5 seconds old that was being locked or crossed, and the lock/cross lasted for at least 1 second.

Our criteria for 1-sec violations matched 48% of all QQQ locks and crosses and 26% of all SPY locks and crosses. Our criteria for 5-sec violations matched 22% of QQQ locks and crosses and 9% of SPY locks and crosses.

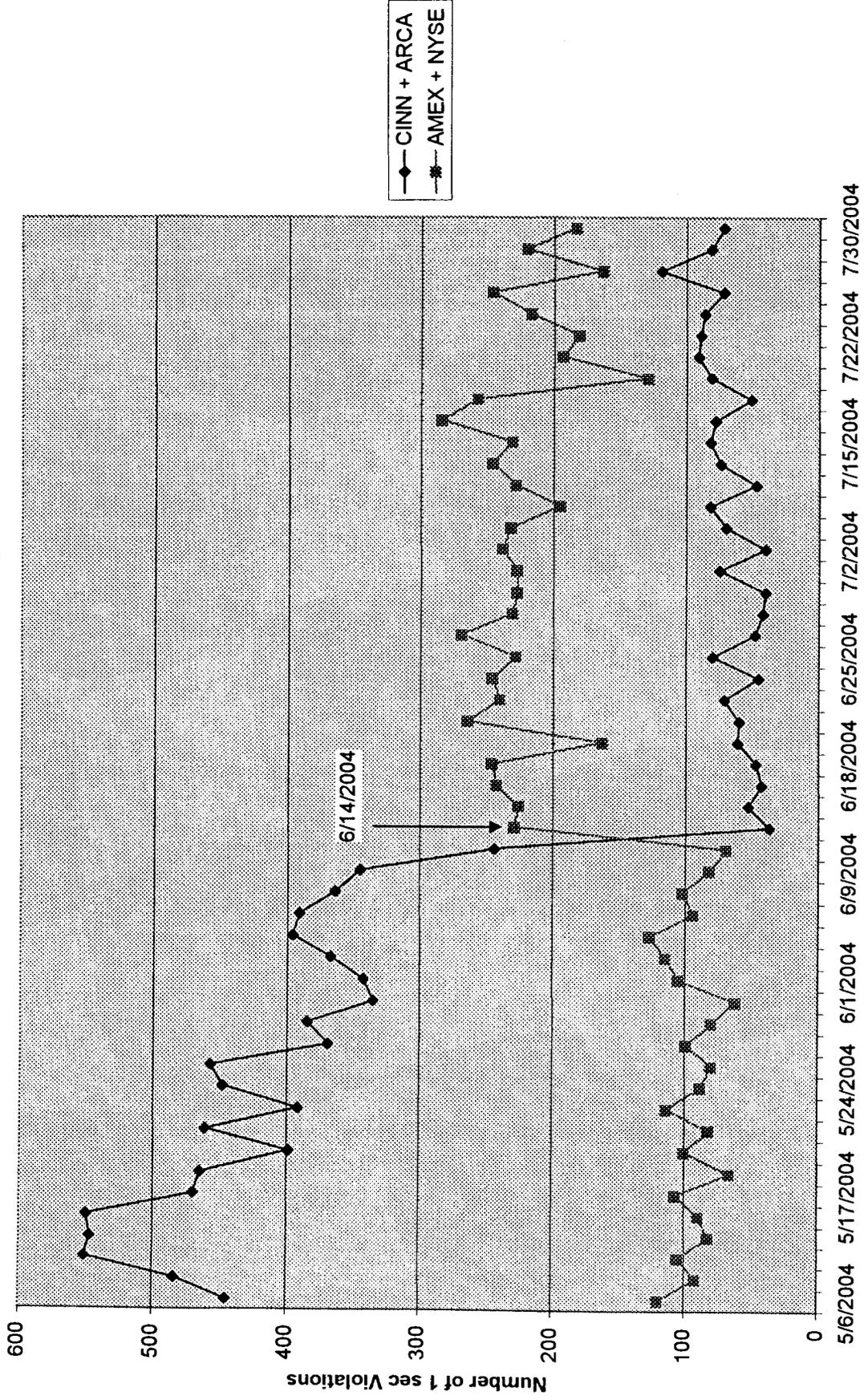
		Average # of 1 second violations per day				% of total	daily violation time (minutes)
		AMEX	NYSE	CINN	ARCA		
SPY	Pre 6/14	48.0	33.0	129.8	275.1	26%	86.8
	Post 6/14	75.7	78.1	7.2	51.9		
	Change	57.84%	136.25%	-94.48%	-81.13%		
QQQ	Pre 6/14	64.3	29.3	159.5	259.0	48%	134.0
	Post 6/14	101.6	121.9	8.8	57.3		
	Change	58.00%	315.65%	-94.47%	-77.89%		
		Average # of 5 second violations per day				% of total	daily violation time (minutes)
		AMEX	NYSE	CINN	ARCA		
SPY	Pre 6/14	13.1	9.0	43.0	86.0	9%	29.5
	Post 6/14	25.8	30.4	0.2	21.3		
	Change	96.35%	235.85%	-99.44%	-75.23%		
QQQ	Pre 6/14	25.4	11.0	63.6	102.3	22%	61.8
	Post 6/14	55.5	68.8	0.6	29.4		
	Change	118.75%	523.13%	-99.13%	-71.25%		

Note the daily violation time is the average time the markets spent crossed or locked each day when the cross or lock was caused by one of these violations. The total time the markets spent crossed or locked each day is considerably more than this. Also note that pre June 14th, crossing the market in this manner wasn't against the rules.

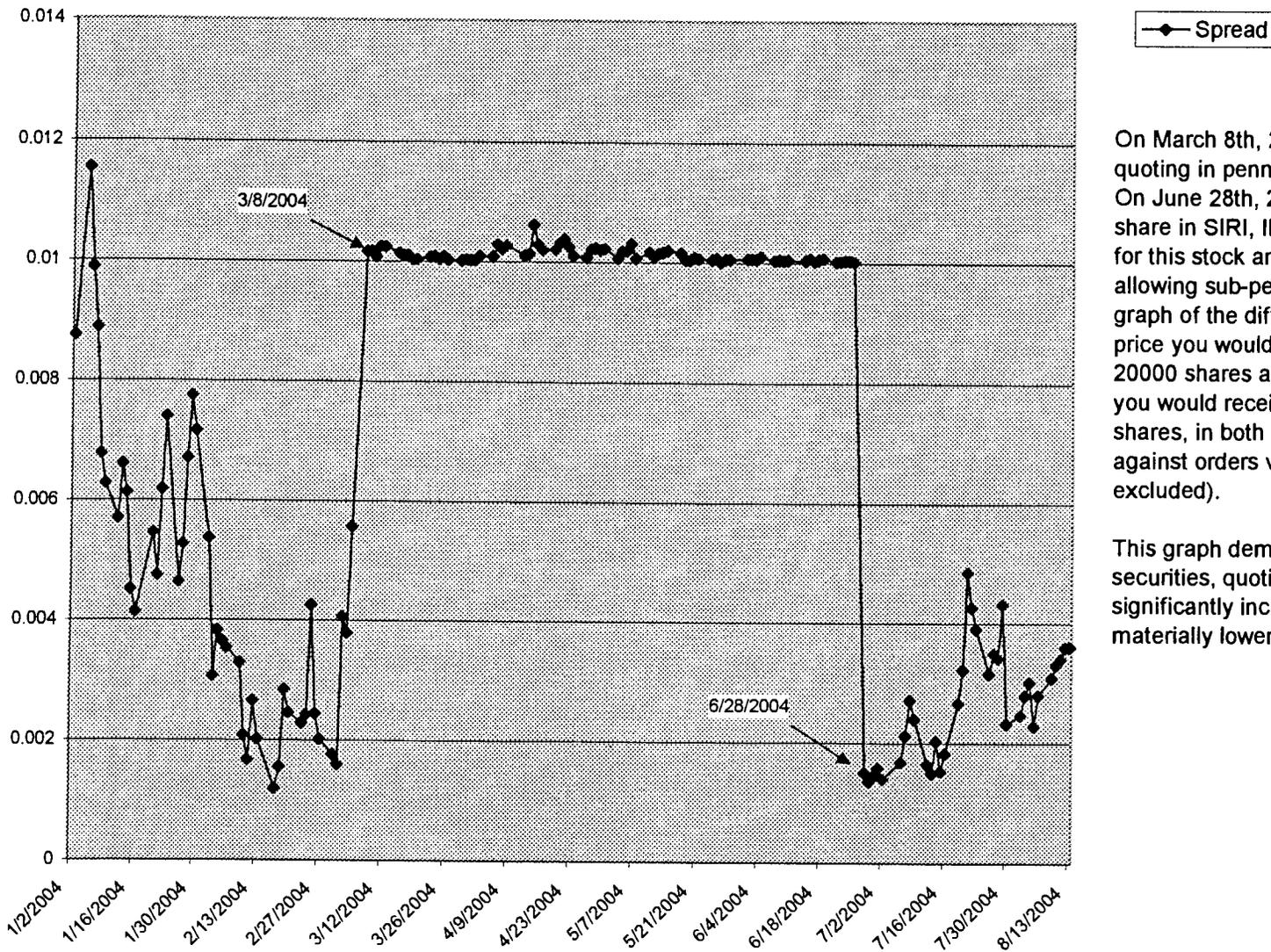
The 4 markets listed account for over 85% of the violations in SPY and over 95% of the violations in QQQ.

QQQ

INET and ArcaEx comply with the 6/14 quote-through ruling, while AMEX and NYSE do not



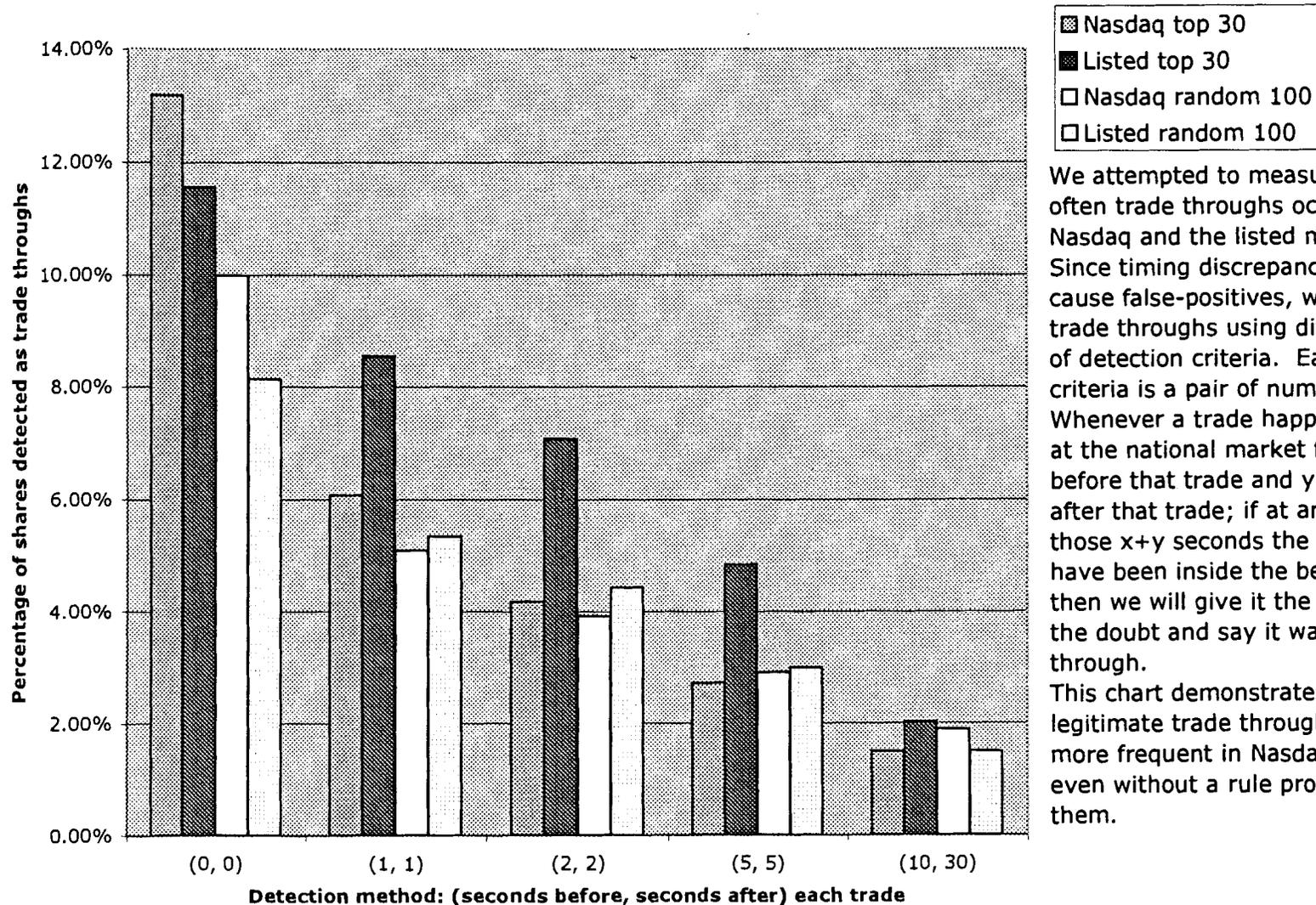
Quoted spread to execute 10000 shares of SIRI on INET, 20040102 - 20040813



On March 8th, 2004, INET switched to quoting in pennies for stocks over \$1. On June 28th, 2004, after losing market share in SIRI, INET made an exception for this stock and switched back to allowing sub-penny quotes. This is a graph of the difference in the average price you would have to pay to buy 20000 shares and the average price you would receive selling 20000 shares, in both cases by executing against orders visible on the book (fees excluded).

This graph demonstrates that in some securities, quoting in sub-pennies can significantly increase the liquidity and materially lower trading costs.

Trade-through incident rate (shares) under various detection methods, July 2004

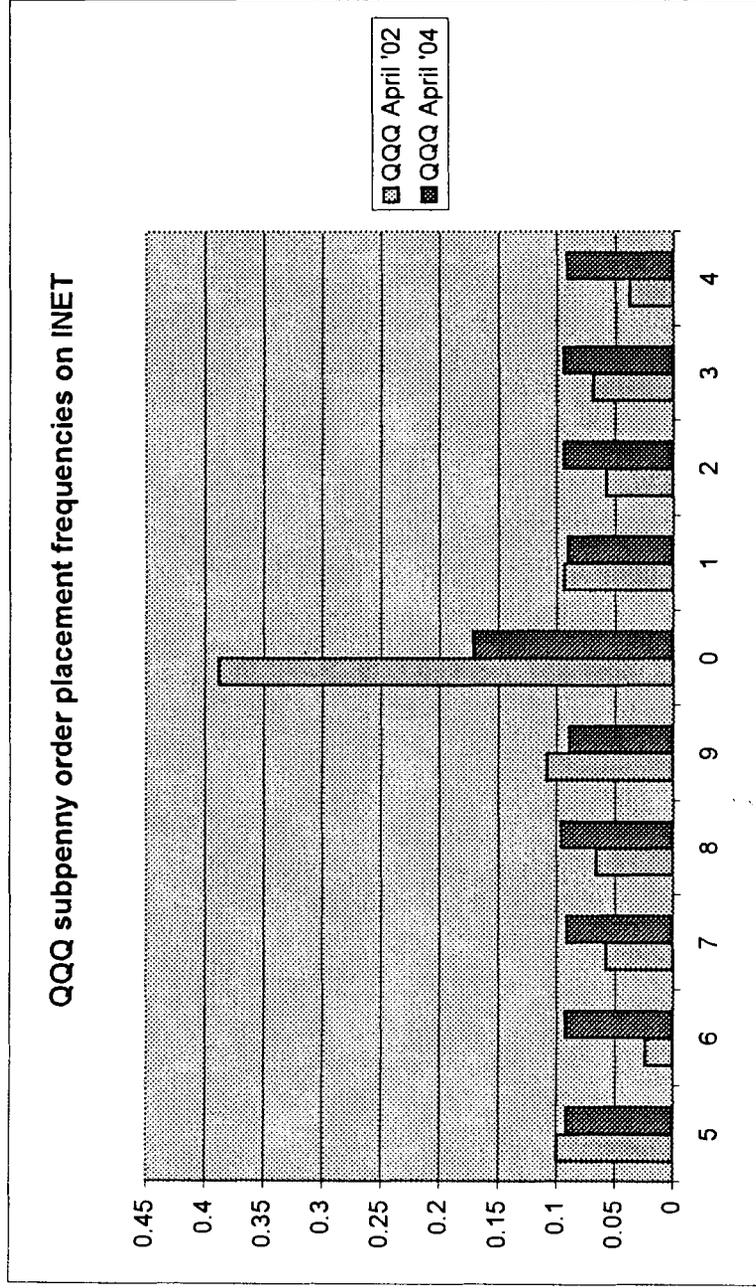


We attempted to measure how often trade throughs occur on both Nasdaq and the listed markets. Since timing discrepancies can cause false-positives, we counted trade throughs using different sets of detection criteria. Each set of criteria is a pair of numbers (x,y). Whenever a trade happens we look at the national market for x seconds before that trade and y seconds after that trade; if at any point in those x+y seconds the trade would have been inside the best market, then we will give it the benefit of the doubt and say it wasn't a trade through.

This chart demonstrates that legitimate trade throughs are not more frequent in Nasdaq stocks even without a rule prohibiting them.

p	April '02	QQQ
5	63669	0.099211
6	15139	0.02359
7	37124	0.057848
8	42232	0.065807
9	69632	0.108502
0	248911	0.387859
1	60065	0.093595
2	36915	0.057522
3	44026	0.068602
4	24043	0.037464

p	April '04	QQQ
5	193589	0.091065
6	196151	0.09227
7	193847	0.091186
8	203076	0.095527
9	189757	0.089262
0	364203	0.171322
1	191821	0.090233
2	200092	0.094124
3	199883	0.094025
4	193424	0.090987



Prevalence of Crossed Markets

We attempted to measure how often crossed markets occur in both Nasdaq and Listed Stocks. Since small timing discrepancies cause a large number of these incidents, we focused on a stricter definition that we call a violation. We counted a cross for an n-second violation when:

1. The market had been uncrossed for at least n seconds.
2. There was at least one quote that was at least n seconds old being crossed.
3. The cross lasted at least 1 second (except for n of 0)

The number of crosses caused during the day and the length of time the market stayed crossed were measured with 0 (any cross of any length), 1, 2 and 5 second values of n.

CQS.top30.VN.csv

v	Count	AvgLen	TotalTime	Correct	Fraction of Day
V0	12385	6.02	74526.35	0.59	0.66%
V1	6032	9.48	57197.65	0.61	0.51%
V2	4888	10.07	49210.69	0.62	0.44%
V5	3358	11.18	37536.55	0.65	0.33%

UQDF.top30.VN.csv

v	Count	AvgLen	TotalTime	Correct	Fraction of Day
V0	116129	1.28	148927.71	0.64	1.33%
V1	21010	3.25	68334.97	0.84	0.61%
V2	15889	3.38	53702.57	0.85	0.48%
V5	9715	3.67	35688.52	0.86	0.32%

iaQ.top30.VN.csv

v	Count	AvgLen	TotalTime	Correct	Fraction of Day
V0	72663	0.44	32321.15	0.49	0.29%
V1	1340	3.89	5208.39	0.4	0.05%
V2	752	4.28	3219.31	0.38	0.03%
V5	269	4.75	1277.03	0.33	0.01%

ia.top30.VN.csv

v	Count	AvgLen	TotalTime	Correct	Fraction of Day
V0	19706	0.17	3287.83	0.4	0.03%
V1	79	3.47	273.88	0.46	0.00%
V2	33	4.39	144.77	0.45	0.00%
V5	13	5.67	73.71	0.38	0.00%

CQS.rand100.VN.csv

v	Count	AvgLen	TotalTime	Correct	Fraction of Day
V0	3091	9.1	28119.89	0.59	0.08%
V1	1537	14.69	22577.11	0.59	0.06%
V2	1269	15.61	19808.52	0.6	0.05%
V5	897	17.31	15525.92	0.62	0.04%

UQDF.rand100.VN.csv

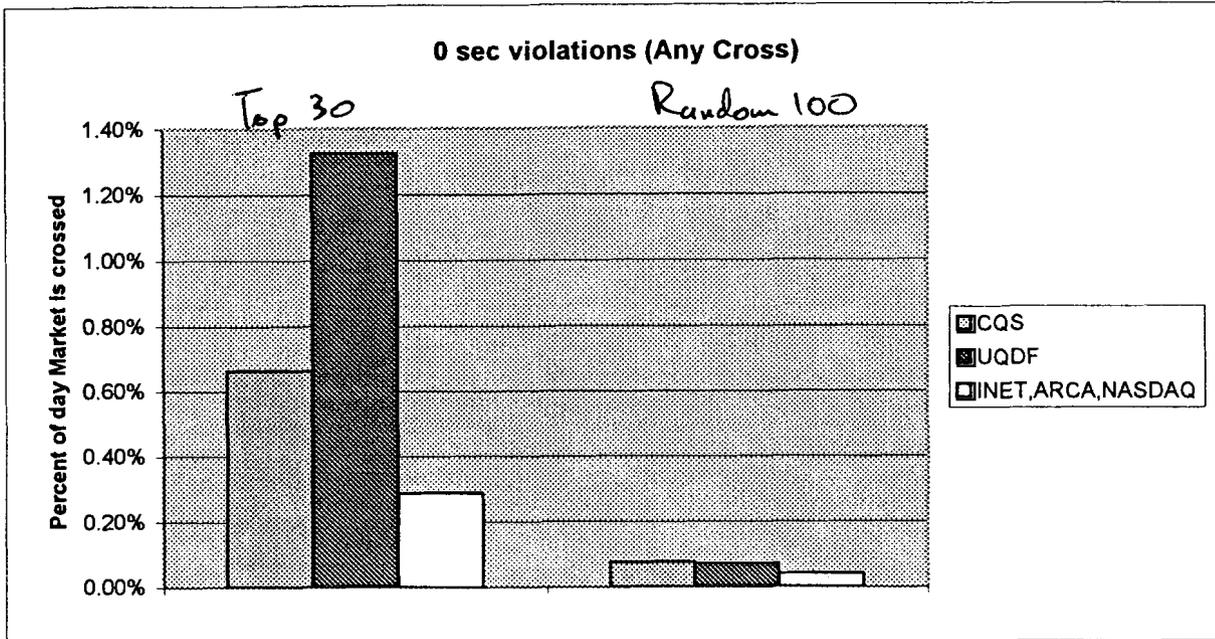
v	Count	AvgLen	TotalTime	Correct	Fraction of Day
V0	11005	2.44	26853.5	0.57	0.07%
V1	1989	8.11	16138.31	0.56	0.04%
V2	1572	9.14	14374.71	0.54	0.04%
V5	1103	10.73	11833.16	0.52	0.03%

iaQ.rand100.VN.csv

v	Count	AvgLen	TotalTime	Correct	Fraction of Day
V0	13075	1.16	15102.13	0.46	0.04%
V1	1054	8.06	8492.2	0.42	0.02%
V2	842	9.07	7633.61	0.41	0.02%
V5	577	10.8	6229.31	0.38	0.02%

ia.rand100.VN.csv

v	Count	AvgLen	TotalTime	Correct	Fraction of Day
V0	3307	0.48	1587.9	0.4	0.00%
V1	107	7.21	771.57	0.43	0.00%
V2	95	7.78	738.75	0.42	0.00%
V5	75	8.8	659.82	0.44	0.00%

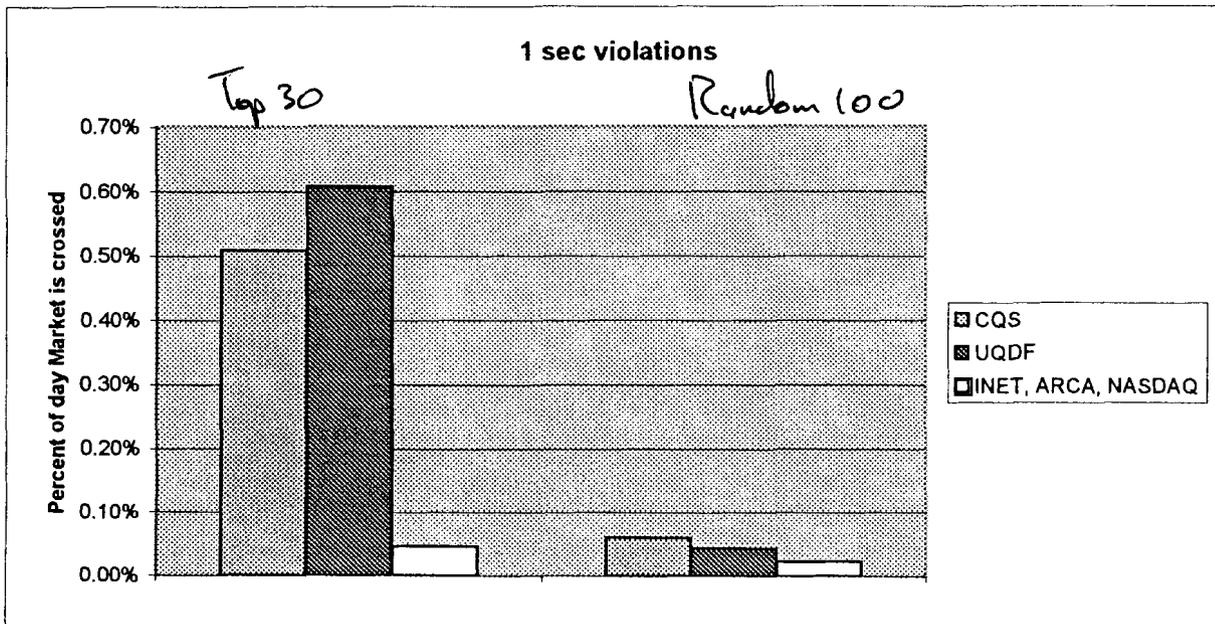


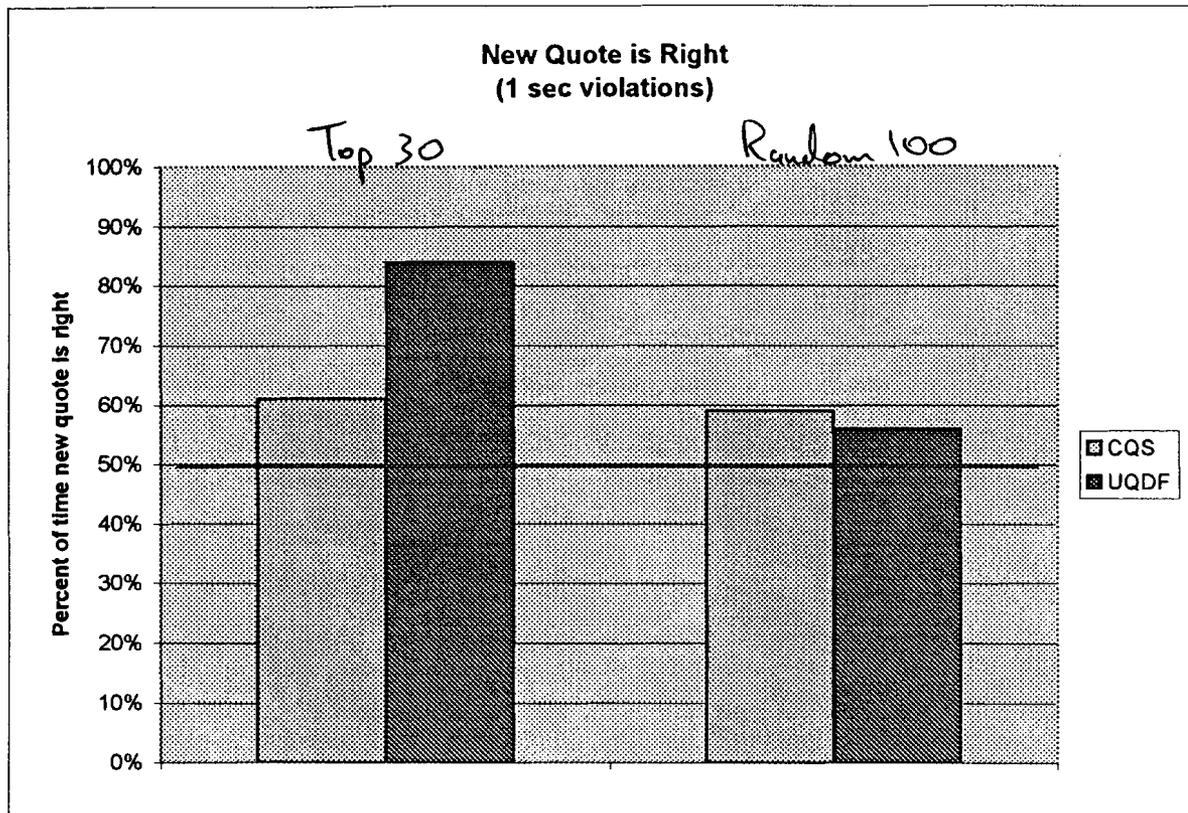
Although Nasdaq markets are crossed more often than Listed markets for high volume stocks, they are not crossed more often in a random selection of stocks, nor do they spend significantly more time in legitimate crosses (those caused by 1 second violations).

It is worth noting that this nearly comparable performance is achieved even though there should be no 1 second violations in NYSE stocks due to the trade through rule. Also Nasdaq markets tend to experience many more crosses that last for a much shorter time than NYSE crosses.

Furthermore, if we only look at the automated markets in Nasdaq stocks, using, if possible, their proprietary data feeds, we can see they are crossed significantly less often than either the overall Nasdaq market or the overall market for Listed stocks. In fact when we consider only legitimate crosses (1 second violations), there are hardly ever crosses in the automated markets.

This demonstrates that a significant number of crossed market situations exist because of data discrepancy or manual markets, and that without any trade through or quote through prohibition rule there is already very little incidence of legitimate crossed automated markets.





This is further evidence that quoting through should be allowed. Of legitimate quote throughs, those not caused solely by data discrepancy (1 sec violations), over 60% of the time, the new quote is right. This is determined by looking at the market when it becomes uncrossed and deciding whether the price of the quote that was crossed still exists in the uncrossed market.