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May 24, 2004

SUBMITTED VIA E-MAIL: rule-comments@sec.gov

Jonathan G. Katz, Secretary
U.S. Securities and Exchange Commission
450 Fifth Street, N.W.
Washington, DC 20549-0609

Re: File No. S7-10-04, Regulation NMS; Proposed Rule

Dear Mr. Katz:

Please find comments enclosed on the Commission's proposed rule governing "Regulation NMS" that we have prepared in response to the U.S. Securities and Exchange Commission's (SEC's) request for comment dated March 9, 2004 (*Federal Register*, Volume 69, Number 46, p. 11126).

The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of regulations and their impact on society. As part of its mission, RSP produces careful and independent analyses of agency rulemaking proposals from the perspective of the public interest. This comment on the SEC's proposed rule for the national market system does not represent the views of any particular affected party or special interest group, but is designed to evaluate the effect of the Commission's proposal on the public interest generally.

The Regulatory Studies Program appreciates the opportunity to comment on the proposed rule. If you have questions, please feel free to contact me at sdudley@gmu.edu or Dr. Jay Cochran at jcochra1@gmu.edu. We hope that consideration of these comments will enhance the quality and development of regulations and policy regarding the national market system.

Susan E. Dudley, Director
Regulatory Studies Program

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REGULATORY STUDIES PROGRAM

Public Interest Comment on

The Securities and Exchange Commission Proposed Rule: Regulation NMS[1]

The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of the impact of regulation on society. As part of its mission, RSP employs contemporary economic scholarship to assess rulemaking proposals from the perspective of the public interest. Thus, our response to the Securities and Exchange Commission's request for comment on Regulation NMS[2] does not represent the views of any particular affected party or special interest group, but is designed to evaluate the effect of the Commission's proposals on overall consumer welfare.

The Securities and Exchange Commission (SEC) is currently considering Regulation NMS ("National Market System"), which is designed to modernize the regulatory structure of the U.S. equity markets. The proposed regulation consists of four interrelated proposals related to: (1) trade-through (2) intermarket access, (3) sub-penny pricing, and (4) market data. In proposing these rules, the SEC notes that security markets are continually evolving because of technological innovation, new market entrants, and changing investment patterns. The SEC notes that one of its most important roles is to "monitor these changes and to ensure that the U.S. regulatory structure remains up to date."

This Public Interest Comment evaluates two of the four proposals contained within Regulation NMS: the trade-through proposal and the sub-penny pricing proposal.[3] In contrast to the SEC's stated objective, both of these proposals have the potential to stifle technological innovation in the marketplace. The trade-through proposal will force

[1] Prepared by Jonathan E. Clarke, Ph.D. Dr. Clarke is Assistant Professor of Finance at the College of Management at Georgia Institute of Technology. The analysis, interpretations, and conclusions in this comment are those of the author; they do not reflect positions of George Mason University or Georgia Institute of Technology.

[2] See "Regulation NMS; Proposed Rule," *Federal Register 69* (46), pp. 11126-11215. Hereafter referred to as the "proposed rule" or "Regulation NMS."

[3] While this comment focuses on the trade-through and sub-penny proposals, this is not to diminish the importance of the market data elements of the proposed rule. For more on the market data aspects of the proposed rule, especially for differing responses of futures markets and securities markets with respect to market data, see Sharon Brown-Hruska and Jerry Ellig, "Financial Markets as Information Monopolies?," *Regulation* 23 (3), (Fall 2000), p. 31 and *passim*. http://www.cato.org/pubs/regulation/regv23n3/ellig.pdf In this connection also, see Sharon Brown-Hruska, "Competing Models for Market Data Dissemination: A Comparison of Stock and Future Markets," Mercatus Center Working Paper in Regulatory Studies, (June 20, 2002).

markets to adapt to antiquated market linkages, which could increase order execution costs for investors. The sub-penny quoting proposal has the potential to keep bid-ask spreads in certain securities artificially high, which could cost investors millions of dollars in extra fees. It could also give market centers the incentive not to invest in upgrades in the way quotes are displayed to the public. The analysis in this comment supports the conclusion that neither proposal is justified.

I. The Trade-Through Proposal

A. Background

The portion of Regulation NMS that has generated the most debate and disagreement among regulators, practioners, and academics is the trade-through proposal. A "trade through" occurs when a market center executes a trade at a price worse than a price posted in another market. The trade-through rule proposed in Regulation NMS would, "require an order execution facility, national securities exchange, and national securities association to establish, maintain, and enforce polices and procedures reasonably designed to prevent the execution of a trade-through in its market."[4] The current version of the trade-through rule was enacted over 20 years ago as part of an SEC effort to preserve an integrated national market.

The Commission's proposed trade-through rule would apply to all NYSE, Amex, and Nasdaq-listed stocks and to any order execution facility that executes orders internally within its market—even if the market does not post its best bid and offer in the consolidated quote system. While rules limiting trading at an inferior price have been in place for NYSE and Amex securities since 1978, no such rules have existed in the market for Nasdaq securities. Thus, the proposal represents a significant expansion of the current trade-through rule.

B. Discussion of issues surrounding the trade-through proposal

Proponents of the trade-through rule argue that it could dramatically improve the price discovery process and increase liquidity by encouraging market participants to quote aggressively and use limit orders. The Commission notes that trade-through rules could also facilitate integration of trading across markets (i.e., decrease market fragmentation) and at the same time reduce the agency conflicts between brokers and customers by forcing brokers to find the best price for their customers.[5]

Prohibiting trade throughs and enforcing market integration and linkages by regulation, as proposed by supporters of the proposal is rational if market linkages perform well, are well monitored, and if price is the most important attribute desired by market participants. However, this is not the case. Currently, the Intermarket Trading System (ITS) electronically links together the NYSE, AMEX, regional stock exchanges, and other trading venues. The ITS is an example of a downstairs linkage of markets. It links

[4] See, Proposed Rule, pp. 11130.

[5] *Ibid*., p. 11130.

"downstairs" trading floors and trading facilities after an order has already reached one of the member markets. Recent research notes that this type of "downstairs" linkage has a number of problems.[6] The most important concern raised is that requiring markets to link directly reduces competition among market centers. A second concern is that since no market center has ownership of the system there is little incentive to invest in its improvement. The ITS was developed in the late 1970's and early 1980's and has not kept pace with technological innovations. Consequently, one negative side effect of the trade-through proposal is that markets will likely have to adapt to this antiquated public market linkage. Ultimately, this could increase order execution times and transaction costs for investors. Order-routing systems, which route orders to a particular market center before they reach the floor, are a more effective way of linking markets.

In its support of the trade-through proposal, the Commission is likely overstating the adverse effects of market fragmentation. Market fragmentation has produced a number of benefits: including lower transaction costs and a wide array of market centers that cater to the varied demands of different types of traders. Certain classes of investors are more concerned with speed of execution or anonymity than they are about price.[7] In the current proposal, these additional aspects of best execution are ignored. Rather, the Commission is attempting to force all market centers to compete on a single dimension—price.

C. A comparison of the NYSE and Nasdaq Stock Market

Since stocks listed on the Nasdaq Stock Market are currently not subject to a trade-through rule, it is interesting to compare market quality across this market and the NYSE. A number of scholarly articles have addressed this issue using recent data from the post-decimalization period.[8]

Generally, the approach adopted by researchers is to compare NYSE stocks to matched samples of similar Nasdaq stocks. The findings of existing studies are mixed. Chung, Van Ness, and Van Ness (2001) find that the average effective spread of Nasdaq-listed stocks is 29 percent larger than the effective spread of similar NYSE-listed stocks. However, a more recent study by Bessembinder (2003) finds that the volume-weighted average effective bid-ask spread for a sample of Nasdaq stocks after decimalization is not statistically different from a similar sample of NYSE listed stocks. He notes "the data support the overall conclusion that trade execution costs are quite similar across NYSE and Nasdaq stocks of matched capitalization in the wake of decimalization." An

[6] See Hans Stoll, "Market Fragmentation," *Financial Analysts Journal* 57 (2001), pp. 16-20.

[7] See Jerry Ellig and Sharon Brown-Hruska, "Issues Related to Market Fragmentation," Mercatus Center Public Interest Comment to the Securities and Exchange Commission, May 10, 2000. Available at http://www.mercatus.org/pdf/materials/94.pdf.

[8] See Kee Chung, Bonnie Van Ness, and Robert Van Ness, "Are Nasdaq Stocks More Costly to Trade than NYSE Stocks?" Working Paper (July 2001): State University of New York at Buffalo and Hendrik Bessembinder, "Trade Execution Costs and Market Quality after Decimalization," *Journal of Financial and Quantitative Analysis* 38(4) (December 2003), pp. 747-777.

additional strand of research shows that both effective and quoted spreads become narrower when stocks move from the Nasdaq to the NYSE.[9]

A key limitation of these existing studies is that they focus only on the price dimension. In practice, market participants are not one dimensionally focused on price. It is just one of a number of factors that they consider. Investors are also concerned with, among other things, speed of execution, anonymity, and certainty of execution. Demand for these different elements will vary from investor to investor. Recent evidence indicates that no single market or type of trading system dominates in all aspects of market quality.[10] The existence of markets catering to different dimensions of best execution ensures that investors can route their orders to the market that best fits their individual demands.[11]

This viewpoint is also confirmed by recent scholarly research that supports the notion that models of trader behavior need to accommodate more than one dimension of execution quality.[12] This study finds evidence that while execution costs on Nasdaq exceed those on the NYSE, orders are executed significantly faster. For larger orders of more than 5,000 shares, this relation is reversed.

Taking into account these non-price dimensions, the Nasdaq Stock Market has flourished. A number of different markets now trade Nasdaq stocks. Orders can be routed to various electronic communications networks (ECNs) and crossing systems, each specializing in different dimensions of best execution.[13] Thus, investors can *choose* their trading venue based on many factors: price, certainty of execution, liquidity, and speed. In contrast, 93 percent of trading volume in NYSE listed securities is executed through its auction market. The option for faster execution or anonymity does not currently exist on the NYSE.

It's worth noting that investors can benefit even if they aren't explicitly choosing their trading venue. Payments from market makers to brokers, such as E*trade, determine where a significant fraction of trading actually occurs in markets. A recent study

[9] See Michael Barclay, "Bid–Ask Spreads and the Avoidance of Odd-Eighth Quotes on Nasdaq: An Examination of Exchange Listings," *Journal of Financial Economics* 45 (1997), pp. 35-60. This study was conducted before the conversion to decimals. It is unclear how decimalization affects the results presented in the paper.

[10] Robert Battalio, Brian Hatch, and Robert Jennings, "Dimensions of Best Execution for Market Orders: Assessing Differences between the NYSE and the Third Market," Working Paper (March 2000): Indiana University.

[11] Ellig and Brown-Hruska (2000), *op. cit*., p. 6.

[12] See Ekkehart Boehmer, "Dimensions of Execution Quality: Recent Evidence for U.S. Equity Markets," Working Paper (October 2003): Texas A&M University.

[13] An electronic communication network, or ECN, is an electronic trading system that automatically matches buy and sell orders at specified prices. Traders on ECNs may anonymously submit orders and trade directly with each other, rather than place orders with a specialist or a dealer. Crossing networks cross multiple orders at a single price at pre-specified times. There is high order execution risk on a crossing network, since a trade is not necessarily executed. However, this execution risk is offset by the ability of traders to remain anonymous and minimize the market impact of their trades.

examines data from Knight Securities, L.P., a large market maker on the Nasdaq Stock Market, and documents the division of market making revenue among the market maker, broker, and the investor. During the time period of the study, Knight paid brokers 2.5 cents per share to the broker for their orders. The study concludes that Knight's payment for order flow was passed back to small investors in the form of lower commissions. Thus, even though the broker, rather than the investor, is choosing the trading venue, competition among brokers forces them to rebate a significant portion of the order flow payments to investors.[14]

D. Regulatory experiment on relaxing the trade-through rule

On September 4, 2002, the SEC relaxed the trade-through rule for three actively traded exchange traded funds (ETFs) by allowing markets to execute trades at price up to three cents worse than those posted at other venues. The three exempted exchange traded funds are the Nasdaq-100 Index ETF, the Dow Jones Industrial Average ETF, and the Standard & Poor's 500 Index ETF. Each of these ETFs is listed on the American Stock Exchange and these ETFs are among the most widely traded securities in the world. The *de minimis* exemption was recently extended through December 4, 2004.

Recent scholarly research on the effect of the *de minimis* exemption on the market quality in the effected exchange traded funds gives invaluable insight into the trade-through rule.[15] Hendershott and Jones document that the relaxing of the trade-through rule did not have a negative effect on market quality. To the contrary, the authors find that effective and realized spreads were slightly *lower* after the exemption went into effect, while ETF prices became slightly *more* efficient following the easing of the restrictions. Overall, the net effect seems positive for these securities.[16]

There is a theoretical reason why the exemption from the trade-through rule lowered spreads in the case of ETFs. As noted previously, the ITS electronically links together the NYSE, AMEX, the regional exchanges, and other trading venues. A key feature of the ITS is that members cannot trade through a price quoted on another venue. If a better price is offered in another member market and the home market cannot match the price, the order must be routed to the other market via ITS. The market on the receiving end of the ITS order has up to 30 seconds to respond with a yes or no answer to filling the order. During the 30 seconds, the market may move away from the quoted price, and the order may or may not be filled. Hendershott and Jones note that this 30-second option is

[14] See Robert Battalio, Robert Jennings and Jamie Selway, "The Relationship Among Market-Making Revenue, Payment for Order Flow, and Trading Costs for Market Orders," *Journal of Financial Services Research* (February 2001), pp. 39-56.

[15] Terrence Hendershott and Charles Jones, "Trade-Through Prohibitions and Market Quality," Working Paper (April 2004): University of California at Berkeley.

[16] ETFs are characterized by extremely heavy trading volume and narrow spreads. Moreover, pricing is driven often driven by arbitrage considerations. These conditions do not necessarily hold for individual securities. Given the spirited debate surrounding this issue, the Commission may wish to consider implementing another pilot study to document the effect of exempting a cross-section of individual common stocks from the trade-through rule.

particularly valuable to an ETF market maker since ETFs are generally characterized by extremely narrow spreads and high trading volume. The value of this option to the market-maker is a cost to the investor whose order is sent over the ITS. In the case of ETFs, therefore, the presence of a trade-through rule could lead to higher trading costs, less certainty of order execution, and an increase in the time of execution.

Another key finding of the above mentioned study was that the *de minimis* exception granted to the ETFs had no discernable impact on the likelihood of trading through. Essentially, the authors concluded that the trade-through rule was not being actively enforced. The current enforcement system requires the party whose order was traded through to contact the offending market center to obtain restitution. Obviously, this makes it unprofitable to pursue small trade-through violations. While it may be optimal to only pursue large trade-through violations, this may prove to be difficult as well. The authors note that even identifying trade throughs is difficult given current data. In light of this evidence, the Commission needs to consider the enforcement aspect of the rule in greater detail.

E. Opt-out provisions

The proposed trade-through rule allows for two major exceptions. The first exception would allow customers to "opt-out" of the protections of the rule by providing informed consent to the execution of their orders, on an order-by-order basis, in one market without regard to the possibility of obtaining a better price in another market. The other major exception would take into account the differences in execution speed in electronic versus manual markets by providing an automated, "fast' market with the ability to trade through a non-automated, "slow" market. This second exception is already creating problems as to what constitutes a "fast" versus a "slow" market.[17] It is important to note that neither of the proposed opt-out provisions solves the basic problems with the trade-through rule discussed above.

F. Conclusion

The Commission needs to recognize that best execution of orders encompasses dimensions other than price. The Nasdaq market, in the absence of the trade-through rule, has flourished. Investors in Nasdaq-listed securities can choose their trading venue based on many factors: price, certainty of price, liquidity, and speed. This sentiment is also echoed in the Commission's proposal. It notes that, "even without a trade-through rule, the Nasdaq market does not appear to lack competitive quoting in most actively traded securities."[18]

Antiquated market linkages and enforcement issues will further diminish the intended impact of the trade-through rule. In sum, the Commission has not justified the need for the trade-through proposal, and available research questions the likely benefits. It should be withdrawn.

[17] See, Kerry Massaro, "NYSE a Fast Market?" *Wall Street and Technology*, March 1, 2004, p. 8.

[18] See, Proposed Rule, p. 11134.

II. Sub-penny quoting proposal

As part of Regulation NMS, the Commission is also proposing "to prohibit market participants from accepting, ranking, or displaying orders, quotes, or indications of interest in a pricing increment finer than a penny in any NMS stock, other than those with a share price below $1.00."[19] The proposal would not, however, affect the ability of market centers to execute trades at increments finer than a penny.

As summarized below, the Commission believes that this proposal will help to preserve the price clarity achieved by decimalization, enhance market depth, and increase market transparency. At best, this proposal is unnecessary, as the major ECNs have already shown a willingness to move away voluntarily from sub-penny quoting without intervention by the Commission. Furthermore, the proposal has the potential to discourage innovation in the way that quotes are reported to traders and could result in higher transaction costs than would prevail in an environment where market forces set the bid and offer prices for securities.

A. Background

In 2001, both the NYSE and Nasdaq Stock Market made a conversion from fractional pricing to a decimal pricing system. Empirical evidence has shown that the conversion substantially lowered spreads.[20] Quoted bid-ask and effective spreads declined significantly on both markets, with the largest declines for heavily traded stocks. However, the conversion was not without costs, as market depth declined following decimalization for both NYSE and Nasdaq-listed securities.[21]

A reduction in spreads benefits both small retail investors and large institutional traders. However, the reduction in market depth is more likely to create problems for institutional traders.[22] Contrary to popular opinion, recent scholarly research finds no evidence that decimalization increased trading costs for institutions.[23] The authors of the study find that institutional trading costs, which included both the commissions of executing the order and the price impact of the order, declined by 23 basis points after decimalization. This is an economically meaningful amount of savings—translating into an average monthly savings of approximately $133 million. Based on the results in this study, it appears that institutions have not been adversely affected by the reduction in depth.

[19] *Ibid*., p. 11164.

[20] See Bessembinder (2003), *op. cit*, p. 747.

[21] Depth was not merely spread out over a finer grid of price levels following decimalization. Research by the Nasdaq Stock Market found that depth *near* the inside quotes declined by about 30 percent following decimalization. See "The Impact of Decimalization on the Nasdaq Stock Market: Final Report to the SEC," Nasdaq Economic Research (June 2001).

[22] See, Jeff Opdyke and Gregory Zuckerman, "Decimal Move Brings Points of Contention From Traders," *Wall Street Journal*, February 12, 2001, p. C1.

[23] Sugato Chakravarty, Venkatesh Panchapagesan, and Robert Wood, "Has Decimalization Hurt Institutional Investors?" Working Paper (May 2003): Purdue University.

Thus, the Commission seems correct in concluding that, on balance, the switch to decimal pricing has been good for the market.

Since decimalization occurred in 2001, an increasing number of market centers began quoting securities in sub-pennies. In a study conducted in 2003, the SEC's Office of Economic Analysis found that sub-penny trades accounted for 12.9 percent of trades in Nasdaq listed issues, 9.8 percent of trades in Amex-listed issues, and 1.0 percent of trades in NYSE-listed securities. The vast majority of sub-penny trades in Nasdaq-listed securities are done through ECNs. It is worth noting that the majority of sub-penny trades on Amex were trades in exchange traded funds.

B. Concerns of the Commission

The Commission is concerned that the increasing prevalence of sub-penny quoting will have a negative impact on market liquidity and the price discovery process. In its Regulation NMS proposal, the Commission raises four major concerns about the impact of sub-penny quoting.[24]

- First, the Commission believes that sub-penny quoting leads to confusing prices by causing quotes to change rapidly or flicker. The Commission and various commentators have noted that flickering quotes could detrimentally affect an investor's understanding of security prices, impair broker-dealer efforts to obtain best execution, make it more difficult to compare execution quality among market centers, and increase the frequency of locked or crossed markets.
- Second, the Commission is concerned that the increase in the number of price points that results from sub-penny pricing would worsen the problems associated with diminished depth which occurred following decimalization. The spreading of buy and sell interest across 1,000 price points per dollar with sub-penny quoting could further exacerbate this reduction in depth and increase trading costs for both retail and institutional investors.
- The Commission believes that sub-penny quoting has increased the incidence of investors "stepping ahead." That is, investors are increasingly attempting to achieve price priority over pending orders by improving the best bid by only a fraction of a cent – an amount viewed as not economically meaningful by the Commission. Ultimately, this type of activity may lead to a reduction in the use of limit orders over time, which is an important source of liquidity. Consistent with this view, a study commissioned by the Office of Economic Analysis found that sub-penny quotes tend to cluster at $0.001 and $0.009.
- Finally, the Commission notes that sub-penny quotes are currently rounded to the nearest cent by securities information processors, and consequently, not included in the quotation information that is distributed to the average investor. The Commission is concerned that this is creating a "hidden market" where security prices are not transparent to the average investor.

[24] See, Proposed Rule, pp. 11166-11167.

C. Evaluation of these concerns

1. Voluntary move away from sub-penny quoting

The major ECNs appear to recognize the problems associated with sub-penny quoting raised by the Commission and have already *voluntarily* moved to eliminate trading in sub-penny increments. In August 2003, BRUT ECN eliminated sub-penny quoting for stocks priced above $10.00 per share. The ban was extended to stocks priced above $5.00 in November 2003. In a similar move, INET eliminated quoting in sub-pennies for securities priced above $1.00 in March 2004. Both ECNs cited results from pilot studies which showed that eliminating trading in sub-pennies lead to greater price discovery, greater market transparency, and higher overall execution quality as the reasons for their decision to impose a one cent minimum price increment.[25] Currently, no major market center permits quoting in sub-pennies in shares priced above $5.00. It is clear that competitive forces have effectively moved markets away from sub-penny quoting without Commission intervention.

It is important to note that both BRUT ECN and INET permitted exceptions to their respective sub-penny quoting bans and allowed Qubes (QQQ), which mimic the NASDAQ-100 Index Tracking Stock, to be traded in sub-pennies. QQQ is the most actively traded exchange traded fund in the world and the most actively traded listed security in the United States. The average spread in Qubes on BRUT and INET is approximately three tenths of a penny. Moreover, quotes in QQQ are not clustered around $0.001 and $0.009, which suggests that investors are not simply "stepping ahead." Mandating a penny increment in this particular case would be exceptionally costly to investors, as spreads would be kept at an artificially high level. Edward Nicoll, the CEO of Instinet Group Incorporated, notes that sub-penny quoting in QQQ by all market centers could save investors as much as $150 million per year.[26] Other actively traded ETFs may similarly benefit from sub-penny quoting. The trading characteristics of QQQ highlight the importance of allowing market centers the flexibility to set the minimum price increment. Mandating a one cent minimum price increment will ultimately prove detrimental to investors by requiring them to pay artificially high spreads on certain securities.

The differences in the price level below which sub-penny trading is allowed to occur on BRUT ECN and INET highlights another problem with the sub-penny quoting rule. The proposal would ban sub-penny increments for stocks in a range where at least one ECN (BRUT) sees benefit in allowing sub-penny quotes. It's plausible that the minimum cutoff for sub-penny quoting varies from market center to market center and over time as economic conditions change. By imposing an arbitrary $1.00 ceiling on the price of stocks that can be traded in sub-pennies, the commission is substantially decreasing the flexibility of market participants to experiment with the appropriate ceiling and respond

[25] As of 2003, BRUT share of Nasdaq trading volume was 8 percent, while INET's share of Nasdaq listed volume was approximately 30 percent. See Ari Weinberg, "Nasdaq's Super Bust," *Forbes.com,* August 8, 2003.

[26] Prepared Testimony of Edward Nicoll, before the Securities and Exchange Commission (April 21, 2004).

to changes in economic conditions of the market that could affect the optimal cut-off level.

Certain common stocks might also benefit from sub-penny quoting. Recent scholarly research finds evidence that the penny tick size is a binding constraint for some securities.[27] The authors of this study examine a large sample of NYSE traded stocks and find convincing evidence that sub-penny pricing may further reduce the spreads of high-volume, low-risk, and low-priced stocks. The authors caution that the benefit of a reduction in spreads due to sub-penny pricing must be weighed against the costs noted by the Commission. However, market centers are in the best position to determine for which securities the benefits of sub-penny quoting outweigh the costs.

2. Order routing strategies

The Commission's concern that sub-penny quoting will further exacerbate the decrease in depth that occurred following decimalization has likely been overstated. Institutions responded to the decrease in depth by altering their order routing practices. Chakravarty, Panchapagesan, and Wood (2003), for example, find that institutions increasingly used ECNs and crossing networks for orders that were easy to fill and full service and independent research brokers for large size orders that are more difficult to fill. Despite many complaints to the contrary, the scientific evidence shows that institutional trading costs did not increase following decimalization. Moreover, institutional trading costs would likely not increase even if the minimum trading increment were less than a penny. Competition among the wide array of trading venues assures that transaction costs will be kept to a minimum.

3. Stifling of innovation in quote displays

The sub-penny quoting proposal could also stifle innovation in the way that quotes are displayed to investors. Josh Levine, the designer of the Island ECN, notes that the problem of flickering quotes can be solved by technological innovations. He notes "There is tremendous opportunity for innovation in the design of the user interfaces that present market data to traders and investors."[28] He suggests, "Graphical displays can replace flickering digits with fluid motion. Human brains are well equipped for recognizing patterns in changing shapes." In the future, these types of innovative displays could lead to more efficient dissemination of market information to certain investors. Competition for order flow ensures that market centers have the incentive to invest the time and money into developing such technology. Unfortunately, imposing a minimum price increment of a penny could lead market centers to under-invest in the development of this type of technology.

[27] See Kee Chung, Charlie Charoenwong, and David Ding, "Penny Pricing and The Components of Spread and Depth Changes," Working Paper (October 2003): State University of New York at Buffalo.

[28] See comments of Josh Levine on the SEC's Request for Comment on the Effects of Decimal Trading in Sub-Pennies, December 3, 2001.

D. Conclusions

While the Commission's concerns have some validity, market participants have already recognized the problems associated with sub-penny quoting and are moving away from the practice. If the Commission enacts the sub-penny quoting proposal, market centers will lose the flexibility to allow sub-penny quoting in those cases where it would benefit the market place. The result will be artificially higher spreads in certain securities, which will ultimately translate into higher transaction costs for investors. Initial evidence indicates that these costs could be significant. The proposal could also stifle technological innovation in the way that quotes are displayed to investors. The Commission should allow competitive forces in the marketplace to determine the prices that investors may bid or offer for securities.

III. Concluding Remarks

Regulation NMS has the potentially to alter the landscape of U.S. securities markets dramatically. As the analysis in this comment shows, both the trade-through rule and the sub-penny pricing proposals are fraught with unintended consequences. Although the Commission hopes to keep the U.S. regulatory structure up to date with recent technological innovations, Regulation NMS has the potential to stifle innovation.

The trade-through proposal would give market centers a disincentive to invest in new technology and would force them to adapt to an antiquated system of market linkages. With regards to the sub-penny quoting proposal, the Commission would be better served by allowing competitive forces in the market place to determine prices.

Appendix I
RSP Checklist

The Securities and Exchange Commission Proposed Rule: Regulation NMS

Element	Commission Approach	RSP Comments and Grades
1. Has the agency identified a significant market failure?	The Commission believes that without price protection in the form of a trade-through rule, markets will suffer because of a decrease in the use of limit orders and an increase in market fragmentation. Similarly, the Commission believes that sub-penny quoting diminishes market quality. ***Grade: F***	The Nasdaq Stock Market has flourished without a trade-through rule. Investors can choose their trading venue based on price, certainty of execution, and speed. In the case of sub-penny quoting, market centers have voluntarily moved away from the practice. In sum, there is no evidence of market failure.
2. Has the agency identified an appropriate federal role?	The proposed rule reflects adjustments to the Securities Exchange Act of 1934. ***Grade: A***	
3. Has the agency examined alternative approaches?	The Commission implemented a *de minimis* exception to the trade-through rule for three exchange traded funds. The results of the study showed that market quality did not suffer from the relaxation of the trade-through rule ***Grade: C***	This regulatory experiment yielded a number of useful insights. However, the Commission should consider extending the exception to a larger sample of common stocks before adopting the proposal.

Element	Agency Approach	RSP Comments and Grades
4. Does the agency attempt to maximize net benefits?	The SEC does consider the potential costs and benefits of the proposals. ***Grade: C***	Research suggests that the benefits of the proposals will be minimal.
5. Does the proposal have a strong scientific or technical basis?	Research conducted by the Commission's Office of Economic Analysis found evidence that investors were using sub-pennies to "step ahead" of displayed limit orders, which has a negative impact on market quality. ***Grade: C***	The Commission's concerns about sub-penny pricing have been supported by various research studies. However, market centers have voluntarily moved away from sub-penny quoting without Commission intervention. Existing scholarly research suggests that the Nasdaq Stock Market has not suffered from the lack of a trade-through rule and that a loosening of the trade-through rule for selected exchange traded funds did not harm market quality. The Commission, however, has largely ignored this work.
6. Are distributional effects clearly understood?	There is only a broad discussion of the distributional effects in the proposed rule. ***Grade: D***	The differing impact of the rule on retail and institutional investors is not adequately discussed nor has the Commission fully considered the impact of the trade-through proposal on market centers that compete on aspects of best execution other than price.
7. Are individual choices and property impacts understood?	The impact of the proposed rules on individual choice is not fully understood. ***Grade: D***	Individual choice may actually be harmed by the proposed trade-through rule. Market centers will be forced by the Commission to compete on price and other dimensions of best execution, such as speed of execution, will suffer.