

Market Structure Bulletin

April 2006

The NASDAQ Market Structure Bulletin is produced to provide up-to-date information on issues around the fundamentally and rapidly changing equity markets. This bulletin is excerpted from a question and answer session with NASDAQ's Chief Economist, Dr. Frank Hatheway.

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Several major companies, Cadence and Schwab, have recently switched their listings to NASDAQ. Does this signal a trend toward the NASDAQ electronic model?

FH: Definitely. Both Schwab and Cadence began their affiliation with NASDAQ through our Dual-Listing program, so they could evaluate NASDAQ's market structure and services directly. They were pleased with the results and made the full switch to NASDAQ.



Frank M. Hatheway is Chief Economist of the NASDAQ Stock Market, and is responsible for a variety of projects and initiatives to support the NASDAQ market and improve its market structure. Prior to joining NASDAQ, Dr. Hatheway was a finance professor at Penn State University and a researcher in market microstructure. He has authored academic articles in the Journal of Finance, Journal of Financial Intermediation and other leading finance journals. Dr. Hatheway has served as an Economic Fellow and Senior Research Scholar with the U.S. Security and Exchange Commission. Dr. Hatheway received his Ph.D. in Economics from Princeton University.

We also know that institutional investors prefer the electronic market structure that NASDAQ pioneered 35 years ago. The level of institutional block trading in NYSE stocks that occurs on NASDAQ bears that out. Before switching, Cadence's block volume on NASDAQ averaged approximately 52%, with some months as high as 69%. The NYSE has also lost significant share of non-block trading in their stocks to NASDAQ electronic trading, and is now beginning to respond and transition to electronic trading with the proposed hybrid and the acquisition of an ECN.

How did trading compare for Schwab and Cadence, before and after they switched to NASDAQ?

FH: Although we have only a few months of data to analyze, we see investor benefits across the board: in speed, in pricing efficiency as measured by executions within the quotes, in liquidity as measured by volume and in tighter spreads.

Executions are as much as 95% faster on NASDAQ, reducing risk for investors. And investors have less uncertainty with an over 65% reduction in executions occurring outside the best quote on NASDAQ.

Liquidity also improved following the switch. Effective spread, a key measure of trading costs, fell for both stocks following the move. This reduction implies investor savings of as much as \$3 million, or more. According to the Amivest measure, liquidity also improved for institutional sized trades with as much as a 50% increase in the amount of dollar volume necessary to move the price one percent. This means NASDAQ trading is less volatile and less expensive for institutional traders.

	EXECUTION SPEED (seconds)		EFFECTIVE SPREADS (cents)		% OUTSIDE BEST QUOTE		AMIVEST LIQUIDITY (\$Millions)	
	NYSE	NASDAQ	NYSE	NASDAQ	NYSE	NASDAQ	NYSE	NASDAQ
CADENCE	15.8	3.3	1.23	1.18	8.1	2.9	\$28.8	\$42.7
SCHWAB	8.9	0.5	0.99	0.82	6.4	2.7	\$77.4	\$86.9

* Includes NASDAQ Market Center, INET and Brut | Source: Market Systems, Inc. SEC 11Ac1-5 data, all marketable order types, all order sizes. Cadence switched to NASDAQ on October 31, 2005. Note: For Cadence, the 3-month volume weighted averages of NYSE's August 2005 through October 2005 11Ac1-5 data and the 3-month volume weighted average of NASDAQ Market Center-Brut-INET's November 2005 through January 2006 11Ac1-5 stats are provided. | Schwab switched to NASDAQ on December 20, 2006. For Schwab, the 3-month volume-weighted averages of NYSE's September 2005 through November 2005 11Ac1-5 stats and 1-month available NASDAQ Market Center-Brut-INET's January 2006 11Ac1-5 stats are provided.

How did volatility compare for Schwab and Cadence, before and after they switched to NASDAQ?

FH: Not surprisingly, we see almost no change in volatility. Overall market conditions drive volatility, not market structure. The lack of impact on volatility is also supported by what we call “implied volatility,” which is the options’ markets assessment of the future volatility of a stock. Options traders put their money into these assessments so they pay attention to things that matter. As professional traders, they are very familiar with both NASDAQ and NYSE trading and the switch has had no impact on their views on volatility.

To sum it up, Cadence and Schwab have gained trading efficiencies in speed and trading spreads at no cost in volatility. Plus, they are also saving on listing fees.

	INTRADAY VOLATILITY (% measured in 5-minute intervals)		IMPLIED VOLATILITY (% Year)	
	NYSE	NASDAQ	NYSE	NASDAQ
CADENCE	0.13	0.16	34.7	34.5
SCHWAB	0.17	0.18	37.0	34.8

Source: Intraday volatility calculated by NASDAQ Economic Research as the statistical standard deviation of five-minute quote returns. Implied volatility from Bloomberg. For Cadence, the 6-month averages of NYSE’s May 2005 through October 2005 stats and NASDAQ’s 5-month available November 2005 through March 2006 stats are provided. | For Schwab, the 6-month averages of NYSE’s June 2005 through November 2005 stats and NASDAQ’s 3-month available January 2006 to March 2006 stats are provided.

How do your findings on implied volatility affect expensing of stock options?

FH: Per accounting guidelines, implied volatility is one of the measures that can be used in calculating expenses associated with employee stock options. Not only was the implied volatility for Cadence and Schwab relatively unchanged after their switches, we have observed that other stocks switching to NASDAQ since 2003 show lower implied volatility on NASDAQ after controlling for changes in overall market volatility.

An NYSE report has recently been re-published that claims the single specialist model is better because it reduces volatility. How do you respond to that?

FH: Actually, we found the NYSE study to be inaccurate due to a key flaw in the methodology. The study does not take a company’s size and trading volume into account – weighting each company equally whether it trades 2,000 or 2 million shares per day. The large majority of companies in the study switching to NYSE are quite small, especially the more recent ones, and these were averaged with a few large, high volume companies.

It is standard practice to utilize a “volume-weighted” approach to this type of analysis, which takes the greater trading activity of the larger companies into account. This is a common sense approach; because the greater a stock’s volume, the more likely the results will be relevant to the average investor. Using a volume-weighted approach, the results are remarkably different, and, in fact, show better performance on NASDAQ.

PRE VS POST SWITCH SPREADS	On NASDAQ (cents)	On NYSE (cents)
Volume-Weighting Method	3.7	3.9

Source: NASDAQ Economic Research, 2.2006

The NASDAQ Closing Cross has been in operation for nearly 2 years. What effect has the Cross and other recent market structure innovations had on the secondary equity offerings of NASDAQ companies?

FH: These changes have had a dramatic effect on NASDAQ’s performance for secondary equity offerings (SEOs).

In a 2006 NASDAQ Economic Research study comparing SEOs on NASDAQ and NYSE, two key measures were investigated:

- **Price pressure** – the downward trend in stock prices in the days leading up to the offering
- **Discount** - the difference between the offering price and the closing price right before pricing of the offering.

The data revealed significant improvement in trading and pricing characteristics for SEOs on NASDAQ.

Looking at **price pressure**, 531 NASDAQ and 421 NYSE SEOs between 2003 and 2005 were studied and compared against results of a similar study in 1993-1998. We learned that the NASDAQ Opening and Closing Cross facilities and other innovations have neutralized price pressure in advance of NASDAQ SEOs. Over the day prior to the pricing of the offering, NASDAQ SEOs experienced 25 basis points **less** price pressure than NYSE SEOs.

Looking at 283 matched pairs of offerings in 2005 – NASDAQ and NYSE companies with similar characteristics – NASDAQ's **discount** was 282 basis points compared to NYSE's at 289 basis points, a differential of 7 basis points in favor of NASDAQ.

So we have seen marked improvement on NASDAQ, and in fact, currently see little difference and even some advantage to SEOs on NASDAQ. The study, *Pricing Activity Surrounding Secondary Offerings 2003-2005*, will be available online later this year.

NASDAQ has recently been granted approval from the SEC to become a stock exchange. What does that mean in terms of how NASDAQ operates?

FH: The move to being an exchange is primarily a change in legal status for NASDAQ as opposed to a change in the way the market operates. We believe NASDAQ's current market structure – fully automated and grounded in robust competition between multiple market makers and Electronic Communications Networks (ECNs) – provides unique benefits not found in other market structures. NASDAQ's open architecture and trading systems will not change with exchange status. The change will be to the statutory authority under which the market operates.

There are still several steps that NASDAQ must complete before we become operational as an exchange. The most visible change is that market participants will see trades done through the NASDAQ exchange systems distinguished from those done elsewhere. These trades will be identified on the relevant market data feeds. Other than that, the transition should be almost seamless.

How will NASDAQ becoming an exchange affect investors, listed companies and its market makers?

FH: One overall benefit is that NASDAQ will be able to fully separate ownership from its regulator, the NASD. This enhances the market's integrity and strengthens investor confidence by removing any perception of conflict of interest between the market and its regulator. It is also one of the last steps in NASDAQ's transition to a public company.

For listed companies, it means only a change in registering their securities under a different part of Section 12 of the Securities Exchange Act of 1934 (the "Act"). Reporting requirements for issuers are the same under both parts but, as an exchange, NASDAQ issuers will be registered under section 12(b).

Market participants will need to become Members of NASDAQ, similar to their NASD membership, in order to trade on NASDAQ systems. Most firms have already signed on as members.