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Via e-mail
Hard copy via DHL

June 30, 2004

Jonathan Katz
Secretary
U.S. Securities and Exchange Commission
450 5th Street NW
Washington, DC 20549

RE: Proposed Rule: Regulation NMS

Dear Mr. Katz:

Tower Research Capital LLC appreciates the opportunity to comment on the Commission's proposed Regulation NMS. Tower designs and executes high-volume automated equity trading strategies that place orders through our affiliated broker/dealer, Lime Brokerage LLC (which has separately filed comments), with the effect of narrowing the spreads on many securities and improving the efficiency of the equities markets.

Tower welcomes the Commission's attempts to protect small and large investors through reform of the National Market System. However, two of the key proposals – the trade-through extension proposal and the subpenny pricing proposal – would have extremely adverse impacts on the market, adding complexity and confusion to the securities market. This would result in slowing down highly efficient markets such as ECNs and increasing costs, to the benefit of a handful of market makers and to the detriment of all other investors. For example, for just the six stocks we have studied (as shown in the Appendix) the estimated annual cost to non-market-making investors of the Rule NMS subpenny pricing proposal is over 400 million dollars. Even if the Commission attempted to implement these proposals with the theoretical safeguards needed to reduce the harmful impacts of these proposals, the Commission would be setting itself a nettlesome, expensive and open-ended task of monitoring and enforcing numerous aspects of market microstructure, impeding the smooth functioning of the securities markets.

The Commission has the opportunity with Regulation NMS to take bold and decisive action to greatly improve the competitiveness and fairness of America's securities markets, which can be achieved by creating a level playing field for highly efficient, transparent, and automated electronic market centers to compete with manual market centers. The interests of the market and the goals of the Commission will be best served if the trade-through rule is in fact abolished, and if quoting and transacting in subpennies is not only allowed but encouraged.

First, the proposed expansion of the anti-competitive trade-through rule beyond listed securities, whether exceptions are made for “fast” or “slow” markets or “automatic” or “manual” quotes, (and the corollary proposal of disallowing market locking and crossing) will not improve price discovery or liquidity, nor will it result in better fills for unsophisticated customers. Rather, in practice it will result in a variety of “gaming” strategies due to the optionality created by such a rule. The stated purpose of the trade-through rule, to protect unsophisticated investors from being filled away from prevailing market prices, is not in fact served by the trade-through rule, which creates a system where unsophisticated investors are filled at *stale* prices that are actually created by the trade-through rule itself. The important goal of protecting investors from bad fills should be implemented at the broker-dealer level, both by removing payment for order flow and by requiring brokers to fill at the best available market price, including prices available on ECNs. This investor protection cannot be achieved by mandating stale prices.

Second, the subpenny pricing proposal is based on inaccurate and misleading NASD and SEC studies, which purport to show that subpennies are used solely for “non-economic” price jumping, and imply (but by no means demonstrate) that liquidity is therefore reduced. The cited studies ignore significant differences (such as liquidity, price, average spread, and presence of invisible quoting) in stocks and market venues and do not even attempt to show that liquidity is reduced.

We have conducted studies on market data from recent time periods that demonstrate the flaws in this proposal, and that clearly demonstrate for many highly liquid securities, liquidity (as represented by size quoted within a 1 penny increment) is vastly improved, and the spread is reduced, by far more than the minimum price increment. Furthermore, given the fact that spreads seem to be steadily narrowing over time in large part due to subpenny quoting, it is apparent that the full benefits of subpenny quotes have yet to be fully realized. However, the Commission’s proposal to undo subpenny pricing would in effect be placing a lower limit on the profits to be generated by market making firms and therefore also placing a very costly upper limit on the efficiency of the market.

Neither the subpenny proposal nor the proposal to expand the trade-through rule from inefficient manual markets to efficient automated markets will achieve the Commission’s stated goals, nor will they achieve Congress’ key goals for the National Market System as stated in Section 11A of the Exchange Act – the economically efficient execution of securities transactions and fair competition among and between broker/dealers and markets. The rules introduce further complexity into the already-arcane rules governing the equity markets, and will have the perverse effect of increasing the bid-ask spread, reducing liquidity and trading speed, and increasing the opportunities for gamesmanship by sophisticated traders.

We believe the Commission should revisit these rules to reflect the remarkable advances in technology since the advent of ECNs, which have created a vastly fairer, more liquid, speedy and robust market than has ever previously existed. The Commission’s legitimate concerns with structuring the market to promote execution at the best possible prices for all market participants are best met by promoting a highly liquid, speedy market. A shackled and constrained market, with artificial barriers to trade, has in the past not allowed discovery of the best prices and will not do so in the future, as we demonstrate below.

I. The trade-through rule should be eliminated for all markets and all quotes, not extended to impair efficient markets and efficient quotes

The trade-through rule is inherently unfair and should be abolished. Our own experience in trading and analyzing both automated and non-automated markets has shown us that the trade-through rule (and the corollary proposal of disallowing market locking and crossing) does not improve price discovery or liquidity, nor does it result in better fills for unsophisticated customers. It is in fact is very likely to result in a variety of “gaming” trading strategies by sophisticated market participants.

In the vast majority of instances where a market locks or crosses, one of the quotes displayed is stale and not truly an indication of the market. This results from the slowness of the market posting the quote, a temporary data glitch, or other non-economic factors. By not allowing other market venues to trade through these stale quotes, you are actually forcing those who place market orders without viewing short term trends – *i.e.*, individual investors and most aggregators of individual investors, such as mutual funds –to be filled at the worse of the stale quote or where the market would have traded otherwise. Since sophisticated participants will be well aware that the stale quote is in fact stale they will obviously be unwilling to match that price if it is disadvantageous to them. Thus, the trade-through rule virtually ensures that the least-sophisticated buyer or seller gets filled at a stale quote that sophisticated participants have backed away from or avoided.

The Commission has made two proposals to extend the trade-through rule with certain exceptions, in one instance allowing trade-throughs of markets that are “slow” (as opposed to “fast”), and in the other instance allowing trade-throughs of “manual” quotes but not of “automated” quotes. These ideas have a theoretical elegance that superficially appears to solve some of the trade-through dilemmas, in particular if there is a robust definition of automated quotes and markets, and an unfettered ability of automatic quotes and markets to trade through manual quotes and markets. However, to be effective in practice, these proposals would require the Commission to micromanage the securities markets to an unprecedented degree, including mandating and policing speeds of execution, order response times, cancel response times, validity of posted quotes, methods of bypassing an automated system, and a variety of other factors. Even then the Commission may not be able to protect investors from abuse of these rules, as the worst abuses are likely to come during fast-moving, volatile markets where the Commission’s intervention could only be retrospective at best.

The best prices for all investors will arise in the absence of the trade-through rule and where ECNs can cross and lock, allowing markets to better discover accurate, real-time prices for stocks. The trade-through rule, instead, allows market makers to take advantage of the free option inherent in the delay created by such a rule, to the disadvantage of other market participants. This granting of a free option to specialists, made possible by the significant delays in the execution on the NYSE is widely acknowledged to be one of the major flaws in the NYSE specialist system. Under the Commission’s proposal this free option would be extended to even more market participants to the detriment of small investors and the market as a whole.

A. The current trade-through rule grants a free look-ahead to NYSE specialists that must be fixed if the trade-through rule is extended to efficient electronic markets

Under the current trade-through rule as applied to the NYSE, the specialist has a free look-ahead period equal to the delay in the market. For example, if it takes 15 seconds to cancel an order on the NYSE, and the quote is therefore 15 seconds slow, if the market moves up after a marketable limit buy order is sent by a market participant at what was the market ask, then that order will not get filled. Conversely, if the market moves down after the same marketable limit buy order has been transmitted by a market participant, when the market participant attempts to cancel its buy, the specialist (who by virtue of his market incumbency has the fastest information feed) will usually fill the order before the cancel takes effect. Basically, if anyone has a free look-ahead period then they will make money off the people trying to trade with them.

With faster markets, every market participant has a similar time to execute, and therefore there is no such advantage to the market participant with the faster information feed. If fills on the NYSE could be guaranteed immediately, then the downside of the trade-through rule would be limited. Frequently, however, one cannot get filled at the NYSE price as the specialist frequently does not update the quotes for up to one minute (a situation known as the specialist being “off the book”). Although the seemingly short delay caused by this may appear economically insignificant, the markets can move by a non-trivial amount in a short period of time, and this results in the specialist having a significant time advantage over those wishing to trade through him, while at the same time forcing those wishing to offer a better market to wait for the specialist to update his price.¹ If this is allowed, it raises the question of whether another exchange or ECN with an even slower response time could force the markets to adhere to its prices. For example, could someone start an ECN or exchange that has a 90 second look-ahead period and force other market participants not to cross that slow ECN or exchange?

B. The optionality problem can be mitigated by mandating and enforcing minimum, highly efficient response times from all “fast” markets or “automated” quotes, but at a cost of vastly increased market complexity

The forgoing strongly suggests that if the Commission chooses not to abolish the trade-through rule, then non-automated execution facilities and quotes should be treated differently than automated execution facilities and quotes, as the Commission noted in its requests for comments on response times and degree of automation. The Commission should be careful in how it determines what is an automated vs. non-automated execution facility or quote. For a market or quote to be considered automated, at a minimum the following conditions must be met:

¹ On the NYSE, a specialist can lock the market for 30 seconds if he is confused as to the status of the book. In that time, you cannot cancel an existing order for the full 30 seconds and any orders you place will be held up for that time period. In order to be classified as a fast market, we would think that the market should be able to trade under all situations in real time.

On the NYSE, if you place an Immediate or Cancel order, the cancels are placed in a bin and sent out every 20 or 30 minutes or so. For fast market status, we would like the cancel confirmations returned within .5 second of when the cancel is sent.

On the NYSE, investors are not allowed to place a non-marketable limit order at all on their electronic system. In a fast market, all investors should have the same access and ability to place limit orders.

- There must of course be no manual intervention possible in responding to an order. All responses to orders, cancels, updates to quotes, etc. must be free from manual intervention.
- Response times must be clearly spelled out for the manual vs. automated distinction to be meaningful. An average execution time of less than .5 seconds should be required for automated responses, whether they are full or partial executions or cancellations, including cancellations of limit orders, responses to cancelled orders, rejections, order confirmations, and all other responses to cancels or orders placed. This is readily achievable with current technology (the slowest of the major ECNs is already much faster than this) and there is no reason for any market center to be any slower. Any slower response time allows sophisticated market participants to take advantage of the above-described optionality at the expense of unsophisticated participants.
- The automated facility should be fully automated to the extent that all responses to orders placed and canceled should be automated and free of any delay. The bid that other markets are unable to cross should be immediately executable.
- Response times are even more important in times of very fast moving markets, and at these times both automated and non-automated facilities may slow down, which strongly indicates that the Commission should set, monitor and enforce standards for robustness of response times in both normal and especially fast-moving markets, and further require public disclosure by market centers of their performance.

Further, the convoluted technical and practical issues that would arise from an extended trade-through rule's necessary exceptions — potentially including but not limited to: flagging orders as manual or automatic, allowing market centers to identify quotes in given securities as all-manual, allowing sweep orders, determining how market participants, particularly individual investors, would distinguish between manual and automated quotes — strongly suggests the Commission choose the simpler and better solution — abolish the trade-through rule entirely. Further, the implementation cost to the securities industry of instituting Rule NMS as originally proposed by the Commission would likely be at least in the tens of millions, and we believe that the complexity implied by the Supplemental Requests for Comments would require expenditures drastically above that estimate. The vastly less expensive and more economically efficient approach is to do away with the trade-through rule entirely and to avoid imposing these unnecessary expenditures on the industry (and ultimately to investors).

C. The Commission's analysis of optionality was erroneous

The optionality created by the trade-through rule in slow markets represents the strongest argument as to why the Commission should not to allow slow exchanges the same trade through rights as fast exchanges. As the Commission correctly observed, a long delay in a market center implies that the person trying to cross the market is short an option for the time the order is outstanding. The optionality reflects a hidden charge for the person trying to execute at that order, and therefore in all cases that value must be taken out of the price (so if you were trying to figure out how to fill at the best possible price and an ECN had a price of \$50.00 and a slow market maker had a price of \$49.99 and the optionality cost of the slower market maker is \$.015, you should receive a better price by trying to fill on the ECN). Therefore, just allowing a faster market center to quote through the slower one does not completely solve the problem of

optionality. It is very often beneficial to the liquidity remover to trade at a worse price on a faster ECN, due to this optionality.

Furthermore, there are vast differences in the optionality of stocks based on a number of factors, some of which include individual stock volatility (not just a broad based average), short term market volatility, price, economic news, time of day, etc. For example, a stock with a price of 50 and an annualized volatility of 80% (not uncommon for Nasdaq securities) has an average ten second standard deviation of \$0.05, and during times of high volatility it can be many multiples of this value. A stock with a similar price and a volatility of 30% only has a ten second optionality value of \$.02, or less than half.

The Commission calculated the optionality value using an average price methodology that does not taking into account these factors, which vary greatly from stock to stock. Thus, an accurate calculation of a fair *de minimus* trade-through variation allowance would need to be a dynamic calculation for each individual stock that would be somehow calculated and conveyed simultaneously to all market participants. Anything short of this would result in arbitrage opportunities easily exploited by an experienced trader or specialist to the detriment of the less sophisticated investor. A better rule, both fairer and easier to enforce, would be to simply allow trade-throughs and assume that the public and broker/dealers are as good or better than the SEC at figuring out how to price implied options and at what prices to execute trades.²

Further, the Commission should be aware that if optionality is not properly taken into account under a no-trade-through regime, then some market centers could increase their delay as much as possible so as to maximize their optionality. An ECN with the longest delay would likely be able to provide the tightest market (as market makers would earn the value of the free option), and therefore under the proposed rules market volume would have to be directed towards that ECN. It would seem probable that some ECNs might even waive their fast market status in order to provide liquidity-adding customers with the most valuable free option available (and therefore they could corner the market by virtue of their slowness). In effect, the slowest market would win – a perverse outcome to an effort to protect investors.

D. The Commission's alternative proposal for allowing crossing and locking by professional traders is a much better solution for unsophisticated investors

The Commission's proposed compromise solution, whereby sophisticated traders who set a flag can ignore the trade-through rule and are allowed to lock and cross the market, in every conceivable scenario results in better fills for unsophisticated customers when compared to a market where locking and crossing are disallowed entirely. As we demonstrate, it is confusing and in fact deceptive and unfair to an unsophisticated customer to disallow market locking and crossing for sophisticated customers. (In theory, the other proposed solution that fast markets cannot lock or cross other fast markets seem appealing, though again in practice it is extremely difficult to implement in a fair manner, similar to the proposed trade-through exceptions.) Practical questions arise when considering how to define a fast market, and how often do they need to be fast. If the market slows down due to technical problems during a time of extreme

² If the SEC enacts a blanket approach to the pricing of options (namely, stocks with a price under 10 of an optionality of X, etc.) then arbitrageurs can profit off of this structural flaw at the expense of the average investor. It would be the equivalent of the SEC mandating a price for all options based solely on stock price while ignoring volatility, which while superficially less confusing, creates a situation where the less sophisticated market participant will be greatly taken advantage of by his better informed co-participant.

market volatility (which is normally the case), requiring market centers that do not slow down to not lock or cross during these times can result in extreme market inefficiency. Without a proper solution to solve these problems it would appear that allowing market crossing/locking in all scenarios is preferable.

One arrangement that seems no more detrimental to unsophisticated customers than not allowing crossed and locked markets is to allow sophisticated customers with the “cross-market” flag set to cross and lock markets with no *de-minimus* provision. An example of this is if the Amex has a QQQ ask at 38 and an ECN posts an ECN bid at 38.03. As unsophisticated customers will always be forced to execute at the best available price, the buy price for the unsophisticated customer will never cross 38 and the sell price will be higher than that which would be previously allowed without the market crossing at 38.03. It is difficult to envision a scenario in which this would result in a worse price.

As to an objection that this is confusing for unsophisticated investors to understand, I would disagree. It seems to me that in the above case, a customer only seeing an ask of 38 and a bid that is capped at 37.99 might indeed think that this was the proper market and choose to sell at 37.99, or simply put in a market sell and be filled at 37.99 which costs him \$.04. If a sophisticated trader places a bid at 38.03 on a fast market, then it stands to reason that this is a valid bid and adds some additional information. If it was a bad price, with the speed of today’s markets the bad quote will be filled in well under 0.2 seconds and therefore it would be nearly invisible in practice to the unsophisticated investor.

This additional information could be interpreted as implying that one of the two quotes is stale and therefore incorrect (the most likely scenario being that a slow market has a stale bid on the screen), or that there is a temporary period of uncertainty (which should soon correct itself when the slow quote adjusts itself). Either way, it is valid information that can and should be seen by a customer, allowing him access to a better price for his order. It seems hard to understand how under any circumstance imaginable it is better for an unsophisticated investor to be denied access to a better quote (one which is more up to date for which he will receive an advantageous fill). In essence, the primary difference between the Commission’s proposal and this change is that the Commission’s proposed rule would deny unsophisticated investors access to better quotes.

Allowing market crossing/locking to remove liquidity but not allowing sophisticated market makers to lock/cross markets with liquidity adding quotes still denies access to unsophisticated investors for speedy fills on the other side of the market. This can be demonstrated using the previous example of an ask on a slow market center of 38 and a bid at 38.03 by a sophisticated investor on a fast market center. An unsophisticated customer attempting to buy at 38 will not be able to buy at any price since they are required to attempt to fill at the stale price of 38 on the slow market center, which being stale will not be filled. Therefore a strong argument can be made for allowing everyone to cross the market if they desire a fast and speedy fill. However, if a premium is to be placed on not allowing market-crossing orders by unsophisticated investors for their protection, then the ability to lock and cross markets by sophisticated investors must be preserved in order to maintain access to non-deceptive quotes.

The Commission’s proposal states “locked quotes can cause confusion regarding the reliability of the displayed quote, and create difficulty for market participants seeking best execution of customer orders.” I respectfully disagree with both statements wholeheartedly. With regards the first point, I would say that the locked market informs the customer that the displayed quote is inaccurate -- something that the customer would not otherwise know. With

regards the second point, it is impossible to achieve the best execution of a customer order without the locked market, since the better price is not allowed to exist under the trade-through rules.

II. The proposed elimination of subpenny quoting is not warranted by up-to-date market data and raises costs for investors to the benefit of market makers

The proposed elimination of subpenny quoting for stocks trading above \$1.00 per share is unwarranted. The advantages of subpenny quoting and trading are economically significant, reducing spreads and therefore the cost of trading by up to 90%. The problems attributed to subpenny quoting have been largely cleared up in the market, and are likely to further improve if the Commission removes some uncertainty from the marketplace by withdrawing its proposal (especially since some market centers have already begun eliminating subpenny quoting).

As the Commission recognizes, the improvement in spreads due to decimalization has significantly benefited smaller customers. However, it appears that some large market participants looking to move very large quantities of shares have complained that decimalization and sub-decimalization have led both to less depth at the top of the order book, and to a practice of “non-economic” improvement on limit orders by subpenny arbitrageurs. Current volume and price data clearly shows that the negative effects on quoted size are small in most cases and in some cases even positive, vastly increasing the liquidity resulting in both lower execution costs and the ability to fill more shares at once, which is in fact significantly better than a market with mandated penny spreads (or higher, as one commenter has proposed).

The studies quoted by the commission do not distinguish between large-cap, small-cap, high-priced, or low-priced stocks. Nor do they distinguish between subpenny trades made by ECNs and market makers (where a large amount of clustering appears to occur at the .001 and .009 levels). Nor do they address the differences in trading rules between ECNs that vastly change the way subpenny orders are placed. These factors are very significant for the benefits of subpenny trading, and any studies that do not address these factors are at best misleading and at worst completely inaccurate. Moreover, the clustering of subpenny trades on the .001 and .009 levels does not necessarily imply that market quotes also cluster around these levels (frequently it appears that market makers post trades at these levels without ever quoting there, for unknown reasons). Also, the studies hypothesize that liquidity (as indicated by posted size at the best market) is reduced, however, they present no evidence for this claim. It is our belief that in light of the facts, the primary result of eliminating subpenny trading would be to preserve a minimum profit for market makers, and would result in significantly worse realized prices for the vast majority of market participants not in the business of making markets.

Furthermore, it is frequently stated that subpenny trading is unfair because unsophisticated investors do not have access to the subpenny quotes. On at least one ECN (INET) these quotes are made publicly available, in real time, for all to view, so this is simply not the case. If there is any question of fairness then ECNs can be required to make available their real-time subpenny quotes if they want to be eligible to quote in sub-pennies.

A. Advantages of subpenny trading

The most important advantage of subpenny trading, both as a policy matter and for market participants, is tighter spreads. Investors who pay the spread (by placing marketable

limit orders or market orders) have a cheaper fill rate under a subpenny regime. This is especially relevant for low priced stocks (under \$10) and very liquid stocks, where spreads are pegged at a penny. For example, the spread on Microsoft (MSFT), which no longer trades in subpennies, is almost always .01. For QQQ, which does trade in subpennies, the spread averages approximately .003 with enormous amounts of size at the bid and ask. For a few stocks, such as Sirius (SIRI), the bid/ask spread is frequently pegged at .0001, with significant size at the bid and ask. For very liquid stocks, there is no evidence that liquidity is meaningfully impaired by subpennies.

In a detailed analysis of several widely-held securities in Appendix, we show that the cost impact of subpennies is indeed economically significant to the market as a whole – in the hundreds of thousands of dollars per day per stock, or a total of more than 400 million per year for just the six securities we examined.

Another advantage to subpenny trading lies in the fact that currently, uninformed traders trying to place a limit order for a stock with large liquidity at the penny level have to wait their turn in line in order to get filled for those shares (as markets operate on a first in, first out basis). For a stock such as JDSU with 120,000 shares plus on either side of the market, this involves adding an order to the very end of a large market queue. The only way to get filled is if all of the shares in the queue you are waiting in get filled, or everyone before you in line cancels their order. In both cases it would appear that the uninformed trader not watching for queue size and order placement would get very adverse fills, as either the market decided to fill 120,000 shares and somehow was wrong on the price, or in the case of everyone else canceling you would have to assume that they knew something that the uninformed trader did not. With sub-penny pricing, however, an uninformed trader could immediately take the first place on the queue in front of the rest. More likely, in my opinion, is that with very small spreads an uninformed trader would decide to place a market order or marketable limit order and simply pay the spread. In the latter case, the smaller the spread the better.

B. Responses to several objections to subpenny quoting

A variety of objections to subpenny quoting have been raised by the Commission and in comments on the previous subpenny concept release, which we address in turn. None of these supposed disadvantages justify barring subpennies.

1. The block traders' inefficiency argument is erroneous

In one of the most seemingly compelling objections to subpenny trading, large block traders and large institutional investors have argued that they will have to place more orders (as order sizes have become incrementally smaller as quotation minimums decrease) thus raising their transaction costs and receiving worse fills. In the example that the Commission gave in its release, an investor tries to sell a block of 100,000 shares when the market price is at \$20 and winds up with a fill at \$19.8. This argument ignores several key facts.

First, any large institutional investor (particularly one with fiduciary duties to end investors, such as a mutual fund) should have negotiated cheaper per-share trading costs (arrangements which are readily available if not standard), not per-order trading costs. Second, large block traders have the institutional resources to fend for themselves, through a variety of currently-available improvements in trading technology such as auto-execution, guaranteed VWAP, and best-efforts VWAP, which should give them much better executions than attempting to place large manual orders. Currently, there are many suppliers of VWAP that guarantee a fill price of the volume weighted average price of a stock for a cost of approximately \$.01 to \$.02 per

share. Moreover, a number of best effort automated execution strategies exist which can accumulate or sell large numbers of shares for a similar cost. These pay-for-execution services are growing rapidly, are becoming cheaper, and almost completely solve the problem of large institutional volume moving the market by a large amount.

Therefore, rule changes which amount to widening the spread at the expense of small investors in order to provide extra liquidity for a large investor who wishes to buy or sell 100,000 shares at once are fundamentally unfair, particularly given that those large investors have more than adequate means to protect their interests. The reality of modern markets is that for trading on automated venues, it is cheaper and more efficient to use automated order execution systems or VWAP for large orders, rather than to attempt to place such orders manually. Such automated order execution systems should reduce transaction costs for those institutions. Third, for all highly liquid stocks that we have studied, the liquidity is either only slightly impaired and in some cases highly improved, as displayed in our results in Appendix. Fourth, subpenny price improvements and faster executions are economically significant and also benefit these investors, as we show in the detailed analyses in Appendix of actual spreads and liquidities.

2. Flickering quotes are an illusion

The Commission and concept release commenters have raised concerns relating to “flickering quotes” and the robustness of trading systems to handle subpenny trading. We believe this is another straw man argument from an industry trying to throw up any possible objection to efforts to reduce its price-fixing ability. Small investors do not generally receive or trade off of data from constantly-changing ECN books, just as they generally don’t receive Level II quotes. Instead, a user of a typical online brokerage such as Ameritrade receives static quotes of the bid-ask spread that are updated as frequently as the user hits “refresh” on his or her browser. Thus the quotes that a small investor receives simply do not refresh at a “flickering” rate. Further, it is important for the Commission to realize that there are subpennies now, and everything runs fine. Technology is continuously getting faster and increasing the capacity of the NMS to handle subpennies. Subpenny stocks also don’t appear to have as many additional quote refreshes as some would suggest, and many actively traded stocks quoted only in pennies already have very fast quote refreshes that are beyond the ability of humans to follow for any length of time. This is an argument for the use of existing technology to display market movements more coherently (such as graphical displays rather than flashing numerical quotes), as opposed to attempting to impose *ex post facto* limits on the speed of the market.

3. Subpenny quoting no longer happens primarily in minimum increments

Another objection to subpenny quoting is the argument that the only increment used is the minimum increment – *i.e.*, that subpennies are used only to jump ahead of another market participants order by no more than .001 cent. As our studies show, for some illiquid stocks it appears that the average bid-ask spread is not significantly narrowed, but for highly liquid stocks it does seem as if the spread is narrowed by far more than the minimum increment. For many heavily traded stocks, especially those with low prices, the best bid or ask was changed by much greater than one minimum increment (and in fact often occurs at a bid and ask separated by only the minimum increment). The improvement of the bid/ask spread for subpenny stocks seems to increase with liquidity and increase the lower the price of the stock.

Moreover, the most commonly cited studies do not take into account several important traits of different stocks and different trading venues. The most obvious is that on highly liquid stocks where the spread is pegged at \$.01 without subpennies, there is increased competition for the inside quote and therefore the market tends to narrow much more. Different market venues also have different styles of trading.

Trading on the Island ECN, for example, is intrinsically different than trading on the Brut ECN. Island contains invisible quotes and no add-liquidity only option for placing orders. Therefore, if someone is trying to narrow the spread and add liquidity on Island, they might accidentally hit an invisible order and remove liquidity by mistake. This mistake is costly: a difference of \$.005 in commission. If this happens frequently enough, then it becomes less advantageous to place subpenny trades due to the hidden cost and therefore spreads will be wider than those on BRUT. This is indeed what we found. Under \$5 stocks (now in subpennies on BRUT) frequently are separated only by the minimum bid/ask spread of .0001, where the inside markets on Island stocks are separated by a larger amount. Therefore, for stocks over \$5 (where Brut does not have subpenny quoting), we would assume a much larger reduction in the spread than for stocks that only have Island subpenny quotes, if subpenny quoting was not discouraged.

4. Subpenny savings are of material economic importance to investors

Another objection to subpenny quoting is the claim of economic insignificance of subpenny differences in orders. As simple math shows, .1 of a cent is equal to 10% of the spread by itself and allows reduction in the spread of 90%. And, as we show in the Appendix, the collective economic value to market participants is huge, since frequently for high volume stocks (which naturally result in a high percentage of total trading) the spread is narrowed by much more than the minimum. Even for the Commission's hypothetical institutional investor who is placing a block order of 100,000 shares, an incremental subpenny improvement of \$.001 still results in a \$100 benefit to the investor. Is it the government's place, as opposed to the market's, to decide whether \$100 is economically significant? Further, a claim that \$.001 is not economically significant does not square with the Commission's proposed reduction of ECN fees to a maximum of \$.001 from \$.003 in most cases (if a reduction in spread of \$.001 to \$.009 is insignificant, isn't a reduction of fees by \$.002 insignificant as well?).

5. Subpenny quoting creates a more efficient market, not a two-tiered market

An additional objection is that subpenny quoting by some market centers and not others creates a two-tiered market system to the benefit of sophisticated arbitrageurs. However, even without seeing the subpenny quote, investors will receive the price benefits by routing to an ECN with subpennies if they place a price at or worse than the price (*e.g.*, if SIRI is on BRUT at 2.8901 and an investor places a buy at 2.9, he or she still receives the price of 2.8901 without being able to view the quote). Moreover, previously there was little incentive for broker/dealers and arbitrageurs to improve existing quotes by subpenny increments as brokers were not required to execute at the best subpenny price and could not see subpenny quotes for their client fills. Therefore, there was no benefit for one market center to quote them when their best price was less than \$.01 away from another market center. It is reasonable to assume that if they were required to do so, that the spread on MSFT, INTC etc. which was almost exactly \$.01 (the minimum required to achieve the best fill) would narrow much further, since competition would drive the process whereas in the past it did not. If the Commission mandated best execution including ECN prices and subpennies, this problem should be eliminated.

Conclusion

When a regulatory system for a market is made more complicated, a more complex series of trading strategies arise in order to take advantage of the loopholes in the regulatory system. The Commission's proposals, while well-intentioned, would actually introduce more gamesmanship than exists in current markets. The Commission should capitalize on the development of ECNs to promote tighter spreads and faster markets, and also promote the significant trend for broker-dealers to use automated and smart order routing technologies that allow for fair and efficient filling of customer orders without the need for clumsy and archaic rules such as the trade-through rule. Moreover, if we assume that markets continue the current trend towards increased efficiency, then the bid-ask spread will be reduced even further if subpenny trading is allowed, as opposed to artificially imposing a minimum spread and therefore a minimum profit for market makers and the professional trading community in general for the future.

One could assume that the clamor for the removal of subpennies by the trading community in general is due in large part to the fact that the competition for making a tight spread is increasing and it is becoming increasingly difficult and less profitable to make markets. There is a large incentive for the existing market makers to keep the spreads as artificially wide as possible and therefore reduce the ability for newcomers to compete by improving on the existing market and narrowing spreads even further.

If one wanted to improve the fairness of a market, I would suggest several improvements. First, completely abolish the anticompetitive trade-through rule and allow free competition for order flow based on efficiency, liquidity, speed and prices – a free competition that manual markets are apparently afraid of given the tenacity of their desire to hold onto the trade through rule. Second, encourage broker-dealers to look for the best price available including ECN prices and subpennies (which I would suggest allowing and even encouraging for all stocks under \$10 and highly liquid stocks), and eliminating efficiency-reducing practices such as payment for order flow from a market maker or ECN to a broker-dealer. Currently, if a significantly better subpenny price exists, it appears as if there is a counter-incentive on the broker-dealers part to get the better subpenny price, as he loses his payment for order flow from the market maker in exchange for a worse price for his client. Although the argument has been made that this improvement is insignificant, I believe that I have shown in no uncertain terms how the spread has definitely been narrowed for high liquidity and lower priced stocks along with a daily dollar value of money saved by liquidity removing clients if they chose to be filled at the tightest market, and also how the liquidity is at worst slightly lower and at best much higher for these high volume stocks. Third, I would also suggest that the a complete and comprehensive market book be made available by brokers to their clients (complete with subpennies, all available markets, and crossed and locked markets) as well as the ability to simply hit the best bid and lift the best offer as an option. This seems by itself to solve most if not all of the problems that have been addressed.

I would be happy to discuss our comments or proposals with the Commission at any opportunity.

Sincerely,

John Martello
Managing Director
Tower Research Capital LLC

Appendix

Studies of spreads and liquidities on sample trading days for six actively trading securities

The analyses below are snapshots of typical trading days for the named securities.³ Average bid and ask sizes are the sum of all market participants' bids and asks as they would appear if included on a level 2 screen (without subpennies). Annualized numbers are for a 250 trading day year. Several studies were performed both on 11/14/2003, the last day certain securities were traded in subpennies due to the INET ECN discontinuing subpenny trading, and on 11/17/2003, the day the same securities resumed trading in penny increments. The study date of 2/23/2004 for JDSU was chosen because for part of that day it traded in subpennies and part of that day it traded in pennies, as it trades on BRUT which trades in subpennies only for stocks under \$5, and the price frequently rose above and dipped below that amount.

1. Nasdaq 100 Tracking Trust (QQQ): on 02/23/2004 approximately 120 million shares traded for the day, price approximately 36.9. Minimum spread on Island .001, on Brut .0001
Average bid/ask spread = .006
Average bid size: 52,222. Average ask size: 58,354.
Economic gain per day from subpennies for non-market makers: \$480,000. Per year \$120,000,000
2. Intel (INTC): on 11/14/2003, priced in subpennies. Approximately 59 million shares traded for the day.
Average bid/ask spread = .00912
Average bid size: 11,651. Average ask size: 12,005

INTC: on 11/17/2003, priced in pennies.
Average bid/ask spread = .010548
Average bid size: 12,188. Average ask size: 13,012
Economic gain per day from subpennies for non-market makers:: \$71,500. Per year \$17,875,000
3. Sirius (SIRI): on 02/23/2004 approximately 50 million shares traded for the day, price approximately 2.819. minimum spread on BRUT .0001
Average bid/ask spread = .00064
Average bid size: 269,788. Average ask size: 312,476
Economic gain per day from subpennies for non-market makers: \$468,000. Per year: \$117,000,000
4. Oracle (ORCL): on 11/14/2003: priced in subpennies. Price approximately 12, approximately 30 million shares traded for the day
Average bid/ask spread = .007381
Average bid size: 26,790. Average ask size: 32,200

³ For subpenny spreads: averages = best ask minus best bid while uncrossed. Averages done at 1 second intervals.

ORCL: on 11/17/2003: subpenny pricing ended
Average bid/ask spread = .01006
Average bid size: 30113. Average ask size: 36021.
Economic gain per day from subpennies for non-market makers: \$78,570. Per year
\$19,642,500.

5. Microsoft (MSFT): on 11/14/2003, priced in subpennies. Approximately 50 million shares traded for the day.
Average bid/ask spread = .0078
Average bid size: 53,425. Average ask size 53770.

MSFT: on 11/17/2003, priced in pennies
Average bid/ask spread = .01005
Average bid size: 52,893 Average ask size: 68,784
Economic gain per day from subpennies for non-market makers: \$110,000. Per year
\$27,500,000.

6. JDS Uniphase (JDSU): both studies on 2/23/2004, a day in which JDSU's price moved above and below the \$5, which is the threshold for trading in subpennies on Brut. Therefore in the same day at different times it traded in subpennies and pennies on Brut (the entire day it trade in pennies on INET). Volume was approximately 70 million shares.

While JDSU price < 5 (min spread .0001):
Average bid/ask spread = .00427
Average bid size : 183538 Average ask size 216027
Economic gain per day from subpennies for non-market makers: \$401,100. Per year
\$100,275,000

While JDSU price > 5 (min spread .01):
Average bid/ask spread = .010011 Cross-market bid size: 124,520 Cross-market ask
size: 175,483

There are several important implications of the above analyses. First, as to the argument that liquidity is impaired by subpenny quoting in the sense that there are fewer shares at the best market, we can show that that contention is completely untrue for some stocks, and largely untrue for others. When comparing stocks within the same price range and specific stocks that moved from trading in subpenny increments to penny increments, there is more liquidity for the same and similar stocks.⁴ For subpenny stocks, you get a better price per share and for a number of stocks with prices \$5 or less a greater number of shares on either side of market.

⁴ Maybe not at the best subpenny level, but that is comparing apples to oranges because what matters is how many shares you can fill at the same price.