# An Empirical Analysis of New Rules Adopted Under Regulation National Market System: Pilot Phase Period Implementation Results

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**Web Appendix**

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# Table 1.1 Quotes: NYSE Pilot Phase Sample, Medians 5-Day Pairings

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NYSE pilot phase stocks.**

**The pairings contain 5 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 36.35% | 30.70% | -5.65% | 0.000 | 0.000 | 36.84% | 35.56% | -1.28% | 0.148 | 0.296 | 41.30% | 42.00% | 0.70% | 0.838 | 0.783 |
| At Bid | 13.13% | 13.08% | -0.05% | 0.526 | 0.965 | 9.50% | 8.97% | -0.53% | 0.936 | 0.828 | 8.46% | 9.15% | 0.69% | 0.652 | 0.178 |
| At Ask | 13.49% | 12.50% | -0.99% | 0.031 | 0.185 | 9.76% | 9.67% | -0.09% | 0.356 | 0.919 | 8.94% | 8.98% | 0.04% | 0.461 | 0.585 |
| Outside NBBO | 18.29% | 19.84% | 1.55% | 0.074 | 0.006 | 11.78% | 12.50% | 0.72% | 1.000 | 0.138 | 7.36% | 8.75% | 1.39% | 0.024 | 0.032 |
| Alone NBBO | 15.48% | 12.46% | -3.02% | 0.000 | 0.000 | 14.65% | 12.90% | -1.75% | 0.000 | 0.002 | 9.76% | 9.58% | -0.18% | 0.043 | 0.133 |
| Alone Bid | 3.70% | 3.49% | -0.21% | 0.007 | 0.001 | 2.82% | 3.01% | 0.19% | 0.686 | 0.698 | 2.04% | 2.52% | 0.48% | 0.000 | 0.001 |
| Alone Ask | 1.34% | 1.30% | -0.04% | 0.289 | 0.200 | 1.58% | 1.61% | 0.03% | 0.758 | 0.708 | 1.19% | 1.42% | 0.23% | 0.007 | 0.024 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 39.56% | 39.33% | -0.23% | 0.004 | 0.037 | 44.69% | 39.83% | -4.86% | 0.066 | 0.040 | 48.35% | 48.14% | -0.21% | 0.414 | 0.821 |
| Vol at Bid | 6.67% | 6.65% | -0.02% | 0.767 | 0.497 | 4.89% | 5.77% | 0.88% | 0.005 | 0.013 | 4.11% | 5.19% | 1.08% | 0.296 | 0.673 |
| Vol at Ask | 7.02% | 6.53% | -0.49% | 0.220 | 0.147 | 5.40% | 5.73% | 0.33% | 0.748 | 0.742 | 4.16% | 5.72% | 1.56% | 0.015 | 0.006 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 22.74% | 24.33% | 1.59% | 0.167 | 0.054 | 13.55% | 14.34% | 0.79% | 0.225 | 0.347 | 10.28% | 10.16% | -0.12% | 0.305 | 0.772 |
| Vol Alone NBBO | 20.83% | 17.35% | -3.48% | 0.000 | 0.000 | 16.90% | 16.42% | -0.48% | 0.060 | 0.178 | 11.53% | 10.16% | -1.37% | 0.041 | 0.095 |
| Vol Alone Bid | 1.84% | 1.92% | 0.08% | 0.830 | 0.638 | 1.71% | 1.75% | 0.04% | 1.000 | 0.423 | 0.88% | 1.31% | 0.43% | 0.000 | 0.000 |
| Vol Alone Ask | 0.67% | 0.62% | -0.05% | 0.808 | 0.873 | 0.96% | 0.98% | 0.02% | 0.697 | 0.602 | 0.59% | 0.65% | 0.06% | 0.184 | 0.752 |

# Table 1.2: Quotes NYSE Matching Sample, Medians 5-Day Pairings

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NYSE matching sample stocks.**

**The pairings contain 5 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 32.24% | 32.00% | -0.24% | 0.434 | 0.640 | 37.82% | 36.16% | -1.66% | 0.984 | 0.937 | 41.84% | 40.11% | -1.73% | 0.004 | 0.021 |
| At Bid | 13.69% | 14.12% | 0.43% | 0.813 | 0.872 | 10.31% | 10.35% | 0.04% | 0.984 | 0.999 | 9.57% | 9.94% | 0.37% | 0.496 | 0.551 |
| At Ask | 13.67% | 13.30% | -0.37% | 0.605 | 0.988 | 10.67% | 10.41% | -0.26% | 0.104 | 0.146 | 9.75% | 10.59% | 0.84% | 0.000 | 0.004 |
| Outside NBBO | 18.73% | 20.10% | 1.37% | 0.935 | 0.697 | 11.64% | 12.05% | 0.41% | 0.904 | 0.773 | 7.31% | 9.47% | 2.16% | 0.000 | 0.006 |
| Alone NBBO | 15.91% | 13.64% | -2.27% | 0.000 | 0.000 | 14.19% | 13.45% | -0.74% | 0.032 | 0.071 | 11.35% | 10.53% | -0.82% | 0.054 | 0.115 |
| Alone Bid | 3.82% | 3.85% | 0.03% | 0.231 | 0.128 | 2.53% | 2.95% | 0.42% | 0.787 | 0.786 | 2.08% | 2.41% | 0.33% | 0.623 | 0.937 |
| Alone Ask | 1.39% | 1.35% | -0.04% | 0.574 | 0.037 | 1.58% | 1.66% | 0.08% | 0.231 | 0.359 | 1.16% | 1.34% | 0.18% | 0.004 | 0.152 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 40.87% | 39.16% | -1.71% | 0.010 | 0.060 | 44.73% | 44.79% | 0.06% | 0.173 | 0.165 | 49.01% | 47.53% | -1.48% | 0.001 | 0.002 |
| Vol at Bid | 6.59% | 6.90% | 0.31% | 0.637 | 0.242 | 5.58% | 5.59% | 0.01% | 0.695 | 0.636 | 4.46% | 5.29% | 0.83% | 0.190 | 0.417 |
| Vol at Ask | 6.69% | 7.08% | 0.39% | 0.006 | 0.019 | 5.92% | 5.29% | -0.63% | 0.128 | 0.221 | 4.52% | 5.57% | 1.05% | 0.009 | 0.032 |
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Outside | 24.04% | 23.73% | -0.31% | 0.790 | 0.723 | 15.56% | 15.79% | 0.23% | 0.253 | 0.016 | 9.95% | 12.90% | 2.95% | 0.000 | 0.000 |
| Vol Alone NBBO | 21.42% | 19.41% | -2.01% | 0.002 | 0.049 | 17.45% | 17.20% | -0.25% | 0.149 | 0.605 | 12.82% | 13.00% | 0.18% | 0.391 | 0.444 |
| Vol Alone Bid | 1.94% | 2.12% | 0.18% | 0.500 | 0.517 | 1.67% | 1.72% | 0.05% | 0.724 | 0.401 | 1.10% | 1.35% | 0.25% | 0.016 | 0.121 |
| Vol Alone Ask | 0.70% | 0.66% | -0.04% | 0.092 | 0.000 | 0.91% | 0.91% | 0.00% | 0.801 | 0.620 | 0.53% | 0.69% | 0.16% | 0.123 | 0.190 |

# Table 1.3: Quotes NYSE Pilot Phase Sample, Medians 3-Day Pairings

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO,**

**Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NYSE Pilot Phase stocks.**

**The pairings contain 3 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 33.74% | 30.63% | -3.11% | 0.000 | 0.000 | 39.37% | 34.20% | -5.17% | 0.000 | 0.001 | 46.75% | 41.33% | -5.42% | 0.000 | 0.000 |
| At Bid | 12.63% | 14.29% | 1.66% | 0.263 | 0.064 | 9.16% | 9.70% | 0.54% | 0.015 | 0.055 | 7.63% | 10.82% | 3.19% | 0.000 | 0.000 |
| At Ask | 13.46% | 12.53% | -0.93% | 0.131 | 0.494 | 9.50% | 9.84% | 0.34% | 0.265 | 0.886 | 7.20% | 9.18% | 1.98% | 0.057 | 0.158 |
| Outside NBBO | 18.18% | 19.40% | 1.22% | 0.022 | 0.001 | 11.90% | 12.45% | 0.55% | 0.012 | 0.006 | 5.22% | 8.71% | 3.49% | 0.000 | 0.000 |
| Alone NBBO | 14.86% | 11.40% | -3.46% | 0.000 | 0.000 | 16.04% | 12.79% | -3.25% | 0.000 | 0.000 | 10.71% | 10.29% | -0.42% | 0.070 | 0.160 |
| Alone Bid | 3.63% | 3.49% | -0.14% | 0.136 | 0.081 | 2.66% | 3.20% | 0.54% | 0.039 | 0.088 | 1.62% | 3.09% | 1.47% | 0.000 | 0.000 |
| Alone Ask | 1.36% | 1.28% | -0.08% | 1.000 | 0.946 | 1.48% | 1.63% | 0.15% | 0.009 | 0.033 | 0.93% | 1.70% | 0.77% | 0.000 | 0.000 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 39.82% | 38.47% | -1.35% | 0.000 | 0.007 | 45.32% | 39.18% | -6.14% | 0.001 | 0.002 | 52.16% | 48.56% | -3.60% | 0.000 | 0.000 |
| Vol at Bid | 6.48% | 6.57% | 0.09% | 0.531 | 0.661 | 4.88% | 5.91% | 1.03% | 0.009 | 0.012 | 3.11% | 5.32% | 2.21% | 0.000 | 0.005 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol at Ask | 6.95% | 6.28% | -0.67% | 0.310 | 0.282 | 4.89% | 5.66% | 0.77% | 0.452 | 0.593 | 3.05% | 5.73% | 2.68% | 0.002 | 0.000 |
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 23.47% | 23.83% | 0.36% | 0.024 | 0.050 | 13.43% | 14.24% | 0.81% | 0.010 | 0.033 | 9.75% | 10.02% | 0.27% | 0.000 | 0.000 |
| Vol Alone NBBO | 20.83% | 16.67% | -4.16% | 0.000 | 0.000 | 17.93% | 15.61% | -2.32% | 0.000 | 0.001 | 13.38% | 12.67% | -0.71% | 0.185 | 0.159 |
| Vol Alone Bid | 1.88% | 1.98% | 0.10% | 1.000 | 0.580 | 1.68% | 1.81% | 0.13% | 0.250 | 0.755 | 0.62% | 1.52% | 0.90% | 0.000 | 0.000 |
| Vol Alone Ask | 0.66% | 0.67% | 0.01% | 0.317 | 0.278 | 0.89% | 0.99% | 0.10% | 0.458 | 0.940 | 0.36% | 0.74% | 0.38% | 0.000 | 0.000 |

## Table 1.4: Quotes, NYSE Matching Sample, Medians 3-Day Pairings

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NYSE Matching sample stocks.**

**The pairings contain 3 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| | | | | | | | | | | | | | | | |
| At NBBO | 32.26% | 32.65% | 0.39% | 0.749 | 0.417 | 38.46% | 35.95% | -2.51% | 0.102 | 0.165 | 48.40% | 41.88% | -6.52% | 0.000 | 0.000 |
| At Bid | 12.92% | 14.42% | 1.50% | 0.114 | 0.102 | 10.07% | 10.25% | 0.18% | 0.128 | 0.342 | 7.87% | 10.58% | 2.71% | 0.002 | 0.002 |
| At Ask | 12.97% | 13.20% | 0.23% | 0.435 | 0.780 | 10.30% | 9.80% | -0.50% | 0.441 | 0.569 | 7.82% | 11.07% | 3.25% | 0.000 | 0.000 |
| Outside NBBO | 19.78% | 19.94% | 0.16% | 0.474 | 0.420 | 11.85% | 12.05% | 0.20% | 0.086 | 0.268 | 5.00% | 8.33% | 3.33% | 0.000 | 0.000 |
| Alone NBBO | 16.67% | 13.80% | -2.87% | 0.000 | 0.000 | 15.45% | 12.82% | -2.63% | 0.000 | 0.000 | 13.33% | 11.23% | -2.10% | 0.002 | 0.000 |
| Alone Bid | 3.85% | 3.94% | 0.09% | 0.519 | 0.804 | 2.50% | 3.21% | 0.71% | 0.026 | 0.094 | 1.61% | 2.59% | 0.98% | 0.000 | 0.000 |
| Alone Ask | 1.37% | 1.34% | -0.03% | 0.816 | 0.455 | 1.53% | 1.73% | 0.20% | 0.013 | 0.206 | 0.84% | 1.43% | 0.59% | 0.000 | 0.000 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 42.03% | 38.82% | -3.21% | 0.017 | 0.016 | 47.08% | 43.41% | -3.67% | 0.003 | 0.007 | 56.81% | 49.00% | -7.81% | 0.000 | 0.000 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol at Bid | 6.32% | 7.36% | 1.04% | 0.038 | 0.013 | 6.18% | 5.92% | -0.26% | 0.351 | 0.680 | 3.51% | 5.46% | 1.95% | 0.000 | 0.000 |
| Vol at Ask | 6.35% | 7.29% | 0.94% | 0.000 | 0.002 | 6.08% | 5.66% | -0.42% | 0.410 | 0.469 | 3.38% | 5.50% | 2.12% | 0.000 | 0.000 |
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 24.03% | 23.53% | -0.50% | 0.671 | 0.736 | 15.20% | 15.79% | 0.59% | 0.003 | 0.001 | 6.87% | 12.27% | 5.40% | 0.000 | 0.000 |
| Vol Alone NBBO | 22.49% | 18.48% | -4.01% | 0.002 | 0.022 | 20.09% | 16.09% | -4.00% | 0.002 | 0.020 | 15.52% | 13.16% | -2.36% | 0.001 | 0.001 |
| Vol Alone Bid | 1.94% | 2.33% | 0.39% | 0.207 | 0.087 | 1.62% | 1.80% | 0.18% | 0.707 | 0.723 | 0.83% | 1.51% | 0.68% | 0.000 | 0.000 |
| Vol Alone Ask | 0.68% | 0.69% | 0.01% | 0.684 | 0.269 | 0.96% | 0.92% | -0.04% | 0.091 | 0.810 | 0.39% | 0.77% | 0.38% | 0.000 | 0.000 |

## Table 1.5: Quotes, NYSE Pilot Phase Sample, Medians 1-Day Pairings (+1 to -1)

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NYSE Pilot Phase stocks.**

**The pairings contain 1 day of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 36.36% | 29.51% | -6.85% | 0.000 | 0.000 | 39.46% | 35.42% | -4.04% | 0.004 | 0.043 | 41.67% | 39.47% | -2.20% | 0.027 | 0.030 |
| At Bid | 11.55% | 15.42% | 3.87% | 0.027 | 0.001 | 9.74% | 11.25% | 1.51% | 0.088 | 0.136 | 8.04% | 12.50% | 4.46% | 0.002 | 0.002 |
| At Ask | 12.48% | 11.82% | -0.66% | 0.209 | 0.723 | 9.28% | 7.46% | -1.82% | 0.557 | 0.074 | 10.12% | 9.96% | -0.16% | 0.962 | 0.459 |
| Outside NBBO | 17.65% | 19.39% | 1.74% | 0.135 | 0.009 | 11.26% | 11.81% | 0.55% | 0.020 | 0.007 | 7.66% | 10.18% | 2.52% | 0.000 | 0.010 |
| Alone NBBO | 13.74% | 9.68% | -4.06% | 0.002 | 0.004 | 15.76% | 10.51% | -5.25% | 0.000 | 0.000 | 9.78% | 9.09% | -0.69% | 0.015 | 0.037 |
| Alone Bid | 3.60% | 3.67% | 0.07% | 1.000 | 0.928 | 2.36% | 3.08% | 0.72% | 0.005 | 0.010 | 1.92% | 2.92% | 1.00% | 0.001 | 0.004 |
| Alone Ask | 1.35% | 1.35% | 0.00% | 0.079 | 0.302 | 1.45% | 1.46% | 0.01% | 0.963 | 0.537 | 1.14% | 1.61% | 0.47% | 0.066 | 0.272 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 39.82% | 37.92% | -1.90% | 0.002 | 0.026 | 45.25% | 35.92% | -9.33% | 0.044 | 0.047 | 46.39% | 42.88% | -3.51% | 0.162 | 0.181 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol at Bid | 6.74% | 8.28% | 1.54% | 0.638 | 0.654 | 4.52% | 6.37% | 1.85% | 0.088 | 0.010 | 3.97% | 5.26% | 1.29% | 0.155 | 0.587 |
| Vol at Ask | 6.78% | 6.08% | -0.70% | 0.629 | 0.894 | 4.63% | 5.38% | 0.75% | 0.964 | 0.949 | 3.40% | 6.16% | 2.76% | 0.015 | 0.003 |
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 24.14% | 23.36% | -0.78% | 0.057 | 0.034 | 13.74% | 13.98% | 0.24% | 0.054 | 0.246 | 11.16% | 10.24% | -0.92% | 0.087 | 0.331 |
| Vol Alone NBBO | 20.00% | 15.69% | -4.31% | 0.000 | 0.005 | 16.52% | 11.20% | -5.32% | 0.001 | 0.004 | 13.40% | 11.81% | -1.59% | 0.047 | 0.060 |
| Vol Alone Bid | 2.14% | 2.16% | 0.02% | 0.341 | 0.664 | 1.44% | 1.92% | 0.48% | 0.009 | 0.008 | 0.81% | 1.53% | 0.72% | 0.001 | 0.012 |
| Vol Alone Ask | 0.77% | 0.67% | -0.10% | 0.688 | 0.512 | 0.67% | 0.74% | 0.07% | 0.748 | 0.526 | 0.47% | 0.67% | 0.20% | 0.082 | 0.967 |

## Table 1.6: Quotes, NYSE Matching Sample, Medians 1-Day Pairings (+1 to -1)

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO,**

**Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NYSE Matching Sample stocks.**

**The pairings contain 1 day of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 34.06% | 31.75% | -2.31% | 0.381 | 0.113 | 42.19% | 34.39% | -7.80% | 0.002 | 0.001 | 41.84% | 40.02% | -1.82% | 0.001 | 0.020 |
| At Bid | 11.95% | 13.33% | 1.38% | 0.504 | 0.490 | 9.37% | 11.80% | 2.43% | 0.000 | 0.003 | 10.27% | 11.78% | 1.51% | 0.772 | 0.471 |
| At Ask | 12.77% | 13.90% | 1.13% | 0.733 | 0.868 | 9.12% | 9.31% | 0.19% | 0.108 | 0.229 | 10.27% | 12.30% | 2.03% | 0.000 | 0.010 |
| Outside NBBO | 19.48% | 20.95% | 1.47% | 0.034 | 0.022 | 11.64% | 11.83% | 0.19% | 0.000 | 0.030 | 7.77% | 9.45% | 1.68% | 0.004 | 0.118 |
| Alone NBBO | 16.47% | 14.36% | -2.11% | 0.038 | 0.008 | 14.42% | 10.91% | -3.51% | 0.007 | 0.004 | 10.91% | 9.47% | -1.44% | 0.005 | 0.023 |
| Alone Bid | 3.58% | 4.05% | 0.47% | 0.266 | 0.237 | 2.49% | 3.49% | 1.00% | 0.000 | 0.000 | 2.09% | 2.76% | 0.67% | 0.024 | 0.015 |
| Alone Ask | 1.38% | 1.40% | 0.02% | 0.577 | 0.902 | 1.38% | 1.65% | 0.27% | 0.074 | 0.900 | 1.08% | 1.38% | 0.30% | 0.008 | 0.159 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 43.58% | 39.39% | -4.19% | 0.011 | 0.015 | 48.37% | 39.16% | -9.21% | 0.000 | 0.000 | 51.28% | 42.64% | -8.64% | 0.000 | 0.000 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol at Bid | 7.25% | 7.94% | 0.69% | 0.739 | 0.561 | 5.59% | 5.94% | 0.35% | 0.118 | 0.298 | 4.27% | 6.77% | 2.50% | 0.004 | 0.002 |
| Vol at Ask | 5.10% | 8.09% | 2.99% | 0.001 | 0.002 | 5.57% | 4.38% | -1.19% | 0.890 | 0.698 | 4.42% | 6.45% | 2.03% | 0.017 | 0.018 |
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 23.33% | 23.29% | -0.04% | 0.269 | 0.197 | 14.64% | 17.64% | 3.00% | 0.000 | 0.000 | 10.11% | 15.16% | 5.05% | 0.001 | 0.001 |
| Vol Alone NBBO | 20.80% | 18.34% | -2.46% | 0.549 | 0.816 | 18.72% | 14.06% | -4.66% | 0.003 | 0.033 | 14.70% | 10.14% | -4.56% | 0.001 | 0.001 |
| Vol Alone Bid | 1.97% | 2.42% | 0.45% | 0.440 | 0.112 | 1.70% | 1.65% | -0.05% | 0.711 | 0.741 | 1.04% | 1.51% | 0.47% | 0.011 | 0.018 |
| Vol Alone Ask | 0.65% | 0.74% | 0.09% | 0.446 | 0.651 | 0.87% | 0.83% | -0.04% | 0.259 | 0.964 | 0.49% | 0.77% | 0.28% | 0.581 | 0.635 |

# Table 1.7: Quotes, NYSE Pilot Phase Sample, Medians Event Day Matching (+0 to -1)

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO,**

**Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NYSE Pilot Phase stocks.**

**The pairings contain 1 day of data before the event to the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxo n |
| At NBBO | | | | | | | | | | | | | | | |
| At Bid | 3.082% | 3.252% | 0.170% | 0.422 | 0.543 | 0.917% | 0.998% | 0.081% | 1.000 | 0.281 | 3.520% | 3.610% | 0.090% | 0.353 | 0.134 |
| At Ask | 14.421% | 14.857% | 0.436% | 0.040 | 0.058 | 5.750% | 5.562% | -0.188% | 0.893 | 0.436 | 10.200% | 8.745% | -1.455% | 0.559 | 0.158 |
| Outside NBBO | 23.077% | 23.848% | 0.771% | 0.429 | 0.923 | 18.498% | 17.124% | -1.374% | 1.000 | 0.886 | 9.270% | 7.895% | -1.375% | 0.748 | 0.978 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alone NBBO | 15.601% | 15.814% | 0.213% | 0.291 | 0.712 | 7.217% | 7.102% | -0.115% | 0.896 | 0.514 | 12.813% | 12.026% | -0.786% | 0.648 | 0.912 |
| Alone Bid | 0.400% | 0.384% | -0.016% | 0.667 | 0.571 | 0.068% | 0.070% | 0.002% | 0.026 | 0.006 | 0.299% | 0.312% | 0.013% | 0.210 | 0.938 |
| Alone Ask | 1.381% | 1.173% | -0.208% | 0.089 | 0.041 | 1.539% | 1.457% | -0.082% | 0.290 | 0.033 | 1.125% | 1.051% | -0.074% | 0.096 | 0.008 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 45.918% | 44.048% | -1.870% | 0.569 | 0.943 | 50.203% | 51.911% | 1.708% | 0.695 | 0.726 | 54.795% | 57.591% | 2.796% | 0.524 | 0.235 |
| Vol at Bid | 7.476% | 6.755% | -0.721% | 0.004 | 0.027 | 7.244% | 7.849% | 0.605% | 0.500 | 0.766 | 5.408% | 5.750% | 0.342% | 0.845 | 0.609 |
| Vol at Ask | 6.965% | 7.094% | 0.129% | 0.294 | 0.563 | 7.307% | 7.254% | -0.053% | 0.096 | 0.639 | 6.323% | 5.118% | -1.205% | 0.330 | 0.459 |
| Vol Inside | 0.000% | 0.000% | 0.000% | | | 0.000% | 0.000% | 0.000% | | | 0.000% | 0.000% | 0.000% | | |
| Vol Outside | 25.903% | 26.825% | 0.922% | 0.792 | 0.602 | 17.479% | 19.119% | 1.640% | 0.542 | 0.905 | 11.823% | 9.332% | -2.491% | 0.463 | 0.115 |
| Vol Alone NBBO | 19.348% | 19.995% | 0.647% | 1.000 | 0.336 | 22.966% | 22.106% | -0.860% | 0.459 | 0.290 | 15.222% | 15.022% | -0.199% | 0.387 | 0.519 |
| Vol Alone Bid | 1.643% | 1.527% | -0.116% | 0.000 | 0.004 | 0.943% | 0.959% | 0.016% | 0.341 | 0.080 | 0.862% | 0.776% | -0.086% | 0.689 | 0.972 |
| Vol Alone Ask | 0.626% | 0.488% | 0.00 | 0.072 | 0.180 | 1.296% | 1.006% | -0.290% | 0.214 | 0.091 | 0.532% | 0.477% | -0.055% | 0.174 | 0.025 |

## Table 1.8: Quotes, NYSE Matching Sample, Medians Event Day Matching (+0 to -1)

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NYSE Matching sample stocks.**

**The pairings contain 1 day of data before the event to the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 40.809% | 37.500% | -3.309% | 0.015 | 0.006 | 58.080% | 58.798% | 0.717% | 0.041 | 0.113 | 52.827% | 52.135% | -0.692% | 0.963 | 0.443 |
| At Bid | 3.458% | 4.468% | 1.011% | 0.001 | 0.003 | 1.344% | 1.248% | -0.096% | 0.747 | 0.745 | 4.414% | 4.585% | 0.171% | 0.768 | 0.673 |
| At Ask | 14.982% | 15.520% | 0.538% | 0.500 | 0.535 | 7.116% | 6.443% | -0.673% | 0.154 | 0.645 | 10.631% | 9.639% | -0.993% | 0.842 | 0.513 |
| Outside NBBO | 23.670% | 24.348% | 0.678% | 0.652 | 0.579 | 18.160% | 18.110% | -0.050% | 0.013 | 0.058 | 9.091% | 9.605% | 0.514% | 0.423 | 0.724 |
| Alone NBBO | 17.507% | 17.360% | -0.147% | 0.964 | 0.633 | 7.939% | 7.254% | -0.686% | 0.091 | 0.003 | 14.000% | 14.257% | 0.257% | 0.207 | 0.209 |
| Alone Bid | 0.436% | 0.454% | 0.019% | 0.228 | 0.060 | 0.080% | 0.070% | -0.010% | 0.711 | 0.687 | 0.345% | 0.391% | 0.046% | 0.320 | 0.927 |
| Alone Ask | 1.318% | 1.208% | -0.110% | 0.263 | 0.155 | 1.524% | 1.449% | -0.075% | 0.319 | 0.073 | 1.038% | 1.079% | 0.041% | 0.386 | 0.130 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 46.867% | 44.605% | -2.262% | 0.261 | 0.309 | 52.178% | 52.850% | 0.672% | 0.350 | 0.255 | 57.647% | 58.582% | 0.936% | 0.576 | 0.632 |
| Vol at Bid | 7.636% | 6.878% | -0.758% | 0.086 | 0.119 | 8.778% | 8.863% | 0.085% | 0.963 | 0.803 | 6.408% | 5.791% | -0.617% | 0.768 | 0.297 |
| Vol at Ask | 7.155% | 7.074% | -0.081% | 0.248 | 0.245 | 9.131% | 7.944% | -1.188% | 0.818 | 0.747 | 6.520% | 6.348% | -0.172% | 1.000 | 0.813 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Inside | 0.000% | 0.000% | 0.000% | | | 0.000% | 0.000% | 0.000% | | | 0.000% | 0.000% | 0.000% | | |
| Vol Outside | 25.627% | 27.801% | 2.174% | 0.500 | 0.246 | 16.862% | 16.653% | -0.210% | 0.423 | 0.144 | 10.465% | 11.705% | 1.241% | 0.814 | 0.882 |
| Vol Alone NBBO | 22.506% | 23.161% | 0.655% | 0.822 | 0.157 | 23.522% | 21.872% | -1.650% | 0.894 | 0.865 | 17.339% | 18.134% | 0.795% | 0.963 | 0.316 |
| Vol Alone Bid | 1.692% | 1.593% | -0.099% | 0.736 | 0.651 | 1.149% | 0.966% | -0.183% | 0.405 | 0.646 | 0.974% | 0.836% | -0.138% | 0.728 | 0.912 |
| Vol Alone Ask | 0.518% | 0.530% | 0.012% | 0.684 | 0.803 | 1.144% | 0.995% | -0.149% | 0.041 | 0.003 | 0.517% | 0.528% | 0.010% | 0.284 | 0.027 |

# Table 1.9: Quotes, NASDAQ Pilot Sample, Medians 5-Day Pairings

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO,**

**Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NASDAQ Pilot Phase stocks.**

**The pairings contain 5 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 54.70% | 54.23% | -0.47% | 0.478 | 0.395 | 60.05% | 61.30% | 1.25% | 0.541 | 0.369 | 63.51% | 61.87% | -1.64% | 0.153 | 0.129 |
| At Bid | 12.15% | 12.50% | 0.35% | 0.816 | 0.718 | 10.57% | 10.10% | -0.47% | 0.178 | 0.452 | 8.81% | 8.46% | -0.35% | 0.550 | 0.402 |
| At Ask | 11.54% | 12.68% | 1.14% | 0.575 | 0.233 | 10.46% | 11.33% | 0.87% | 0.339 | 0.453 | 7.42% | 9.82% | 2.40% | 0.000 | 0.000 |
| Outside NBBO | 10.00% | 10.08% | 0.08% | 0.254 | 0.327 | 6.13% | 6.09% | -0.04% | 0.476 | 0.172 | 3.70% | 4.07% | 0.37% | 0.250 | 0.636 |
| Alone NBBO | 41.42% | 41.04% | -0.38% | 0.855 | 0.735 | 42.77% | 43.15% | 0.38% | 0.197 | 0.363 | 38.30% | 40.78% | 2.48% | 0.346 | 0.127 |
| Alone Bid | 3.45% | 3.75% | 0.30% | 0.218 | 0.099 | 2.82% | 2.78% | -0.04% | 0.567 | 0.855 | 2.08% | 2.05% | -0.03% | 0.690 | 0.591 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alone Ask | 0.83% | 0.92% | 0.09% | 0.816 | 0.215 | 1.35% | 1.19% | -0.16% | 0.520 | 0.136 | 0.79% | 0.61% | -0.18% | 1.000 | 0.693 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 64.38% | 63.99% | -0.39% | 0.120 | 0.244 | 71.44% | 71.15% | -0.29% | 0.634 | 0.917 | 73.35% | 73.81% | 0.46% | 0.541 | 0.980 |
| Vol at Bid | 5.19% | 5.63% | 0.44% | 0.056 | 0.019 | 4.60% | 5.21% | 0.61% | 0.698 | 0.526 | 4.00% | 3.81% | -0.19% | 0.658 | 0.329 |
| Vol at Ask | 5.30% | 5.32% | 0.02% | 0.744 | 0.442 | 4.67% | 4.98% | 0.31% | 0.891 | 0.604 | 3.37% | 3.83% | 0.46% | 0.012 | 0.034 |
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 12.25% | 13.06% | 0.81% | 0.073 | 0.140 | 7.25% | 7.39% | 0.14% | 0.084 | 0.201 | 3.78% | 5.09% | 1.31% | 0.891 | 0.677 |
| Vol Alone NBBO | 51.43% | 52.15% | 0.72% | 0.437 | 0.934 | 52.41% | 54.64% | 2.23% | 0.390 | 0.395 | 45.74% | 50.67% | 4.93% | 0.029 | 0.022 |
| Vol Alone Bid | 1.92% | 2.21% | 0.29% | 0.202 | 0.028 | 1.94% | 2.10% | 0.16% | 0.731 | 0.596 | 1.19% | 1.20% | 0.01% | 0.490 | 0.810 |
| Vol Alone Ask | 0.31% | 0.36% | 0.05% | 0.471 | 0.551 | 0.74% | 0.74% | 0.00% | 0.366 | 0.072 | 0.25% | 0.20% | -0.05% | 0.058 | 0.149 |

## Table 1.10: Quotes, NASDAQ Matching Sample, Medians 5-Day Pairings

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NASDAQ Matching Sample stocks.**

**The pairings contain 5 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| At NBBO | 52.51% | 52.35% | -0.16% | 0.006 | 0.104 | 50.01% | 59.33% | 9.32% | 0.483 | 0.578 | 61.51% | 63.43% | 1.92% | 0.357 | 0.502 |
| At Bid | 12.50% | 12.50% | 0.00% | 0.621 | 0.828 | 10.40% | 10.89% | 0.49% | 0.467 | 0.903 | 9.42% | 8.33% | -1.09% | 0.303 | 0.141 |
| At Ask | 11.33% | 12.07% | 0.74% | 0.029 | 0.083 | 10.74% | 11.17% | 0.43% | 0.328 | 0.529 | 8.39% | 8.84% | 0.45% | 0.092 | 0.107 |
| Outside NBBO | 10.00% | 10.03% | 0.03% | 0.045 | 0.049 | 6.45% | 6.56% | 0.11% | 0.337 | 0.644 | 4.21% | 4.08% | -0.13% | 0.723 | 0.483 |
| Alone NBBO | 40.77% | 41.17% | 0.40% | 0.011 | 0.040 | 42.31% | 43.77% | 1.46% | 0.003 | 0.002 | 38.92% | 40.18% | 1.26% | 0.384 | 0.564 |
| Alone Bid | 3.66% | 3.75% | 0.09% | 0.353 | 0.391 | 2.93% | 3.00% | 0.07% | 0.398 | 0.233 | 2.33% | 2.17% | -0.16% | 0.570 | 0.534 |
| Alone Ask | 0.62% | 0.75% | 0.13% | 0.066 | 0.143 | 1.12% | 1.00% | -0.12% | 0.080 | 0.176 | 0.64% | 0.52% | -0.12% | 0.200 | 0.465 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 64.06% | 62.11% | -1.95% | 0.026 | 0.026 | 70.15% | 69.39% | -0.76% | 0.635 | 0.965 | 71.43% | 70.40% | -1.03% | 0.024 | 0.078 |
| Vol at Bid | 5.09% | 5.72% | 0.63% | 0.095 | 0.198 | 4.84% | 4.81% | -0.03% | 0.524 | 0.834 | 3.54% | 3.83% | 0.29% | 0.398 | 0.490 |
| Vol at Ask | 5.26% | 5.20% | -0.06% | 0.174 | 0.164 | 4.20% | 4.02% | -0.18% | 0.139 | 0.112 | 3.58% | 4.47% | 0.89% | 0.003 | 0.008 |
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 12.69% | 12.89% | 0.20% | 0.003 | 0.006 | 8.15% | 8.60% | 0.45% | 0.583 | 0.878 | 5.28% | 5.97% | 0.69% | 0.114 | 0.353 |
| Vol Alone NBBO | 50.00% | 51.82% | 1.82% | 0.435 | 0.998 | 51.93% | 55.65% | 3.72% | 0.114 | 0.034 | 49.19% | 47.16% | -2.03% | 0.443 | 0.561 |
| Vol Alone Bid | 1.94% | 2.27% | 0.33% | 0.004 | 0.037 | 1.89% | 2.09% | 0.20% | 0.263 | 0.215 | 1.10% | 1.10% | 0.00% | 1.000 | 0.658 |
| Vol Alone Ask | 0.21% | 0.27% | 0.06% | 0.043 | 0.056 | 0.62% | 0.56% | -0.06% | 0.867 | 0.725 | 0.23% | 0.18% | -0.05% | 0.658 | 0.260 |

## Table 1.11: Quotes, NASDAQ Pilot Sample, Medians 3-Day Pairings

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NASDAQ Pilot Phase stocks.**

**The pairings contain 3 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 54.62% | 54.05% | -0.57% | 0.249 | 0.559 | 60.90% | 60.30% | -0.60% | 0.861 | 0.800 | 68.70% | 63.72% | -4.98% | 0.000 | 0.000 |
| At Bid | 12.40% | 12.50% | 0.10% | 0.673 | 0.952 | 10.06% | 10.56% | 0.50% | 0.953 | 0.436 | 7.04% | 8.03% | 0.99% | 0.084 | 0.042 |
| At Ask | 11.18% | 12.69% | 1.51% | 0.366 | 0.194 | 10.44% | 11.17% | 0.73% | 0.332 | 0.502 | 6.02% | 8.82% | 2.80% | 0.000 | 0.000 |
| Outside NBBO | 9.65% | 10.23% | 0.58% | 0.976 | 0.830 | 6.32% | 6.16% | -0.16% | 1.000 | 0.232 | 2.63% | 3.66% | 1.03% | 0.007 | 0.094 |
| Alone NBBO | 42.61% | 41.18% | -1.43% | 0.392 | 0.228 | 43.00% | 44.14% | 1.14% | 0.129 | 0.252 | 42.42% | 45.07% | 2.65% | 0.615 | 0.684 |
| Alone Bid | 3.47% | 3.70% | 0.23% | 0.360 | 0.276 | 2.81% | 2.79% | -0.02% | 0.745 | 0.975 | 1.69% | 1.96% | 0.27% | 0.000 | 0.002 |
| Alone Ask | 0.81% | 0.89% | 0.08% | 0.444 | 0.187 | 1.37% | 1.14% | -0.23% | 0.148 | 0.046 | 0.46% | 0.36% | -0.10% | 0.705 | 0.295 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 63.79% | 64.33% | 0.54% | 0.768 | 0.936 | 71.40% | 70.88% | -0.52% | 0.682 | 0.931 | 76.58% | 75.19% | -1.39% | 0.006 | 0.028 |
| Vol at Bid | 5.40% | 5.77% | 0.37% | 0.741 | 0.213 | 4.84% | 5.15% | 0.31% | 0.289 | 0.935 | 2.96% | 3.40% | 0.44% | 0.071 | 0.129 |
| Vol at Ask | 5.08% | 5.31% | 0.23% | 0.718 | 0.637 | 4.64% | 5.01% | 0.37% | 0.304 | 0.672 | 2.54% | 3.23% | 0.69% | 0.000 | 0.021 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 12.56% | 13.56% | 1.00% | 0.696 | 0.953 | 7.72% | 7.38% | -0.34% | 0.130 | 0.568 | 2.89% | 4.84% | 1.95% | 0.046 | 0.121 |
| Vol Alone NBBO | 52.43% | 53.06% | 0.63% | 0.093 | 0.721 | 52.39% | 55.02% | 2.63% | 0.170 | 0.269 | 49.93% | 55.16% | 5.23% | 0.067 | 0.048 |
| Vol Alone Bid | 1.92% | 2.26% | 0.34% | 0.394 | 0.080 | 1.98% | 2.12% | 0.14% | 0.976 | 0.729 | 0.79% | 1.20% | 0.41% | 0.001 | 0.038 |
| Vol Alone Ask | 0.27% | 0.33% | 0.06% | 0.947 | 0.789 | 0.77% | 0.68% | -0.09% | 0.242 | 0.037 | 0.15% | 0.11% | -0.04% | 0.043 | 0.024 |

## Table 1.12: Quotes, NASDAQ Matching Sample, Medians 3-Day Pairings

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NASDAQ Matching Sample stocks.**

**The pairings contain 3 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 52.57% | 53.43% | 0.86% | 0.026 | 0.525 | 59.26% | 58.90% | -0.36% | 1.000 | 0.846 | 66.67% | 65.85% | -0.82% | 0.537 | 0.405 |
| At Bid | 12.15% | 12.08% | -0.07% | 0.738 | 0.367 | 10.89% | 10.74% | -0.15% | 0.113 | 0.486 | 7.21% | 7.77% | 0.56% | 0.764 | 0.808 |
| At Ask | 11.62% | 11.95% | 0.33% | 0.204 | 0.509 | 10.37% | 11.39% | 1.02% | 0.428 | 0.381 | 6.93% | 8.14% | 1.21% | 0.027 | 0.181 |
| Outside NBBO | 9.77% | 9.73% | -0.04% | 0.038 | 0.049 | 5.99% | 6.69% | 0.70% | 0.059 | 0.348 | 2.94% | 3.72% | 0.78% | 0.008 | 0.107 |
| Alone NBBO | 40.30% | 41.81% | 1.51% | 0.390 | 0.938 | 43.57% | 43.43% | -0.14% | 0.521 | 0.549 | 42.93% | 43.88% | 0.95% | 0.260 | 0.184 |
| Alone Bid | 3.53% | 3.63% | 0.10% | 0.805 | 0.693 | 3.03% | 2.90% | -0.13% | 0.976 | 0.666 | 1.69% | 2.13% | 0.44% | 0.009 | 0.040 |
| Alone Ask | 0.57% | 0.68% | 0.11% | 0.448 | 0.473 | 1.01% | 0.87% | -0.14% | 0.037 | 0.116 | 0.33% | 0.27% | -0.06% | 0.573 | 0.730 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 64.52% | 61.69% | -2.83% | 0.005 | 0.009 | 70.91% | 70.48% | -0.43% | 0.381 | 0.392 | 75.06% | 71.40% | -3.66% | 0.000 | 0.001 |
| Vol at Bid | 4.98% | 5.54% | 0.56% | 0.504 | 0.249 | 4.56% | 4.62% | 0.06% | 0.860 | 0.870 | 2.94% | 3.76% | 0.82% | 0.001 | 0.006 |
| Vol at Ask | 5.35% | 5.18% | -0.17% | 0.334 | 0.664 | 3.73% | 4.96% | 1.23% | 0.064 | 0.146 | 2.74% | 4.12% | 1.38% | 0.000 | 0.018 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 12.96% | 12.33% | -0.63% | 0.004 | 0.005 | 8.09% | 8.63% | 0.54% | 0.175 | 0.496 | 3.62% | 5.40% | 1.78% | 0.001 | 0.005 |
| Vol Alone NBBO | 49.74% | 52.64% | 2.90% | 0.496 | 0.643 | 51.54% | 55.84% | 4.30% | 0.815 | 0.212 | 53.21% | 48.46% | -4.75% | 0.050 | 0.136 |
| Vol Alone Bid | 1.88% | 2.16% | 0.28% | 0.060 | 0.213 | 1.80% | 1.94% | 0.14% | 0.302 | 0.558 | 0.74% | 1.19% | 0.45% | 0.005 | 0.041 |
| Vol Alone Ask | 0.18% | 0.25% | 0.07% | 0.129 | 0.258 | 0.54% | 0.49% | -0.05% | 0.926 | 0.652 | 0.08% | 0.07% | -0.01% | 0.665 | 0.327 |

# Table 1.13: Quotes, NASDAQ Pilot Sample, Medians 1-Day Pairing (+1 to -1)

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO,**

**Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NASDAQ Pilot Phase stocks.**

**The pairings contain 1 day of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 35.83% | 54.49% | 18.66% | 0.124 | 0.407 | 62.07% | 58.33% | -3.74% | 0.020 | 0.026 | 61.90% | 60.55% | -1.35% | 0.053 | 0.191 |
| At Bid | 11.95% | 12.81% | 0.86% | 0.715 | 0.425 | 11.11% | 12.60% | 1.49% | 0.242 | 0.046 | 9.68% | 8.80% | -0.88% | 0.531 | 0.743 |
| At Ask | 11.71% | 12.71% | 1.00% | 0.210 | 0.268 | 10.73% | 12.00% | 1.27% | 0.104 | 0.147 | 8.20% | 10.92% | 2.72% | 0.005 | 0.010 |
| Outside NBBO | 11.11% | 10.86% | -0.25% | 1.000 | 0.773 | 5.42% | 6.20% | 0.78% | 0.197 | 0.618 | 3.86% | 4.94% | 1.08% | 0.160 | 0.522 |
| Alone NBBO | 44.59% | 39.81% | -4.78% | 0.138 | 0.037 | 44.38% | 43.57% | -0.81% | 0.687 | 0.703 | 37.45% | 40.00% | 2.55% | 0.760 | 0.462 |
| Alone Bid | 3.43% | 3.91% | 0.48% | 0.400 | 0.199 | 2.71% | 3.00% | 0.29% | 0.261 | 0.076 | 2.17% | 2.37% | 0.20% | 0.262 | 0.079 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alone Ask | 0.76% | 0.92% | 0.16% | 0.085 | 0.077 | 1.61% | 1.32% | -0.29% | 0.958 | 0.433 | 0.90% | 1.10% | 0.20% | 0.133 | 0.887 |
| ***Average Volume n Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 66.71% | 60.93% | -5.78% | 0.028 | 0.002 | 72.13% | 68.51% | -3.62% | 0.106 | 0.150 | 71.53% | 72.59% | 1.06% | 0.838 | 0.814 |
| Vol at Bid | 5.04% | 6.32% | 1.28% | 0.231 | 0.011 | 5.56% | 5.57% | 0.01% | 0.879 | 0.380 | 4.42% | 3.64% | -0.78% | 0.095 | 0.287 |
| Vol at Ask | 5.20% | 4.89% | -0.31% | 0.754 | 0.736 | 4.77% | 5.67% | 0.90% | 0.263 | 0.313 | 4.03% | 3.77% | -0.26% | 0.093 | 0.313 |
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 12.68% | 14.63% | 1.95% | 0.043 | 0.016 | 6.82% | 8.01% | 1.19% | 0.005 | 0.030 | 5.53% | 6.98% | 1.45% | 0.160 | 0.278 |
| Vol Alone NBBO | 52.86% | 52.47% | -0.39% | 0.284 | 0.543 | 51.61% | 52.29% | 0.68% | 0.290 | 0.472 | 49.87% | 49.40% | -0.47% | 0.879 | 0.388 |
| Vol Alone Bid | 1.95% | 2.89% | 0.94% | 0.007 | 0.002 | 1.63% | 2.53% | 0.90% | 0.153 | 0.015 | 1.42% | 1.81% | 0.39% | 0.098 | 0.181 |
| Vol Alone Ask | 0.24% | 0.38% | 0.14% | 0.168 | 0.116 | 0.84% | 0.87% | 0.03% | 0.874 | 0.342 | 49.00% | 0.43% | -48.57% | 0.525 | 0.092 |

## Table 1.14: Quotes, NASDAQ Matching Sample, Medians 1-Day Pairing (+1 to -1)

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NASDAQ Matching Sample stocks.**

**The pairings contain 1 day of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 32.63% | 52.61% | 19.98% | 0.610 | 0.958 | 60.28% | 57.64% | -2.64% | 0.005 | 0.003 | 50.09% | 61.33% | 11.24% | 0.168 | 0.124 |
| At Bid | 12.02% | 11.85% | -0.17% | 1.000 | 0.946 | 10.44% | 11.01% | 0.57% | 0.612 | 0.929 | 9.88% | 8.60% | -1.28% | 0.209 | 0.083 |
| At Ask | 11.31% | 11.06% | -0.25% | 0.918 | 0.994 | 9.09% | 10.74% | 1.65% | 0.010 | 0.007 | 9.64% | 10.31% | 0.67% | 0.753 | 0.539 |
| Outside NBBO | 10.96% | 10.37% | -0.59% | 0.469 | 0.595 | 6.22% | 7.69% | 1.47% | 0.000 | 0.001 | 4.51% | 5.81% | 1.30% | 0.041 | 0.253 |
| Alone NBBO | 40.34% | 39.33% | -1.01% | 0.011 | 0.080 | 45.85% | 39.18% | -6.67% | 0.003 | 0.041 | 37.90% | 36.67% | -1.23% | 0.332 | 0.123 |
| Alone Bid | 3.68% | 3.54% | -0.14% | 0.915 | 0.683 | 2.70% | 3.00% | 0.30% | 0.185 | 0.140 | 2.38% | 4.37% | 1.99% | 0.259 | 0.696 |
| Alone Ask | 0.70% | 0.67% | -0.03% | 0.767 | 0.490 | 0.86% | 1.30% | 0.44% | 0.311 | 0.147 | 0.74% | 5.70% | 4.96% | 0.682 | 0.848 |
| ***Average Volume n Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 63.35% | 58.39% | -4.96% | 0.103 | 0.171 | 67.64% | 68.24% | 0.60% | 0.615 | 0.480 | 72.33% | 65.07% | -7.26% | 0.025 | 0.021 |
| Vol at Bid | 4.97% | 6.26% | 1.29% | 0.497 | 0.094 | 4.97% | 5.16% | 0.19% | 0.361 | 0.541 | 3.77% | 4.37% | 0.60% | 0.295 | 0.144 |
| Vol at Ask | 5.72% | 4.94% | -0.78% | 0.438 | 0.214 | 4.59% | 4.83% | 0.24% | 0.722 | 0.939 | 5.42% | 5.70% | 0.28% | 0.462 | 0.366 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Inside | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | | |
| Vol Outside | 14.45% | 13.82% | -0.63% | 0.326 | 0.124 | 8.11% | 9.68% | 1.57% | 0.060 | 0.121 | 5.28% | 8.00% | 2.72% | 0.001 | 0.008 |
| Vol Alone NBBO | 50.53% | 48.62% | -1.91% | 0.334 | 0.263 | 50.32% | 51.54% | 1.22% | 0.227 | 0.366 | 49.28% | 42.86% | -6.42% | 0.262 | 0.211 |
| Vol Alone Bid | 2.17% | 2.54% | 0.37% | 0.089 | 0.142 | 1.86% | 1.88% | 0.02% | 0.154 | 0.402 | 1.22% | 1.96% | 0.74% | 0.361 | 0.355 |
| Vol Alone Ask | 0.29% | 0.23% | -0.06% | 0.678 | 0.445 | 0.49% | 0.62% | 0.13% | 0.122 | 0.460 | 0.25% | 40.00% | 39.75% | 0.413 | 0.898 |

# Table 1.15: Quotes, NASDAQ Pilot Sample, Medians Event Day Matching (+0 to -1)

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO,**

**Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NASDAQ Pilot Phase stocks.**

**The pairings contain 1 day before the event day to the event day. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 58.571% | 58.549% | -0.022% | 0.878 | 0.478 | 70.715% | 71.008% | 0.293% | 1.000 | 0.997 | 66.418% | 68.443% | 2.025% | 0.682 | 0.236 |
| At Bid | 11.513% | 11.220% | -0.292% | 1.000 | 0.844 | 2.168% | 1.900% | -0.268% | 0.000 | 0.000 | 9.827% | 8.696% | -1.131% | 0.712 | 0.796 |
| At Ask | 11.749% | 12.397% | 0.648% | 0.601 | 0.895 | 12.542% | 11.668% | -0.874% | 0.387 | 0.461 | 8.743% | 8.108% | -0.635% | 0.288 | 0.134 |
| Outside NBBO | 10.795% | 9.376% | -1.419% | 0.498 | 0.717 | 8.059% | 6.153% | -1.906% | 0.638 | 0.782 | 3.404% | 3.220% | -0.185% | 0.444 | 0.251 |
| Alone NBBO | 43.875% | 42.537% | -1.338% | 0.003 | 0.000 | 37.446% | 36.745% | -0.701% | 0.000 | 0.005 | 38.776% | 37.241% | -1.534% | 0.004 | 0.002 |
| Alone Bid | 1.087% | 0.685% | -0.402% | 0.000 | 0.000 | 0.256% | 0.272% | 0.015% | 0.919 | 0.729 | 0.959% | 0.870% | -0.090% | 0.357 | 0.188 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alone Ask | 0.684% | 0.829% | 0.145% | 0.385 | 0.110 | 1.523% | 1.457% | -0.067% | 0.016 | 0.093 | 0.877% | 0.885% | 0.008% | 0.326 | 0.400 |
| ***Average Volume in Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 67.435% | 67.396% | -0.040% | 0.759 | 0.614 | 73.122% | 74.719% | 1.597% | 1.000 | 0.790 | 76.129% | 77.215% | 1.086% | 0.574 | 0.587 |
| Vol at Bid | 5.045% | 4.952% | -0.093% | 0.875 | 0.419 | 4.947% | 4.481% | -0.466% | 0.025 | 0.015 | 4.301% | 4.204% | -0.097% | 0.493 | 0.922 |
| Vol at Ask | 5.167% | 5.150% | -0.016% | 0.402 | 0.585 | 4.616% | 4.345% | -0.271% | 0.647 | 0.405 | 4.007% | 39.908% | 35.901% | 0.671 | 0.557 |
| Vol Inside | 0.000% | 0.000% | | | | 0.000% | 0.000% | | | | 0.000% | 0.000% | | | |
| Vol Outside | 13.866% | 13.594% | -0.273% | 0.434 | 0.634 | 8.630% | 7.465% | -1.164% | 0.714 | 0.503 | 5.534% | 4.435% | -1.099% | 0.913 | 0.510 |
| Vol Alone NBBO | 53.186% | 50.844% | -2.342% | 0.016 | 0.002 | 52.049% | 51.337% | -0.712% | 0.038 | 0.134 | 48.754% | 43.890% | -4.865% | 0.000 | 0.000 |
| Vol Alone Bid | 1.796% | 1.825% | 0.029% | 0.242 | 0.295 | 1.716% | 1.701% | -0.015% | 1.000 | 0.943 | 1.301% | 1.082% | -0.218% | 0.665 | 0.683 |
| Vol Alone Ask | 0.245% | 0.325% | 0.081% | 0.118 | 0.017 | 0.907% | 0.801% | -0.106% | 0.310 | 0.706 | 0.484% | 0.304% | -0.180% | 0.119 | 0.130 |

## Table 1.16: Quotes, NASDAQ Matching Sample, Medians Event Day Matching (+0 to -1)

**This table contains the median pair-wise differences for the percentage of quotes at the NBBBO, at the Bid, at the Ask, Inside the NBBO, Outside the NBBO, Alone at the NBBO, Alone at the Bid, Alone at the Ask and the corresponding volume statistics for NASDAQ Matching sample stocks.**

**The pairings contain 1 day before the event day to the event day. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **Pre Phase** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average # of Quotes*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| At NBBO | 58.824% | 57.613% | -1.210% | 0.509 | 0.395 | 68.915% | 67.952% | -0.964% | 0.175 | 0.044 | 63.536% | 64.103% | 0.567% | 0.442 | 0.174 |
| At Bid | 11.594% | 9.901% | -1.693% | 0.005 | 0.010 | 2.232% | 2.011% | -0.221% | 0.001 | 0.000 | 9.091% | 7.782% | -1.309% | 0.873 | 0.999 |
| At Ask | 11.638% | 11.419% | -0.219% | 0.715 | 0.786 | 11.158% | 12.734% | 1.577% | 0.033 | 0.041 | 10.096% | 8.889% | -1.207% | 0.223 | 0.219 |
| Outside NBBO | 9.698% | 8.696% | -1.003% | 0.681 | 0.988 | 7.385% | 7.754% | 0.369% | 0.168 | 0.007 | 3.947% | 3.804% | -0.143% | 0.110 | 0.240 |
| Alone NBBO | 42.857% | 41.250% | -1.607% | 0.446 | 0.262 | 38.713% | 35.196% | -3.517% | 0.002 | 0.000 | 37.063% | 35.071% | -1.992% | 0.757 | 0.727 |
| Alone Bid | 1.083% | 0.926% | -0.157% | 0.203 | 0.155 | 0.311% | 0.232% | -0.078% | 0.000 | 0.000 | 0.909% | 0.881% | -0.028% | 1.000 | 0.189 |
| Alone Ask | 0.615% | 0.797% | 0.181% | 0.722 | 0.731 | 1.063% | 1.054% | -0.010% | 0.259 | 0.510 | 0.730% | 0.708% | -0.022% | 0.953 | 0.436 |
| ***Average Volume n Shares*** | | | | | | | | | | | | | | | |
| Vol at NBBO | 68.209% | 68.592% | 0.383% | 0.960 | 0.512 | 71.829% | 70.890% | -0.939% | 0.010 | 0.002 | 72.634% | 75.286% | 2.652% | 0.035 | 0.050 |
| Vol at Bid | 5.419% | 4.553% | -0.866% | 0.041 | 0.026 | 4.803% | 4.640% | -0.164% | 0.839 | 0.202 | 4.231% | 4.255% | 0.024% | 0.313 | 0.434 |
| Vol at Ask | 5.263% | 5.039% | -0.225% | 0.715 | 0.415 | 4.323% | 4.596% | 0.273% | 0.186 | 0.391 | 5.416% | 3.401% | -2.014% | 0.243 | 0.115 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol Inside | 0.000% | 0.000% | | | | 0.000% | 0.000% | | | | 0.000% | 0.000% | | | |
| Vol Outside | 12.755% | 13.131% | 0.376% | 0.878 | 0.998 | 8.193% | 9.206% | 1.014% | 0.028 | 0.001 | 5.625% | 4.819% | -0.806% | 0.545 | 0.511 |
| Vol Alone NBBO | 52.269% | 52.319% | 0.050% | 0.611 | 0.381 | 53.431% | 52.629% | -0.802% | 0.039 | 0.049 | 47.565% | 44.783% | -2.782% | 0.680 | 0.610 |
| Vol Alone Bid | 2.135% | 1.665% | -0.470% | 0.056 | 0.288 | 1.704% | 1.596% | -0.108% | 0.474 | 0.151 | 1.240% | 1.022% | -0.218% | 0.049 | 0.324 |
| Vol Alone Ask | 0.192% | 0.308% | 0.116% | 0.261 | 0.197 | 0.637% | 0.622% | -0.016% | 0.707 | 0.181 | 0.248% | 0.244% | -0.004% | 0.679 | 0.672 |

## Table 2.1: Trades, NYSE Pilot Phase Sample, Medians 5-Day Pairings

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 5 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility. The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades (Raw Counts)** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 32500.00 | 30200.00 | -2300.00 | 0.748 | 0.236 | 139900 | 131950 | -7950.00 | 0.658 | 0.169 | 40100.00 | 31700.00 | -8400.00 | 0.000 | 0.000 |
| Ave. Trade Size | 210.00 | 210.00 | 0.00 | 0.853 | 0.895 | 197 | 200 | 3.00 | 0.256 | 0.017 | 220.00 | 215.00 | -5.00 | 0.296 | 0.065 |
| Ave. Trade Price | 43.50 | 44.19 | 0.69 | 0.412 | 0.000 | 44.08 | 44.95 | 0.87 | 0.826 | 0.000 | 41.85 | 42.97 | 1.12 | 0.000 | 0.195 |
| ***Trades*** | | | | | | | | | | | | | | | |
| % # of buy trades | 50.621% | 49.260% | -1.36% | 0.002 | 0.000 | 50.608% | 49.979% | -0.63% | 0.000 | 0.000 | 52.066% | 48.198% | -3.87% | 0.000 | 0.000 |
| % # of sell trades | 49.379% | 50.740% | 1.36% | 0.002 | 0.000 | 49.392% | 50.022% | 0.63% | 0.000 | 0.000 | 47.934% | 51.802% | 3.87% | 0.000 | 0.000 |
| % # of trades inside NBBO | 27.29% | 27.66% | 0.37% | 0.676 | 0.759 | 22.59% | 24.59% | 2.01% | 0.000 | 0.000 | 14.29% | 15.47% | 1.18% | 0.006 | 0.001 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % # of trades outside NBBO | 6.81% | 8.03% | 1.22% | 0.000 | 0.000 | 3.18% | 3.83% | 0.65% | 0.000 | 0.000 | 2.65% | 2.80% | 0.15% | 0.806 | 0.209 |
| % # of buy trades at ask | 31.53% | 29.41% | -2.12% | 0.000 | 0.000 | 34.95% | 32.65% | -2.30% | 0.000 | 0.000 | 40.36% | 35.75% | -4.61% | 0.000 | 0.000 |
| % # of sell trades at bid | 30.47% | 30.33% | -0.14% | 0.073 | 0.135 | 33.03% | 33.65% | 0.62% | 0.164 | 0.175 | 35.90% | 40.00% | 4.10% | 0.000 | 0.000 |
| Quoted half spread | 0.013690 | 0.013925 | 0.000235 | 0.021 | 0.126 | 0.007500 | 0.007736 | 0.000236 | 0.947 | 0.171 | 0.006250 | 0.006421 | 0.000171 | 0.955 | 0.307 |
| % quoted half spread | 0.034249% | 0.033887% | -0.000362% | 0.018 | 0.076 | 0.020563% | 0.020288% | -0.000275% | 0.260 | 0.302 | 0.016781% | 0.017211% | 0.000430% | 0.422 | 0.300 |
| Bid vol at quoted spread | 4.66 | 4.51 | -0.15 | 0.000 | 0.002 | 5.90 | 0.72 | -5.18 | 0.000 | 0.000 | 8.79 | 7.79 | -1.00 | 0.000 | 0.001 |
| % bid vol at quoted spread | 49.420% | 49.977% | 0.56% | 0.054 | 0.015 | 49.398% | 50.228% | 0.83% | 0.000 | 0.000 | 49.927% | 50.000% | 0.07% | 0.153 | 0.018 |
| Ask vol at quoted spread | 5.00 | 4.52 | -0.48 | 0.000 | 0.000 | 6.08 | 5.51 | -0.57 | 0.000 | 0.000 | 8.77 | 7.80 | -0.97 | 0.000 | 0.000 |
| % Ask vol at quoted spread | 50.581% | 50.623% | 0.04% | 0.054 | 0.015 | 50.602% | 49.772% | -0.83% | 0.000 | 0.000 | 50.073% | 50.000% | -0.07% | 0.153 | 0.018 |
| Total Vol at QS | **10.22** | **9.45** | **-0.77** | **0.000** | **0.000** | **12.49** | **11.45** | **-1.04** | 0.000 | 0.000 | **18.01** | **15.87** | **-2.14** | 0.000 | 0.000 |
| Effective half spread | 0.005594 | 0.005797 | 0.000203 | 0.401 | 0.866 | 0.003163 | 0.003250 | 0.000087 | 0.000 | 0.000 | 0.002823 | 0.002835 | 0.000012 | 0.595 | 0.601 |
| % effective half spread | 0.013992% | 0.014492% | 0.000500% | 0.588 | 0.916 | 0.008748% | 0.008852% | 0.000104% | 0.001 | 0.002 | 0.007478% | 0.007377% | -0.000101% | 0.956 | 0.677 |

# Table 2.2: Trades, NYSE Matching Sample, Medians 5-Day Pairings

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 5 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 21300.00 | 21300.00 | 0.00 | 0.336 | 0.739 | 112600.00 | 109300.00 | -3300.00 | 0.518 | 0.112 | 28800.00 | 21900.00 | -6900.00 | 0.000 | 0.000 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ave. Trade Size | 197.00 | 195.00 | -2.00 | 0.030 | 0.005 | 190.00 | 189.00 | -1.00 | 0.296 | 0.506 | 202.00 | 200.00 | -2.00 | 0.042 | 0.065 |
| Ave. Trade Price | 47.24 | 47.44 | 0.21 | 0.025 | 0.829 | 47.15 | 47.22 | 0.07 | 0.005 | 0.969 | 46.66 | 46.49 | -0.17 | 0.115 | 0.890 |
| % # of buy trades | 51.579% | 49.153% | -2.43% | 0.000 | 0.000 | 50.557% | 50.000% | -0.56% | 0.022 | 0.010 | 51.566% | 49.129% | -2.44% | 0.000 | 0.000 |
| % # of sell trades | 48.421% | 50.848% | 2.43% | 0.000 | 0.000 | 49.443% | 50.000% | 0.56% | 0.022 | 0.010 | 48.434% | 50.871% | 2.44% | 0.000 | 0.000 |
| % # of trades inside NBBO | 29.31% | 29.90% | 0.60% | 0.739 | 0.542 | 25.53% | 27.57% | 2.04% | 0.000 | 0.000 | 16.70% | 18.92% | 2.22% | 0.000 | 0.000 |
| % # of trades outside NBBO | 6.39% | 7.08% | 0.69% | 0.001 | 0.001 | 3.30% | 3.75% | 0.44% | 0.000 | 0.000 | 2.68% | 2.74% | 0.06% | 0.618 | 0.755 |
| % # of buy trades at ask | 31.30% | 28.57% | -2.73% | 0.000 | 0.000 | 34.26% | 32.50% | -1.75% | 0.000 | 0.000 | 38.71% | 34.54% | -4.17% | 0.000 | 0.000 |
| % # of sell trades at bid | 28.70% | 29.41% | 0.71% | 0.006 | 0.000 | 32.22% | 31.62% | -0.60% | 0.238 | 0.101 | 35.79% | 36.50% | 0.71% | 0.000 | 0.001 |
| Quoted half spread | 0.015277 | 0.015301 | 0.000024 | 0.046 | 0.503 | 0.007997 | 0.008402 | 0.000405 | 0.000 | 0.000 | 0.006686 | 0.007034 | 0.000348 | 0.010 | 0.035 |
| % quoted half spread | 0.035030% | 0.034424 % | -0.000606% | 0.047 | 0.445 | 0.020081% | 0.020806% | 0.000725% | 0.000 | 0.001 | 1.760900% | 0.017774% | -1.743126% | 0.074 | 0.118 |
| Bid vol at quoted spread | 4.17 | 4.00 | -0.17 | 0.000 | 0.004 | 4.81 | 4.62 | -0.18 | 0.000 | 0.000 | 6.27 | 5.96 | -0.30 | 0.012 | 0.007 |
| % bid vol at quoted spread | 50.000% | 50.169% | 0.17% | 0.144 | 0.016 | 49.275% | 50.263% | 0.99% | 0.000 | 0.000 | 48.763% | 50.000% | 1.24% | 0.001 | 0.000 |
| Ask vol at quoted spread | 4.36 | 3.93 | -0.43 | 0.000 | 0.000 | 5.11 | 4.65 | -0.46 | 0.000 | 0.000 | 6.85 | 5.99 | -0.86 | 0.000 | 0.000 |
| % Ask vol at quoted spread | 50.000% | 49.832% | -0.17% | 0.144 | 0.016 | 50.725% | 49.737% | -0.99% | 0.000 | 0.000 | 51.237% | 50.000% | -1.24% | 0.001 | 0.000 |
| Total Vol at QS | **8.93** | **8.43** | **-0.50** | **0.000** | **0.000** | **10.39** | **9.45** | **-0.94** | **0.000** | **0.000** | **13.59** | **11.92** | **-1.67** | **0.000** | **0.000** |
| Effective half spread | 0.005988 | 0.006137 | 0.000149 | 0.312 | 0.537 | 0.003250 | 0.003529 | 0.000279 | 0.000 | 0.000 | 0.002891 | 0.002914 | 0.000023 | 0.843 | 0.635 |
| % effective half spread | 0.013829% | 0.014009 % | 0.000180% | 0.074 | 0.332 | 0.008251% | 0.008889% | 0.000638% | 0.000 | 0.000 | 0.007615% | 0.007590% | -0.000025% | 0.615 | 0.438 |

# Table 2.3: Trades, NYSE Pilot Phase Sample, Medians 3-Day Pairings

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 3 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades (Raw Counts)** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 29950.00 | 32750.00 | 2800.00 | 0.000 | 0.000 | 129950 | 142150 | 12200.00 | 0.000 | 0.000 | 36800.00 | 34300.00 | -2500.00 | 0.094 | 0.025 |
| Ave. Trade Size | 206.00 | 214.50 | 8.50 | 0.005 | 0.002 | 199.5 | 200 | 0.50 | 0.162 | 0.582 | 220.00 | 210.00 | -10.00 | 0.366 | 0.222 |
| Ave. Trade Price | 43.23 | 43.83 | 0.60 | 0.000 | 0.000 | 45.12 | 44.95 | -0.17 | 0.000 | 0.000 | 42.95 | 42.40 | -0.55 | 0.000 | 0.000 |
| % # of buy trades | 50.000% | 49.476% | -0.52% | 0.285 | 0.075 | 50.420% | 49.755% | -0.66% | 0.000 | 0.001 | 50.000% | 47.095% | -2.91% | 0.000 | 0.000 |
| % # of sell trades | 50.000% | 50.524% | 0.52% | 0.285 | 0.075 | 49.581% | 50.245% | 0.66% | 0.000 | 0.001 | 50.000% | 52.905% | 2.91% | 0.000 | 0.000 |
| % # of trades inside NBBO | 27.36% | 27.27% | -0.09% | 0.589 | 0.566 | 22.54% | 24.58% | 2.04% | 0.003 | 0.001 | 14.38% | 15.69% | 1.30% | 0.463 | 0.366 |
| % # of trades outside NBBO | 6.48% | 7.83% | 1.35% | 0.000 | 0.000 | 3.02% | 4.26% | 1.24% | 0.000 | 0.000 | 2.08% | 3.13% | 1.05% | 0.000 | 0.000 |
| % # of buy trades at ask | 31.31% | 29.41% | -1.90% | 0.002 | 0.000 | 35.06% | 32.20% | -2.86% | 0.000 | 0.000 | 39.54% | 34.78% | -4.75% | 0.000 | 0.000 |
| % # of sell trades at bid | 31.27% | 30.39% | -0.88% | 0.857 | 0.924 | 33.03% | 33.92% | 0.89% | 0.212 | 0.234 | 37.50% | 40.82% | 3.32% | 0.000 | 0.000 |
| Quoted half spread | 0.013333 | 0.013924 | 0.000591 | 0.275 | 0.401 | 0.007561 | 0.007802 | 0.000241 | 0.222 | 0.854 | 0.006188 | 0.006279 | 0.000091 | 0.248 | 0.866 |
| % quoted half spread | 0.033138% | 0.033517 % | 0.000379% | 0.307 | 0.543 | 0.020752% | 0.020649% | -0.000103% | 0.528 | 0.803 | 0.016610% | 0.017511% | 0.000901% | 0.109 | 0.083 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bid vol at quoted spread | 4.69 | 4.62 | -0.07 | 0.082 | 0.056 | 6.01 | 5.54 | -0.48 | 0.000 | 0.000 | 9.00 | 7.69 | -1.31 | 0.021 | 0.009 |
| % bid vol at quoted spread | 49.974% | 50.000% | 0.03% | 0.000 | 0.000 | 49.488% | 50.544% | 1.06% | 0.002 | 0.000 | 49.743% | 50.628% | 0.88% | 0.010 | 0.005 |
| Ask vol at quoted spread | 4.84 | 4.61 | -0.23 | 0.006 | 0.000 | 6.17 | 5.40 | -0.77 | 0.000 | 0.000 | 9.17 | 7.61 | -1.56 | 0.000 | 0.000 |
| % Ask vol at quoted spread | 50.026% | 50.000% | -0.03% | 0.150 | 0.098 | 50.513% | 49.456% | -1.06% | 0.002 | 0.000 | 50.257% | 49.372% | -0.88% | 0.010 | 0.005 |
| Total Vol at QS | **10.00** | **9.67** | **-0.33** | **0.013** | **0.000** | **12.96** | **11.33** | **-1.64** | **0.000** | 0.000 | **18.75** | **15.60** | **-3.14** | **0.000** | 0.000 |
| Effective half spread | 0.005518 | 0.005789 | 0.000271 | 0.084 | 0.152 | 0.003136 | 0.003279 | 0.000143 | 0.000 | 0.000 | 0.002716 | 0.002868 | 0.000152 | 0.004 | 0.000 |
| % effective half spread | 0.013558% | 0.014652 % | 0.001094% | 0.064 | 0.275 | 0.008668% | 0.009248% | 0.000580% | 0.000 | 0.000 | 0.007164% | 0.007703% | 0.000539% | 0.000 | 0.000 |

# Table 2.4: Trades, NYSE Matching Sample, Medians 3-Day Pairings

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 3 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 20200.00 | 23500.00 | 3300.00 | 0.000 | 0.000 | 103500 | 123800 | 20300.00 | 0.000 | 0.000 | 27100.00 | 24200.00 | -2900.00 | 0.201 | 0.018 |
| Ave. Trade Size | 194.00 | 198.50 | 4.50 | 0.220 | 0.262 | 194 | 191 | -3.00 | 0.911 | 0.218 | 201.00 | 200.00 | -1.00 | 0.712 | 0.726 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ave. Trade Price | 47.61 | 46.53 | -1.08 | 0.000 | 0.000 | 47.48 | 46.908 | -0.57 | 0.000 | 0.000 | 47.10 | 4625.00 | 4577.90 | 0.000 | 0.000 |
| % # of buy trades | 51.454% | 49.105% | -2.35% | 0.000 | 0.000 | 50.283% | 49.921% | -0.36% | 0.017 | 0.006 | 50.000% | 48.649% | -1.35% | 0.000 | 0.001 |
| % # of sell trades | 48.546% | 50.895% | 2.35% | 0.000 | 0.000 | 49.717% | 50.079% | 0.36% | 0.017 | 0.006 | 50.000% | 51.351% | 1.35% | 0.000 | 0.001 |
| % # of trades inside NBBO | 29.30% | 28.91% | -0.38% | 0.667 | 0.518 | 25.69% | 27.71% | 2.01% | 0.000 | 0.000 | 17.65% | 19.41% | 1.76% | 0.001 | 0.005 |
| % # of trades outside NBBO | 6.04% | 7.14% | 1.10% | 0.000 | 0.000 | 3.13% | 4.10% | 0.97% | 0.000 | 0.000 | 2.08% | 3.26% | 1.18% | 0.000 | 0.000 |
| % # of buy trades at ask | 30.77% | 28.35% | -2.42% | 0.000 | 0.000 | 33.88% | 31.44% | -2.44% | 0.000 | 0.000 | 37.70% | 33.33% | -4.37% | 0.000 | 0.000 |
| % # of sell trades at bid | 29.37% | 30.00% | 0.63% | 0.092 | 0.006 | 32.15% | 32.46% | 0.32% | 0.889 | 0.827 | 38.16% | 36.83% | -1.33% | 0.044 | 0.198 |
| Quoted half spread | 0.014900 | 0.015045 | 0.000145 | 0.870 | 0.090 | 0.008218 | 0.008456 | 0.000238 | 0.031 | 0.018 | 0.006751 | 0.007156 | 0.000405 | 0.243 | 0.205 |
| % quoted half spread | 0.033515% | 0.033507 % | -0.000008% | 0.673 | 0.059 | 0.020394% | 0.021088% | 0.000694% | 0.002 | 0.005 | 0.017908% | 0.017895% | -0.000013% | 0.001 | 0.031 |
| Bid vol at quoted spread | 4.22 | 4.22 | 0.00 | 0.117 | 0.256 | 4.86 | 4.73 | -0.14 | 0.002 | 0.000 | 6.25 | 6.15 | -0.10 | 0.811 | 0.398 |
| % bid vol at quoted spread | 50.000% | 50.540% | 0.54% | 0.241 | 0.115 | 49.376% | 50.460% | 1.08% | 0.000 | 0.000 | 49.029% | 50.633% | 1.60% | 0.002 | 0.000 |
| Ask vol at quoted spread | 4.27 | 4.05 | -0.22 | 0.126 | 0.022 | 5.26 | 4.57 | -0.68 | 0.000 | 0.000 | 6.84 | 5.89 | -0.95 | 0.000 | 0.000 |
| % Ask vol at quoted spread | 50.000% | 49.489% | -0.51% | 0.241 | 0.115 | 50.624% | 49.540% | -1.08% | 0.000 | 0.000 | 50.971% | 49.367% | -1.60% | 0.002 | 0.000 |
| Total Vol at QS | **8.86** | **8.70** | **-0.16** | **0.021** | **0.033** | **10.62** | **9.40** | **-1.23** | **0.000** | **0.000** | **13.35** | **12.11** | **-1.23** | **0.021** | **0.001** |
| Effective half spread | 0.005665 | 0.006091 | 0.000426 | 0.020 | 0.004 | 0.003228 | 0.003705 | 0.000477 | 0.000 | 0.000 | 0.002845 | 0.003020 | 0.000175 | 0.002 | 0.000 |
| % effective half spread | 0.013147% | 0.013768 % | 0.000621% | 0.000 | 0.001 | 0.008094% | 0.009211% | 0.001117% | 0.000 | 0.000 | 0.007362% | 0.008133% | 0.000771% | 0.000 | 0.000 |

## Table 2.5: Trades, NYSE Pilot Phase Sample, Medians 1-Day Pairings (+1 to -1)

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 1 day of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades (Raw Counts)** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 32500.00 | 33600.00 | 1100.00 | 0.082 | 0.006 | 137350 | 142950 | 5600.00 | 0.012 | 0.000 | 34200.00 | 35000.00 | 800.00 | 0.000 | 0.000 |
| Ave. Trade Size | 200.00 | 214.00 | 14.00 | 0.034 | 0.029 | 196 | 196.5 | 0.50 | 0.748 | 0.755 | 212.00 | 201.00 | -11.00 | 0.244 | 0.466 |
| Ave. Trade Price | 43.65 | 43.72 | 0.07 | 0.002 | 0.376 | 45.15 | 44.95 | -0.20 | 0.000 | 0.000 | 43.45 | 43.34 | -0.11 | 0.000 | 0.000 |
| ***Trades*** | | | | | | | | | | | | | | | |
| % # of buy trades | 48.240% | 48.190% | -0.05% | 0.682 | 0.417 | 50.000% | 47.970% | -2.03% | 0.001 | 0.022 | 48.550% | 44.500% | -4.05% | 0.000 | 0.000 |
| % # of sell trades | 51.760% | 51.810% | 0.05% | 0.682 | 0.417 | 50.000% | 52.030% | 2.03% | 0.001 | 0.022 | 51.450% | 55.500% | 4.05% | 0.000 | 0.000 |
| % # of trades inside NBBO | 27.42% | 26.67% | -0.75% | 0.437 | 0.255 | 23.23% | 24.43% | 1.20% | 0.926 | 0.614 | 14.09% | 14.61% | 0.52% | 0.030 | 0.067 |
| % # of trades outside NBBO | 7.58% | 7.14% | -0.44% | 1.000 | 0.406 | 3.06% | 3.98% | 0.92% | 0.000 | 0.000 | 2.24% | 3.32% | 1.08% | 0.000 | 0.000 |
| % # of buy trades at ask | 28.85% | 28.25% | -0.60% | 0.836 | 0.727 | 33.33% | 30.42% | -2.91% | 0.001 | 0.002 | 37.74% | 31.44% | -6.30% | 0.000 | 0.000 |
| % # of sell trades at bid | 33.33% | 32.49% | -0.84% | 0.959 | 0.922 | 34.79% | 36.43% | 1.64% | 0.001 | 0.002 | 40.34% | 44.81% | 4.47% | 0.000 | 0.000 |
| Quoted half spread | 0.012970 | 0.013974 | 0.001004 | 0.740 | 0.823 | 0.007455 | 0.007686 | 0.000231 | 0.183 | 0.541 | 0.005973 | 0.619500 | 0.613527 | 0.015 | 0.065 |
| % quoted half spread | 0.034336% | 0.032803 % | -0.001533% | 0.742 | 0.644 | 0.020937% | 0.020826% | -0.000111% | 0.922 | 0.914 | 0.016531% | 0.016626% | 0.000095% | 0.957 | 0.969 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bid vol at quoted spread | 4.68 | 5.00 | 0.32 | 0.243 | 0.224 | 5.33 | 5.12 | -0.21 | 0.000 | 0.002 | 8.47 | 8.06 | -0.41 | 1.000 | 0.764 |
| % bid vol at quoted spread | 50.581% | 50.805% | 0.22% | 1.000 | 0.642 | 49.893% | 50.467% | 0.57% | 0.143 | 0.036 | 50.000% | 50.368% | 0.37% | 0.389 | 0.320 |
| Ask vol at quoted spread | 4.49 | 4.57 | 0.08 | 0.376 | 0.550 | 5.61 | 4.85 | -0.75 | 0.000 | 0.000 | 8.52 | 7.25 | -1.27 | 0.084 | 0.286 |
| % Ask vol at quoted spread | 49.419% | 49.196% | -0.22% | 1.000 | 0.642 | 50.107% | 49.533% | -0.57% | 0.143 | 0.036 | 50.000% | 49.632% | -0.37% | 0.389 | 0.320 |
| **Total Vol at QS** | **9.67** | **9.92** | 0.26 | **0.062** | **0.208** | **11.60** | **10.11** | -1.49 | **0.000** | **0.000** | **17.64** | **15.52** | -2.11 | **0.872** | **0.691** |
| Effective half spread | 0.005783 | 0.005529 | -0.000254 | 0.783 | 0.414 | 0.003083 | 0.003199 | 0.000116 | 0.002 | 0.015 | 0.002673 | 0.002848 | 0.000175 | 0.137 | 0.039 |
| % effective half spread | 0.014093% | 0.014084% | -0.000009% | 0.660 | 0.599 | 0.008753% | 0.008847% | 0.000094% | 0.000 | 0.003 | 0.007203% | 0.007858% | 0.000655% | 0.000 | 0.002 |

# Table 2.6: Trades, NYSE Matching Sample, Medians 1-Day Pairings (+1 to -1)

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 1 day of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 20400.00 | 23500.00 | 3100.00 | 0.015 | 0.002 | 103950.00 | 122650.00 | 18700.00 | 0.001 | 0.000 | 23400.00 | 24700.00 | 1300.00 | 0.013 | 0.000 |
| Ave. Trade Size | 191.00 | 200.00 | 9.00 | 0.753 | 0.827 | 189.00 | 187.00 | -2.00 | 0.667 | 0.632 | 197.00 | 203.00 | 6.00 | 0.683 | 0.741 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ave. Trade Price | 47.62 | 47.42 | -0.20 | 0.000 | 0.000 | 47.27 | 46.91 | -0.36 | 0.000 | 0.000 | 47.30 | 46.86 | -0.44 | 0.000 | 0.000 |
| % # of buy trades | 47.921% | 46.961% | -0.96% | 0.296 | 0.402 | 49.571% | 49.404% | -0.17% | 0.306 | 0.739 | 48.770% | 44.828% | -3.94% | 0.000 | 0.001 |
| % # of sell trades | 52.079% | 53.039% | 0.96% | 0.296 | 0.403 | 50.429% | 50.596% | 0.17% | 0.306 | 0.741 | 51.423% | 55.172% | 3.75% | 0.000 | 0.001 |
| % # of trades inside NBBO | 29.63% | 28.89% | -0.74% | 0.527 | 0.876 | 26.89% | 27.91% | 1.02% | 0.597 | 0.655 | 18.03% | 19.17% | 1.14% | 0.875 | 0.955 |
| % # of trades outside NBBO | 6.06% | 7.14% | 1.08% | 0.002 | 0.004 | 2.86% | 4.21% | 1.35% | 0.000 | 0.000 | 2.20% | 4.00% | 1.80% | 0.000 | 0.000 |
| % # of buy trades at ask | 27.07% | 27.07% | 0.00% | 0.636 | 0.673 | 33.21% | 30.77% | -2.44% | 0.025 | 0.085 | 34.88% | 30.97% | -3.90% | 0.000 | 0.000 |
| % # of sell trades at bid | 31.71% | 31.58% | -0.13% | 0.833 | 0.368 | 33.14% | 33.36% | 0.22% | 0.115 | 0.253 | 38.89% | 39.36% | 0.47% | 0.002 | 0.020 |
| Quoted half spread | 0.015792 | 0.015752 | -0.000040 | 0.536 | 0.103 | 0.008303 | 0.004340 | -0.003963 | 0.001 | 0.003 | 0.006800 | 0.007095 | 0.000295 | 0.911 | 0.448 |
| % quoted half spread | 0.033723% | 0.034175 % | 0.000452% | 0.502 | 0.163 | 0.001004% | 0.000861% | -0.000143% | 0.000 | 0.001 | 0.012484% | 0.001877% | -0.010607% | 0.093 | 0.893 |
| Bid vol at quoted spread | 4.29 | 4.26 | -0.03 | 0.573 | 0.892 | 4.45 | 4.80 | 0.35 | 0.112 | 0.058 | 5.76 | 6.52 | 0.76 | 0.080 | 0.006 |
| % bid vol at quoted spread | 50.373% | 50.663% | 0.29% | 0.537 | 0.419 | 49.890% | 50.726% | 0.84% | 0.011 | 0.000 | 49.543% | 51.230% | 1.69% | 0.007 | 0.004 |
| Ask vol at quoted spread | 3.86 | 4.00 | 0.14 | 0.129 | 0.129 | 4.86 | 4.27 | -0.59 | 0.000 | 0.000 | 5.91 | 5.70 | -0.21 | 1.000 | 0.301 |
| % Ask vol at quoted spread | 49.627% | 49.337% | -0.29% | 0.537 | 0.419 | 50.110% | 49.274% | -0.84% | 0.011 | 0.000 | 50.457% | 48.771% | -1.69% | 0.007 | 0.004 |
| **Total Vol at QS** | **8.50** | **8.84** | 0.34 | **0.314** | **0.382** | **9.83** | **9.11** | -0.72 | **0.003** | **0.000** | **12.03** | **12.82** | 0.79 | **0.300** | **0.249** |
| Effective half spread | 0.005626 | 0.006111 | 0.000485 | 0.010 | 0.007 | 0.001399 | 0.003763 | 0.002364 | 0.000 | 0.000 | 0.002942 | 0.003046 | 0.000104 | 0.204 | 0.121 |
| % effective half spread | 0.012487% | 0.014019 % | 0.001532% | 0.010 | 0.007 | 0.008000% | 0.009197% | 0.001197% | 0.000 | 0.000 | 0.007541% | 0.007817% | 0.000276% | 0.022 | 0.011 |

# Table 2.7: Trades, NYSE Pilot Phase Sample, Medians Event Day Matching (+0 to -1)

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 1 day of data before the event date to the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades (Raw Counts)** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 32600.00 | 31450.00 | -1150.00 | 0.383 | 0.126 | 131200.00 | 146100.00 | 14900.00 | 0.790 | 0.177 | 34100.00 | 32400.00 | -1700.00 | 0.691 | 0.210 |
| Ave. Trade Size | 202.50 | 228.00 | 25.50 | 0.003 | 0.000 | 195.00 | 200.00 | 5.00 | 1.000 | 0.343 | 212.00 | 202.00 | -10.00 | 0.473 | 0.748 |
| Ave. Trade Price | 43.66 | 44.09 | 0.43 | 0.000 | 0.000 | 45.18 | 45.33 | 0.15 | 0.000 | 0.000 | 43.86 | 44.10 | 0.24 | 0.054 | 0.043 |
| ***Trades*** | | | | | | | | | | | | | | | |
| % # of buy trades | 48.258% | 49.180% | 0.92% | 0.181 | 0.209 | 50.000% | 50.000% | 0.00% | 0.716 | 0.615 | 48.472% | 48.356% | -0.12% | 0.724 | 0.443 |
| % # of sell trades | 51.742% | 50.820% | -0.92% | 0.181 | 0.209 | 50.000% | 50.000% | 0.00% | 0.716 | 0.615 | 51.528% | 51.644% | 0.12% | 0.724 | 0.443 |
| % # of trades inside NBBO | 27.47% | 27.20% | -0.27% | 0.680 | 0.845 | 23.70% | 24.66% | 0.96% | 0.249 | 0.224 | 14.29% | 13.87% | -0.42% | 0.117 | 0.376 |
| % # of trades outside NBBO | 7.69% | 7.37% | -0.32% | 0.487 | 0.489 | 2.90% | 2.97% | 0.07% | 0.492 | 0.714 | 2.22% | 2.96% | 0.74% | 0.007 | 0.008 |
| % # of buy trades at ask | 28.57% | 29.75% | 1.18% | 0.117 | 0.022 | 33.33% | 32.92% | -0.41% | 0.781 | 0.905 | 37.84% | 36.51% | -1.32% | 0.648 | 0.692 |
| % # of sell trades at bid | 33.33% | 29.81% | -3.52% | 0.002 | 0.005 | 34.36% | 33.33% | -1.03% | 0.485 | 0.609 | 40.34% | 36.38% | -3.96% | 0.723 | 0.156 |
| Quoted half spread | 0.011089 | 0.010362 | -0.000727 | 0.603 | 0.917 | 0.006775 | 0.006930 | 0.000155 | 0.234 | 0.455 | 0.005831 | 0.005860 | 0.000029 | 0.587 | 0.655 |
| % quoted half spread | 0.027672% | 0.027247 % | -0.000425% | 1.000 | 0.638 | 0.018078% | 0.018537% | 0.000459% | 0.060 | 0.152 | 0.014825% | 0.014850% | 0.000025% | 0.712 | 0.587 |
| Bid vol at quoted spread | 3.81 | | 0.10 | 0.689 | 0.998 | 5.00 | 5.00 | 0.00 | 0.580 | 0.811 | 6.54 | 6.57 | 0.03 | 0.539 | 0.462 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3.91 | | | | | | | | | | | | | |
| % bid vol at quoted spread | 50.000% | 50.000% | 0.00% | 0.960 | 0.520 | 50.000% | 50.000% | 0.00% | 0.580 | 0.917 | 50.000% | 49.848% | -0.15% | 0.798 | 0.779 |
| Ask vol at quoted spread | 3.69 | 3.73 | 0.04 | 0.146 | 0.120 | 5.05 | 5.00 | -0.05 | 0.580 | 0.578 | 6.92 | 7.03 | 0.11 | 0.261 | 0.880 |
| % Ask vol at quoted spread | 50.000% | 50.000% | 0.00% | 0.960 | 0.520 | 50.000% | 50.000% | 0.00% | 0.580 | 0.917 | 50.000% | 50.152% | 0.15% | 0.798 | 0.779 |
| **Total Vol at QS** | **8.07** | **7.84** | **-0.23** | **0.766** | **0.485** | **10.31** | **10.31** | **0.00** | **0.270** | **0.229** | **13.95** | **14.17** | **0.22** | **0.919** | **0.333** |
| Effective half spread | 0.004428 | 0.004642 | 0.000214 | 0.793 | 0.776 | 0.002810 | 0.002845 | 0.000035 | 0.296 | 0.438 | 0.002559 | 0.002644 | 0.000085 | 0.419 | 0.342 |
| % effective half spread | 0.011597% | 0.011106 % | -0.000491% | 0.754 | 0.916 | 0.007800% | 0.007547% | -0.000252% | 0.187 | 0.299 | 0.006414% | 0.006552% | 0.000138% | 0.493 | 0.260 |

# Table 2.8: Trades, NYSE Matching Sample, Medians Event Day Matching (+0 to -1)

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 1 day of data before the event date to the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 20300.00 | 27950.00 | 7650.00 | 0.037 | 0.010 | 103500.00 | 141000.00 | 37500.00 | 0.050 | 0.014 | 24900.00 | 28100.00 | 3200.00 | 1.000 | 0.659 |
| Ave. Trade Size | 190.50 | 197.00 | 6.50 | 0.044 | 0.003 | 186.00 | 189.00 | 3.00 | 0.069 | 0.056 | 195.00 | 192.00 | -3.00 | 0.794 | 0.435 |
| Ave. Trade Price | 47.61 | 47.64 | 0.03 | 0.000 | 0.000 | 47.29 | 47.51 | 0.22 | 0.010 | 0.005 | 47.08 | 47.08 | 0.00 | 0.021 | 0.207 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % # of buy trades | 47.727% | 50.669% | 2.94% | 0.009 | 0.001 | 49.604% | 50.000% | 0.40% | 0.452 | 0.237 | 48.373% | 49.575% | 1.20% | 0.412 | 0.101 |
| % # of sell trades | 52.273% | 49.331% | -2.94% | 0.009 | 0.001 | 50.396% | 50.000% | -0.40% | 0.452 | 0.237 | 51.627% | 50.425% | -1.20% | 0.412 | 0.101 |
| % # of trades inside NBBO | 29.79% | 29.33% | -0.47% | 0.104 | 0.193 | 27.02% | 27.31% | 0.30% | 0.068 | 0.187 | 18.49% | 18.76% | 0.27% | 0.493 | 0.595 |
| % # of trades outside NBBO | 6.15% | 6.47% | 0.32% | 0.127 | 0.082 | 2.86% | 2.85% | -0.01% | 0.801 | 0.553 | 2.21% | 2.73% | 0.52% | 0.022 | 0.014 |
| % # of buy trades at ask | 26.87% | 29.82% | 2.95% | 0.012 | 0.001 | 32.83% | 33.03% | 0.20% | 0.362 | 0.440 | 34.62% | 35.85% | 1.23% | 1.000 | 0.423 |
| % # of sell trades at bid | 31.73% | 28.76% | -2.97% | 0.000 | 0.000 | 33.33% | 32.06% | -1.27% | 0.274 | 0.111 | 38.83% | 36.09% | -2.74% | 0.959 | 0.267 |
| Quoted half spread | 0.012598 | 0.011664 | -0.000934 | 0.748 | 0.577 | 0.007592 | 0.007851 | 0.000259 | 0.528 | 0.878 | 0.006177 | 0.006341 | 0.000164 | 0.913 | 0.973 |
| % quoted half spread | 0.027894% | 0.029581% | 0.001687% | 0.524 | 0.385 | 0.019530% | 0.019480% | -0.000050% | 0.924 | 0.934 | 0.016587% | 0.015936% | -0.000651% | 1.000 | 0.810 |
| Bid vol at quoted spread | 3.22 | 3.23 | 0.01 | 0.013 | 0.016 | 3.96 | 3.98 | 0.02 | 0.478 | 0.785 | 4.99 | 5.34 | 0.35 | 0.044 | 0.003 |
| % bid vol at quoted spread | 50.000% | 49.857% | -0.14% | 0.002 | 0.007 | 50.000% | 50.000% | 0.00% | 1.000 | 0.229 | 49.869% | 50.000% | 0.13% | 0.642 | 0.849 |
| Ask vol at quoted spread | 3.13 | 3.26 | 0.13 | 0.509 | 0.181 | 4.18 | 4.00 | -0.18 | 0.318 | 0.287 | 5.08 | 5.23 | 0.15 | 0.195 | 0.092 |
| % Ask vol at quoted spread | 50.000% | 50.143% | 0.14% | 0.002 | 0.007 | 50.000% | 50.000% | 0.00% | 1.000 | 0.229 | 50.131% | 50.000% | -0.13% | 0.642 | 0.849 |
| **Total Vol at QS** | **6.68** | **6.83** | **0.15** | **0.130** | **0.522** | **8.27** | **8.33** | **0.06** | **0.814** | **0.888** | **10.49** | **11.26** | **0.77** | **0.012** | **0.001** |
| Effective half spread | 0.004600 | 0.005000 | 0.000400 | 0.021 | 0.118 | 0.002905 | 0.002938 | 0.000033 | 0.807 | 0.546 | 0.002696 | 0.002701 | 0.000005 | 0.702 | 0.388 |
| % effective half spread | 0.011043% | 0.011787% | 0.000744% | 0.136 | 0.133 | 0.007392% | 0.007450% | 0.000058% | 0.597 | 0.680 | 0.006735% | 0.006711% | -0.000023% | 0.559 | 0.574 |

## Table 2.9: Trades, NASDAQ Pilot Phase Sample, Medians 5- Day Pairings

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 5 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades (Raw Counts)** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 6900.00 | 6177.00 | -723.00 | 0.393 | 0.134 | 41951.00 | 40720.00 | -1231.00 | 0.023 | 0.362 | 10505.00 | 8752.00 | -1753.00 | 0.000 | 0.000 |
| Ave. Trade Size | 180.00 | 175.00 | -5.00 | 0.638 | 0.381 | 160.00 | 158.00 | -2.00 | 0.040 | 0.331 | 161.00 | 164.00 | 3.00 | 0.507 | 0.265 |
| Ave. Trade Price | 21.47 | 22.02 | 0.55 | 0.000 | 0.000 | 21.72 | 22.06 | 0.34 | 0.000 | 0.000 | 21.79 | 22.19 | 0.40 | 0.000 | 0.000 |
| % # of buy trades | 50.00% | 50.00% | 0.00% | 0.122 | 0.117 | 49.41% | 50.00% | 0.59% | 0.399 | 0.124 | 50.00% | 50.00% | 0.00% | 0.141 | 0.089 |
| % # of sell trades | 50.00% | 50.00% | 0.00% | 0.122 | 0.117 | 50.59% | 50.00% | -0.59% | 0.399 | 0.124 | 50.00% | 50.00% | 0.00% | 0.141 | 0.089 |
| % # of trades inside NBBO | 34.23% | 35.32% | 1.09% | 0.317 | 0.415 | 25.41% | 28.35% | 2.94% | 0.000 | 0.000 | 18.87% | 20.00% | 1.13% | 0.013 | 0.003 |
| % # of trades outside NBBO | 4.88% | 4.27% | -0.61% | 0.345 | 0.108 | 4.14% | 3.34% | -0.80% | 0.000 | 0.000 | 3.11% | 1.48% | -1.63% | 0.000 | 0.000 |
| % # of buy trades at ask | 27.27% | 25.34% | -1.93% | 0.034 | 0.024 | 31.88% | 30.03% | -1.85% | 0.008 | 0.010 | 36.49% | 33.82% | -2.67% | 0.000 | 0.000 |
| % # of sell trades at bid | 25.00% | 27.41% | 2.41% | 0.032 | 0.041 | 33.33% | 31.58% | -1.75% | 0.002 | 0.000 | 34.95% | 36.00% | 1.05% | 0.040 | 0.058 |
| Quoted half spread | 0.027852 | 0.028516 | 0.000664 | 0.802 | 0.523 | 0.018372 | 0.018333 | -0.000039 | 0.135 | 0.018 | 0.011200 | 0.011326 | 0.000126 | 0.665 | 0.822 |
| % quoted half spread | 0.148281% | 0.152667% | 0.004386% | 0.100 | 0.659 | 0.113241% | 0.104506% | -0.008735% | 0.155 | 0.002 | 0.071457% | 0.070545% | -0.000912% | 0.618 | 0.456 |
| Bid vol at quoted spread | 2.25 | 2.43 | 0.18 | 0.030 | 0.033 | 2.66 | 2.68 | 0.02 | 0.905 | 0.861 | 3.16 | 3.06 | -0.10 | 0.004 | 0.011 |
| % bid vol at quoted spread | 47.740% | 50.000% | 2.26% | 0.004 | 0.001 | 48.400% | 50.260% | 1.86% | 0.000 | 0.000 | 49.420% | 50.000% | 0.58% | 0.544 | 0.768 |
| Ask vol at quoted spread | 2.67 | 2.46 | -0.21 | 0.065 | 0.104 | 2.95 | 2.68 | -0.27 | 0.000 | 0.000 | 3.38 | 3.19 | -0.19 | 0.091 | 0.025 |
| % Ask vol at quoted spread | 52.260% | 50.000% | -2.26% | 0.004 | 0.001 | 51.600% | 49.740% | -1.86% | 0.000 | 0.000 | 50.580% | 50.000% | -0.58% | 0.544 | 0.768 |
| Total Vol at QS | **5.40** | **5.50** | **0.10** | **0.829** | **0.930** | **6.12** | **5.91** | **-0.21** | 0.001 | 0.000 | **7.07** | **6.89** | **-0.18** | 0.009 | 0.008 |
| Effective half spread | 0.009839 | 0.010076 | 0.000237 | 0.775 | 0.873 | 0.007078 | 0.006643 | -0.000435 | 0.001 | 0.000 | 0.004611 | 0.004444 | -0.000167 | 0.313 | 0.058 |
| % effective half spread | 0.055220% | 0.055741% | 0.000521% | 0.521 | 0.607 | 0.044973% | 0.038658% | -0.006315% | 0.000 | 0.000 | 0.028887% | 0.028192% | -0.000695% | 0.101 | 0.031 |

# Table 2.10: Trades, NASDAQ Matching Sample, Medians 5-Day Pairings

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 5 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 6061.00 | 6187.00 | 126.00 | 0.825 | 0.108 | 36200.00 | 36568.50 | 368.50 | 0.354 | 0.070 | 9445.00 | 7961.00 | -1484.00 | 0.000 | 0.000 |
| Ave. Trade Size | 168.00 | 173.00 | 5.00 | 0.046 | 0.198 | 157.50 | 163.00 | 5.50 | 0.586 | 0.020 | 157.00 | 161.00 | 4.00 | 0.563 | 0.128 |
| Ave. Trade Price | 19.24 | 19.41 | 0.17 | 0.408 | 0.001 | 19.02 | 19.11 | 0.09 | 0.501 | 0.039 | 19.33 | 19.55 | 0.22 | 0.769 | 0.380 |
| % # of buy trades | 50.260% | 49.060% | -1.20% | 0.000 | 0.000 | 49.660% | 49.300% | -0.36% | 0.087 | 0.421 | 50.000% | 50.000% | 0.00% | 0.083 | 0.368 |
| % # of sell trades | 49.740% | 50.940% | 1.20% | 0.000 | 0.000 | 50.340% | 50.700% | 0.36% | 0.087 | 0.421 | 50.000% | 50.000% | 0.00% | 0.083 | 0.368 |
| % # of trades inside NBBO | 34.95% | 34.29% | -0.66% | 0.889 | 0.936 | 26.65% | 28.27% | 1.62% | 0.000 | 0.002 | 18.41% | 20.34% | 1.93% | 0.006 | 0.000 |
| % # of trades outside NBBO | 3.92% | 4.35% | 0.43% | 0.878 | 0.807 | 3.93% | 3.82% | -0.11% | 0.306 | 0.692 | 2.86% | 1.32% | -1.54% | 0.000 | 0.000 |
| % # of buy trades at ask | 26.67% | 24.55% | -2.12% | 0.005 | 0.013 | 31.38% | 30.52% | -0.86% | 0.009 | 0.009 | 35.06% | 33.33% | -1.73% | 0.002 | 0.005 |
| % # of sell trades at bid | 25.35% | 26.92% | 1.57% | 0.091 | 0.042 | 32.58% | 31.87% | -0.71% | 0.417 | 0.139 | 35.00% | 34.78% | -0.22% | 0.549 | 0.661 |
| Quoted half spread | 0.028498 | 0.027241 | -0.001257 | 0.461 | 0.486 | 0.018485 | 0.017374 | -0.001111 | 0.691 | 0.264 | 0.010000 | 0.010661 | 0.000661 | 0.369 | 0.294 |
| % quoted half spread | 0.144047% | 0.139526% | -0.004521% | 0.825 | 0.485 | 0.101892% | 0.097158% | -0.004734% | 0.927 | 0.185 | 0.059757% | 0.061602% | 0.001845% | 0.337 | 0.194 |
| Bid vol at quoted spread | 2.27 | 2.35 | 0.08 | 0.940 | 0.689 | 2.71 | 2.69 | -0.02 | 0.093 | 0.524 | 3.00 | 2.87 | -0.13 | 0.013 | 0.032 |
| % bid vol at quoted spread | 50.000% | 50.000% | 0.00% | 0.796 | 0.548 | 49.910% | 49.730% | -0.18% | 0.692 | 0.606 | 49.890% | 48.780% | -1.11% | 0.554 | 0.771 |
| Ask vol at quoted spread | 2.38 | 2.40 | 0.02 | 0.680 | 0.171 | 2.87 | 2.67 | -0.20 | 0.299 | 0.311 | 3.24 | 3.11 | -0.13 | 0.249 | 0.326 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Ask vol at quoted spread | 50.000% | 50.000% | 0.00% | 0.796 | 0.548 | 50.090% | 50.270% | 0.18% | 0.692 | 0.606 | 50.110% | 51.220% | 1.11% | 0.554 | 0.771 |
| Total Vol at QS | **5.12** | **5.21** | **0.09** | **0.319** | **0.194** | **6.03** | **5.67** | **-0.36** | **0.063** | **0.402** | **7.06** | **6.42** | **-0.64** | **0.012** | **0.072** |
| Effective half spread | 0.009781 | 0.009840 | 0.000059 | 0.460 | 0.837 | 0.006787 | 0.006558 | -0.000229 | 0.759 | 0.944 | 0.004245 | 0.004178 | -0.000067 | 0.910 | 0.618 |
| % effective half spread | 0.047671% | 0.049504% | 0.001833% | 0.507 | 0.944 | 0.039617% | 0.038849% | -0.000768% | 0.784 | 0.549 | 0.025469% | 0.023798% | -0.001671% | 0.768 | 0.704 |

# Table 2.11: Trades, NASDAQ Pilot Phase Sample, Medians 3-Day Pairings

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 3 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades (Raw Counts)** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 6202.00 | 7800.00 | 1598.00 | 0.000 | 0.000 | 38608.00 | 52115.00 | 13507.00 | 0.000 | 0.000 | 8315.00 | 11088.00 | 2773.00 | 0.001 | 0.000 |
| Ave. Trade Size | 179.00 | 179.00 | 0.00 | 0.030 | 0.295 | 163.00 | 161.00 | -2.00 | 0.362 | 0.887 | 158.00 | 169.00 | 11.00 | 0.231 | 0.192 |
| Ave. Trade Price | 20.69 | 21.87 | 1.18 | 0.033 | 0.000 | 21.82 | 21.91 | 0.09 | 0.069 | 0.001 | 22.12 | 21.85 | -0.27 | 0.000 | 0.000 |
| % # of buy trades | 50.000% | 50.000% | 0.00% | 0.596 | 0.730 | 50.000% | 49.580% | -0.42% | 0.458 | 0.698 | 50.000% | 50.00% | 0.00% | 0.313 | 0.180 |
| % # of sell trades | 50.000% | 50.000% | 0.00% | 0.596 | 0.730 | 50.000% | 50.420% | 0.42% | 0.458 | 0.698 | 50.000% | 50.00% | 0.00% | 0.313 | 0.180 |
| % # of trades inside NBBO | 33.82% | 35.09% | 1.27% | 0.320 | 0.584 | 24.58% | 28.57% | 3.99% | 0.000 | 0.000 | 18.92% | 20.00% | 1.08% | 0.192 | 0.144 |
| % # of trades outside NBBO | 4.58% | 4.41% | -0.17% | 0.969 | 0.470 | 4.23% | 3.80% | -0.43% | 0.508 | 0.333 | 2.38% | 2.22% | -0.16% | 1.000 | 0.818 |
| % # of buy trades at ask | 26.28% | 26.67% | 0.39% | 0.225 | 0.520 | 32.56% | 29.63% | -2.93% | 0.000 | 0.000 | 36.36% | 34.29% | -2.07% | 0.035 | 0.006 |
| % # of sell trades at bid | 25.38% | 27.07% | 1.69% | 0.214 | 0.260 | 33.33% | 32.52% | -0.81% | 0.024 | 0.013 | 34.78% | 35.29% | 0.51% | 0.531 | 0.267 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quoted half spread | 0.027917 | 0.028049 | 0.000132 | 0.495 | 0.983 | 0.018352 | 0.018998 | 0.000646 | 0.506 | 0.667 | 0.011272 | 0.011631 | 0.000359 | 0.535 | 0.661 |
| % quoted half spread | 0.147285% | 0.154512% | 0.007227% | 0.365 | 0.523 | 0.113124% | 0.109551% | -0.003573% | 0.394 | 0.629 | 0.070271% | 0.073627% | 0.003356% | 0.759 | 0.891 |
| Bid vol at quoted spread | 2.31 | 2.53 | 0.22 | 0.048 | 0.092 | 2.76 | 2.84 | 0.08 | 0.088 | 0.234 | 3.10 | 3.39 | 0.29 | 0.795 | 0.935 |
| % bid vol at quoted spread | 48.000% | 49.510% | 1.51% | 0.100 | 0.130 | 48.050% | 50.250% | 2.20% | 0.000 | 0.000 | 48.840% | 50.000% | 1.16% | 0.090 | 0.170 |
| Ask vol at quoted spread | 2.61 | 2.61 | 0.00 | 0.679 | 0.851 | 3.03 | 2.76 | -0.27 | 0.002 | 0.001 | 3.38 | 3.31 | -0.07 | 0.501 | 0.177 |
| % Ask vol at quoted spread | 52.000% | 50.490% | -1.51% | 0.100 | 0.130 | 51.960% | 49.750% | -2.21% | 0.000 | 0.000 | 51.160% | 50.000% | -1.16% | 0.090 | 0.170 |
| Total Vol at QS | **5.45** | **5.63** | **0.18** | **0.715** | **0.698** | **6.22** | **6.11** | **-0.11** | 0.188 | 0.017 | **7.07** | **7.55** | **0.48** | 0.383 | 0.368 |
| Effective half spread | 0.009902 | 0.010076 | 0.000174 | 0.928 | 0.836 | 0.007132 | 0.006829 | -0.000303 | 0.311 | 0.087 | 0.004654 | 0.004572 | -0.000082 | 0.680 | 0.580 |
| % effective half spread | 0.054719% | 0.056102% | 0.001383% | 0.415 | 0.495 | 0.044152% | 0.039705% | -0.004447% | 0.215 | 0.034 | 0.029203% | 0.029602% | 0.000399% | 0.683 | 0.883 |

# Table 2.12: Trades, NASDAQ Matching Sample, Medians 3-Day Pairings

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 3 days of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 5631.00 | 7700.00 | 2069.00 | 0.000 | 0.000 | 32864.00 | 52192.00 | 19328.00 | 0.000 | 0.000 | 7862.00 | 10097.00 | 2235.00 | 0.000 | 0.000 |
| Ave. Trade Size | 167.00 | 176.00 | 9.00 | 0.012 | 0.059 | 165.00 | 166.00 | 1.00 | 0.522 | 0.041 | 161.00 | 165.00 | 4.00 | 0.696 | 0.731 |
| Ave. Trade Price | 19.10 | 19.12 | 0.02 | 0.018 | 0.203 | 19.01 | 18.94 | -0.07 | 0.000 | 0.000 | 19.14 | 19.20 | 0.06 | 0.000 | 0.000 |
| % # of buy trades | 50.000% | 49.740% | -0.26% | 0.044 | 0.254 | 50.000% | 48.890% | -1.11% | 0.049 | 0.141 | 50.580% | 48.450% | -2.13% | 0.002 | 0.010 |
| % # of sell trades | 50.000% | 50.260% | 0.26% | 0.044 | 0.254 | 50.000% | 51.110% | 1.11% | 0.049 | 0.141 | 49.420% | 51.550% | 2.13% | 0.002 | 0.010 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % # of trades inside NBBO | 35.56% | 34.48% | -1.08% | 0.667 | 0.684 | 26.53% | 28.20% | 1.67% | 0.001 | 0.010 | 18.57% | 20.41% | 1.84% | 0.546 | 0.124 |
| % # of trades outside NBBO | 3.19% | 4.46% | 1.27% | 0.141 | 0.058 | 3.64% | 3.90% | 0.26% | 0.037 | 0.377 | 2.44% | 2.38% | -0.06% | 0.883 | 0.616 |
| % # of buy trades at ask | 25.64% | 25.00% | -0.64% | 0.688 | 0.951 | 32.11% | 30.34% | -1.77% | 0.012 | 0.003 | 35.68% | 32.08% | -3.60% | 0.000 | 0.000 |
| % # of sell trades at bid | 26.47% | 26.24% | -0.23% | 0.885 | 0.952 | 32.42% | 32.26% | -0.16% | 0.410 | 0.808 | 33.33% | 35.58% | 2.25% | 0.044 | 0.005 |
| Quoted half spread | 0.027655 | 0.026659 | -0.000996 | 0.344 | 0.667 | 0.018799 | 0.018697 | -0.000102 | 0.201 | 0.864 | 0.009876 | 0.010999 | 0.001123 | 0.026 | 0.029 |
| % quoted half spread | 0.138295% | 0.143139% | 0.004844% | 0.603 | 0.748 | 0.102410% | 0.103216% | 0.000806% | 0.177 | 0.977 | 0.059003% | 0.064477% | 0.005474% | 0.016 | 0.027 |
| Bid vol at quoted spread | 2.31 | 2.44 | 0.13 | 0.597 | 0.574 | 2.82 | 2.74 | -0.08 | 0.023 | 0.066 | 3.00 | 2.96 | -0.04 | 0.550 | 0.313 |
| % bid vol at quoted spread | 50.000% | 50.350% | 0.35% | 0.812 | 0.872 | 50.020% | 49.710% | -0.31% | 0.812 | 0.754 | 49.530% | 47.850% | -1.68% | 0.258 | 0.511 |
| Ask vol at quoted spread | 2.38 | 2.46 | 0.08 | 0.847 | 0.493 | 3.08 | 2.73 | -0.35 | 0.141 | 0.092 | 3.44 | 3.37 | -0.07 | 0.516 | 0.353 |
| % Ask vol at quoted spread | 50.000% | 49.650% | -0.35% | 0.812 | 0.872 | 49.980% | 50.290% | 0.31% | 0.812 | 0.754 | 50.470% | 52.150% | 1.68% | 0.258 | 0.511 |
| Total Vol at QS | **5.14** | **5.53** | **0.39** | **0.478** | **0.276** | **6.31** | **5.79** | **-0.52** | **0.081** | **0.067** | **7.32** | **6.56** | **-0.76** | **0.132** | **0.165** |
| Effective half spread | 0.009311 | 0.009557 | 0.000246 | 0.394 | 0.207 | 0.006643 | 0.006817 | 0.000174 | 0.066 | 0.286 | 0.004123 | 0.004418 | 0.000295 | 0.064 | 0.092 |
| % effective half spread | 0.045688% | 0.049445% | 0.003757% | 0.277 | 0.236 | 0.039527% | 0.040714% | 0.001187% | 0.026 | 0.632 | 0.024548% | 0.025345% | 0.000797% | 0.021 | 0.068 |

# Table 2.13: Trades, NASDAQ Pilot Phase Sample, Medians 1-Day Pairing (+1 to -1)

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 1 day of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades (Raw Counts)** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trade Volume | 4720.00 | 9708.00 | 4988.00 | 0.000 | 0.000 | 37652.00 | 55735.50 | 18083.50 | 0.000 | 0.000 | 8024.50 | 101855.50 | 93831.00 | 0.000 | 0.000 |
| Ave. Trade Size | 179.00 | 186.00 | 7.00 | 0.001 | 0.059 | 153.00 | 156.00 | 3.00 | 0.556 | 0.116 | 158.00 | 165.50 | 7.50 | 0.367 | 0.598 |
| Ave. Trade Price | 22.08 | 21.88 | -0.20 | 0.466 | 0.528 | 22.26 | 22.46 | 0.20 | 0.038 | 0.010 | 22.28 | 22.47 | 0.19 | 0.000 | 0.000 |
| ***Trades*** | | | | | | | | | | | | | | | |
| % # of buy trades | 48.15% | 48.72% | 0.57% | 0.580 | 0.664 | 48.33% | 48.88% | 0.55% | 0.659 | 0.270 | 48.96% | 48.16% | -0.80% | 0.770 | 0.551 |
| % # of sell trades | 51.85% | 51.28% | -0.57% | 0.580 | 0.664 | 51.66% | 51.12% | -0.54% | 0.659 | 0.270 | 51.04% | 51.84% | 0.80% | 0.770 | 0.551 |
| % # of trades inside NBBO | 35.71% | 35.03% | -0.68% | 0.461 | 0.294 | 25.03% | 29.36% | 4.33% | 0.001 | 0.000 | 19.20% | 20.67% | 1.47% | 0.413 | 0.133 |
| % # of trades outside NBBO | 3.92% | 4.62% | 0.70% | 0.733 | 0.729 | 4.25% | 3.55% | -0.70% | 0.090 | 0.085 | 2.20% | 2.79% | 0.59% | 0.546 | 0.683 |
| % # of buy trades at ask | 23.47% | 26.42% | 2.95% | 0.120 | 0.051 | 31.41% | 29.28% | -2.13% | 0.285 | 0.551 | 33.80% | 33.33% | -0.47% | 0.089 | 0.051 |
| % # of sell trades at bid | 27.63% | 28.29% | 0.66% | 0.805 | 0.859 | 33.89% | 33.42% | -0.47% | 0.243 | 0.019 | 35.86% | 34.78% | -1.08% | 0.954 | 0.985 |
| Quoted half spread | 0.029393 | 0.029643 | 0.000250 | 0.585 | 0.950 | 0.018514 | 0.019504 | 0.000990 | 0.099 | 0.375 | 0.011754 | 0.011603 | -0.000151 | 0.779 | 0.600 |
| % quoted half spread | 0.145549% | 0.170231% | 0.024682% | 0.482 | 0.983 | 0.105541% | 0.107566% | 0.002025% | 0.043 | 0.454 | 0.066923% | 0.073802% | 0.006879% | 0.677 | 0.236 |
| Bid vol at quoted spread | 2.33 | 2.65 | 0.32 | 0.048 | 0.039 | 2.59 | 2.76 | 0.17 | 0.102 | 0.390 | 2.96 | 3.39 | 0.43 | 0.833 | 0.502 |
| % bid vol at quoted spread | 48.330% | 49.930% | 1.60% | 0.182 | 0.186 | 49.190% | 50.380% | 1.19% | 0.102 | 0.155 | 49.530% | 50.850% | 1.32% | 0.294 | 0.428 |
| Ask vol at quoted spread | 2.50 | 2.65 | 0.15 | 0.135 | 0.316 | 2.72 | 2.47 | -0.25 | 0.327 | 0.216 | 3.06 | 3.26 | 0.20 | 0.573 | 0.991 |
| % Ask vol at quoted spread | 51.670% | 50.070% | -1.60% | 0.182 | 0.186 | 50.810% | 49.620% | -1.19% | 0.102 | 0.155 | 50.470% | 49.150% | -1.32% | 0.294 | 0.428 |
| Total Vol at QS | **5.38** | **5.66** | **0.28** | **0.085** | **0.102** | **5.82** | **5.67** | **-0.15** | 1.000 | 0.343 | **6.34** | **7.75** | **1.41** | 0.726 | 0.794 |
| Effective half spread | 0.010632 | 0.011250 | 0.000618 | 0.696 | 0.516 | 0.007137 | 0.007153 | 0.000016 | 0.599 | 0.984 | 0.004821 | 0.004569 | -0.000252 | 0.726 | 0.804 |
| % effective half spread | 0.054420% | 0.059203% | 0.004783% | 0.815 | 0.395 | 0.041494% | 0.039428% | -0.002066% | 0.327 | 0.735 | 0.027490% | 0.030602% | 0.003112% | 1.000 | 0.704 |

# Table 2.14: Trades: NASDAQ Matching Sample, Medians 1-Day Pairing (+1 to -1)

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 1 day of data on both sides of the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 4700.00 | 8083.00 | 3383.00 | 0.000 | 0.000 | 34030.00 | 52192.00 | 18162.00 | 0.000 | 0.000 | 6926.00 | 10098.50 | 3172.50 | 0.000 | 0.000 |
| Ave. Trade Size | 164.00 | 171.00 | 7.00 | 0.006 | 0.021 | 156.00 | 162.00 | 6.00 | 0.130 | 0.075 | 156.50 | 159.50 | 3.00 | 1.000 | 0.966 |
| Ave. Trade Price | 19.10 | 19.15 | 0.05 | 0.042 | 0.023 | 19.14 | 19.30 | 0.16 | 0.000 | 0.000 | 19.35 | 19.20 | -0.15 | 0.000 | 0.000 |
| % # of buy trades | 48.150% | 47.370% | -0.78% | 0.288 | 0.779 | 49.660% | 47.580% | -2.08% | 0.001 | 0.010 | 47.260% | 45.990% | -1.27% | 0.442 | 0.666 |
| % # of sell trades | 51.850% | 52.630% | 0.78% | 0.288 | 0.779 | 50.350% | 52.420% | 2.07% | 0.001 | 0.010 | 52.750% | 54.010% | 1.26% | 0.442 | 0.666 |
| % # of trades inside NBBO | 35.00% | 34.15% | -0.85% | 0.118 | 0.622 | 26.67% | 28.60% | 1.93% | 0.021 | 0.046 | 18.18% | 21.63% | 3.45% | 0.036 | 0.004 |
| % # of trades outside NBBO | 3.13% | 5.64% | 2.51% | 0.023 | 0.004 | 3.41% | 3.94% | 0.53% | 0.046 | 0.072 | 2.44% | 2.62% | 0.18% | 0.629 | 0.315 |
| % # of buy trades at ask | 23.53% | 23.08% | -0.45% | 0.899 | 0.850 | 32.11% | 29.08% | -3.03% | 0.001 | 0.002 | 34.47% | 29.45% | -5.02% | 0.001 | 0.000 |
| % # of sell trades at bid | 30.00% | 28.21% | -1.79% | 0.851 | 0.654 | 32.12% | 33.33% | 1.21% | 0.029 | 0.245 | 36.34% | 36.24% | -0.10% | 0.442 | 0.468 |
| Quoted half spread | 0.026795 | 0.026834 | 0.000039 | 0.681 | 0.445 | 0.016667 | 0.017724 | 0.001057 | 0.080 | 0.092 | 0.009457 | 0.010824 | 0.001367 | 0.033 | 0.022 |
| % quoted half spread | 0.145422% | 0.176185% | 0.030763% | 0.805 | 0.235 | 0.093283% | .096057% | .002774% | 0.074 | 0.153 | 0.057237% | 0.060238% | 0.003001% | 0.016 | 0.018 |
| Bid vol at quoted spread | 2.21 | 2.52 | 0.31 | 0.453 | 0.240 | 2.62 | 2.69 | 0.07 | 0.549 | 0.901 | 3.01 | 2.93 | -0.08 | 0.208 | 0.170 |
| % bid vol at quoted spread | 50.000% | 51.330% | 1.33% | 0.366 | 0.468 | 50.180% | 50.000% | -0.18% | 0.843 | 0.336 | 50.000% | 47.940% | -2.06% | 0.079 | 0.162 |
| Ask vol at quoted spread | 2.26 | 2.24 | -0.02 | 0.869 | 0.730 | 2.89 | 2.50 | -0.39 | 0.258 | 0.184 | 3.35 | 3.31 | -0.04 | 0.883 | 0.821 |
| % Ask vol at quoted spread | 50.000% | 48.670% | -1.33% | 0.366 | 0.468 | 49.820% | 50.010% | 0.19% | 0.843 | 0.336 | 50.000% | 52.060% | 2.06% | 0.079 | 0.162 |
| Total Vol at QS | **4.77** | **5.32** | **0.55** | **0.565** | **0.277** | **5.87** | **5.43** | **-0.44** | **0.843** | **0.696** | **7.16** | **6.77** | **-0.39** | **0.465** | **0.500** |
| Effective half spread | 0.008891 | 0.010597 | 0.001706 | 0.099 | 0.128 | 0.006108 | 0.006671 | 0.000563 | 0.159 | 0.054 | 0.004199 | 0.004481 | 0.000282 | 0.205 | 0.223 |
| % effective half spread | 0.048349% | 0.057526% | 0.009177% | 0.118 | 0.095 | 0.036256% | 0.039353% | 0.003097% | 0.055 | 0.095 | 0.023010% | 0.024060% | 0.001050% | 0.093 | 0.341 |

# Table 2.15: Trades, NASDAQ Pilot Phase Sample, Medians Event Day Matching (0 to -1)

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 1 day of data before the event date to the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades (Raw Counts)** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 4558.50 | 7169.50 | 2611.00 | 0.000 | 0.000 | 37233.00 | 44480.00 | 7247.00 | 0.001 | 0.001 | 8004.00 | 9566.00 | 1562.00 | 0.011 | 0.002 |
| Ave. Trade Size | 180.00 | 184.50 | 4.50 | 0.327 | 0.957 | 152.00 | 159.00 | 7.00 | 0.026 | 0.051 | 157.00 | 160.00 | 3.00 | 0.809 | 0.496 |
| Ave. Trade Price | 21.23 | 21.39 | 0.16 | 0.000 | 0.000 | 22.25 | 22.11 | -0.14 | 0.013 | 0.005 | 22.29 | 22.88 | 0.59 | 0.007 | 0.012 |
| % # of buy trades | 47.987% | 47.913% | -0.07% | 0.356 | 0.484 | 47.908% | 49.733% | 1.83% | 0.868 | 0.528 | 48.413% | 49.222% | 0.81% | 0.224 | 0.429 |
| % # of sell trades | 52.013% | 52.087% | 0.07% | 0.356 | 0.484 | 52.092% | 50.267% | -1.83% | 0.868 | 0.528 | 51.587% | 50.778% | -0.81% | 0.224 | 0.429 |
| % # of trades inside NBBO | 36.36% | 33.75% | -2.61% | 0.503 | 0.298 | 25.10% | 27.31% | 2.21% | 0.261 | 0.232 | 19.20% | 17.99% | -1.22% | 0.126 | 0.015 |
| % # of trades outside NBBO | 3.88% | 3.10% | -0.78% | 0.245 | 0.023 | 4.11% | 3.01% | -1.10% | 0.145 | 0.033 | 2.26% | 1.64% | -0.61% | 0.250 | 0.119 |
| % # of buy trades at ask | 23.13% | 25.00% | 1.87% | 0.069 | 0.029 | 31.13% | 30.82% | -0.31% | 0.301 | 0.680 | 33.47% | 34.41% | 0.93% | 0.953 | 0.401 |
| % # of sell trades at bid | 27.34% | 28.69% | 1.36% | 0.458 | 0.392 | 33.95% | 32.77% | -1.18% | 0.312 | 0.365 | 36.21% | 36.81% | 0.60% | 0.032 | 0.144 |
| Quoted half spread | 0.000000 | 0.000000 | 0.000000 | 0.333 | 0.986 | 0.007077 | 0.008177 | 0.001100 | 0.574 | 0.877 | 0.005714 | 0.005735 | 0.000021 | 0.061 | 0.037 |
| % quoted half spread | 0.000000% | 0.000000% | 0.000000% | 0.333 | 0.373 | 0.053051% | 0.057136% | 0.004085% | 0.756 | 0.843 | 0.031923% | 0.028082% | -0.003841% | 0.084 | 0.121 |
| Bid vol at quoted spread | 2.19 | 2.42 | 0.23 | 0.343 | 0.276 | 3.03 | 3.25 | 0.22 | 0.602 | 0.211 | 3.58 | 3.87 | 0.29 | 0.023 | 0.176 |
| % bid vol at quoted spread | 50.000% | 49.281% | -0.72% | 0.221 | 0.185 | 50.000% | 50.000% | 0.00% | 0.19 | 0.312 | 50.000% | 50.000% | 0.00% | 0.628 | 0.463 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ask vol at quoted spread | 2.21 | 2.71 | 0.50 | 0.019 | 0.002 | 3.12 | 3.39 | 0.27 | 0.047 | 0.071 | 3.78 | 4.09 | 0.31 | 0.027 | 0.006 |
| % Ask vol at quoted spread | 50.000% | 50.719% | 0.72% | 0.221 | 0.185 | 50.000% | 50.000% | 0.00% | 0.19 | 0.312 | 50.000% | 50.000% | 0.00% | 0.628 | 0.463 |
| Total Vol at QS | **4.73** | **5.50** | **0.77** | **0.005** | **0.002** | **6.31** | **7.10** | **0.79** | 0.433 | 0.169 | **7.64** | **8.35** | **0.71** | 0.069 | 0.014 |
| Effective half spread | 0.000000 | 0.000000 | 0.000000 | 0.708 | 0.459 | 0.003136 | 0.003333 | 0.000197 | 0.574 | 0.080 | 0.002583 | 0.002500 | -0.000083 | 0.020 | 0.015 |
| % effective half spread | 0.000000% | 0.000000% | 0.000000% | 0.881 | 0.889 | 0.021518% | 0.019621% | -0.001897% | 0.534 | 0.127 | 0.013609% | 0.012272% | -0.001337% | 0.025 | 0.096 |

# Table 2.16: Trades, NASDAQ Matching Sample, Medians Event Day Matching (+0 to -1)

**This table contains the median pair-wise differences for several variables including the total trade volume, the average trade size, and the average trade price.**

**Also included are the % # of buy and sell trades, % of trades inside, outside, buy trades at the ask, and sell trades at the bid.**

**Execution costs are also provided and include quoted half spreads, % quoted half spreads, the effective half spreads and % effective half spreads.**

**The pairings contain 1 day of data before the event date to the event date. The results are divided in three time slices to isolate beginning and end of day volatility.**

**The sign test and the Wilcoxon test are the p-value results.**

| **No F Trades** | **1st Time Slice 9:30 am - 10:00 am** | | | | | **2nd Time Slice 10:00 am - 3:30 pm** | | | | | **3rd Time Slice 3:30 pm - 4:00pm** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average Descriptives*** | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon | Pre | Post | Dif | Sign | Wilcoxon |
| Trade Volume | 4740.50 | 6905.00 | 2164.50 | 0.001 | 0.000 | 33912.00 | 37273.00 | 3361.00 | 0.004 | 0.009 | 6770.00 | 9110.00 | 2340.00 | 0.036 | 0.014 |
| Ave. Trade Size | 164.00 | 186.50 | 22.50 | 0.001 | 0.003 | 156.00 | 158.00 | 2.00 | 0.101 | 0.248 | 153.50 | 155.50 | 2.00 | 0.809 | 0.708 |
| Ave. Trade Price | 19.86 | 19.96 | 0.10 | 0.000 | 0.000 | 19.14 | 19.43 | 0.29 | 0.099 | 0.416 | 20.12 | 19.36 | -0.76 | 0.279 | 0.217 |
| % # of buy trades | 47.564% | 46.195% | -1.37% | 0.800 | 0.856 | 49.655% | 48.873% | -0.78% | 0.050 | 0.113 | 46.667% | 49.444% | 2.78% | 0.078 | 0.297 |
| % # of sell trades | 52.436% | 53.805% | 1.37% | 0.800 | 0.856 | 50.345% | 51.127% | 0.78% | 0.050 | 0.112 | 53.333% | 50.556% | -2.78% | 0.078 | 0.297 |
| % # of trades inside NBBO | 34.52% | 35.29% | 0.77% | 0.707 | 0.553 | 27.31% | 27.73% | 0.42% | 0.307 | 0.182 | 17.92% | 15.95% | -1.97% | 0.717 | 0.274 |
| % # of trades outside NBBO | 3.13% | 4.76% | 1.63% | 0.158 | 0.152 | 3.39% | 3.37% | -0.02% | 0.395 | 0.240 | 1.84% | 2.01% | 0.17% | 0.454 | 0.690 |
| % # of buy trades at ask | 23.45% | 22.51% | -0.94% | 0.653 | 0.735 | 32.11% | 28.81% | -3.29% | 0.030 | 0.018 | 34.34% | 33.33% | -1.00% | 1.000 | 0.722 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % # of sell trades at bid | 30.28% | 29.41% | -0.87% | 0.655 | 0.705 | 31.98% | 33.33% | 1.35% | 0.396 | 0.509 | 36.54% | 36.86% | 0.32% | 0.953 | 0.848 |
| Quoted half spread | 0.000000 | 0.000000 | 0.000000 | 0.455 | 0.726 | 0.008664 | 0.007849 | -0.000815 | 0.341 | 0.554 | 0.005362 | 0.005630 | 0.000268 | 0.627 | 0.939 |
| % quoted half spread | 0.000000% | 0.000000% | 0.000000% | 0.654 | 0.522 | 0.045163% | 0.045123% | -0.000040% | 0.375 | 0.295 | 0.020525% | 0.026798% | 0.006273% | 0.788 | 0.728 |
| Bid vol at quoted spread | 2.09 | 2.34 | 0.25 | 0.014 | 0.006 | 2.83 | 2.92 | 0.09 | 0.874 | 0.895 | 3.31 | 3.67 | 0.36 | 0.167 | 0.125 |
| % bid vol at quoted spread | 50.000% | 50.000% | 0.00% | 0.648 | 0.862 | 50.000% | 50.433% | 0.43% | 0.525 | 0.412 | 50.000% | 50.000% | 0.00% | 0.912 | 0.796 |
| Ask vol at quoted spread | 2.06 | 2.32 | 0.26 | 0.008 | 0.004 | 3.01 | 2.80 | -0.21 | 0.460 | 0.524 | 3.64 | 3.67 | 0.03 | 0.204 | 0.168 |
| % Ask vol at quoted spread | 50.000% | 50.000% | 0.00% | 0.648 | 0.862 | 50.000% | 49.568% | -0.43% | 0.525 | 0.412 | 50.000% | 50.000% | 0.00% | 0.912 | 0.796 |
| Total Vol at QS | **4.34** | **5.26** | **0.92** | **0.003** | **0.000** | **6.10** | **6.26** | **0.16** | **0.139** | **0.247** | **7.61** | **8.00** | **0.39** | **0.154** | **0.070** |
| Effective half spread | 0.000000 | 0.000000 | 0.000000 | 0.407 | 0.642 | 0.003353 | 0.003136 | -0.000217 | 0.848 | 0.927 | 0.002500 | 0.002500 | 0.000000 | 1.000 | 0.757 |
| % effective half spread | 0.000000% | 0.000000% | 0.000000% | 0.600 | 0.592 | 0.017232% | 0.018015% | 0.000783% | 1.000 | 0.889 | 0.009072% | 0.011256% | 0.002184% | 0.840 | 0.896 |

## Table 3.1: NASDAQ Pilot Phase Stocks: Event Study Regressions

**Rule 611 Pilot Phase Implementation Event Date: July 9, 2007**

**Estimation Period: 100-days prior to Event Period**

**Event Period: 15 days on both sides of the Event Date**

**Returns from CRSP Database**

| Full Sample N=94 | | | |
|---|---|---|---|
| **Period** | **CARS** | **t-stat** | **P-value** |
| dn1 - dn15 | -0.006040 | -0.838050 | 0.404154 |
| dn1 - dn10 | -0.004700 | -0.582060 | 0.561935 |
| dn1 – dn5 | -0.012760 | -1.436150 | 0.154316 |
| Event | 0.004921 | 0.454757 | 0.650343 |
| up1 - up5 | -0.002190 | -0.185990 | 0.852860 |
| up1 - up10 | -0.014950 | -1.193630 | 0.235658 |
| up1 - up15 | -0.040730 | -2.964340 | 0.003853 |

| Mid-Cap Sample N=29 | | | |
|---|---|---|---|
| **Period** | **CARS** | **t-stat** | **P-value** |
| dn1 - dn15 | -0.015420 | -1.63070 | 0.114153 |
| dn1 - dn10 | -0.003090 | -0.28639 | 0.776690 |
| dn1 – dn5 | -0.013830 | -1.15807 | 0.256620 |
| Event | 0.000516 | 0.04022 | 0.968203 |
| up1 – up5 | -0.003030 | -0.21616 | 0.830430 |

| | | | |
|---|---|---|---|
| up1 – up10 | -0.019490 | -1.37706 | 0.179404 |
| up1 – up15 | -0.021790 | -1.34978 | 0.187898 |

| **Small-Cap Sample N=62** | | | |
|---|---|---|---|
| **Period** | **CARS** | **t-stat** | **P-value** |
| dn1 – dn15 | -0.003520 | -0.354440 | 0.724228 |
| dn1 – dn10 | -0.006820 | -0.614070 | 0.541451 |
| dn1 – dn5 | -0.013300 | -1.088880 | 0.280491 |
| Event | 0.007571 | 0.496161 | 0.621564 |
| up1 – up5 | -0.001070 | -0.064520 | 0.948763 |
| up1 – up10 | -0.012760 | -0.721360 | 0.473443 |
| up1 – up15 | -0.047790 | -2.478400 | 0.015979 |

Nasdaq Large Cap firms N=3 (sample regression omitted)

## Table 3.2: NYSE Pilot Phase Stocks: Event Study Regressions

**Rule 611 Pilot Phase Implementation Event Date: July 9, 2007**

**Estimation Period: 100-days prior to Event Period**

**Event Period: 15 days on both sides of the Event Date**

**Returns from CRSP Database**

| **Full Sample N=87** | | | |
|---|---|---|---|
| **Period** | **CARS** | **t-stat** | **P-value** |
| dn1 - dn15 | -0.012003 | -2.202440 | 0.030310 |
| dn1 - dn10 | -0.007014 | -1.093700 | 0.277141 |
| dn1 – dn5 | 0.004371 | 0.629676 | 0.530576 |
| Event | -0.000728 | -0.106494 | 0.915439 |
| up1 – up5 | -0.016579 | -2.133343 | 0.035745 |
| up1 – up10 | -0.026273 | -3.081189 | 0.002769 |
| up1 – up15 | -0.046837 | -4.574548 | 0.000016 |
| **Large Cap Sample N=55** | | | |
| **Period** | **CARS** | **t-stat** | **P-value** |
| dn1 - dn15 | -0.006135 | -1.526460 | 0.132732 |
| dn1 - dn10 | 0.000756 | 0.164524 | 0.869933 |
| dn1 - dn5 | -0.000015 | -0.002960 | 0.997649 |
| Event | -0.000024 | -0.005095 | 0.995954 |
| up1 - up5 | -0.012583 | -2.212486 | 0.031182 |
| up1 - up10 | -0.015200 | -2.118473 | 0.038752 |
| up1 - up15 | -0.023748 | -2.726367 | 0.008617 |

| Mid-Cap Sample N=27 | | | |
|---|---|---|---|
| **Period** | **CARS** | **t-stat** | **P-value** |
| dn1 - dn15 | -0.013301 | -0.978396 | 0.336895 |
| dn1 - dn10 | -0.012801 | -0.799914 | 0.431009 |
| dn1 – dn5 | 0.009597 | 0.560763 | 0.579760 |
| Event | -0.001511 | -0.083971 | 0.933723 |
| up1 – up5 | -0.016994 | -0.906734 | 0.372875 |
| up1 – up10 | -0.025856 | -1.348841 | 0.189020 |
| up1 – up15 | -0.043413 | -2.212406 | 0.035927 |

| Small-Cap Sample N=5 | | | |
|---|---|---|---|
| Period | CARS | t-stat | P-value |
| dn1 - dn15 | -0.069550 | -1.906990 | 0.129193 |
| dn1 - dn10 | -0.061230 | -1.476170 | 0.213941 |
| dn1 - dn5 | 0.024397 | 0.571318 | 0.598353 |
| Event | -0.004230 | -0.101620 | 0.923949 |
| up1 - up5 | -0.058300 | -1.239350 | 0.282962 |
| up1 - up10 | -0.150330 | -3.080610 | 0.036910 |
| up1 - up15 | -0.319310 | -4.403240 | 0.011662 |

**Table 4.1**
**Total Consolidated Volume (5-Day Averages)**

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| | **9-Feb-07** | **% of Total** | **7-Jul-11** | **% of Total** | **Difference** | **% Dif** |
| Exchange | 3,231,414,019 | 64% | 4,518,812,876 | 69% | 1,287,398,857 | 40% |
| Off-Exchange | 1,845,987,973 | 36% | 2,062,435,806 | 31% | 216,447,833 | 12% |
| | | | | | | |
| **Total** | **5,077,401,992** | | **6,581,248,682** | | **1,503,846,690** | **30%** |

**Table 4.2**

**Total Consolidated Volume by Exchange (5 Day-Averages)**

| **Facility** | **9-Feb-07** | **% of Total** | **7-Jul-11** | **% of Total** | **Difference** | **Change in % of Total** |
|---|---|---|---|---|---|---|
| **Exchanges** | | | | | | |
| NYSE | 1,481,198,376 | 29% | 900,435,464 | 14% | -580,762,912 | -15% |
| ARCA (ECN) | 746,217,242 | 15% | 824,915,282 | 13% | 78,698,040 | -2% |
| NASDAQ | 913,566,204 | 18% | 1,263,303,133 | 19% | 349,736,929 | 1% |
| BATS (ECN) | 0 | 0% | 692,963,189 | 11% | 692,963,189 | 11% |
| BEX (Boston) | 4,199,740 | 0% | 145,461,182 | 2% | 141,261,442 | 2% |
| ISE/EDGE | 419,920 | 0% | 542,054,164 | 8% | 541,634,244 | 8% |
| NSX | 14,802,401 | 0% | 42,974,270 | 1% | 28,171,869 | 0% |
| CHX | 25,307,571 | 0% | 10,463,561 | 0% | -14,844,010 | 0% |

| | | | | | | |
|---|---|---|---|---|---|---|
| AMEX | 40,953,437 | 1% | 18,734,736 | 0% | -22,218,701 | -1% |
| CBOE | 75,380 | 0% | 8,263,580 | 0% | 8,188,200 | 0% |
| PHLX | 4,673,748 | 0% | 69,244,316 | 1% | 64,570,568 | 1% |
| **Total** | **3,231,414,019** | **64%** | **4,518,812,877** | **69%** | **1,287,398,858** | **5%** |
| **Off-Exchange** | | | | | | |
| NASDAQ | 690,732,902 | 14% | 1,899,802,130 | 29% | 3,113,563,739 | 15% |
| NYSE | - | | 162,633,676 | 2% | 232,397,625 | 2% |
| Other | 1,155,255,071 | 23% | - | | -<br>1,155,255,071 | -23% |
| **Total** | **1,845,987,973** | **36%** | **2,062,435,806** | **31%** | 2,190,706,293 | **-5%** |
| | | | | | | |
| **Grand Total** | **5,077,401,992** | **100%** | **6,581,248,683** | **100%** | **6,805,485,011** | **0%** |

**Table 4.3**

**NYSE Consolidated Volume Based on 5-Day Average**

| **Facility** | **9-Feb-07** | **% of Total** | **7-Jul-11** | **% of Total** | **Difference** | **Change in % of Total** |
|---|---|---|---|---|---|---|
| **Exchanges** | | | | | | |
| NYSE | 1,477,279,876 | 55% | 900,435,464 | 25% | -576,844,412 | -30% |
| ARCA (ECN) | 268,382,320 | 10% | 354,494,438 | 13% | 86,112,118 | 3% |
| NASDAQ | 0 | 0% | 530,898,795 | 19% | 530,898,795 | 19% |
| BATS (ECN) | 5,743,626 | 0% | 313,433,790 | 11% | 307,690,164 | 10% |
| BEX (Boston) | 2,432,480 | 0% | 80,260,826 | 2% | 77,828,346 | 2% |

| | | | | | | |
|---|---|---|---|---|---|---|
| ISE/EDGE | 258,440 | 0% | 274,559,107 | 8% | 274,300,667 | 8% |
| NSX | 9,586,940 | 0% | 23,479,618 | 1% | 13,892,678 | 0% |
| CHX | 17,274,843 | 1% | 3,725,576 | 0% | -13,549,267 | 0% |
| AMEX | 1,346,220 | 0% | 0 | 0% | -1,346,220 | 0% |
| CBOE | 0 | 0% | 1,362,780 | 0% | 1,362,780 | 0% |
| PHLX | 3,325,740 | 0% | 24,594,991 | 1% | 21,269,251 | 1% |
| **Total** | **1,785,630,485** | **67%** | **2,507,245,385** | **69%** | **721,614,900** | **2%** |
| **Off-Exchange** | | | | | | |
| NASDAQ | 0 | 0% | 1,009,986,480 | 29% | 1,009,986,480 | 29% |
| NYSE | 0 | 0% | 94,746,509 | 2% | 94,746,509 | 2% |
| Other | 892,270,244 | 33% | 0 | 0% | -892,270,244 | -33% |
| **Total** | **892,270,244** | **33%** | **1,104,732,989** | **31%** | **212,462,745** | **-2%** |
| | | | | | | |
| **Grand Total** | **2,677,900,729** | **100%** | **3,611,978,374** | **100%** | **934,077,645** | **0%** |

| Table 4.44 | | | | | | |
|---|---|---|---|---|---|---|
| **Nasdaq Consolidated Volume Based on 5-Day Averages** | | | | | | |
| **Based on 5-Day Average** | | | | | | |
| **Facility** | **9-Feb-07** | **% of Total** | **7-Jul-11** | **% of Total** | **Difference** | **Change in % of Total** |
| **Exchanges** | | | | | | |
| NYSE | 0 | 0% | 0 | 0% | 0 | 0% |
| ARCA (ECN) | 386,430,082 | 18% | 204,538,084 | 12% | -181,891,998 | -7% |
| NASDAQ | 913,566,204 | 44% | 492,017,722 | 28% | -421,548,482 | -15% |
| BATS (ECN) | 195,950,375 | 9% | 198,106,752 | 11% | 2,156,377 | 2% |
| BEX (Boston) | 1,714,420 | 0% | 37,768,233 | 2% | 36,053,813 | 2% |
| ISE/EDGE | 152,820 | 0% | 159,787,187 | 9% | 159,634,367 | 9% |
| NSX | 1,622,901 | 0% | 14,133,908 | 1% | 12,511,007 | 1% |
| CHX | 6,085,188 | 0% | 1,913,296 | 0% | -4,171,892 | 0% |
| AMEX | 31,320 | 0% | 4,703,415 | 0% | 4,672,095 | 0% |
| CBOE | 0 | 0% | 1,456,202 | 0% | 1,456,202 | 0% |
| PHLX | 826,588 | 0% | 19,414,632 | 1% | 18,588,044 | 1% |
| **Total** | **1,506,379,898** | **72%** | **1,133,839,431** | **66%** | **-372,540,467** | **-6%** |
| **Off-Exchange** | | | | | | |
| NASDAQ | 494,782,527 | 24% | 549,221,534 | 32% | 54,439,007 | 8% |
| NYSE | 0 | 0% | 43,445,567 | 3% | 43,445,567 | 3% |
| Other | 95,404,906 | 5% | 0 | 0% | -95,404,906 | -5% |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Total** | **590,187,433** | **28%** | **592,667,101** | **34%** | **2,479,668** | **6%** |
| | | | | | | |
| **Grand Total** | **2,096,567,331** | **100%** | **1,726,506,532** | **100%** | **-370,060,799** | **0%** |

Appendix A – NASDAQ Pilot Phase Sample

Information for the 94 NASDAQ Stocks included in the pilot phase sample

- **Original Sample included 100 NASDAQ Stocks. Six firms were dropped due to data CRSP omissions.**

| | NASDAQ Pilot Phase Sample | | | | | |
|---|---|---|---|---|---|---|
| | Pilot Phase Stock Name | Ticker | Market Value (in $M) | Closing Price | Ave # of Shares Traded | Sector and Industry |
| 1 | ARKANSAS BEST CORPORATION | ABFS | 775.077 | 30.790 | 1,154.911 | Services Trucking |
| 2 | AMERICAN COMMERCIAL LINES INC | ACLI | 1,015.938 | 20.260 | 766.030 | Services Air Delivery & Freight Services |
| 3 | ADVANCED ENERGY INDUSTRIES INC | AEIS | 489.412 | 10.810 | 627.267 | Technology Diversified Electronics |
| 4 | ALEXION PHARMACEUTICALS INC | ALXN | 2,455.509 | 65.320 | 924.076 | Healthcare Drug Manufacturers |
| 5 | ARM HOLDINGS PLC | ARMH | 3,018.117 | 7.080 | 600.019 | Technology Diversified Electronics |
| 6 | ASSOCIATED BANC-CORP | ASBC | 3,580.833 | 28.180 | 1,914.122 | Financial Regional Midwest Banks |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | ASCENT SOLAR TECHNOLOGIES INC | ASTI | 169.260 | 15.000 | 574.713 | Technology Semiconductor |
| 8 | AVICI SYSTEMS INC | AVCI | 100.938 | 6.840 | 121.658 | |
| 9 | AVOCENT CORPORATION | AVCT | 829.685 | 16.600 | 1,218.167 | |
| 10 | AVID TECHNOLOGY INC | AVID | 1,064.379 | 25.920 | 673.635 | Technology Multimedia & Graphic Software |
| 11 | AVI BIOPHARMA INC | AVII | 79.889 | 1.240 | 410.204 | Healthcare Biotechnology |
| 12 | ASPEN TECHNOLOGY INC | AZPN.PK | 1,237.622 | 14.050 | 733.804 | Technology Business Software |
| 13 | BALLARD POWER SYSTEMS INC | BLDP | 528.304 | 4.590 | 517.897 | Industrial Goods Industrial Electrical Equipment |
| 14 | CHINA BAK BATTERY INC | CBAK | 233.002 | 4.400 | 581.664 | Industrial Goods Industrial Electrical Equipment |
| 15 | COGENT COMMUNICATIONS GRP | CCOI | 986.306 | 20.470 | 1,108.638 | Technology Diversified Communication Services |

| | **Pilot Phase Stock Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** | |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| 16 | CHARLOTTE RUSSE HOLDING INC | CHIC | 450.371 | 18.030 | 995.409 | Services Apparel Stores |
| 17 | CASUAL MALE RETAIL GRP INC | CMRG | 200.878 | 4.860 | 602.287 | Services Apparel Stores |
| 18 | COSI INC | COSI | 122.910 | 3.000 | 231.689 | Services Restaurants |
| 19 | CEPHEID INC | CPHD | 1,694.970 | 30.540 | 1,687.408 | Technology Scientific & Technical Instruments |
| 20 | CERADYNE INC | CRDN | 1,315.265 | 48.150 | 705.012 | Aerospace & Defense |
| 21 | CSG SYSTEMS INTL INC | CSGS | 431.020 | 12.760 | 694.519 | Technology Business Software & Services |
| 22 | DIODES INC | DIOD | 927.597 | 23.150 | 554.402 | Technology Semiconductor – Integrated Circuits |
| 23 | EDDIE BAUER HOLDINGS INC | EBHI | 196.921 | 6.420 | 401.773 | Services Apparel Stores |
| 24 | EAGLE BULK SHIPPING INC | EGLE | 1,155.091 | 24.720 | 992.026 | Services Shipping |
| 25 | EMAGEON INC | EMAG | 61.635 | 2.880 | 131.006 | Healthcare Technology |
| 26 | FINISH LINE INC -CL A | FINL | 95.547 | 2.240 | 1,295.210 | Services Apparel Stores |

| | | | | | | |
|---|---|---|---|---|---|---|
| 27 | FLAMEL TECHNOLOGIES SA-ADR | FLML | 225.754 | 9.390 | 183.234 | Healthcare Drug Delivery |
| 28 | FORMFACTOR INC | FORM | 1,176.995 | 24.220 | 1,055.661 | Technology Semiconductor – Broad Line |
| 29 | FIBERTOWER CORP | FTWR | 261.687 | 1.790 | 526.663 | Technology Wireless Communication |
| 30 | GENVEC INC | GNVC | 116.847 | 1.550 | 678.039 | Healthcare Biotechnology |
| 31 | INTERDIGITAL INC | IDCC | 958.884 | 20.210 | 727.655 | Technology Wireless Communication |

| | Pilot Phase Stock Name | Ticker | Market Value (in $M) | Closing Price | Ave # of Shares Traded | |
|---|---|---|---|---|---|---|
| 32 | INNERWORKINGS INC | INWK | 664.745 | 13.850 | 504.843 | Services Business Services |
| 33 | KNOT INC | KNOT | 461.936 | 14.640 | 375.563 | Technology Internet Information Providers |
| 34 | LCA VISION INC | LCAV | 314.714 | 16.510 | 654.766 | Healthcare Medical Practioners |
| 35 | LIFECELL CORP | LIFC | 1,346.777 | 39.510 | 622.595 | Healthcare Biotechnology |
| 36 | LA JOLLA PHARMACEUTICAL CO | LJPC | 140.605 | 3.550 | 98.466 | Healthcare Biotechnology |
| 37 | LINCARE HOLDINGS INC | LNCR | 2,678.480 | 33.410 | 1,277.767 | Healthcare Home Health Care |
| 38 | MEDIACOM COMMUNICATIONS CORP | MCCC | 389.236 | 4.960 | 628.981 | Technology Broadcasting & Cable TV |
| 39 | MILLICOM INTL CELLULAR SA | MICC | 11,445.970 | 105.940 | 1,045.978 | Technology Wireless Telecommunications |
| 40 | MKS INSTRUMENTS INC | MKSI | 1,054.322 | 18.600 | 504.074 | Industrial Goods Diversified Machinery |

| | | | | | | |
|---|---|---|---|---|---|---|
| 41 | MACROVISION CORP | MVSN | 903.336 | 16.790 | 1,172.969 | Technology<br>Systems Software |
| 42 | NABI BIOPHARMACEUTICALS | NABI | 215.891 | 3.530 | 524.013 | Healthcare<br>Biotechnology |
| 43 | NAPSTER INC | NAPS | 83.622 | 1.810 | 270.607 | Technology<br>Home Entertainment Software |
| 44 | NEWPORT CORP | NEWP | 389.414 | 10.500 | 441.952 | Technology<br>Scientific & Technical Instruments |
| 45 | NORTHFIELD LABORATORIES INC | NFLD | 28.577 | 1.060 | 111.497 | Healthcare<br>Biotechnology |
| 46 | NUTRITION 21 INC | NXXI | 35.010 | 0.560 | 162.227 | Healthcare<br>Biotechnology |
| 47 | OMNI ENERGY SERVICES CORP | OMNI | 74.476 | 3.960 | 241.458 | Oil & Gas<br>Equipment Services |
| 48 | OMNITURE INC | OMTR | 1,729.411 | 24.720 | 1,412.117 | Technology<br>Internet Service Providers |
| 49 | O'REILLY AUTOMOTIVE INC | ORLY | 3,386.422 | 29.430 | 2,023.213 | Services<br>Auto Parts |
| | **Pilot Phase Stock Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 50 | PACER INTERNATIONAL INC | PACR | 594.565 | 17.130 | 547.943 | Services Air Delivery & Freight Services |
| 51 | PANACOS PHARMACEUTICALS INC | PANC | 26.768 | 0.500 | 493.235 | Healthcare Biotechnology |
| 52 | P F CHANGS CHINA BISTRO INC | PFCB | 739.440 | 28.440 | 1,576.414 | Services Restaurants |
| 53 | PROGRESSIVE GAMING INTL CORP | PGIC | 152.505 | 2.460 | 241.875 | Services Gaming |
| 54 | PARALLEL PETROLEUM CORP | PLLL | 572.592 | 13.880 | 651.600 | Oil & Gas Exploration & Production |
| 55 | PANERA BREAD CO | PNRA | 1,166.344 | 37.780 | 831.319 | Services Specialty Eateries |
| 56 | PSYCHIATRIC SOLUTIONS INC | PSYS | 1,657.992 | 30.170 | 1,108.359 | Healthcare Specialized Health Services |
| 57 | PAIN THERAPEUTICS INC | PTIE | 381.941 | 8.660 | 259.214 | Healthcare Drug Manufacturer |
| 58 | PIXELWORKS INC | PXLW | 39.876 | 0.860 | 204.905 | Technology Semiconductor – Integrated Circuits |
| 59 | QLT INC | QLTI | 273.855 | 3.670 | 514.366 | Healthcare Biotechnology |

| | | | | | | |
|---|---|---|---|---|---|---|
| 60 | QUANTUM FUEL SYS TECH WORLDW | QTWW | 44.205 | 0.570 | 1,063.050 | Consumer Goods Auto Parts |
| 61 | REGENERON PHARMACEUT | REGN | 1,296.561 | 20.280 | 633.309 | Healthcare Biotechnology |
| 62 | RENOVIS INC | RNVS | 77.997 | 2.620 | 60.646 | Healthcare Biotechnology |
| 63 | RYANAIR HOLDINGS PLC -ADR | RYAAY | 9,964.527 | 33.420 | 1,145.169 | Services Airlines |
| 64 | SCIELE PHARMA INC | SCRX | 852.724 | 23.920 | 1,230.508 | Healthcare Pharmaceuticals |
| 65 | SEATTLE GENETICS INC | SGEN | 710.120 | 9.160 | 750.353 | Healthcare Biotechnology |
| 66 | SHIRE PLC -ADR | SHPGY | 10,037.030 | 53.850 | 1,459.214 | Healthcare Drug Manufacturer |
| 67 | SIFY TECHNOLOGIES LTD -ADR | SIFY | 204.584 | 4.780 | 245.120 | Technology Internet Service Providers |

| | Pilot Phase Stock Name | Ticker | Market Value (in $M) | Closing Price | Ave # of Shares Traded | |
|---|---|---|---|---|---|---|
| 68 | SKYWEST INC | SKYW | 1,584.280 | 26.020 | 581.467 | Services Regional Airlines |
| 69 | SHANDA INTERACTIVE-ADR | SNDA | 1,983.610 | 27.490 | 1,070.084 | Technology Multimedia & Graphics Software |
| 70 | SOLARFUN POWER HOLDINGS -ADR | SOLF | 910.429 | 16.190 | 5,042.447 | Electrical Equipment and Components |
| 71 | SONIC CORP | SONC | 1,348.699 | 22.180 | 1,624.574 | Services Restaurants |
| 72 | S1 CORP | SONE | 328.280 | 5.660 | 273.456 | Technology Internet Services Provider |
| 73 | STEWART ENTERPRISES -CL A | STEI | 674.057 | 7.120 | 780.170 | Specialized Consumer Services |
| 74 | STATS CHIPPAC LTD -ADR | STTSY.PK | 1,899.346 | 9.280 | 9.431 | Technology Semiconductors |
| 75 | SUPERGEN INC | SUPG | 188.528 | 3.280 | 529.536 | Healthcare Drug Manufacturer |
| 76 | SAVVIS INC | SVVS | 1,069.832 | 20.200 | 949.090 | Technology Internet Software & Services |
| 77 | SMITH & WESSON HOLDING | SWHC | 191.819 | 4.750 | 1,535.582 | Industrial Goods |

| | | | | | | |
|---|---|---|---|---|---|---|
| | CORP | | | | | Aerospace Defense |
| 78 | SIERRA WIRELESS INC | SWIR | 464.071 | 14.810 | 943.669 | Technology Diversified Communication Services |
| 79 | SYNAPTICS INC | SYNA | 694.486 | 26.500 | 2,390.051 | Technology Computer Peripherals |
| 80 | TECH DATA CORP | TECD | 1,906.680 | 34.380 | 723.450 | Services Computer wholesale |
| 81 | TARGETED GENETICS CORP | TGEN | 23.381 | 1.180 | 53.568 | Healthcare Biotechnology |
| 82 | THRESHOLD PHARMACEUTICALS | THLD | 15.324 | 0.410 | 110.037 | Healthcare Biotechnology |
| 83 | THORATEC CORP | THOR | 864.224 | 16.000 | 663.998 | Healthcare Medical Instruments & Supplies |
| 84 | TESSERA TECHNOLOGIES INC | TSRA | 1,874.441 | 39.170 | 565.844 | Technology Semiconductor Equipment & Materials |
| | **Pilot Phase Stock Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** | |
| 85 | TEXAS ROADHOUSE INC | TXRH | 839.263 | 12.070 | 1,228.728 | Services Restaurant |

| | | | | | | |
|---|---|---|---|---|---|---|
| 86 | ULTRA CLEAN HOLDINGS INC | UCTT | 210.602 | 9.790 | 272.554 | Technology Semiconductor – Specialized |
| 87 | UNITED NATURAL FOODS INC | UNFI | 1,027.303 | 23.980 | 591.598 | Services Food Wholesale |
| 88 | UNITED ONLINE INC | UNTD | 755.919 | 11.170 | 813.318 | Services Specialty Retail |
| 89 | UTI WORLDWIDE INC | UTIW | 1,857.527 | 18.700 | 764.937 | Services Air Delivery & Freight Services |
| 90 | VERENIUM CORP | VRNM | 258.685 | 4.100 | 381.031 | Basic Materials Specialty Chemicals |
| 91 | WINN-DIXIE STORES INC | WINN | 955.126 | 17.720 | 361.236 | Services Grocery Stores |
| 92 | WARREN RESOURCES INC | WRES | 740.075 | 12.720 | 405.137 | Basic Materials Oil & Gas Equipment & Services |
| 93 | ZEBRA TECHNOLOGIES CP - CL A | ZBRA | 2,088.802 | 30.710 | 609.034 | Technology Computer Peripherals |
| 94 | ZIONS BANCORPORATION | ZION | 5,863.585 | 54.740 | 2,735.148 | Financial Regional – Pacific Banks |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Average | | 1,177.783 | 17.141 | 792.422 | |
| | Median | | 702.303 | 14.345 | 631.145 | |
| | Standard Deviation | | 1,937.598 | 16.405 | 676.435 | |
| | Maximum | | 11,445.970 | 105.940 | 5,042.447 | |
| | Minimum | | 15.324 | 0.410 | 9.431 | |
| | Small Cap Firms (< $1 billion) | | 62.000 | | | |
| | Mid-Cap Firms ($1 B - $8 B) | | 29.000 | | | |
| | Large Cap Firms ( > $8 billion) | | 3.000 | | | |

## *Appendix B – NASDAQ Matching Sample*

Information for the 94 NASDAQ Matching Stocks included in the pilot phase sample

| | NASDAQ Matching Sample | | | | |
|---|---|---|---|---|---|
| | **Matching Sample Stock Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| 1 | Energy Conversion Dev | ENER | 922.669 | 23.080 | 1,304.066 |
| 2 | Resources Connection Inc | RECN | 944.859 | 20.850 | 689.772 |
| 3 | Veeco Instruments Inc | VECO | 449.821 | 14.160 | 517.685 |
| 4 | Healthways Inc | HWAY | 2,023.647 | 56.300 | 1,053.267 |
| 5 | Ansys Inc | ANSS | 2,732.825 | 34.910 | 773.709 |
| 6 | Popular Inc | BPOP | 3,785.992 | 13.520 | 3,528.027 |
| 7 | People Support Inc | PSPT | 283.839 | 12.510 | 274.759 |
| 8 | China Grentech Corp - ADR | GRRF | 177.998 | 7.120 | 131.087 |
| 9 | Cybersource Corp | CYBS | 1,149.435 | 16.750 | 1,189.326 |
| 10 | Euronet Worldwide Inc | EEFT | 1,287.919 | 26.440 | 662.186 |
| 11 | Cell Therapeutics Inc | CTIC | 96.016 | 1.660 | 372.597 |
| 12 | Netgear Inc | NTGR | 937.686 | 26.660 | 719.134 |
| 13 | Global Sources LTD | GSOL | 617.079 | 13.250 | 605.578 |
| 14 | Power-One Inc | PWER | 200.027 | 2.290 | 423.387 |
| 15 | J2 Global Communications Inc | JCOM | 1,080.864 | 21.910 | 574.821 |
| 16 | Dress Barn | DBRN | 733.338 | 12.190 | 1,293.732 |
| 17 | Stein Mart Inc. | SMRT | 266.188 | 6.390 | 867.704 |

| | | | | | |
|---|---|---|---|---|---|
| 18 | Cost Plus Inc | CPWM | 88.348 | 4.000 | 227.383 |
| 19 | OSI Pharmaceuticals | OSIP | 2,315.752 | 39.880 | 1,799.640 |
| 20 | Old Dominion Freight | ODFL | 1,086.858 | 29.150 | 734.096 |
| 21 | Acxion Corp | ADES | 858.667 | 10.610 | 716.207 |
| 22 | Monolithic Power Systems Inc | MPWR | 514.473 | 15.640 | 507.640 |
| 23 | Cache Inc | CACH | 170.631 | 10.990 | 406.430 |
| 24 | Tetra Tech Inc | TTEK | 1,152.219 | 19.690 | 799.077 |
| 25 | Captaris Inc | CAPA | 89.797 | 3.370 | 138.293 |
| 26 | Hot Topic Inc | HOTT | 241.908 | 5.550 | 782.573 |
| 27 | Dexcom Inc | DXCM | 237.969 | 8.410 | 226.073 |
| 28 | Cymer Inc | CYMI | 825.588 | 27.010 | 1,253.032 |
| 29 | USA Mobility Inc | USMO | 327.993 | 12.010 | 272.731 |
| 30 | Penwest Pharmacticals Co | PPCO | 119.086 | 5.090 | 695.782 |

| | NASDAQ Matching Sample | | | | |
|---|---|---|---|---|---|
| | Matching Sample Stock Name | Ticker | Market Value (in $M) | Closing Price | Ave # of Shares Traded |
| 31 | Iconix Brand Group Inc | ICON | 1,183.263 | 20.790 | 994.610 |
| 32 | Fuelcell Energy Inc | FCEL | 575.236 | 8.410 | 1,703.005 |
| 33 | Divx Inc | DIVX | 493.121 | 14.250 | 378.480 |
| 34 | Sun Healthcare Group Inc | SUNH | 742.906 | 17.230 | 584.472 |
| 35 | Amedisys Inc | AMED | 1,118.014 | 42.630 | 558.955 |
| 36 | Alexza Pharmaceuticals Inc | ALXA | 195.470 | 6.300 | 130.263 |
| 37 | Perrigo Co. | PRGO | 2,882.707 | 30.840 | 1,479.482 |
| 38 | Dennys Corp | DENN | 319.504 | 3.390 | 791.879 |
| 39 | NII Holdings Inc | NIHD | 7,389.480 | 42.660 | 3,844.050 |
| 40 | Fei Co | FEIC | 822.286 | 22.660 | 554.213 |
| 41 | Tekelec | TKLC | 825.044 | 11.990 | 489.837 |
| 42 | Angiotech Pharmaceuticals | ANPI | 267.132 | 3.140 | 574.935 |
| 43 | Silverstar Holdings Ltd | SSTR | 31.152 | 1.640 | 270.202 |
| 44 | Universal Display Corp | PANL | 570.267 | 16.170 | 484.089 |
| 45 | Advanced Life Sciences Hldgs | ADLS | 38.503 | 1.000 | 261.580 |
| 46 | Acusphere inc | ACUS | 25.451 | 0.550 | 271.959 |
| 47 | Particle Drilling Tech Inc | PDRT | 63.889 | 2.020 | 192.438 |
| 48 | Websense Inc | WBSN | 930.228 | 20.500 | 963.078 |
| 49 | Dollar Tree Stores Inc | DLTR | 2,575.463 | 28.010 | 1,940.556 |
| 50 | Fuel Tech Inc | FTEK | 426.515 | 19.040 | 422.832 |
| 51 | Insmed Inc | INSM | 90.150 | 0.740 | 488.636 |

| | | | | | |
|---|---|---|---|---|---|
| 52 | CBRL Group | CBRL | 742.850 | 31.270 | 867.258 |
| 53 | Century Casinos Inc | CNTY | 110.951 | 4.690 | 104.294 |
| 54 | Bronco Drilling Co | BRNC | 419.829 | 15.660 | 642.708 |
| 55 | Tractor Supply Co | TSCO | 1,484.985 | 38.540 | 789.346 |
| 56 | Lifepoint Hospitals Inc | LPNT | 1,568.754 | 27.000 | 793.086 |
| 57 | Tercica Inc | TRCA | 341.615 | 6.640 | 170.162 |
| 58 | Centillium Communications | CTLM | 31.944 | 0.770 | 224.697 |
| 59 | Idenix Pharmaceuticals | IDIX | 291.621 | 5.190 | 426.441 |
| 60 | LJ International Inc | JADE | 67.955 | 3.170 | 925.408 |
| 61 | Axcan Pharma Inc | AXCA | 1,258.120 | 22.720 | 636.407 |
| 62 | Biodelivery Sciences Intl | BDSI | 54.378 | 2.850 | 56.888 |
| 63 | C H Robinson Worldwide | CHRW | 9,424.638 | 55.540 | 2,198.263 |
| 64 | Allscripts Healthcare Soltns | MDRX | 842.107 | 14.830 | 1,326.803 |
| 65 | Akorn Inc | AKRX | 665.977 | 7.500 | 536.018 |

| | NASDAQ Matching Sample | | | | |
|---|---|---|---|---|---|
| | **Matching Sample Stock Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| 66 | Intuitive Surgical Inc | ISRG | 9,705.086 | 254.000 | 1,345.605 |
| 67 | Travelzoo Inc | TZOO | 225.720 | 15.840 | 240.089 |
| 68 | Hub Group Inc | HUBG | 1,110.494 | 29.130 | 503.594 |
| 69 | Netease.com Inc. ADR | NTES | 2,216.956 | 18.070 | 1,119.895 |
| 70 | YRC Worldwide Inc | YRCW | 1,036.932 | 18.310 | 4,080.849 |
| 71 | Rent-A-Center Inc | RCII | 1,143.734 | 17.100 | 1,191.120 |
| 72 | Navisite Inc | NAVI | 158.472 | 4.500 | 249.747 |
| 73 | Exide Technologies | XIDE | 622.475 | 8.270 | 445.535 |
| 74 | Chartered Semiconductor | CHRT | 1,371.425 | 5.400 | 39.430 |
| 75 | Cadence Pharmaceuticals | CADX | 165.630 | 5.690 | 544.964 |
| 76 | Gigamedia LTD | GIGM | 920.173 | 17.450 | 981.486 |
| 77 | Wet Seal Inc - CLA | WTSLA | 287.328 | 3.050 | 1,842.925 |
| 78 | Hutchinson Technology Inc | HTCH | 415.745 | 15.770 | 910.012 |
| 79 | Electronics for Imaging Inc | EFII | 837.896 | 14.760 | 1,619.825 |
| 80 | Insight Enterprises | NSIT | 836.472 | 17.270 | 458.128 |
| 81 | Genaera Corp | GENR | 30.035 | 1.720 | 47.084 |
| 82 | Genta | GNTA.OB | 15.004 | 0.490 | 121.956 |
| 83 | Bruker Biosciences Corp | BRKR | 1,083.117 | 10.250 | 537.649 |
| 84 | Concur Technologies Inc | CNQR | 1,544.253 | 35.060 | 996.872 |
| 85 | Bebe Stores Inc | BEBE | 1,020.787 | 11.520 | 1,107.233 |
| 86 | Rudolph Technologies Inc | RTEC | 298.931 | 10.250 | 245.720 |

| | | | | | |
|---|---|---|---|---|---|
| 87 | Performance Food Group Co | PFGC | 1,123.055 | 31.630 | 937.783 |
| 88 | Entegris Inc | ENTG | 889.542 | 7.700 | 970.341 |
| 89 | UAP Holding Corp | UAPH | 2,011.201 | 38.340 | 1,566.082 |
| 90 | Superior Bancorp | SUPR | 232.225 | 5.790 | 258.283 |
| 91 | Caseys General Stores Inc. | CASY | 1,317.706 | 26.000 | 639.923 |
| 92 | Rosetta Resources Inc | ROSE | 892.119 | 17.530 | 324.677 |
| 93 | National Instruments Corp. | NATI | 2,138.190 | 26.860 | 532.318 |
| 94 | American Capital Strategies | ACAS | 6,602.393 | 35.170 | 4,568.366 |
| | | | | | |
| | Average | | 1,115.363 | 18.666 | 840.900 |
| | Median | | 742.878 | 14.505 | 620.993 |
| | Standard Deviation | | 1,702.336 | 27.537 | 819.651 |
| | Maximum | | 9,705.086 | 254.000 | 4,568.366 |
| | Minimum | | 15.004 | 0.490 | 39.430 |

| | NASDAQ Matching Sample | | | | |
|---|---|---|---|---|---|
| | **Matching Sample Stock Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| | | | | | |
| | Small Cap Firms (< $1 billion) | | 62.000 | | |
| | Mid-Cap Firms ($1 B - $8 B) | | 30.000 | | |
| | Large Cap Firms ( > $8 billion) | | 2.000 | | |

## *Appendix C – NYSE Pilot Phase Sample*

## *Information for the 87 NYSE Stocks included in the pilot phase sample*

- Original Sample included 100 NYSE Stocks. Twelve firms were dropped due to data omissions on CRSP and one firm was eliminated by the NYSE since it was acquired by another firm just prior to the pilot phase period and not replaced.

| | NYSE Pilot Phase Sample | | | | |
|---|---|---|---|---|---|
| | **Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| 1 | APPLERA CORP-APPLIED BIOSYS | ABI | 5,291.069 | 31.460 | 2,195.528 |
| 2 | ABBOTT LABORATORIES | ABT | 86,813.435 | 56.180 | 8,792.668 |
| 3 | ACE LTD | ACE | 19,195.030 | 58.240 | 3,377.051 |
| 4 | ARCH COAL INC | ACI | 6,288.805 | 43.950 | 4,279.218 |
| 5 | AMERN EAGLE OUTFITTERS INC | AEO | 4,916.824 | 22.980 | 6,659.347 |
| 6 | AETNA INC | AET | 26,651.303 | 53.260 | 4,072.447 |
| 7 | AGCO CORP | AG | 5,515.249 | 60.220 | 2,450.622 |
| 8 | AMERICAN INTERNATIONAL GROUP | AIG | 139,417.008 | 54.970 | 19,961.286 |
| 9 | ABERCROMBIE & FITCH -CL A | ANF | 6,856.917 | 79.590 | 2,366.643 |
| 10 | PEABODY ENERGY CORP | BTU | 14,317.712 | 53.860 | 6,331.901 |
| 11 | CITIGROUP INC | C | 140,318.539 | 28.170 | 128,317.666 |
| 12 | CONAGRA FOODS INC | CAG | 10,473.347 | 21.480 | 3,592.668 |
| 13 | CARDINAL HEALTH INC | CAH | 20,970.653 | 58.000 | 3,520.658 |
| 14 | CONTINENTAL AIRLS INC -CL B | CAL | 2,677.096 | 27.280 | 5,612.868 |
| 15 | CAMECO CORP | CCJ | 11,644.130 | 33.810 | 3,073.255 |

| | | | | | |
|---|---|---|---|---|---|
| 16 | CLEAR CHANNEL COMMUNICATIONS | CCU | 15,286.145 | 30.700 | 12,410.324 |
| 17 | CENTERPOINT ENERGY INC | CNP | 5,136.851 | 15.990 | 2,808.292 |
| 18 | CANADIAN NATURAL RESOURCES | CNQ | 34,440.108 | 63.810 | 2,423.875 |
| 19 | CAMPBELL SOUP CO | CPB | 12,106.448 | 31.560 | 1,975.684 |
| 20 | DOMINION RESOURCES INC | D | 24,744.264 | 43.000 | 3,524.423 |
| 21 | GENENTECH INC | DNA | 73,884.864 | 70.160 | 4,057.455 |
| 22 | DOW CHEMICAL | DOW | 36,491.539 | 38.640 | 8,701.419 |
| 23 | AMDOCS LTD | DOX | 6,898.857 | 33.050 | 1,657.429 |
| 24 | DORAL FINANCIAL CORP | DRL | 1,064.900 | 19.790 | 95.091 |
| 25 | CONSOLIDATED EDISON INC | ED | 11,829.952 | 43.570 | 2,880.743 |
| 26 | ISHARES MSCI EMERGING MKT FD | EEM | 23,572.457 | 136.890 | 30,405.469 |
| 27 | EDISON INTERNATIONAL | EIX | 16,942.172 | 52.000 | 2,635.929 |
| 28 | EL PASO CORP | EP | 11,508.986 | 16.430 | 8,645.861 |
| 29 | ISHARES MSCI TAIWAN FUND | EWT | 2,447.772 | 13.690 | 12,148.269 |
| 30 | FAIRCHILD SEMICONDUCTOR INTL | FCS | 1,524.182 | 12.250 | 1,970.858 |
| 31 | FREMONT GENERAL CORP | FMT | 262.779 | 3.300 | 1,401.930 |
| 32 | FOREST LABORATORIES -CL A | FRX | 12,374.486 | 39.680 | 3,780.955 |
| 33 | GANNETT CO | GCI | 8,573.004 | 36.930 | 3,058.731 |
| 34 | GENERAL DYNAMICS CORP | GD | 34,148.430 | 84.530 | 2,362.048 |
| 35 | GENERAL ELECTRIC CO | GE | 357,355.590 | 35.360 | 52,439.859 |
| | **NYSE Pilot Phase Sample** | | | | |
| | **Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| 36 | GOLDMAN SACHS GROUP INC | GS | 79,003.246 | 199.550 | 13,025.581 |
| 37 | HESS CORP | HES | 28,951.662 | 90.630 | 5,360.790 |

| | | | | | |
|---|---|---|---|---|---|
| 38 | HARTFORD FINANCIAL SERVICES | HIG | 25,264.523 | 80.500 | 3,311.377 |
| 39 | PETROHAWK ENERGY CORP | HK | 2,983.664 | 15.750 | 2,909.785 |
| 40 | HONEYWELL INTERNATIONAL INC | HON | 44,111.705 | 59.070 | 5,873.001 |
| 41 | BLOCK H & R INC | HRB | 6,253.654 | 19.240 | 3,228.995 |
| 42 | ICICI BANK LTD -ADR | IBN | 33,264.975 | 60.760 | 3,219.759 |
| 43 | INTL GAME TECHNOLOGY | IGT | 13,425.378 | 42.680 | 3,311.974 |
| 44 | IMPAC MORTGAGE HOLDINGS INC | IMH | 111.843 | 1.470 | 694.322 |
| 45 | INTL PAPER CO | IP | 13,786.044 | 32.200 | 4,405.003 |
| 46 | JOHNSON & JOHNSON | JNJ | 180,690.893 | 63.140 | 16,179.419 |
| 47 | JPMORGAN CHASE & CO | JPM | 159,614.761 | 47.400 | 42,575.658 |
| 48 | KING PHARMACEUTICALS INC | KG | 2,564.123 | 10.490 | 4,544.064 |
| 49 | KOHL'S CORP | KSS | 14,281.440 | 45.530 | 7,955.481 |
| 50 | LEGG MASON INC | LM | 9,514.596 | 71.950 | 2,819.308 |
| 51 | LOWE'S COMPANIES INC | LOW | 38,656.598 | 26.430 | 16,471.815 |
| 52 | LOEWS CORP | LTR | 24,631.694 | 46.510 | 2,957.868 |
| 53 | MASCO CORP | MAS | 8,456.584 | 22.930 | 6,399.379 |
| 54 | MEDTRONIC INC | MDT | 52,575.646 | 46.500 | 6,685.964 |
| 55 | ALTRIA GROUP INC | MO | 159,638.000 | 75.790 | 15,258.214 |
| 56 | MERCK & CO | MRK | 100,339.731 | 46.100 | 22,273.433 |
| 57 | MARATHON OIL CORP | MRO | 33,432.881 | 47.070 | 8,270.596 |
| 58 | MORGAN STANLEY | MS | 54,500.373 | 49.340 | 18,189.089 |
| 59 | MGIC INVESTMENT CORP/WI | MTG | 1,505.809 | 18.410 | 3,771.015 |
| 60 | NEWMONT MINING CORP | NEM | 23,581.065 | 54.250 | 12,075.320 |
| 61 | NEWFIELD EXPLORATION CO | NFX | 6,534.777 | 49.920 | 1,536.558 |
| 62 | ANNALY CAPITAL MANAGMENT INC | NLY | 8,925.141 | 19.710 | 10,332.969 |
| 63 | NRG ENERGY INC | NRG | 9,209.658 | 38.590 | 4,978.772 |

| | | | | | |
|---|---|---|---|---|---|
| 64 | NATIONAL SEMICONDUCTOR CORP | NSM | 4,689.939 | 18.400 | 6,902.039 |
| 65 | NEWS CORP | NWS | 19,128.642 | 19.390 | 3,579.912 |
| 66 | NEW YORK TIMES CO -CL A | NYT | 2,394.255 | 16.740 | 3,615.893 |
| 67 | PROCTER & GAMBLE CO | PG | 203,170.892 | 65.420 | 14,625.509 |
| 68 | PROGRESSIVE CORP-OHIO | PGR | 12,691.910 | 18.550 | 5,327.010 |
| 69 | PULTE HOMES INC | PHM | 4,186.074 | 16.350 | 10,924.623 |
| 70 | PRUDENTIAL FINANCIAL INC | PRU | 37,999.640 | 84.070 | 4,427.200 |
| 71 | QWEST COMMUNICATION INTL INC | Q | 10,816.472 | 5.890 | 24,191.998 |
| 72 | ROWAN COS INC | RDC | 3,788.142 | 34.040 | 3,152.687 |
| 73 | RADIAN GROUP INC | RDN | 734.025 | 9.130 | 3,305.536 |
| 74 | RELIANT ENERGY INC | RRI | 7,302.942 | 21.210 | 3,608.471 |
| 75 | RYLAND GROUP INC | RYL | 1,421.177 | 33.770 | 3,410.873 |
| 76 | SAP AG -ADR | SAP | 59,458.971 | 47.710 | 3,853.936 |
| 77 | SK TELECOM LTD -ADR | SKM | 18,153.546 | 24.840 | 2,172.839 |
| 78 | SAKS INC | SKS | 2,558.389 | 18.050 | 3,017.534 |
| | **NYSE Pilot Phase Sample** | | | | |
| | **Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| 79 | CONSTELLATION BRANDS -CL A | STZ | 4,009.247 | 20.900 | 2,152.506 |
| 80 | AT&T INC | T | 232,633.570 | 38.490 | 36,813.040 |
| 81 | TITANIUM METALS CORP | TIE | 3,514.679 | 21.670 | 2,686.518 |
| 82 | TEMPLE-INLAND INC | TIN | 1,995.195 | 18.810 | 3,033.736 |
| 83 | TOLL BROTHERS INC | TOL | 3,684.037 | 23.280 | 6,473.306 |
| 84 | GRUPO TELEVISA SA -ADR | TV | 11,015.909 | 22.250 | 3,933.032 |
| 85 | VONAGE HOLDINGS CORP | VG | 310.169 | 1.990 | 1,059.705 |

| | | | | | |
|---|---|---|---|---|---|
| 86 | VIACOM INC | VIA | 23,166.247 | 38.700 | 3,878.513 |
| 87 | WCI COMMUNITIES INC | WCI | 254.759 | 6.050 | 2,350.049 |
| | | | | | |
| | Average | | 34,446.324 | 40.372 | 8,863.223 |
| | Median | | 12,106.448 | 35.360 | 3,853.936 |
| | Standard Deviation | | 59,256.664 | 29.249 | 15,764.985 |
| | Maximum | | 357,355.590 | 199.550 | 128,317.666 |
| | Minimum | | 111.843 | 1.470 | 95.091 |
| | Small Cap Firms (< $1 billion) | | 5.000 | | |
| | Mid-Cap Firms ($1 B - $8 B) | | 27.000 | | |
| | Large Cap Firms ( > $8 billion) | | 55.000 | | |
| | Total | | 87.000 | | |

## *Appendix D – NYSE Matching Sample*

***Information for the 87 NYSE Stocks included in the matching sample***

| | NYSE Matching Sample | | | | |
|---|---|---|---|---|---|
| | **Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| 1 | Health Net Inc. | HNT | 5123.66 | 46.49 | 1732.38 |
| 2 | Unitedhealth Group Inc | UNH | 65693.52 | 50.84 | 9128.96 |
| 3 | Chubb Corp | CB | 19400.54 | 51.79 | 4159.62 |
| 4 | Tesoro Corp | TSO | 5328.6 | 38.9 | 5588.55 |
| 5 | Limited Brands Inc | LTD | 6734.46 | 19.07 | 6738.7 |
| 6 | Medco Health Solutions Inc | MHS | 26735.45 | 49.98 | 6164.1 |
| 7 | Avery Dennison Corp | AVY | 5092.2 | 51.75 | 1235.1 |
| 8 | HSBC Holdings PLC -ADR | HBC | 174006.43 | 75.31 | 2772.46 |
| 9 | Polo Ralph Lauren CP -CL A | RL | 3534.49 | 60.68 | 2748.88 |
| 10 | Talisman Energy Inc | TLM | 16124.25 | 15.83 | 6075.48 |
| 11 | Bank of American Corp | BAC | 195932.62 | 44.15 | 57067.6 |
| 12 | Coca-Cola Enterprises Inc | CCE | 11180.73 | 23.05 | 3018.55 |
| 13 | Automatic Data Processign | ADP | 21194.89 | 40.28 | 3375.48 |
| 14 | Carlisle Cos Inc | CSL | 2065.03 | 33.3 | 541.97 |
| 15 | Southwestern Energy Co | SWN | 9561.4 | 56.1 | 3045.46 |
| 16 | Macy's Inc | M | 11959.13 | 27.62 | 11129.75 |
| 17 | CMS Energy Corp | CMS | 3527.18 | 15.67 | 3229.83 |

| | | | | | |
|---|---|---|---|---|---|
| 18 | EOG Resources | EOG | 21482.39 | 87.33 | 2983.09 |
| 19 | SYSCO Corp | SYY | 17636.64 | 29 | 5257.28 |
| 20 | PPL Corp | PPL | 18181.78 | 48.85 | 2772.43 |
| 21 | Lilly (ELI) & Co | LLY | 58292.34 | 51.39 | 8336.68 |
| 22 | Du Pont (EI) DE Nemours | DD | 40618.99 | 45.18 | 8678.78 |
| 23 | AVNET Inc | AVT | 5342.96 | 35.61 | 1839.92 |
| 24 | Imperial Capital Bancorp Inc | IMP | 109.83 | 20.26 | 99.83 |
| 25 | Mirant Corp | MIR | 9420.93 | 36.79 | 3773.86 |
| 26 | Capital One Financial Group | COF | 20356.87 | 54.62 | 11970.88 |
| 27 | Entergy Corp | ETR | 20889.56 | 108.18 | 2423.42 |
| 28 | Spectra Energy Corp | SE | 14441.69 | 22.84 | 3729.19 |
| 29 | Ishares MSCI Germany Fund | EWG | 1712.88 | 31.2 | 3382.65 |
| 30 | Intl Rectifier Corp | ARF | 2018.09 | 27.83 | 1008.39 |
| 31 | Downey Financial Corp | DSL | 959.01 | 34.43 | 1115.92 |
| | **NYSE Matching Sample** | | | | |
| | **Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| 32 | Elan Corp PLC -ADR | ELN | 11924.15 | 25.36 | 3873.42 |
| 33 | Gamestop Corp | GME | 8299.36 | 51.56 | 4158.35 |
| 34 | Deere & Co | DE | 38142.36 | 87.56 | 6816.88 |
| 35 | Siemens AG -ADR | SI | 118892.1 | 130.05 | 1069.28 |
| 36 | American Express Co | AXP | 56892.54 | 49.13 | 16301.21 |
| 37 | Petro-Canada | PCZ | 22045.73 | 45.6 | 1200.44 |
| 38 | AFLAC Inc | AFL | 29722.12 | 61.09 | 3834.39 |

| | | | | | |
|---|---|---|---|---|---|
| 39 | EXCO Resources Inc | XCO | 1565.35 | 14.98 | 1084.73 |
| 40 | Emerson Electric | EMR | 40059.48 | 50.78 | 5118.96 |
| 41 | Service Corp International | SCI | 3344.06 | 12 | 1267.46 |
| 42 | China Life Ins Co -ADR | LFC | 27656.37 | 55.75 | 2734.16 |
| 43 | Marriott Intl Inc | MAR | 13224.76 | 35.96 | 3587.04 |
| 44 | Alesco Financial Inc | AFN | 212.44 | 3.59 | 681.49 |
| 45 | Agrium Inc | AGU | 10161.48 | 64.42 | 4143.55 |
| 46 | Pfizer Inc | PFE | 159544.25 | 23.36 | 51433.09 |
| 47 | Wachovia Corp | WB | 75401.2 | 38.47 | 32453.15 |
| 48 | Health Management Assoc | HMA | 1310.42 | 5.4 | 4224.14 |
| 49 | Omnicom Group | OMC | 14831.45 | 45.37 | 3188.18 |
| 50 | Assurant Inc | AIZ | 7638.15 | 64.78 | 1543.97 |
| 51 | Carnival Corp/PLC (USA) | CCL | 27688.77 | 44.4 | 5532.73 |
| 52 | Allstate Corp | ALL | 28090.64 | 49.22 | 5247.42 |
| 53 | Ingersoll-Rand Co Ltd | IR | 10762.57 | 39.49 | 5830.76 |
| 54 | Astrazeneca PLC -ADR | AZN | 61340.2 | 42.1 | 2068.15 |
| 55 | Wal-mart Stores Inc | WMT | 203204.02 | 50.74 | 28108.57 |
| 56 | Novartis AG -ADR | NVS | 115011.56 | 50.79 | 2662.48 |
| 57 | Transocean Inc | RIG | 38623.79 | 122.25 | 8399.42 |
| 58 | U S Bancorp | USB | 58620.18 | 33.95 | 17525.09 |
| 59 | Astoria Financial Corp | AF | 2610.26 | 27.18 | 1586.93 |
| 60 | Goldcorp Inc | GG | 26371.91 | 37.23 | 10305.72 |
| 61 | Pioneer Natural Resources Co | PXD | 5025.07 | 41.9 | 1757.01 |
| 62 | Thornburg Mortgage Inc | TMA | 1636.87 | 11.14 | 4517.35 |

| | | | | | |
|---|---|---|---|---|---|
| 63 | AES Corp. (THE) | AES | 12776.12 | 19.09 | 5476.24 |
| 64 | Cypress Semiconductor Corp | CY | 3381.22 | 21.24 | 10294.94 |
| 65 | CBS Corp | CBS | 15761.62 | 25.2 | 7186.24 |
| 66 | R H Donnelley Corp | RHD | 2143.15 | 30.07 | 1472.22 |
| | **NYSE Matching Sample** | | | | |
| | **Name** | **Ticker** | **Market Value (in $M)** | **Closing Price** | **Ave # of Shares Traded** |
| 67 | Pepsico Inc | PEP | 109540.23 | 68.05 | 8649.58 |
| 68 | XL Capital Ltd | XL | 8025.89 | 45 | 3627.2 |
| 69 | D R Horton Inc | DHI | 5436.14 | 17.26 | 12610.84 |
| 70 | METLIFE Inc | MET | 43606.29 | 58.88 | 6857.38 |
| 71 | EMBARQ Corp | EQ | 6925.3 | 45.32 | 1669.32 |
| 72 | Pride International Inc | PDE | 5292.75 | 31.71 | 3470.45 |
| 73 | PMI Group Inc | PMI | 770.64 | 9.5 | 4407.88 |
| 74 | Progress Energy Inc | PGN | 11708.15 | 45.17 | 1843 |
| 75 | KB Home | KBH | 2461.94 | 27.5 | 7188.86 |
| 76 | Corning Inc | GLW | 38072.15 | 24.16 | 16901.07 |
| 77 | Crown Castle Intl Corp | CCI | 10301.5 | 36.12 | 2818.75 |
| 78 | Dillards Inc -CL A | DDS | 1411.72 | 19.84 | 2189.4 |
| 79 | Dean Foods Co | DF | 3681.02 | 27.97 | 1754 |
| 80 | Verizon Communications Inc | VZ | 111713.92 | 38.83 | 19173.29 |
| 81 | Ivanhoe Mines LTD | IVN | 3623.21 | 9.66 | 1074.58 |
| 82 | Sealed Air Corp | SEE | 4223.83 | 26.15 | 2014.49 |
| 83 | Standard Pacific Corp | SPF | 273.65 | 3.76 | 6290.26 |

| | | | | | |
|---|---|---|---|---|---|
| 84 | Harley-Davidson Inc | HOG | 9692.64 | 40.64 | 3783.23 |
| 85 | Citizens Communications Co | CZN | 3759.58 | 11.47 | 4599.48 |
| 86 | Las Vegas Sands Corp | LVS | 31164.32 | 87.75 | 3650.51 |
| 87 | Beazer Homes USA Inc | BZH | 341.51 | 8.71 | 2602.59 |
| | | | | | |
| | Average | | 28,512.650 | 40.563 | 6,540.075 |
| | Median | | 11,708.154 | 38.830 | 3,773.856 |
| | Standard Deviation | | 43,376.363 | 24.008 | 9,187.379 |
| | Maximum | | 203,204.020 | 130.050 | 57,067.602 |
| | Minimum | | 109.829 | 3.590 | 99.834 |
| | Small Cap Firms (< $1 billion) | | 6.000 | | |
| | Mid-Cap Firms ($1 B - $8 B) | | 28.000 | | |
| | Large Cap Firms ( > $8 billion) | | 53.000 | | |

### *Appendix E – Preferencing Notification Example*

# *Your Rights and Responsibilities as a Raymond James Client*

(Retrieved June 6, 2007 http://www.raymondjames.com/billofrights/order_flow.htm)

## *Indirect Compensation for Order Flow*

Some transactions, generally in equities and options, involve an indirect form of compensation to the firm. If transactions are directed to it, the firm receiving the directed order may reciprocate by giving other orders to the referring firm. This practice is somewhat common for listed orders directed to “third market” firms that execute trades at prices equivalent to or better than exchange quotes, as well as in the over-the-counter market. Similarly, firms may receive payment for order flow on some options transactions. The amounts vary substantially, but generally do not exceed $0.75 per contract. All market makers do not pay for option order flow and such payment is not generally relevant in making the decision as to where to send the transaction.

Raymond James & Associates will send trades to a particular broker/dealer or market center in order to receive best execution quality. As a result, we may receive compensation. It may also be possible that this practice has resulted in markets that are less efficient. The source and specific amount of any such compensation are available upon request.

Additionally, Raymond James & Associates is a market maker in a number of over-the-counter securities. As a result of these directed orders, trading profits or losses may be generated by Raymond James in stocks purchased by clients.

The information in this section also appears in the brochure entitled: “Your rights and responsibilities as a Raymond James client.”

## *Appendix F – Goldman Sachs Policy Statement*

*www2.**goldmansachs**.co**m/disclosures/apr-**reg**-**nms**.pdf (Retrieved August 24, 2008)*

**Goldman, Sachs & Co. Policy Statement Regarding Compliance with Regulation NMS's**

**Order Protection Rule**

Dear Client:

As we recently informed you, the Securities and Exchange Commission adopted the Order Protection Rule as one of several market structure amendments adopted in Regulation NMS. Among other things, the Order Protection Rule imposes a series of order handling obligations on exchanges, market makers and broker-dealers. This statement confirms how Goldman, Sachs & Co. ( "Goldman Sachs" ) handles customer orders in light of the requirements of the Order Protection Rule.

The Order Protection Rule prohibits exchanges, market makers and broker-dealers from "trading through" protected quotations for any NMS security, namely stocks. Protected quotations are the best bids and offers on each of the national and regional exchanges and the NASD' s Alternative Display Facility ( "ADF" ). A "trade through" occurs when a market participant executes an order at a price that is inferior to the protected quotations displayed in these markets. Therefore, when executing your stock order, Goldman Sachs will be prohibited from effecting that transaction at a price that is lower (higher) than the best bids (offers) in the market, without first satisfying those better-priced protected quotations.

The Order Protection Rule contains various exceptions that, under certain circumstances, permit the execution of trades at prices that would otherwise constitute a trade-through. However, in instances where no other exception is available, we intend to use a special order type designated by the SEC (known as an "intermarket sweep order" ( "ISO" )) to sweep the market and execute any better-priced quotations. In any transaction where the firm commits capital, you may choose to waive the fills resulting from the ISOs. If you elect this option, Goldman Sachs will still be required to satisfy those better-priced quotations and the benefit of those executions will be factored into your negotiated price. Alternatively, you may elect to receive the ISO executions directly, in which case your transaction price will reflect the receipt of those better-priced executions and, accordingly, will differ from the originally-negotiated price. Although the mechanics may differ, with either choice, you will receive the benefit of the better priced quotations.

If you elect to receive fills resulting from ISOs directly, you need not take any action; we will provide you with those executions in the absence of any instructions to the contrary. If you elect to waive the fills resulting from ISOs, you may negotiate a waiver on an order-by-order basis or grant a blanket waiver by signing the attached "Consent of Waiver" form and returning it to your Goldman Sachs representative.

We look forward to providing you with the level of service and execution quality that you have come to expect from us. Please contact your Goldman Sachs representative should you have any questions.

Sincerely,

Goldman, Sachs & Co.

**Consent to Waiver Form**

By my signature, I acknowledge that I have read and understood the ***Goldman, Sachs & Co. Policy Statement Regarding Compliance with Regulation NMS's Order Protection Rule*** and, in instances where Goldman, Sachs & Co. uses one or more intermarket sweep orders ("ISOs") in compliance with the Order Protection Rule requirements of Regulation NMS, I hereby elect to waive receipt of any better-priced executions received by Goldman, Sachs & Co. in connection with those ISOs. I understand that Goldman, Sachs & Co. will still be required to satisfy any protected quotations in the market and that, by waiving receipt of any such executions, my order may not be executed at as favorable a price as may have been available had I accepted such executions.

Name of Client:

By:

Name:

Title:

Date:

### *Appendix G – A Review of the Empirical Measures of Trading Costs*

Most of the literature that studies competition among venues and among orders compares measures of the bid/ask spread. Two of the most common measures include the quoted spread and the effective spread. The quoted spread captures the difference between the bid (selling price) and ask (buying price) available on the market and measures the cost of completing a round trip (buy and sell) transaction assuming the trade occurs at the quoted price. For a single trade (a buy or a sell), the quoted half-spread is used to measure transaction costs. The quoted half-spread is calculated as:

$$QS_{it} = (Ask_{it} – Bid_{it})/2)$$

or as a percent:

$$\%QS_{it} = 100 * (Ask_{it} – Bid_{it}) / (2*M_{it})$$

where $Ask_{it}$ and $Bid_{it}$ are the posted ask price and bid price for security *i* at time *t*, respectively, and $M_{it}$ is the quote midpoint or mean of $Ask_{it}$ and $Bid_{it}$ and a proxy for the true underlying security value.

For many trades, the quoted spread is just a starting point for negotiations between buyers and sellers trading securities, and many trades occur at prices inside and also outside the posted quotes. For instance, orders may execute at prices inside the quotes when the specialist on the NYSE floor decides to improve on the quote (Ready, 1999). Electronic markets also have *hidden limit orders* that are entered at prices inside the best quotes. The NASDAQ market recently disclosed that 20% of its order flow is non-displayed.[1]

[1] Retrieved November 15, 2008 http://www.nasdaqtrader.com/Trader.aspx?id=DarkLiquidity

In addition, quoted prices pertain only to the quoted depth, and larger orders may need to walk-the-book, executing against limit orders at prices higher than the best quotes, leading to a weighted-average trade price outside the quotes. A better measure of trading costs when trades occur either *inside* or *outside* the quotes is the effective half-spread and the percentage effective half-spread which is based on the actual trade price. The effective half-spread is calculated as:

$$ES_{it} = D_{it} * (P_{it} – M_{it}) / 2$$

or as a percent:

$$\%ES_{it} = 100 * D_{it} * (P_{it} – M_{it}) / (2*M_{it})$$

where $P_{it}$ is the transaction price for security *i* at time *t*, $D_{it}$ is an indicator variable that equals one for customer buy orders and negative one for customer sell orders, and $M_{it}$ is the midpoint used as a proxy for the true underlying value of security *i* at time *t*. The effective half-spread calculates the difference between the actual price and the true underlying value of the security. It can also be viewed as an estimate of the actual cost paid by traders and the gross revenue earned by liquidity providers.

An additional measure in the literature to assess trading costs is called the price affect of trades. This measure was first introduced by Kraus and Stoll (1972) and is designed to capture the informational component of trading costs included in the effective spread. It is based on the behavior of prices after a transaction and reflects the change in the estimate of the security's value as a result of order flow imbalance, i.e., the difference between buy and sell order quantities. When the number of buy orders is greater than the number of sell orders, the security is considered undervalued and liquidity providers tend to adjust their prices upward. When the number of sell orders is greater than the number of buy orders, the security is considered overvalued and liquidity providers tend to adjust their prices downward. These adjustments (or costs) reflect the magnitude of the imbalance between informed traders and liquidity traders and as such the extent of insider information held by informed traders (Bessembinder & Venkataraman, 2007). The costs incurred by liquidity traders can be estimated as:

$$\text{Price affect} = PI_{it} = D_{it} * (V_{it+n} - V_{it}) / V_{it}$$

where $V_{it+n}$ denotes the security's value n periods after the transaction. The price adjustment from $V_{it}$ to $V_{it+n}$ captures the market's assessment of the private information conveyed by the trade (Huang & Stoll, 1996).[2] As a result of informed traders, liquidity traders earn less than the average effective spread for trades. This cost is captured as the price affect of trades and represents the informational component of the effective spread.

A fourth measure, called the realized spread, captures the *non-informational* component of the effective spread. The realized spread is calculated as the effective spread minus the price affect of trades:

$$RS_{it} = ES_{it} - PI_{it}$$

As a result, Seppi (1997) believes that trading costs are better measured by realized spreads than by effective spreads.

[2] Huang & Stoll (1996) use four different time intervals that vary from 5 to 35 minutes.

## *Appendix H: TAQ Database Codes*

| **Quote Code (Mode)** | **Description** |
|---|---|
| 4 | New dissemination: A regulatory halt used when relevant news influencing the stock is disseminated. Trading is suspended until the resultant affect has been assessed. |
| 5 | Slow quote on the offer due to an LRP or GAP Quote: A non-firm quote that, as of Reg. NMS activation will not be eligible for NBBO and may be traded through. |
| 7 | Order imbalance: A non-regulatory halt used when there is a severe buy or sell order imbalance. To prevent a disorderly market, trading is temporarily suspended. |
| 9 | Non-firm quote: A regulatory halt used when the level of trading activity in a security is such that the Exchange cannot collect, process, and disseminate quotes that accurately reflect market conditions. The specialist, with Floor approval, may switch to “non-firm mode” for 30 minutes. |
| 11 | New pending: Indicates a regulatory trading halt or delayed opening due to an expected news announcement which may influence trading in the stock. A trading halt or opening delay may be reversed once the news has been disseminated. |
| 13 | Trading halt due to related security: A non-regulatory halt used when events relating to one security will affect the price and performance of another security (e.g., a tender offer.) |
| 14 | Trading halt in view of common: A non-regulatory trading halt used when matters that affect the common stock of a company may affect the performance of other classes of securities for the same company. |
| 15 | Slow quote on the bid due to an LRP or GAP Quote: A non-firm quote that, as of Reg. |

| | |
|---|---|
| | NMS activation will not be eligible for NBBO and may be traded through. |
| 19 | Related Security News dissemination: a regulatory halt used when news relating to one security will affect trading in an associated security. For example, news pertaining to the common issues of a company may affect the preferred issued. |
| 20 | Related Security News pending: Same as above but refers to expected news. |
| 22 | Slow quote on the bid and offer due to an LRP or Gap Quote: A non-firm quote that, as of Reg. NMS activation will not be eligible for NBBO and may be traded through. |
| 27 | Additional information: A regulatory halt or delayed opening used if more disclosure of information for the security is requested by the exchange. If inadequate information is disclosed during a trading half or delayed opening due to news dissemination (mode 4) or news pending (mode 11), the reason could subsequently be reported as mode 27. |
| 28 | Additional information due to related security: A regulatory halt or delayed opening used if more disclosure of information for the security is requested for a related security. |

| **Trade Code (Mode)** | **Description** |
|---|---|
| 2 | Symbol correction (out of time sequence). |
| 7 | Trade cancelled due to error. |
| 8 | Trade cancelled. |
| 9 | Trade cancelled due to symbol correction |
| 10 | Cancel record (associated with 8). |
| 11 | Error record (associated with 7). |
| 12 | Correction record |
| A | Cash-Only Basis: All trading in that issue for the day is on a ‘cash only’ basis. Every trade for that day will have a condition of A. |

| | |
|---|---|
| C | Cash sale: A transaction which calls for the delivery and payment of securities on the same day the trade took place. |
| D | NASDAQ: Next day Settlement Only: All trading in that issue for that day is for 'next day settlement' only. Every trade for that day will have a condition of D. |
| F | Intermarket Sweep Order: ISO trades occur when an exchange sweeps its book without checking for a trade through. The broker agrees to be responsible for best execution. These trades were first reported on February 8, 2007, but were no commonly used until Reg. NMS went into effect on March 5, 2007. |
| N | Next day (N): Calls for delivery of securities on the first business day following the day of the contract. |
| O | Opened Last: An opening trade that occurs in sequence but is reported to the tape at a later time. |
| R | Seller: "Seller's Option". Delivery date is specified by the seller and must be between two and sixty calendar days following the day of the contract (but not on the third business day after the trade date, which is considered regular way). |
| Z | Sold Sale: A transaction that is reported to the tape at a time later than it occurred and when other trades occurred between the time of the transaction report time. |

## *Appendix I: Statistical Formulas*

## Paired Sample T-Test

The paired sample t-test is a statistical technique used to compare two population means when two samples are correlated. Examples include before-after studies, cases of matched pairs, or control group studies. By using the paired sample t-test, we can statistically conclude whether or not there is a significance difference between the before and after period means.

There are four assumptions made in the paired sample t-test:

1. Only the matched pair can be used to perform the t-test.
2. Normal distributions are assumed.
3. Variance of the two samples is the same.
4. Independence of observations in paired sample t-test.

As in most cases of using the paired sample t-test, the significance level for this study set at 5%.

From SPSS the parameter formula for the t statistic for Equality of Means (t test algorithms):

$t = D / S_D$

with $(W-1)$ degrees of freedom.

$D = \bar{X} - \bar{Y}$ ; the mean difference between the two samples

$$S_D = \sqrt{\left(S^2_X + S^2_Y - 2S_{XY}\right)/W}$$

; the sample variance and W is the sample size

## Sign Test and the Wilcoxon Test

The sign test and the Wilcoxon test are both non parametric tests. They are generally used as an alternative to the paired sample t-test when the assumptions (normality or independence) are violated. For the sign test, the number of + and – signs are counted for a given distribution. A + sign is given for an observation value greater than the mean value, and a – sign is given for an observation value less than the mean value.

From SPSS the Sign Test (nonparametric tests algorithms) are:

For two related samples from a continuous field, this tests:

$H_0$: $\theta$ = Median($X_1 - X_2$) = 0

$H_A$: $\theta<0$ or $\theta>0$

### Counting Signs

For each record, the difference $d_i = x_{i1} - x_{i2}$ is computed and the number of positive($n_{p,f}$) and negative($n_{n,f}$) differences, incorporating the frequency weight, are counted:

$$n_{p,f} = \sum_{i=1}^{n} f_i I(d_i > 0)$$

$$n_{n,f} = \sum_{i=1}^{n} f_i I(d_i < 0)$$

Cases with $x_{i1}=x_{i2}$ are ignored.

# Wilcoxon Matched-Pairs Signed-Rank Test (nonparametric tests algorithms)

### *From SPSS Help Topics:*

### *Computation of Ranked Differences*

For each case, the difference

$D_i=X_i-Y_i$

is computed, as well as the absolute value of $D_i$. All nonzero absolute differences are then sorted into ascending order, and ranks are assigned. In the case of ties, the average rank is used. The sums of the ranks corresponding to positive differences $(S_p)$ and negative differences $(S_n)$ are calculated. The average positive rank is

$\boxed{X}_p=S_p/n_p$

and the average negative rank is

$\boxed{X}_n=S_n/n_n$

where $n_p$ is the number of cases with positive differences and $n_n$ the number with negative differences.

### *Test Statistic and Significance Level*

The test statistic is

$$Z = \frac{\min(S_p, S_n) - (n(n+1)/4)}{\sqrt{n(n+1)(2n+1)/24 - \sum_{j=1}^{l}\left(t_j^3 - t_j\right)/48}}$$

where

| | |
|---|---|
| $n$ | Number of cases with non-zero differences |
| $l$ | Number of ties |
| $t_j$ | Number of elements in the j-th tie, $j=1,\ldots,l$ |

For large sample sizes the distribution of *Z* is approximately standard normal. A two-tailed probability level is printed.

## *Appendix J: Crossed NBBOs with Volume*

| PRE | | | | | | |
|---|---|---|---|---|---|---|
| Date_group | Total | Bid Vol | Ask Vol | Crossed | Bid Vol | Ask Vol |
| 0619_1 | 375213 | 7704118 | 9777788 | 415 | 4185 | 2389 |
| 0619_2 | 312969 | 6158285 | 6619170 | 261 | 1329 | 1724 |
| 0619_3 | 92679 | 587936 | 567636 | 34 | 208 | 68 |
| 0619_4 | 85979 | 669679 | 665523 | 22 | 87 | 39 |
| 0620_1 | 434204 | 6671515 | 7987865 | 897 | 6859 | 9479 |
| 0620_2 | 368381 | 6404356 | 6937591 | 517 | 3511 | 3896 |
| 0620_3 | 107027 | 612799 | 651818 | 27 | 197 | 67 |
| 0620_4 | 103450 | 806915 | 712191 | 42 | 166 | 83 |
| 0621_1 | 454611 | 7637892 | 8113134 | 985 | 5382 | 4643 |
| 0621_2 | 382650 | 6058484 | 6733994 | 636 | 3607 | 4452 |
| 0621_3 | 105629 | 625511 | 582179 | 40 | 129 | 78 |
| 0621_4 | 102331 | 682383 | 600247 | 56 | 356 | 253 |
| 0622_1 | 445298 | 8168628 | 7927330 | 921 | 6970 | 11558 |
| 0622_2 | 398275 | 7333112 | 7689708 | 774 | 7287 | 10051 |
| 0622_3 | 107531 | 1376123 | 984559 | 46 | 276 | 114 |
| 0622_4 | 96345 | 752290 | 691564 | 78 | 540 | 459 |
| 0625_1 | 483946 | 7691444 | 8207117 | 1150 | 6349 | 8403 |
| 0625_2 | 404482 | 5798133 | 6606592 | 634 | 3386 | 3770 |
| 0625_3 | 123639 | 1033076 | 868468 | 65 | 612 | 162 |
| 0625_4 | 112994 | 678158 | 686130 | 52 | 231 | 117 |
| 0626_1 | 491498 | 7147149 | 8338505 | 1127 | 5895 | 5693 |
| 0626_2 | 406073 | 6478883 | 7135832 | 563 | 4777 | 3976 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0626_3 | 120059 | 832212 | 803529 | 59 | 153 | 233 |
| 0626_4 | 102846 | 626877 | 609100 | 56 | 316 | 342 |
| 0627_1 | 491478 | 8495809 | 9396789 | 894 | 9901 | 8947 |
| 0627_2 | 395786 | 6606063 | 6929168 | 450 | 2872 | 2996 |
| 0627_3 | 115583 | 773111 | 747041 | 40 | 160 | 169 |
| 0627_4 | 108233 | 786764 | 679386 | 54 | 304 | 466 |
| 0628_1 | 437192 | 7072317 | 8918202 | 2456 | 12956 | 15434 |
| 0628_2 | 376305 | 5763857 | 5838843 | 1613 | 11393 | 8478 |
| 0628_3 | 108647 | 642205 | 676574 | 56 | 324 | 231 |
| 0628_4 | 93315 | 558047 | 575393 | 45 | 127 | 159 |
| 0629_1 | 434542 | 6245258 | 7089479 | 951 | 11187 | 6843 |
| 0629_2 | 381526 | 5820365 | 5858866 | 656 | 5006 | 7073 |
| 0629_3 | 112768 | 815696 | 676989 | 52 | 208 | 154 |
| 0629_4 | 101006 | 602579 | 618462 | 45 | 138 | 163 |
| 0702_1 | 375961 | 7872963 | 9163507 | 416 | 2844 | 2636 |
| 0702_2 | 316584 | 7009619 | 7586256 | 308 | 2028 | 2273 |
| 0702_3 | 92168 | 666600 | 664003 | 20 | 46 | 130 |
| 0702_4 | 89858 | 728086 | 623197 | 31 | 365 | 867 |
| 0703_1 | 216159 | 4059407 | 4536336 | 1281 | 10854 | 8957 |
| 0703_2 | 175710 | 3414803 | 3517949 | 810 | 4337 | 10037 |
| 0703_3 | 49389 | 320317 | 321725 | 11 | 22 | 25 |
| 0703_4 | 47646 | 381652 | 344685 | 17 | 159 | 337 |
| 0705_1 | 370186 | 7696414 | 8829585 | 1510 | 9358 | 8874 |
| 0705_2 | 312279 | 5770917 | 6484315 | 996 | 6482 | 7747 |
| 0705_3 | 88276 | 543885 | 547918 | 61 | 216 | 230 |
| 0705_4 | 85660 | 633446 | 603329 | 30 | 61 | 59 |
| 0706_1 | 372411 | 7177515 | 6632707 | 469 | 4780 | 3580 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0706_2 | 317993 | 5639799 | 5453380 | 350 | 2082 | 1876 |
| 0706_3 | 74990 | 533370 | 500055 | 30 | 73 | 48 |
| 0706_4 | 80954 | 570272 | 547812 | 17 | 44 | 25 |
| | | | | | | |
| Totals | 12440714 | 189737094 | 204859521 | 23126 | 161135 | 170863 |
| % | | | | 0.19% | 0.08% | 0.08% |
| | | | | | | |

**POST (with slow quotes)**

| Date_group | Total | Bid Vol | Ask Vol | Crossed | Bid Vol | Ask Vol |
|---|---|---|---|---|---|---|
| 0709_1 | 372617 | 7575694 | 6809061 | 374 | 4371 | 2116 |
| 0709_2 | 329037 | 6166322 | 5775570 | 286 | 1798 | 1326 |
| 0709_3 | 85267 | 578758 | 591745 | 17 | 63 | 48 |
| 0709_4 | 89574 | 629662 | 669599 | 28 | 131 | 57 |
| 0710_1 | 475809 | 8656865 | 7553515 | 783 | 6398 | 13315 |
| 0710_2 | 402520 | 6916079 | 6544988 | 508 | 4468 | 2098 |
| 0710_3 | 108239 | 656012 | 665797 | 26 | 64 | 38 |
| 0710_4 | 115837 | 738806 | 783838 | 34 | 76 | 67 |
| 0711_1 | 440835 | 7201776 | 7081731 | 757 | 7252 | 5135 |
| 0711_2 | 366297 | 6103758 | 6215058 | 530 | 4257 | 3398 |
| 0711_3 | 94222 | 611267 | 618432 | 85 | 532 | 554 |
| 0711_4 | 92180 | 679766 | 798144 | 67 | 171 | 366 |
| 0712_1 | 437904 | 9509583 | 9599512 | 705 | 5246 | 8733 |
| 0712_2 | 370998 | 8842294 | 7968921 | 514 | 5349 | 10095 |
| 0712_3 | 93274 | 578845 | 512859 | 46 | 205 | 98 |
| 0712_4 | 94371 | 668981 | 640006 | 41 | 405 | 151 |
| 0713_1 | 392390 | 10675045 | 8947602 | 546 | 6555 | 4319 |
| 0713_2 | 327373 | 5845602 | 5722709 | 345 | 1777 | 2161 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0713_3 | 78935 | 452003 | 409519 | 29 | 50 | 100 |
| 0713_4 | 79735 | 634021 | 680247 | 24 | 84 | 115 |
| 0716_1 | 404496 | 7948987 | 7888976 | 491 | 2803 | 3719 |
| 0716_2 | 330610 | 6083417 | 5900287 | 341 | 2175 | 1736 |
| 0716_3 | 98256 | 569994 | 537014 | 22 | 77 | 44 |
| 0716_4 | 94898 | 694143 | 744343 | 15 | 23 | 34 |
| 0717_1 | 427997 | 7080406 | 6881242 | 719 | 4853 | 5011 |
| 0717_2 | 357969 | 6154147 | 5850372 | 492 | 2714 | 2771 |
| 0717_3 | 95843 | 567042 | 538457 | 22 | 60 | 73 |
| 0717_4 | 92511 | 628322 | 607526 | 24 | 66 | 179 |
| 0718_1 | 507332 | 7378147 | 7029792 | 1333 | 9727 | 8490 |
| 0718_2 | 437518 | 7470448 | 6875332 | 1094 | 11770 | 5745 |
| 0718_3 | 104075 | 530967 | 491181 | 34 | 140 | 90 |
| 0718_4 | 109011 | 670839 | 584626 | 41 | 105 | 202 |
| 0719_1 | 436442 | 6743890 | 6622397 | 838 | 6183 | 5766 |
| 0719_2 | 379171 | 6563941 | 6609699 | 669 | 3458 | 4222 |
| 0719_3 | 92493 | 526581 | 528492 | 53 | 210 | 494 |
| 0719_4 | 80511 | 496031 | 553627 | 23 | 51 | 78 |
| 0720_1 | 513089 | 7177105 | 6531800 | 1379 | 10024 | 13785 |
| 0720_2 | 432330 | 7121143 | 7315854 | 741 | 7396 | 3940 |
| 0720_3 | 109011 | 608895 | 511547 | 51 | 170 | 141 |
| 0720_4 | 122602 | 805204 | 625765 | 64 | 281 | 130 |
| 0723_1 | 453271 | 7538760 | 7252637 | 856 | 5674 | 6135 |
| 0723_2 | 387441 | 7216849 | 7573496 | 709 | 3933 | 5415 |
| 0723_3 | 99333 | 517164 | 544801 | 46 | 115 | 81 |
| 0723_4 | 101095 | 566789 | 608180 | 59 | 172 | 291 |
| 0724_1 | 561765 | 7793669 | 7111178 | 1491 | 14605 | 10256 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0724_2 | 483661 | 7310954 | 6986407 | 1041 | 6326 | 6318 |
| 0724_3 | 147617 | 774995 | 691750 | 133 | 409 | 285 |
| 0724_4 | 140734 | 771032 | 748618 | 70 | 184 | 245 |
| 0725_1 | 602845 | 6756805 | 6473864 | 2148 | 14039 | 14501 |
| 0725_2 | 551849 | 6703301 | 6460509 | 1586 | 10034 | 8096 |
| 0725_3 | 161127 | 747874 | 709751 | 116 | 275 | 293 |
| 0725_4 | 142336 | 713355 | 694741 | 99 | 295 | 369 |
| 0726_1 | 769785 | 8101527 | 7783153 | 6088 | 50948 | 53648 |
| 0726_2 | 674084 | 6991377 | 6542708 | 3915 | 30321 | 24931 |
| 0726_3 | 193955 | 841491 | 782284 | 165 | 683 | 559 |
| 0726_4 | 178649 | 882319 | 774499 | 162 | 550 | 661 |
| | | | | | | |
| Totals | 15723126 | 223769049 | 213555758 | 32875 | 250101 | 243024 |
| % | | | | 0.21% | 0.11% | 0.11% |