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Testimony of

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**Before the House Financial Services Committee
Subcommittee on Capital Markets, Insurance and GSEs**

February 15, 2005

Chairman Baker and Ranking Member Kanjorski, thank you for this opportunity to discuss NASDAQ's views on the re-proposed version of Regulation NMS.¹

I. Summary Position on Proposed Regulation NMS

NASDAQ supports the goals of proposed Regulation NMS -- investor protection, enhanced competition, and transparency. And, we feel the proposal makes major strides towards achieving these goals. Moreover, NASDAQ commends the Securities and Exchange Commission (the "Commission" or the "SEC") for its focus on intermarket access standards, sub-penny trading, data revenue distribution, and reform of the trade-through rule.

In fact, NASDAQ supports much of proposed Regulation NMS, including the restrictions on sub-penny trading, the proposed access standards, and restrictions on access fees. While we are cautious about government imposed limits on fees, we think the current direction Reg. NMS takes in requiring participants to access certain quotes, demands such a limitation to protect investors. Most importantly, we applaud the impact the SEC's access standards will have on speeding the demise of the outmoded anticompetitive ITS system.

With regard to the SEC's proposal on market data, we support the SEC's liberalization of proprietary market data and the likely enhanced competitive environment that will result from this liberalization. We support the SEC's desire to change the way market data revenue is distributed by the various market data plans. However, we, along with the majority of

¹ Securities Exchange Act Release No. 50870 (Dec. 16, 2004), 69 FR 77424 (Dec. 27, 2004) ("Second Regulation NMS Proposing Release").

commenters, believe that one element of the proposed formula that governs how market data revenue is distributed, the element known as the "Quote Credit" is seriously flawed and will be gamed by market participants.

Finally, with respect to the much debated topic of the trade-through rule, our position remains unchanged. NASDAQ opposes the trade-through rule because it is not needed, it is costly and, ultimately, it will not serve the best interest of investors. We are proud of the market quality experienced by investors every day on the Nasdaq Stock Market. We achieve that high quality without the anticompetitive effects of a trade-through rule. Investors have been, and will continue to be, protected from inferior executions by the strict application of, and surveillance for, broker-dealer best execution obligations and by competition. On the NASDAQ market, trade-through rates are minimal. We do not believe that extending the trade-through rule to NASDAQ is supported by the facts and may indeed be harmful to investors.

Philosophically, NASDAQ believes that no government decision maker, no matter how well-intentioned, is equipped to make the minute, technical judgments that are now handled by technology and competition in routing and executing millions of trades and billions of shares every day. Simply put, NASDAQ's primary concerns with Regulation NMS, as currently proposed, reflect our belief that market forces and best execution must serve as the bedrock principles to serve public purposes in the securities markets.

Nevertheless, we recognize that the SEC has moved forward with its market structure thinking. Allowing investors to make distinctions between fast and slow markets will help modernize our overall market structure. While repealing the trade-through rule would be a simpler way to achieve a competitive, pro-investor national market system, the advances proposed by the Commission with regard to floor-based markets are groundbreaking. Its proposal is driving floor-based markets to automate today. This proposal will enable electronic markets to compete and will offer investors a better opportunity for best execution than they currently have today. This contribution to the national market system is significant and worthy of praise.

II. Exempting "slow" quotes from the trade-through rule is a good step towards bringing competition to floor-based markets but the trade-through rule should not be extended to NASDAQ.

The Commission's work on the trade-through rule, reflected in the incentive given for markets to adopt electronic quotes, is a step forward and represents a competitive improvement within the NYSE listed space. Although NASDAQ prefers repeal of the trade-through rule, the fast-slow quote designation will have a dramatically positive effect. Inexplicably, however, Regulation NMS has evolved from an endeavor to bring competition to the NYSE space into an effort to impose a trade-through rule on the competitive, pro-investor NASDAQ market.

Application of the trade-through rule to Nasdaq-listed securities would be harmful to investors. The NASDAQ market is already a quality market. We are not convinced that the rule would even achieve the SEC's desired goal of increasing the use of limit orders. In contrast, we know that the rule will impose financial and technical costs and deprive millions of investors of the ability to determine for themselves what is best for them. Furthermore, the Commission studies used to justify extending the rule to NASDAQ significantly overstate the current extent of trade-throughs in the NASDAQ market and makes faulty assumptions about the functioning of the market.

A. Proposed Regulation NMS replaces investor choice with regulatory mandate.

Promoting transparency, disclosure, competition and investor has been the Commission's guiding principle when regulating secondary market trading of equity securities. Soon after being given the statutory mandate to foster a national market system, the SEC adopted rules to require the collection and dissemination of quotes and trade reports of certain over-the-counter ("OTC") equity securities. With access to this information investors could now determine whether the prices they were paying were fair. The SEC exposed OTC trading to some sunlight and in effect deputized millions of investors to protect themselves.

This empowerment of investors leverages the SEC's assets and is facilitated by a broker's duty of best execution – brokers must place the interests of their customers ahead of their own and seek the most advantageous terms reasonably available under the circumstances. This rule provides a legal foundation that ensures each investor – big or small – will hold the broker accountable for achieving what that investor believes is the best price for that investor's circumstances.

To further empower both the investor and regulator, the SEC recently required brokers and markets to disclose order execution quality statistics and descriptions of how they handle customer orders, again applying the information and disclosure principle. Throughout its years of study and review of secondary market trading, the SEC has not created a bright-line test for determining what constitutes best price or best execution. Instead, it has used this well accepted legal concept that keeps brokers and markets vigilant in performing the best they can for their customers.

Competition has also played an important role in ensuring that investors receive quality service and executions. Nowhere is the power of competition more evident than in the trading of Nasdaq-listed securities. – where competition fostered by the SEC and its policies has driven

phenomenal advancement in technological innovation and customer choice.² It is by no means inconsequential that all of these innovations and benefits developed only in the market that was free from the competitive distortions of a trade-through rule.

The combination of informed choice, competition, and regulatory oversight has served investors and the national market system well. Despite the quality and efficiency demonstrated by the NASDAQ market, the Commission is proposing to impose the trade-through rule on NASDAQ.

The Commission relies on two economic studies conducted by its staff to support application of the trade-through rule to Nasdaq-listed securities. NASDAQ respectfully disagrees with the Commission staff studies. NASDAQ is responding to these studies in detail. Our full analysis is attached as Exhibit 1 to my testimony.³ In general, however, the Commission staff studies significantly overstate the current extent of trade-throughs in Nasdaq-listed securities and erroneously conclude that differential fill rates for large marketable limit orders in Nasdaq-listed and NYSE-listed stocks are evidence of a defect in NASDAQ's market structure. Surprisingly, the Commission staff's conclusion with respect to fill rates for large marketable limit orders fails to consider a widely used order routing technique of intentionally sending oversized orders at displayed quotes searching (also known as "pinging") for reserves within the many limit order books trading Nasdaq-listed securities. Thus, this trading device produces orders that are never fully expected to be completely filled. The SEC study ignored these orders when compiling our fill rate, which would be much higher otherwise.

In proposing to retain a modified trade-through rule for exchange-listed securities and expanding it to include Nasdaq-listed securities, the Commission will be transforming its role from that of a referee of the national market system – acting when necessary to ensure the protection of investors – to an active, moment to moment player in the national market system, controlling nearly all aspects of interaction in the system (e.g., recording response times, judging access standards, and setting access fees). This transformation is an unavoidable corollary to the Commission's underlying decision on the trade-through rule. This allows the trade-through rule to grant millions of momentary monopolies. A momentary monopoly is created because the rule distorts the competitive balance by, for the most part, requiring investors to interact with whomever is displaying a protected quote. These momentary monopolies are wholly unnecessary for the NASDAQ. With respect to NYSE-listed securities, the lack of competition and innovation in

² Competition has also led to innovation and greater responsiveness to investor needs. Examples include NASDAQ's opening and closing crosses, anonymous trading, routing, and the multitude of order types that NASDAQ and other markets provide.

³ See Exhibit 1. *Re-Proposed Regulation NMS; File No. (S7-10-04), Nasdaq Comments on SEC Staff Studies*, Nasdaq Economic Research, The Nasdaq Stock Market, Inc., January 25, 2005.

the market for NYSE-listed securities is the direct result of the competitive distortions that the current trade-through rule causes. Therefore, modification of the current trade-through rule to allow differentiation between automated and non-automated will introduce some needed competition into the NYSE market.

B. Choosing between the "Market BBO" and "Depth of Book" trade-through rule alternatives ignores the optimal policy choice of whether a trade-through rule should be applied at all.

Many in Congress have asked NASDAQ what we think of the two alternatives in the latest NMS proposal. Just to be clear – neither a top of book or depth of book version of the trade-through rule seems better than the NASDAQ open competitive model without the trade-through rule. The real question is: Has the trade-through rule outlived its usefulness and should it be repealed?

For those who do support a trade-through rule, however, we have found it interesting that the arguments relied upon conveniently evaporated from their advocacy when the depth of book alternative was proposed by the Commission. In fact, some seem to be taking intellectually inconsistent positions. This was evident when NYSE last testified before you on February 20th at the New York Field Hearing. You will remember Mr. Thain's "best price rule" arguments. He said:

"The principle behind the trade-through rule is, in my view, critical to protecting investor interests. Why should investors ever receive anything other than the best price? There is talk of the importance of speed, anonymity, and other factors. But in a commoditized market like that which exists for equities, if displayed prices across all markets are available immediately, there is absolutely no reason to allow agents to buy and sell on behalf of their clients for anything other than the best price."⁴

However, by January 12 of this year, the NYSE seems to have had a change of heart. In a letter to the SEC, the NYSE was praising the virtues of "promoting investors' ability to choose among alternative trading venues" and decrying that "mandatory Depth of Book routing eliminates intermarket competition by giving any limit order, regardless of where it was placed, the same protection."

If you really worship at the altar of best price, the depth of book alternative fulfills that objective better and more completely than the Market

Testimony of John A. Thain, Chief Executive Officer, New York Stock Exchange, Inc.. Capital Markets Subcommittee of the House Financial Services Committee held February 20, 2004. Field Hearing entitled "Market Structure III: The Role of the Specialist in the Evolving Modern Marketplace."

BBO alternative. If someone supports a trade-through protection for one price, how can one logically argue against protection of an order as little as one penny away from that price? That is saying that the first investor in line deserves to have his or her spot protected but the second person in line, and any subsequent people in line, do not.

Those who oppose the depth of book alternative have cited the importance of competing market fill rates, competition and factors other than price as important investor casualties of a depth of book alternative. Of course, these are the very same public policy rationales upon which opponents of the trade-through rule rely.

Moving from the theoretical to the practical, however, we must mention that the practical implications of a depth-of-book trade-through rule would be extremely complex to implement and fraught with the potential for unintended consequences. Therefore, while we empathize with the philosophical rationale for full-book trade-through protection, the practical implications are overwhelming and the rule would create tremendous market structure complexity without accomplishing any tangible investor benefits that trade-through repeal would not.

C. Reforming the trade-through rule and the NYSE's hybrid market proposal

With respect to exchange-listed securities, the re-proposed Regulation NMS would be a definite improvement over the status quo, because the proposal acknowledges the value of speed and certainty of execution and allows electronic markets to compete at electronic speeds. By forcing the NYSE and other manual markets to automate, Regulation NMS would advance the goals of the national market system by enhancing competition in these markets. Manual markets will no longer be the weak link in the national market system, slowing down faster markets while humans – some with a distinct time and place advantage on the floor – attempt to execute orders. The “Fast vs. Slow” quote distinction has guided behavior in the NASDAQ market for some time, absent any guidance from the Commission.

In response to the Commission's proposed Regulation NMS, the NYSE has also proposed a substantial change to its own market structure rules. A side by side comparison of the NYSE's hybrid market proposal and Regulation NMS creates some uncertainty as to how these two fundamental market structure proposals will work together, and whether the NYSE's proposal allows even the limited competitive benefits of Regulation NMS in the listed market to be achieved.

For example, NASDAQ understands that the exception from the trade-through rule for market re-openings will include re-openings after a market has halted trading due to an order imbalance. As discussed below, this will provide the halted market an advantage over markets that continue to trade.

Furthermore, it is unclear what will be considered a re-opening under the NYSE's hybrid market proposal. For example, is trading on the NYSE considered halted each time a liquidity replenishment point is reached or when the specialist gaps the quotes in a security? If so, the NYSE will be able to ignore the quotes of other markets each time it returns from these halted states.

Furthermore, if re-openings are limited to an order imbalance, what kind of discretion does a market have to declare an "imbalance." In addition, is the NYSE free to change its rules concerning what types of orders create an imbalance? Is NASDAQ permitted to propose similar imbalance rules for market makers faced with large order imbalances on their desks? To provide market participants an opportunity to fully review and comment on both the NYSE hybrid proposal and re-proposed Regulation NMS, the proposals must be considered serially. Because the NYSE proposal is intended as a response to Regulation NMS, if the Commission adopts Regulation NMS, it should require the NYSE to resubmit the hybrid rule filing with a detailed explanation as to how it will operate and comply with the new regulation.

As mentioned above, the interpretation of what constitutes a market re-opening may provide halted markets an unfair competitive advantage. By allowing markets to trade-through other valid quotes during a re-opening after an imbalance or other market-specific non-regulatory halt ("non-regulatory halts"), the Commission creates a significant loophole in its own rule that works singularly to the advantage of manual markets. Once a market has declared a halt, market participants know they can execute orders on the re-opening market without regard to trade-through restrictions. Market participants electing to send orders to the halted market will in effect be electing to opt-out of trade-through protection, to the detriment of those displaying quotes and orders on other markets. This creates a disincentive to posting quotes and sending orders to other markets that continue to trade. Accordingly, if the trade-through proposal is adopted, markets re-opening after non-regulatory halts must be required to provide trade-through protection to the protected quotes of other markets.

III. Market data rules should be simplified to embrace competition, end gaming by market participants, and reduce costs to investors.

NASDAQ supports much of the Commission's pro-competitive liberalization of the rules governing distribution, consolidation and display of core and non-core market data by self-regulatory organizations ("SROs") and other market participants. However, the Commission has failed to extend that pro-competitive principle to the government-mandated market data plans, which stifle competition and raise the cost of market data for all investors. If the Commission is content simply to tinker with the Plan Allocation Formula, Nasdaq suggests that it adopt a simpler formula based entirely on proportionate dollar volume or proportionate share volume, and

forego its Quoting Share proposal, which makes the formula needlessly complex and more vulnerable to manipulation.

A primary objective of the national market system is to provide investors with accurate and timely market data with which to make informed investment decisions in a cost-effective manner.⁵ The Commission's paramount mission should be to safeguard the integrity of this "core" market data while striking a balance between competition and regulation to ensure a vibrant, accessible market for additional "non-core" market data. To the extent re-proposed Regulation NMS embodies such an approach, NASDAQ is in full support. NASDAQ welcomes the Commission's attempts to increase investor choice and market competition by proposing to reduce the data that vendors are required to display and the instances in which they must display it ("Display Amendment"), and by liberalizing the current restrictions on independent distribution of data outside of the national market system plans. The added competition will inevitably lower average investors' market data costs.

NASDAQ opposes, however, the proposal to re-engineer the Plan Allocation Formula in its current form. While elements of the proposal are consistent with the Commission's mandate to ensure data integrity, an over-emphasis on re-allocating revenue among SROs would place investors at risk of higher-cost and lower-quality data. In particular, the inclusion of a "Quote Share" component in the formula still leaves ample opportunities for manipulation that could cost investors even more than current practices. Adopting the proposed Quote Share element will motivate market participants to adopt artificial trading practices that distort core market data and increase investor costs by forcing national market system plans and vendors to purchase added distribution capacity.

The Commission's Quote Share proposal would lead to increased quotation activity as market participants chase valuable quotation credits in SRO member revenue sharing programs. For example, the Commission can expect innovative competitors to do some of the following:

- **Flickering Quotes:** displaying quotations just long enough to earn quotation credits but not long enough to risk execution;
- **Security Targeting:** generating quotations in securities where each quotation credit is proportionately more valuable;
- **Market Targeting:** generating quotations on markets with little or no resident liquidity to minimize the risk of order interaction;
- **Shredding Quotes:** generating multiple quotations in a single market, single quotations in multiple markets, or multiple quotations in multiple markets to slow the pace of executions

⁵ See, e.g., Exchange Act §11A(a)(1)(C)(iii), (D).

and thereby prolong the period in which quotation credits are earned; and

- ***Shifting Quotes***: moving quotations from one market to another to lengthen the chase by potential contra parties and thereby earn additional quotation credits.

The Commission must simplify the formula further to neutralize the potential for harmful economic incentives that the Allocation Formula could create. The simplest, fairest and most transparent Plan Allocation Formula would be based solely on share or dollar volume of trading activity, a metric the Commission has already endorsed by incorporating it into the square-root dollar volume Security Income Allocation method. Share volume and dollar volume are simple and transparent to calculate, would not motivate market participants to alter their quoting or trading behavior, and cannot be inexpensively manipulated by market participants to maximize their draw on member revenue sharing programs.

IV. *We Need a Consensus Rule to Modernize Our Nation's Market Structure.*

NASDAQ respects the efforts of the Commission to deal with this tough and complex issue. Let me reiterate that NASDAQ supports a great number of the proposals contained in Regulation NMS. We have seen some thoughtful comments from market participants on the proposed rule and are hopeful that Commissioners are still evaluating all the information placed on the record. We also sincerely appreciate this Subcommittee's interest in market structure issues and believe that this hearing will reinforce the notion that this major undertaking requires thoughtful deliberation

In the end, NASDAQ is hopeful that Reg. NMS is completed in a timely manner. It is important to move competition forward in the trading of NYSE issues, and the current rule process seems to be heading in the right policy direction. Again, we hope the Commission will reject the imposition of any trade-through rule on NASDAQ. The Commission's market structure rules are critical to maintaining U.S. superiority in the global equity markets, and will impact the way Americans and all investors view the quality and fairness of our equity markets. Finally, we would urge consensus decision-making, which is an indicator of a fair process and will yield the best rules.

In conclusion, I would like to take this opportunity to address another issue that relates to the national market system. I would like to compliment the Commission on working with NASDAQ on our exchange registration application. Commission staff publicly stated at the SEC December 15 open meeting that a solution is at hand on the NASDAQ application, and that the application could be considered expeditiously. The Commission has worked hard and in good faith with NASDAQ, and we appreciate their commitment to finding a solution that would enable NASDAQ to register as an exchange. I also would like to thank many of you for expressing support for NASDAQ's

exchange registration in the past. Approval of the application will separate our regulator from our market, strengthening integrity of our market.

Thank you for holding this hearing and considering NASDAQ's views.

Report in Support of Testimony by

**Mr. Robert Greifeld
CEO and President
The Nasdaq Stock Market**

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February 15, 2005



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February 12, 2005

Executive Summary

In re-proposing Regulation NMS, the SEC concludes that trading in both Nasdaq- and NYSE-listed stocks would benefit from strengthened protection against trade-throughs." In reaching this conclusion, the Commission cites one study of trade-throughs and three studies of market quality as providing the necessary supporting data. While each study has its own unique purpose in supporting the proposed rule, Nasdaq believes that each also contains a flaw in conceptual design, data selection, or execution that undermines its findings. In this appendix, Nasdaq offers our analyses of these four studies. To summarize:

- The goals of the Trade-Through Study were to characterize trade-throughs for both Nasdaq and the NYSE and to explore the effects of competition on the frequency of trade-throughs in Nasdaq-listed securities. The study uses 2003 data and fails to acknowledge advances in the Nasdaq-listed trading environment during 2004 that have lowered the trade-through rate in Nasdaq stocks to 1.5%, significantly less than the 2.5% reported for 2003 in the Commission's study. Once large trades and trades during crossed markets are excluded, the 2004 trade-through rate drops to 0.8%.
- In the release, as well as in comments made in the open meeting, the Commission expressed concern about two market quality aspects of Nasdaq stocks, the fill rate of large marketable limit orders and volatility. The SEC went on to argue that a trade-through rule would create an added incentive to post liquidity-providing limit orders that would improve fill rates, lower volatility, and improve market quality.
- Contrary to the release, differential fill rates for large marketable limit orders do not indicate a market defect but reflect the prevalence of reserve size in Nasdaq quotes. Large marketable limit orders execute far more shares, at lower cost, in Nasdaq-listed trading than in NYSE-listed trading.
- The Matched Pairs Study is largely a study of small stocks. The SEC compares market quality of 113 pairs of Nasdaq and NYSE stocks. Over a quarter of the stocks are not NYSE eligible and only 10% are from the Nasdaq-100. Even for these small stocks, the study shows that Nasdaq market quality is on parity with the NYSE.
- The S&P Index Study also compares market quality in Nasdaq- and NYSE-listed S&P index constituent stocks. The study overstates the effective spreads of Nasdaq stocks using a methodology that favors higher priced NYSE stocks and also uses statistics from an atypical month.
- The Volatility Study contains results that Nasdaq cannot reproduce. The SEC's short-term volatility estimates are more than three times higher than Nasdaq's AND higher than those in an NYSE study upon which the SEC study is based.

I. Introduction

In the release re-proposing Regulation NMS¹, the Securities and Exchange Commission ("SEC" or "Commission") concludes that although the trading environment for stocks listed both on the Nasdaq Stock Market Inc., ("Nasdaq") and on the New York Stock Exchange ("NYSE") has significant strengths, "both markets have weaknesses that could be reduced by strengthened protection against trade-throughs."² In reaching this conclusion, the Commission refers to one study of trade-throughs³ and three studies of market quality⁴ to provide the necessary supporting data. We support the Commission in seeking compelling empirical evidence of flaws in the current structure of U.S equity markets before embarking on a program of sweeping reform. In order that the Commission's final decision be based upon as complete and thorough an understanding of the available empirical evidence as possible, we have prepared our own analyses of the four studies and the issues addressed therein. We suggest that the Commission's studies significantly overstate the current extent of trade-throughs in Nasdaq securities and incorrectly characterize execution quality of Nasdaq- and NYSE-listed stocks.

The SEC studies either focus directly on the proposed rule or on the relative performance of the markets for Nasdaq- and NYSE-listed securities. The Trade-Through Study addresses a key point of proposed Regulation NMS and will be considered in detail below. For the market quality studies, Nasdaq unequivocally supports the Commission's efforts to achieve unsurpassed market quality for all investors in U.S. equity markets but we do not accept the argument that any shortcomings in market quality for Nasdaq- or NYSE-listed securities are best addressed by strengthened trade-through restrictions. Nevertheless, Nasdaq has prepared an in-depth analysis of those studies as well.

While each study has its own unique purpose in supporting the proposed rule, each also contains a flaw in conceptual design, data selection, or execution that undermines its findings. In particular, the Trade-Through Study uses out-of-date data from the Fall of 2003, both the Matched-Pairs Study and the S&P Index Study erroneously describe the marketable limit order fill rate of Nasdaq securities as evidence of a market flaw, the Matched-Pairs Study fails in its stated intent of replicating SEC 2001⁵ by omitting

¹ Securities Exchange Act Release No. 50870 (December 16, 2004), 69 FR 77424 (December 27, 2004).

² 69 FR 77432.

³ Memorandum from the Office of Economic Analysis, Commission, to File, dated December 15, 2004 (Analysis of Trade-Throughs in Nasdaq and NYSE Issues) ("Trade-Through Study").

⁴ Memorandum to File, from Office of Economic Analysis, dated December 15, 2004 (Comparative analysis of execution quality for NYSE and Nasdaq stocks based on a matched sample of stocks) ("Matched Pairs Study"); Memorandum to File, from Division of Market Regulation, dated December 15, 2004 (Comparative analysis of Rule 11Ac1-5 statistics by S&P Index) ("S&P Index Study"); Memorandum to File, from Office of Economic Analysis, dated December 15, 2004 (Analysis of volatility for stocks switching from Nasdaq to NYSE) ("Volatility Study").

⁵ Report on the comparison of order execution quality across equity market structures" U.S. Securities and Exchange Commission, 2001, Washington, D.C ("SEC 2001").

almost all active Nasdaq securities, the S&P Index Study only partially controls for the effects of stock price on trading spreads thereby biasing its results in favor of higher price NYSE stocks, and finally the results of the Volatility Study cannot be reproduced and may be erroneous. We believe that the results from the more complete analyses presented here firmly establish that investors in NYSE-listed stocks would benefit from extending the competitive environment of Nasdaq trading to NYSE securities and that the converse, creating a monopoly at the inside for Nasdaq securities, would be a step backwards for U.S. capital markets and investors.

II. Trade-Through Study

The Commission's Trade-Through Study is designed with the stated goals of characterizing trade-throughs for Nasdaq and NYSE securities⁶ and determining whether competition has created a 'no-trade-through zone' in Nasdaq securities.⁷ To achieve these goals, the study uses databases prepared by Nasdaq and the NYSE to measure trade-throughs on four Thursdays between September and December 2003.⁸ We address a number of issues in this analysis which collectively indicate that the Commission's Trade-Through Study has significantly underestimated the benefits of competition on creating a 'no-trade-through zone' for Nasdaq securities and overestimated the possible gains from proposed Regulation NMS.

Our primary concern is the choice of 2003 for the sample. At that time, there were five independent major electronic market centers for Nasdaq trading: three ECNs and two SROs. Today there are three: one ECN and two SROs.⁹ Furthermore, the routing linkages maintained by these markets, as well as routing and matching systems of trading firms and third party vendors, were less developed in 2003 than today. All these changes reflect the power of competitive forces. It would seem reasonable, therefore, to use more recent data not only to capture Nasdaq-listed trading as it exists today but also to be used in conjunction with the 2003 results to determine whether market forces are reducing the rate of trade-throughs over time.

The table below shows the trade-through rate, in trades and shares, for 2003 and 2004 using the Trade-Through Study's methodology.¹⁰ As is

⁶ Trade-Through Study at 1.

⁷ 69 FR 77443.

⁸ The actual dates are September 18, October 16, November 20, and December 18, 2003. All are Thursdays immediately prior to expiration Fridays.

⁹ In 2003 the five electronic major market centers in Nasdaq securities consisted of three major independent ECNs and two SROs; the Island ECN quoting and printing on the National Stock Exchange ("NSX"), Instinet ECN quoting and printing to the NASD's Alternate Display Facility ("ADF"), BRUT ECN quoting on Nasdaq and printing to the Boston Stock Exchange ("BSE"), as well as Nasdaq and ArcaEx. Today, there is one major independent ECN and two SROs; INET ATS resulting from the merger of the Island and Instinet ECNs and quoting and printing to NSX, Nasdaq which acquired the BRUT ECN, and ArcaEx.

¹⁰ We employ the methodologies of the Trade-Through Study, particularly the three-second sample window. Sample dates remain Thursdays before expiration Fridays, September 16, October 14, November

readily apparent, the 2003 trade-through rate significantly overstates the current 2004 rate (1.5% today vs. 2.5% a year ago). In addition to the decline in the overall trade-through rate, every major electronic market center shows a decline in its individual trade-through rate.¹¹

Nasdaq-Listed Trade-Through Rates by Executing Market Center

Market	% Trades			% Shares		
	Late 2003	Late 2004	Change	Late 2003	Late 2004	Change
Amex	26.4%	40.6%	14.2%	38.1%	56.6%	18.5%
Boston	0.6%	-	-	0.3%	-	-
National	2.0%	1.4%	-0.6%	1.9%	1.3%	-0.6%
NASD ADF	3.0%	0.6%	-2.4%	3.1%	0.2%	-2.9%
Chicago	7.1%	4.8%	-2.3%	18.9%	33.2%	14.3%
Pacific (ArcaEx)	1.6%	1.4%	-0.2%	1.7%	1.3%	-0.4%
Nq-SuperMontage	3.4%	1.8%	-1.6%	2.9%	1.6%	-1.3%
Nq-Internalized	3.2%	1.4%	-1.8%	16.6%	13.0%	-3.6%
Total	2.5%	1.5%	-1.0%	7.8%	5.9%	-1.9%

Furthermore, competitive forces are not done. Nasdaq, whose Nasdaq Market Center does not currently route orders to market centers external to Nasdaq, acquired the BRUT ECN in September 2004 largely to provide external routing capability to its participants.

The Trade-Through Study indicates that the consideration of trade size is an important methodological issue.¹² The trade-through statistics presented above do not account for trade-throughs that occur when the total trade size is larger than the displayed depth. **When displayed size is taken into account, the Nasdaq-listed trade-through rate for late 2004 declines from 1.5% to 1.0% for trades and from 5.9% to 0.8% for volume.** An important question not addressed in the Trade-Through Study is whether these large trades intentionally avoid interacting with the posted quotes or are part of an execution that 'swept the street' or otherwise interacted with the market.

Of the remaining trade-throughs, the Trade-Through Study does not address changes in trade-through rates likely to result from the access provisions of proposed Regulation NMS, whether the sweep provisions differ

18, and December 16, 2004. We thank the Commission's Office of Economic Analysis for sharing their methodology with us.

¹¹ The late 2004 numbers are only the most recent results from an on-going trend. Trade-through rates from the dates March 18, April 15, May 20, and June 17, 2004 fall between the late 2003 rates and those reported for late 2004.

¹² Trade-Through Study at 1, 2.

significantly from routing practices today, and the appropriateness of the databases. As discussed below, each of these issues could be addressed with available data and has a significant bearing on the efficacy of the proposed rule, as well as its costs and benefits.

One of the provisions of the proposed access rules is a prohibition on locking and crossing the National Best Bid and Offer ("NBBO").¹³ If this proposal is adopted, trade-throughs that result from crossed markets would be significantly reduced if not eliminated. The Trade-Through Study discounts the number of trade-throughs resulting from crossed markets when assessing the need for strengthened trade-through provisions. We disagree with the study's observation that trade-through rates are not materially affected by executions that occur in crossed markets. We estimate that trade-through rates fall to 2.1% in 2003 and 1.3% percent in late 2004 when trade-throughs occurring during a crossed NBBO are dropped.¹⁴

In addressing the extent to which market centers already practice the equivalent of proposed Regulation NMS sweep orders today, it must be noted that Nasdaq does not currently route to non-participating market centers such as ArcaEx and Instinet's INET ATS. We do, however, observe how often these market centers route orders to Nasdaq. This analysis is complicated by the fact that if a Nasdaq-participating ECN is at the inside, INET or ArcaEx may route to that ECN directly rather than through Nasdaq systems. Limitations of the data notwithstanding, ArcaEx and Instinet are typically among the top three liquidity demanders on the Nasdaq Market Center.

Finally, the databases used (NASTRAQ for Nasdaq trades and TAQ for NYSE trades and both Nasdaq and NYSE quotes) may not be appropriate relative to alternatives such as OATS and other audit trail data.¹⁵ First, NASTRAQ and TAQ represent events as recorded by the Securities Information Processor ("SIP"), not as observed by market centers and traders when deciding whether and where to route incoming orders. Nasdaq maintains internal databases covering routing decisions to participating market centers.¹⁶ Even a small amount of latency can create a measurement problem when using a three-second window to evaluate trade-throughs. An alternative way to measure trade-throughs would be to identify trade-throughs where a market center knowingly traded through based on data available at the time, thereby accounting for network latency. Second, while the databases are believed to be accurate, even small errors in time stamps or other relevant fields may result in mis-measurement of trade-

¹³ 69 FR 77447

¹⁴ Our figure represents the fraction of trade-throughs reported to the tape in the same second as the NBBO was crossed. This method differs from that referenced in the Commission's Trade-Through Study at 5 in that the Trade-Through Study requires the market to be crossed for the entirety of the three second window, which is rare.

¹⁵ Trade-Through Study at 8, 9.

¹⁶ Nasdaq systems are incapable of trading through quotes on our book representing participating market centers. It should be noted that the SEC's methodology produces 'false positives' in situations where trades executed by the Nasdaq Market Center are erroneously identified as being outside the Nasdaq Inside.

throughs. Because the number of trade-throughs is small, identifying the fraction caused by data errors becomes more important. Finally, for quotes, TAQ does not identify the order submitter(s). Only audit trail data can reveal whether 100-share quotes being traded through represent retail orders.¹⁷

Although our comments to this point have focused on the trade-through rate in Nasdaq-listed securities, we would like to highlight one aspect of trade-through rates for NYSE-listed stocks. Tables 4 and 11 of the Trade-Through Study break out trade-through rates by dollar volume rank. For Nasdaq stocks, the Commission study reports trade-through rates decrease from 2.9% to 2.3% across the top four dollar volume ranks reported in Table 4. In the top row of the table below are the comparable rates for NYSE-listed stocks as calculated in Table 11 of the Trade-Through Study. NYSE trading shows a much greater range of trade-through rates, from 5.4% to 1.2%. We have also included the average time at the National Best Bid and Offer for the NYSE and the average for Nasdaq and ArcaEx combined.¹⁸ The table shows the much higher than average trade-through rate for active NYSE stocks and the very strong correlation between quote competition and trade-throughs in NYSE securities. Apparently, where there are few competing quotes to trade through, NYSE stocks only trade through about 1% of the time. But in the limited set of stocks where active quote competition exists, the best price is much more frequently ignored.

Quote Competition and Trade-Throughs in NYSE-listed Stocks

	Dollar Volume Rank			
	Top 20 Stocks	Stocks 21-100	Stocks 101-500	Stocks 501-1000
Trade-Through Rate (SEC Study Table 11)	5.4%	3.9%	1.8%	1.2%
Nasdaq / ArcaEx Time at Inside Quote	28.1%	25.2%	9.4%	5.7%
NYSE Time at Inside Quote	79.6%	82.9%	92.4%	92.4%

The goals of the Trade-Through Study were to characterize trade-throughs and to explore the effects of competition on the incidence of trade-throughs in Nasdaq-listed securities. Nasdaq believes that competitive forces have significantly lowered trade-through rates in Nasdaq-listed securities since the 2003 period studied by the SEC. Furthermore, many of the trade-throughs identified in Nasdaq-listed securities occur as the result of crossed markets, are large trades, or occur simultaneously with routed orders. Trade-throughs of these types will either disappear under other provisions of

¹⁷ 69 FR 77433.

¹⁸ For simplicity in calculations, we did not estimate time at the inside for other market centers in NYSE-listed stocks.

proposed Regulation NMS or will continue to occur much as they do today but in compliance with the proposed rules. Nasdaq also notes that the trade-through rate in NYSE-listed stocks with active quote competition is much higher than for similarly active Nasdaq stocks and much higher than for inactive NYSE stocks with little quote competition. Consequently, Nasdaq argues that competitive forces are achieving the goals envisioned by strengthened trade-through restrictions for Nasdaq securities; and if there is any market structure failure evident from the Trade-Through Study, it is for NYSE trading where competition has not lowered trade-through rates.

III. Limit Order Fill Rates

The goal of the staff studies is to provide empirical evidence of defects in Nasdaq- or NYSE-trading that are best addressed by strengthening trade-through restrictions. In the text of the Regulation NMS re-proposing release, as well as in comments made during the December 15 hearing, the Commission expressed concern about the fill rate of large marketable limit orders in Nasdaq-listed stocks.¹⁹ The SEC goes on to argue that a trade-through rule would create an added incentive to post liquidity-providing limit orders that would allow more shares of larger marketable orders to be filled.²⁰ Nasdaq disagrees with the Commission's conclusion. We do not believe that two isolated statistics, out of the more than 240 statistics in Rule 11Ac1-5 ("11Ac1-5" or "dash-5") reports, provide evidence of a market defect. Nor do we believe that the staff studies identify a lack of liquidity for large orders or establish the value of trade-through restrictions in enhancing liquidity for large orders.

Nasdaq stocks provide a hospitable environment for large marketable limit orders. Compared with the NYSE peer stocks in the Matched Pairs Study, far more shares of marketable limit orders are *executed* for Nasdaq stocks, and done so at prices equal to or better than for NYSE stocks. The fill rates referenced in the release are the result of much greater submission of 11Ac1-5 covered shares for Nasdaq. What presumably matters to submitters of marketable orders is the number of shares *executed* and the *price*, not just the fill rate of a single order.

On the electronic venues trading Nasdaq stocks, it is common for submitters of non-marketable limit orders and quotes to use hidden "reserve" size. This size can be revealed only when the orders are traded against. Traders submit oversized orders priced at the inside quote to take advantage of the possibility of reserve size being available. There is no harm in doing so since none of the electronic markets charge a commission on unexecuted shares, and the presence of a large marketable order is undetectable by other traders. It is our understanding, by contrast, that electronic orders submitted for NYSE stocks over the SuperDot system do not have similar reserve size capability although floor orders may only be partially displayed.

¹⁹ 69 FR 77432-77433

²⁰ 69 FR 77433

If a trader on the NYSE submits an oversized large marketable limit order priced at the opposing inside quote, that submission can be observed by the specialist and floor brokers in the trading crowd.²¹

Another difference between the two markets is the different handling of Immediate-or-Cancel or IOC orders which are included in 11Ac1-5 data as limit orders. In electronic venues, an IOC order can interact only with orders already standing on the electronic book. On the floor, a large IOC order can interact with any interest already on the floor and is not limited to orders on the electronic book. Consequently, a large IOC order sent to a floor grants a free option to those on the floor whereas there is effectively no free option value from an IOC submitted to an electronic book. The lack of a free option, as well as the avoidance of disclosure risk cited in the previous paragraph, makes marketable IOC limit orders exceedingly popular in electronic venues where they have effectively supplanted market orders as the order of choice in accessing available liquidity at the current price.

With these points in mind, reconsider the results of the Commission studies. Table 10 of the Matched Pairs Study illustrates a difference in fill rates for large marketable limit orders. For the "Large" market capitalization category, the Matched Pairs Study reports that Nasdaq's fill rate is 20% versus a rate of 66% for NYSE. A more complete view of marketable limit order executions is shown in the following table, which is similar to Table 3 in the Matched Pairs Study.²² For large marketable limit orders in the "Large" market capitalization group, 1,032 million Nasdaq shares are filled compared with only 332 million NYSE shares, a factor of three difference. In fact, among all size/market capitalization categories, there are many more Nasdaq shares of marketable limit orders filled than NYSE shares.

²¹ Under Direct+ rules in effect during the time of the SEC's study, any order in the 11Ac1-5 large marketable limit order categories could not have been a Direct+ order.

²² The table uses the same sample months and sample stocks as the Matched Pairs Study. The table adds two data elements, the total number of covered shares, and the shares executed *at the market center*, which excludes shares that are routed away from the market center for execution.

**11Ac1-5 Shares of Marketable Limit Orders for
Matched Pairs Sample**

(January – June 2004, all Market Centers, millions of shares)

		<i>Large Mkt Cap</i>		<i>Medium Mkt Cap</i>		<i>Small Mkt Cap</i>	
		Nasdaq	NYSE	Nasdaq	NYSE	Nasdaq	NYSE
100-499 Shares	Covered	3,079	1,236	601	349	246	158
	Executed	2,019	792	476	252	194	119
	Executed at MC	1,550	742	350	241	142	115
500-1999 Shares	Covered	5,836	2,319	899	427	381	194
	Executed	3,066	1,584	561	325	233	149
	Executed at MC	2,452	1,451	443	302	182	142
2000-4999 Shares	Covered	3,014	727	567	165	258	99
	Executed	1,449	545	247	121	117	72
	Executed at MC	1,154	530	197	117	94	70
5000-9999 Shares	Covered	4,469	474	687	113	296	70
	Executed	1,033	333	157	75	67	45
	Executed at MC	832	324	125	72	54	43

The above table shows that for Nasdaq stocks, many more covered shares of marketable limit orders are submitted. For the largest order size category and the largest market capitalization group, there are almost 10 times as many shares submitted for the Nasdaq stocks compared with the NYSE peers (4.4 billion compared with 474 million). In terms of (non-routed) executions, Nasdaq-listed exceeds NYSE-listed executions by a factor of about 2.6 (832/324). Thus, the Nasdaq-listed fill rate indeed differs from the NYSE fill rate, but there are substantially more executions. In every order size/market capitalization group cell, Nasdaq-listed executions, adjusting for routing, exceed those of the NYSE peers. Even if one reduces the Nasdaq-listed executed shares, already adjusted for routing, by an additional 30%, as suggested by the Matched Pairs Study, Nasdaq-listed executed volume would still exceed NYSE-listed volume for all data cells except those for the three largest order sizes for the "Small" market capitalization group.

As a technical matter, when comparing total shares executed, it is best to count only those shares executed at the reporting market center. Otherwise, double counting could occur.²³ For example, suppose ArcaEx

²³ Note that the double counting concept just referred to is different than the one used in the Matched Pairs Study. In selecting NYSE peers for its Nasdaq sample, the Matched Pairs Study adjusted downward Nasdaq-listed dollar volume to account for what it termed a "difference in volume reporting between the Nasdaq and the NYSE." The study does not provide details as to why this adjustment is necessary. One possibility would be that the Nasdaq-listed market has a higher level of dealer intermediation than the

receives an order for 5,000 shares, executes 4,000 shares, and routes the remainder to INET, which executes the remaining 1,000 shares. In dash-5 data, ArcaEx would report total executed shares of 5,000, and INET would report 1,000 shares. The grand total of executed shares would be 6,000, which is too high unless one uses as the ArcaEx total the 4,000 shares executed at the market center. Note that the difference between executed shares and executed at the market center shares is higher for Nasdaq-listed than for NYSE-listed. On average, the difference is about 20% for Nasdaq and 5% for NYSE. This implies more inter-market center routing on Nasdaq.

The quantity of shares executed is one measure of a market's performance, another is the price of those executions. The Matched Pairs Study concludes that effective spreads for Nasdaq stocks tend to be lower for larger orders. Specifically, Table 4 shows that for the two largest marketable limit order categories and for all three market capitalization groups, Nasdaq effective spreads are lower than or not statistically different from NYSE spreads, measured either in cents per share or basis points. In sum, rather than demonstrating a market structure defect, Nasdaq trading fills more shares of large marketable limit orders at better prices than the NYSE.

The Commission claims that the fill rate for large marketable limit orders would increase for Nasdaq securities under a trade-through rule. Large marketable limit orders in Nasdaq stocks, however, execute many more shares at more favorable prices than in NYSE trading. The re-proposing release fails to acknowledge that similar order types mean different things and operate in different ways in electronic and floor-based markets. Furthermore, if a defect were found in liquidity for large orders in Nasdaq stocks, the Commission still must establish that a trade-through rule for these stocks is the optimal solution for fixing this supposed market structure defect.

IV. Matched Pairs Study

The Commission's Matched Pairs Study is one of two studies using Rule 11Ac1-5 statistics to compare the execution quality of marketable orders in NYSE- and Nasdaq-listed stocks. As with the S&P Index Study, the goal of the Matched Pairs Study is to evaluate comments regarding execution quality received on the Regulation NMS proposals.²⁴ Of these two studies, the more detailed and sophisticated is the Matched Pairs Study. It uses a "matched

NYSE-listed market. Whether true or not, this argument does not apply to dash-5 data, even though the Matched Pairs Study intimates that it does (page 3 of study). Dash-5 shares are shares of orders submitted by investors. How these orders are translated into reported volume is a separate matter. For example, suppose an order for 1000 shares to buy is submitted for a Nasdaq stock to a market maker. The market maker sells the shares and reports volume of 1000 shares. Sometime later, suppose the market maker receives a sell order for 1000 shares. It would buy the shares, and report another 1000 shares of volume for a total of 2000 shares. Dash-5 would report 2000 shares. By contrast, suppose the identical situation had occurred on the NYSE. It is possible that the specialist, holding the first order long enough without an execution, would be able to match it directly with the opposing sell order. Reported NYSE volume would be 1000 but dash-5 volume for the NYSE would be, however, the same 2000 shares as was the case for the Nasdaq market maker.

²⁴ S&P Matched Pairs Study at 1 and 69 FR 77432.

pairs” methodology to attempt an “all else equal” comparison in which observed differences in market quality are not driven by stock characteristics unrelated to market structure.

The Commission’s Office of Economic Analysis (“OEA”) has provided Nasdaq with the sample of matched peers that it used in its study, as well as other information related to the construction of the sample.²⁵ This information has allowed us, to a large extent, to replicate the study. From this information we have determined that the results presented by the Matched Pairs Study are more representative of the experience of smaller stocks. Over one quarter of the Nasdaq sample stocks are not NYSE eligible. Any conclusions on market quality drawn from the Matched Pairs Study should be made with this fact in mind.

The Matched Pairs Study takes an earlier SEC study,²⁶ released in 2001, as its model.²⁷ Its basic design is to draw a sample of Nasdaq stocks, then find an NYSE peer for each based on its similarity to the Nasdaq stock along four dimensions, market capitalization, average dollar volume, price, and (non-market structure related) volatility. Given the set of peer stocks, various aspects of market quality for marketable orders - effective spreads, price impact, execution speed - are compared. Table 1 of the Matched Pairs Study provides detail as to the universe of Nasdaq stocks under consideration. Very low priced or inactive stocks were eliminated, yielding a universe of 1,711 Nasdaq stocks from which a sample was drawn. We estimate that these stocks represent 88% of both the market capitalization and dollar volume of all Nasdaq-listed stocks.

At this stage, one might ask how many of the 1,711 stocks would be eligible for an NYSE listing. Nasdaq, using posted NYSE initial listing guidelines, estimates that at the end of 2003 approximately 1,000 Nasdaq listings could qualify for the NYSE. The Matched Pairs Study took no consideration of NYSE listing eligibility when drawing the sample, apparently including some 700 non-NYSE eligible stocks in its sampling universe.

The next step is to order the 1,711 stocks by fourth quarter 2003 dollar volume, and select every 5th stock. Since the distribution of dollar volume on Nasdaq (on NYSE as well) is extremely skewed, the study’s sampling procedure yields a similarly skewed sample of stocks—few large stocks and many small stocks. The sample is not representative of investors’ trading experience, which is related to trading volume. To correct this sample deficiency, the study adds (again following the SEC 2001 approach) all stocks that were in the top 20 of dollar volume, share volume, or market capitalization. There are 31 unique stocks in the top 20 of the three

²⁵ Nasdaq thanks the Commission’s Office of Economic Analysis for their assistance in preparing this analysis of the Matched Pairs Study.

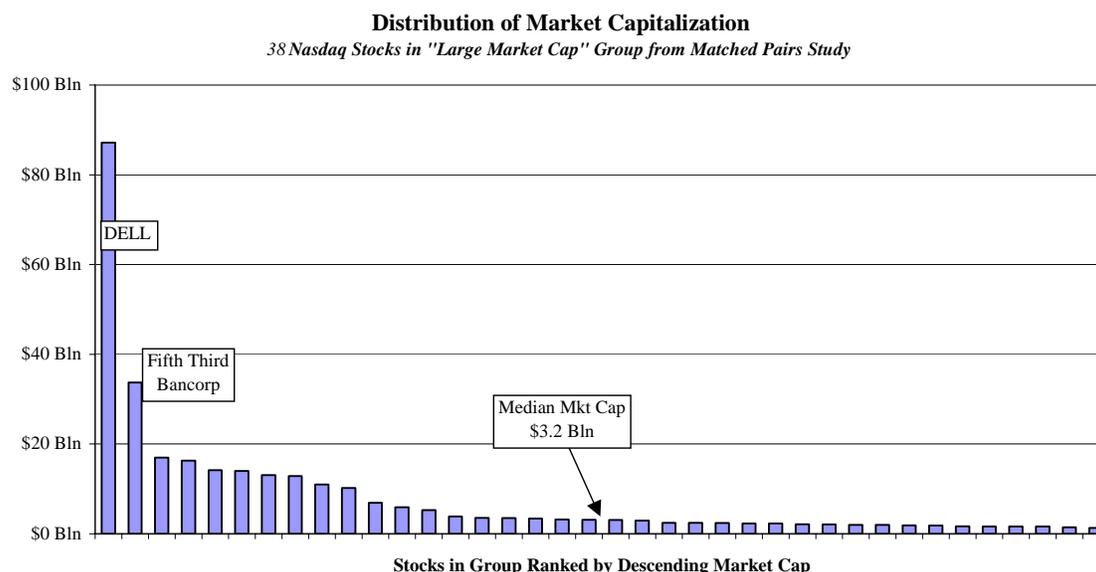
²⁶ “Report on the Comparison of Order Execution Across Equity Market Structures,” U. S. Securities and Exchange Commission, January 2001.

²⁷ Matched Pairs Study at 2.

variables. The impact of the “Top 20” addition is largely undone, however, by a final step in the sampling design—the elimination of stocks for which the quality of the match is poor. In this step (which was not part of the SEC 2001 study) the target sample of 368 is reduced to 133 stocks.

Of the 31 “Top 20” stocks, only 9 make it into the final sample. Evidently, large Nasdaq stocks were unlikely to find a good NYSE match, and therefore are excluded. Missing are such marquee names as Microsoft, Intel, Cisco, Applied Materials, Oracle, and Sun Microsystems. Only 15 Nasdaq-100 companies are in the final sample. Ironically, though large Nasdaq stocks are poorly represented, we estimate that about 30 of the final sample stocks are too small to qualify for an initial NYSE listing.

The study proceeds to stratify the results by categorizing each stock pair into one of three market capitalization groups. The problem with the categorization is that it is essentially done the same way as the sampling. The 113 stock pairs are simply divided into three equal groups of about 38 stocks each. The composition of the groups mirrors the skew of market capitalization. It would seem that at a minimum, the remaining 9 “Top 20” stocks should have formed their own category (as was done in the SEC 2001 study). Instead, they were combined into the “Large” market capitalization category. As a result, the distribution of market capitalization in the “Large” category is extremely skewed, as illustrated in the figure below. Since all the summary statistics provided by the study are simple means, the influence in the averages of a stock like Dell, with 28% of the market cap of the group, is only $1/38$ (= 2.6%).



The median stock in the “Large” category has a market capitalization of \$3.2 billion. For reference, the median market cap for S&P 500 stocks in January 2004 was \$9 billion. The median for the S&P MidCap 400, though, was \$2 billion. Thus, the study’s “Large” category is perhaps better viewed

as a sample of middle capitalization stocks. The study's "Medium" and "Small" categories have median market caps of \$800 million and \$300 million, which are in line with the median of \$620 million for the S&P SmallCap 600.

The Matched Pairs Study compares execution quality across market structures with and without trade-through restrictions. Using six months of 11Ac1-5 data and a methodology designed to produce a sample of small to medium sized stocks with similar characteristics traded on the two markets, the study finds strengths and weaknesses in both markets.²⁸ This sentiment was echoed in the proposing release. Even ignoring the fact that over 25% of the Nasdaq sample stocks are too small to meet NYSE initial listing requirements and that the great majority of Nasdaq's marquee names are dropped from the sample, the study finds Nasdaq-listed market quality to be roughly in parity with that of NYSE stocks. The only defect claimed to have been identified is the fill rate of large marketable limit orders discussed in Section III. Furthermore, the study provides no evidence that the presence or absence of trade-through restrictions has any effect on the results.

V. S&P Index Study

The Commission's S&P Index Study presents an analysis of Rule 11Ac1-5 statistics from January 2004 comparing execution quality of marketable orders between NYSE- and Nasdaq-listed stocks. The goal of the study is to evaluate execution quality in four groups of stocks based upon membership in S&P indexes. A key advantage of using S&P indexes to form the groups is that the categorization is done by an independent third party, Standard and Poor's, and stocks within an index share certain fundamental characteristics. Further, S&P indexes are well known and accepted among the general public.

We would offer the following two comments on the S&P Index Study as it applies to the analysis of effective spread. Our first comment pertains to the S&P Index Study's apparent goal of controlling for differences in stock price.²⁹ Table 1 of the study shows that with the exception of stocks in the S&P 100, stocks within the same index are fairly well matched on average in terms of market capitalization. They are not as well matched with regard to average price, however. The NYSE-listed stocks have, on average, higher price levels.³⁰ The primary innovation of the study, perhaps motivated by the difference in prices, appears to be the presentation of spread results in terms of basis points rather than cents per share. That is, the spread in cents is divided by the share price to convert it to basis point terms. Such a spread measure is often termed "relative spread."

²⁸ 69 FR 77432

²⁹ 69 FR 77432

³⁰ Ibid

As a mathematical necessity, relative spread comparisons using S&P indexes will therefore look more favorable to the higher-priced NYSE stocks than cents-per-share results. Are dash-5 results more accurately conveyed when presented in basis points? The study seems to imply that if a stock on the NYSE has, for example, a price twice that of a Nasdaq stock it could have a cents-per-share spread twice that of the Nasdaq stock, and still be deemed the same. It turns out, however, that as an empirical matter on both markets, cent-per-share spreads do not increase proportionately with share price. In other words, if stock A has a price of \$20 and stock B a price of \$40, the spread of B will typically have a spread less than twice that of A.

As an illustrative example consider the following two tables. The first is extracted from Table 2 of the Commission's S&P Index Study and presents the relative effective spread of 398 Nasdaq and NYSE-listed securities that compose securities 101-500 in the S&P 500 index as of January 2004. The second table takes the same group of stocks and breaks out the stocks into six price tiers based on the average price of the stock.

SEC Results, Table 2

Small Market Orders, S&P 101-500

<i>Effective Spread (basis points)</i>	
NYSE	NASDAQ
4.9	5.2

Same Data Grouped by Price Tier

Small Market Orders, S&P 101-500

Price Tier	<i>Issues within Tier (%)</i>		<i>Eff. Spread (cents)</i>		<i>Eff. Spread (basis pts)</i>	
	NYSE	NASDAQ	NYSE	NASDAQ	NYSE	NASDAQ
<= \$5	1%	3%	1.0	0.9	23.2	24.7
\$5 - \$10	2%	9%	1.1	0.9	14.3	14.1
\$11 - \$20	14%	9%	1.2	1.2	8.0	8.4
\$21 - \$50	56%	58%	1.8	1.7	5.2	5.0
\$51 - \$70	16%	18%	2.5	2.3	4.2	3.9
> \$70	12%	3%	3.2	4.8	3.9	6.3
All	100% (331 Stocks)	100% (67 Stocks)	2.0	1.6	4.9	5.2

The first point from the larger table is that cent-per-share spreads do not increase proportionately with share price.³¹ Nasdaq stocks priced below

³¹ Technically, one can speak of the "elasticity" of the spread (in cents) with respect to the share price—the percentage change in spread associated with a one percent change in price. Mathematically, the relationship between spread and price may be expressed as $\log(\text{spread}) = a + b \times \log(\text{price})$, where the

\$5 have an average spread of 0.9 cents, whereas Nasdaq stocks priced above \$70 have an average spread of 4.8 cents. The stock prices differ by a factor of more than 14 but the spreads differ by a factor of approximately five. The second point from the table is the compositional difference in average stock price between the two markets. Nasdaq has more low-priced stocks (12% below \$10) and fewer high-priced stocks (3% above \$70) than the NYSE (3% below \$10 and 12% above \$70).³²

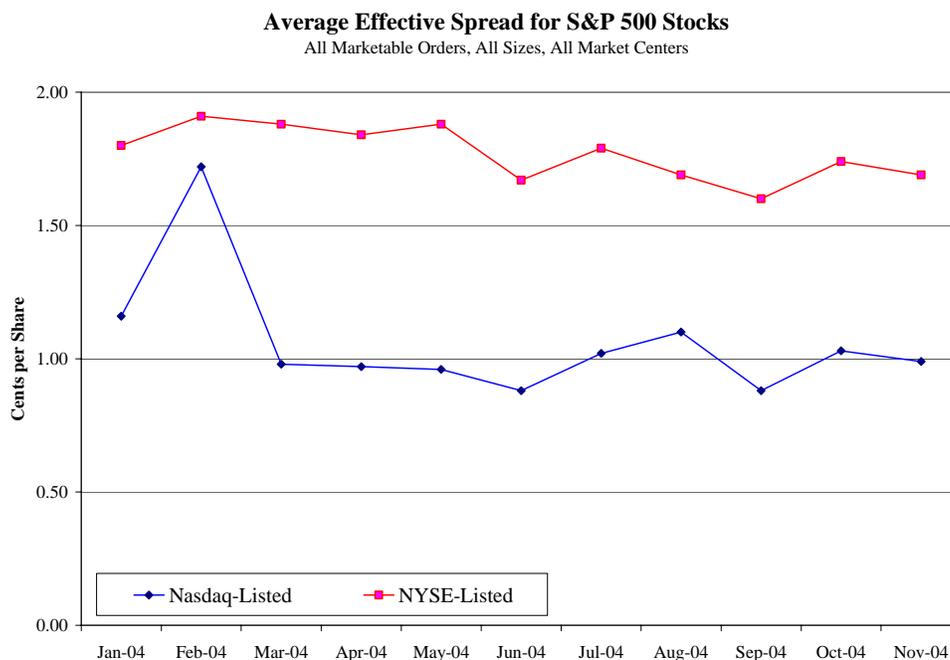
These results imply that while one should take share price into account when comparing spreads, simply dividing the spread by price does not automatically make comparisons any better. A relative spread approach overcorrects for price. Note that this statement is true even if one believes that basis points are the correct metric for measuring trading costs. Under such a belief system, one would accept the empirical fact that higher-priced stocks are simply cheaper to trade than lower-priced stocks on both NYSE and Nasdaq. The fully correct way to make comparisons across markets would be to use some statistical technique such as matched pairs that attempts to measure spread differences on an "all else equal" basis.

Our second comment relates to the choice of January 2004 as a sample period. Statistics reported pursuant to Rule 11Ac1-5 vary considerably month to month and care must be taken when drawing statistics from a single month to be sure the sample is representative. The January dash-5 statistics for S&P 500 Nasdaq stocks report the second highest average effective spread for all of 2004 released to date.³³

elasticity is b . Using the same data as was used in the S&P Index Study, we have estimated this elasticity using cross-sectional regression. Estimates are very similar for both Nasdaq and NYSE, averaging around 0.45. To illustrate the meaning of this value, if a stock (on either market) had a price of \$20 and an effective spread of 2 cents, the expected spread of a \$40 stock for the same order type and size would be about 2.7 cents ($= 2 \text{ cents} \times \exp(0.45 \times \log(40/20))$). The \$20 stock's relative spread would be 10.0 bp, while that of the \$40 stock would be 6.8 bp.

³² There are also compositional differences within the price tiers but for simplicity these are not shown.

³³ The Market Systems Inc. data for February, the month least favorable to Nasdaq, contains clearly erroneous data from ArcaEx. Nasdaq has not identified the source of the error nor do we know if data from the proceeding month, January, is similarly contaminated.



By using a single month, rather than a longer period such as six months as used in the Matched Pairs Study, the S&P Index Study presents results that may not be representative. For example, consider the following table that contains similar data to Table 2 in the S&P Index Study for November 2004 (the most recent dash-5 report month). The results from the Commission's S&P Index Study are completely reversed and the dash-5 data now shows Nasdaq spreads 0.7 bp lower than NYSE spreads rather than 0.2 bp higher.

November 2004 Results

Small Market Orders, S&P 101-500

Effective. Spread (basis points)	
NYSE	NASDAQ
4.4	3.7

Overall in November 2004, Nasdaq spreads, following the S&P Index Study methodology of measuring spreads in basis points without controlling for compositional effects as suggested above, are lower in 8 of 8 order size and type categories for S&P 100 stocks and 6 of 8 order size and type categories for S&P 101-500 stocks. Nasdaq reiterates our earlier conclusion that Nasdaq-listed effective spreads for S&P 500 stocks are significantly narrower than effective spreads for NYSE-listed S&P 500 stocks.

VI. Volatility Study

The Commission's Volatility Study is designed with the stated goal of comparing transitory volatility between Nasdaq- and NYSE-listed securities. To achieve this goal, the study follows the methodology of an NYSE study by comparing the short-term volatility of the national best bid and best ask quote midpoint for 91 stocks that switched from Nasdaq to the NYSE between April 2001 and January 2004. Three questions need to be considered in evaluating the study. First, are the stocks representative? Second, are the statistical measures valid? Finally, is the quote data accurately recorded? We believe that the answer to all three questions is 'no' and that the study is flawed.

Comparing markets through the analysis of securities that switch from one market to the other appears to be a reasonable study design, but pitfalls can exist. Stocks that switch are self-selected. They do not constitute a random sample. One might expect those companies dissatisfied with their stock's recent performance on Nasdaq to be more likely to switch. If this recent performance included above average volatility for reasons completely unrelated to market structure, the study is contaminated. Also, corporate action sometimes coincides with the switch, so that stock characteristics are different before and after. The Volatility Study includes at least one such stock that results in significantly overstating Nasdaq's mean 5-minute volatility.³⁴ It is also true that specialists are often involved in courting a Nasdaq issue. Therefore, it is not inconceivable that the specialists may take extra precaution with respect to market quality immediately after the switch - knowing they will be closely watched during this period. This effect may wear off with time. Finally, most switchers during the last few years have been smaller companies and not necessarily representative of the stocks most actively traded.

The Volatility Study measures volatility with variance, when it should be measured with standard deviation.³⁵ It should be noted that NYSE Chief Economist Paul Bennett used standard deviation as the appropriate measure in his study of stocks that switch markets.³⁶ By using variance, rather than standard deviation, in reporting means and medians, the Commission's study has squared the difference between Nasdaq and NYSE volatility, creating a misrepresentation of relative volatility.³⁷

³⁴ The specific stock in the Volatility Study sample, Cedar Shopping Centers, underwent a 1-6 reverse split and a restructuring coincident with the move. The volatility of this stock declined 99.3% following the move.

³⁵ Formally, if X is a random variable symmetrically distributed around 0, and $Y = kX$, then Y is unambiguously more volatile than X by a factor of k . The standard deviations of X and Y would differ by this factor, but the variances would differ by a factor of k^2 .

³⁶ See Bennett and Wei, 2003, Market Structure, Fragmentation, and Volatility – Evidence from Recent Listings Switchers, NYSE Working Paper.

³⁷ Volatility Study Table at 2, Figure at 3.

The most troubling aspect with the Volatility Study is that Nasdaq is not able to replicate the results for Nasdaq trading but we are able to replicate the study's results for NYSE trading.³⁸ While our estimates and those of the Commission's Office of Economic Analysis ("OEA") are within 10% for 40 stocks, OEA's estimates are more than 20% above ours for 40 stocks and more than double ours for 7 stocks.³⁹ It should be noted that variance estimates are highly sensitive to outliers. Differences between Nasdaq's data and the TAQ data provided by the NYSE and used by OEA could be responsible for the discrepancy.⁴⁰ Another potential problem is that the pre-switch data may contain trading in sixteenths for stocks that switched markets close to the time of Nasdaq's decimal conversion whereas all of the post-switch data was in decimals.

The table below presents our results on volatility for five of the return horizons done in the study.⁴¹ To facilitate comparison with the SEC results reproduced in the table, our results are shown as variances. Our results exclude Cedar Shopping Centers, which experienced a significant change in capital structure coincident with the switch.⁴² The calculations differ in that we used Nasdaq and SIAC data rather than TAQ and excluded data prior to decimalization. Note that for the five-minute horizon, the SEC variance is approximately three times larger than our variance. The 10-minute SEC variance more than twice our variance.

Comparison of Nasdaq and SEC Results for Nasdaq Volatility

90 Nasdaq-to-NYSE Transfers: April 2001 – January 2004

Time Horizon	Median		Mean	
	Nasdaq	SEC	Nasdaq	SEC
5	0.000559	0.000761	0.000685	0.002063
10	0.000520	0.000692	0.000662	0.001531
15	0.000488	0.000632	0.000645	0.001426
30	0.000456	0.000591	0.000619	0.000995
60	0.000457	0.000588	0.000603	0.001012

In order to provide what Nasdaq believes to be accurate estimates of volatility, reservations with the sample construction notwithstanding, the two tables below present Nasdaq estimates of the mean volatility measure appropriately by standard deviation and the mean variance ratio on the two markets around the time of a market switch.

In the first table, we show cross-sectional variation among the volatility results with more active stocks that traded more than 1 million

³⁸ We thank the Commission's Office of Economic Analysis for their cooperation in trying to resolve this discrepancy.

³⁹ Email correspondence between OEA staff and Nasdaq Economic Research.

⁴⁰ Since Nasdaq quote data is readily available, Nasdaq questions why the NYSE was used as the source of Nasdaq quote data in both the Volatility and Trade-Through Studies.

⁴¹ The Nasdaq sample is 90 stocks because we exclude Cedar Shopping Centers.

⁴² Had this stock been included, our mean variance for the 5-minute horizon would have been 0.000827 rather than 0.000685.

shares per day on Nasdaq showing a much smaller change in volatility than those that traded less than 100,000 shares per day. The average change in standardized 5-minute volatility is from 2.48% to 2.14% or 0.334%. As was noted above, this finding of a change in volatility may be totally unrelated to market structure and the trade-through rule. Other possibilities include natural variation in volatility or the results may reflect cross-subsidization on the part of the NYSE specialist following a switch.

Standard Deviation of Intraday NBBO Midpoint Returns⁴³

90 Nasdaq-to-NYSE Transfers: April 2001- January 2004

Avg. Daily Vol. of Stock	5-minute		10-minute		60-minute	
	Nasdaq	NYSE	Nasdaq	NYSE	Nasdaq	NYSE
< 100K Shares (N=24)	2.33%	1.78%	2.25%	1.77%	2.12%	1.78%
100K – 1 MM Shares (N=55)	2.42%	2.11%	2.37%	2.10%	2.23%	2.10%
> 1MM Shares (N=11)	3.16%	3.04%	3.18%	3.02%	3.15%	2.87%
All Stocks	2.48%	2.14%	2.44%	2.13%	2.31%	2.11%

The second table illustrates changes in transitory volatility as measured by variance ratios using the same technique as in Volatility Study Table 2. It should be noted that the level of transitory volatility increases for the more active stocks that switched from Nasdaq to trade on the NYSE.

Average Variance Ratios of Intraday NBBO Midpoint Returns⁴⁴

90 Nasdaq-to-NYSE Transfers: April 2001- January 2004

Avg. Daily Vol. of Stock	5-minute		10-minute	
	Nasdaq	NYSE	Nasdaq	NYSE
< 100K Shares (N=24)	1.29	1.08	1.18	1.04
100K – 1 MM Shares (N=55)	1.20	1.05	1.14	1.03
> 1MM Shares (N=11)	1.04	1.15	1.04	1.13
All Stocks	1.21	1.07	1.14	1.04

⁴³ Standard deviations have been normalized to reflect daily returns, using the same adjustment as OEA. Specifically, the 5-minute variances are multiplied by (390/5), the 10-minute variances by (390/10), and the 60-minute variances by (390/60), all recognizing the standard trading day has 390 minutes in it.

⁴⁴ Variance ratios, following the methodology of the OEA study, are calculated by dividing the indicated short-horizon return variance by the 60-minute return variance. The figures in the table are averages of variance ratios of the stocks in each category, not the ratio of the average variances. Under perfect market efficiency, the variance ratio should be one.

The goal of the Volatility Study is to determine the effects of illiquidity and transitory volatility for Nasdaq- and NYSE-listed stocks. The study's analysis consisted of measuring the changes in volatility from the Nasdaq environment to the NYSE environment for stocks that switched from one market to the other. Nasdaq was not able to replicate the study's results for Nasdaq-listed trading in certain stocks but was able to do so for NYSE-listed stocks. For some stocks, the differences between Nasdaq's estimates and those of the Commission staff were considerable, over 100%. Nasdaq suggests that the public interest would best be served if Nasdaq and the Commission staff can come to an agreement on the basic facts outlined in the study before any results from the analysis are used in forming a basis for Commission action.