Memorandum

To: File

From: Office of Economic Analysis

Subject: Sub-penny Trading Cost and Sub-penny Clustering

Date: December 15, 2004

To help evaluate comments received on the Regulation NMS proposal, OEA calculated a dollar cost estimate of prohibiting sub-penny quoting, and examined the distribution of sub-penny price points by market.

Sub-penny Trading Cost

OEA estimated the dollar cost of prohibiting sub-penny quoting based on an analysis of trade data in Nasdaq, Amex, and NYSE stocks for the four day period June 7-10, 2004. The estimated annualized cost of trading at the penny price, rather than the sub-penny price, is about $20 million for Nasdaq-listed stocks, $16 million for Amex-listed stocks, and $12 million for NYSE-listed stocks. These are estimates of the potential gross costs of the rule and do not reflect the value of anticipated benefits. The NYSE and Amex analyses are based on Trade and Quote data (TAQ) and the Nasdaq analysis is based on the Nastraq data which are available from the NYSE and Nasdaq, respectively.

In Nasdaq stocks, sub-penny trading has declined over time as ECNs have curtailed the use sub-penny quotes on their systems. While our April 2003 analysis found that 12.9% of trades in Nasdaq stocks occurred in sub-pennies, that fraction has fallen substantially. In the June 2004 sample, we find that 1.5% of trades over $1.00 are reported in a sub-penny increment accounting for 4.7% of share volume. Excluding VWAP trades from the sample lowers sub-penny trade reports to 1.4% of trades and 2.4% of share volume.[1] Trades below $1.00 are excluded from the sample as the proposed rule prohibits sub-penny quoting only in stock above $1.00.

In Amex-listed stocks the majority of sub-penny trading continues to occur in the ETFs. (QQQs were listed on Amex during the study period). Overall, 9.9% of trades in Amex securities were executed in sub-pennies, but the figure falls to less than one percent if ETFs are excluded. Less than 1% of trades in NYSE-listed stocks are reported in sub-pennies, and those trades are reported primarily as third market trades. (Average price

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[1] The Nastraq trade file identifies VWAP trades. The rationale for excluding VWAP trades is the execution of sub-penny trades is not prohibited by the rules, and VWAP trades are not the result of sub-penny quoting. In addition to VWAP trades, trades with a condition code other than 'regular way' are excluded, such as trades reported after normal trading hours, bunched trades, next day trades, and late trade reports. The dollar cost estimates excludes these trades.

trades are reported to the NYSE, but are identified on the file and excluded from this sample).

The cost of prohibiting sub-penny trading is calculated as the cost of pricing sub-penny executions at the near side penny, rather than the sub-penny price point. This price difference, multiplied by the executed volume produces a dollar cost per trade. For example, the 'cost' to a sub-penny trade at price $25.248 for 300 shares is as follows. The assumption is without sub-penny quotes this trade will occur at $25.25 – a difference of $0.002 per share. At 300 shares this trades incurs a cost of $0.60 ($.002 x 300 shares). (A sub-penny trade at $25.242 incurs a cost of $0.002 under the assumption it will execute at $25.24). Summed across all sub-penny trades, the average daily cost is $80,973 for Nasdaq stocks, or $ 20,400,235 on an annual basis with a 252 day trading year. Costs for Amex-listed stocks including the ETFs are $16 million on an annual basis or $1.2 million excluding the QQQs. The cost for NYSE-listed stocks is $12 million on an annual basis.

The above cost estimates will be overstated to the extent they include sub-penny trades that do not result from sub-penny quotes (such as price improvement from internalizing dealers which could not be identified in the data). Such sub-penny trading will continue to be permitted under the rule.

Clearly, for every trade that pays a 'worse' price in the absence of better sub-penny quotes, the counter side trade receives an equivalent better price. However, this estimate provides only a 'gross' cost estimate. In addition, the estimate assumes order submission strategies with regard to size and timing are unchanged, even though the price of orders will change.

Sub-penny Clustering on ECNs and Nasdaq

To evaluate comments that the original clustering study did not differentiate between quote and trade clustering, OEA also examined the distribution of sub-penny price point by market. Because trades reported on ECNs result from quotes placed on those systems, ECN trade clustering patterns are a good proxy for quote clustering patterns. We examined trade data for April 21, 2003, a day from the sample week used in the original study. The analysis is based on Nastraq data which is available from Nasdaq. The data show that sub-penny trades cluster on the 1s and 9s on both ECNs and Nasdaq. Specifically, the data show that trades executed on the 1s and 9s account for 52% of sub-penny trades on the National Stock Exchange, 59% of sub-penny trades on the ADF, and 48% of sub-penny trades on Nasdaq. Thus, we believe the clustering patterns across markets are consistent with the original findings and conclusions.