

How NASDAQ's Electronic Market Works: A Live Demonstration



Frank Hatheway, NASDAQ Chief Economist
Peter Martyn, Vice President, NASDAQ Transaction Services

American Enterprise Institute
September 9, 2004



Agenda

- I. Evolution of NASDAQ
- II. What is Market Structure and Why Does it Matter?
- III. How does the Market Work?
- IV. A Window on NASDAQ Trading
- IV. Business Continuity – Leading Wall Street
- V. Q&A



What is NASDAQ?

NASDAQ was established in 1971 as a subsidiary of the National Association of Securities Dealers (NASD).

- N.A.S.D.A.Q.?
 - The original purpose was to electronically disseminate quotes for stocks not listed on exchanges
 - Hence the name “National Association of Securities Dealers Automated Quotation System” (NASDAQ), quotes were disseminated by paper copy, newspapers, and several private electronic systems

NASDAQ – A History of Firsts

- NASDAQ – First trading day, February 8th, 1971 with quotes on 2,500 securities. Today, approximately 3,300 securities are traded on NASDAQ
- 1982: Creation of the NASDAQ National Market and Real Time Trade Reporting
- 1984: Small Order Execution System (SOES) automatically executes small orders against the best quotations, making greater volume and efficiency in trading possible.
- 1985: Creation of the NASDAQ-100 Index
- 1986: Automated Confirmation Transactions (ACT) same day trade comparisons. Opens fully redundant backup system.
- 1991: First market to launch television advertising campaign.
- 2001: Spin-off from NASD
- 2002: Launch of Super Montage (now known as NASDAQ Market Center)
- 2004: Launch of dual listing initiative, NASDAQ Market Center, NASDAQ Closing and Opening Cross

International Markets Moved to Electronic Model Over a Decade Ago

The NASDAQ Model is the Market Model of Choice Throughout the World

Exchange	Date	Current Use
London	1986	Space occupied by Knight Securities
Copenhagen	1987	Electronics/Record Shop
Paris	1991	Securities museum
Stockholm	1991	Nobel Prize museum
Milan	1996	Conference space
Switzerland	1996	Office space
Toronto	1997	Office space
Tokyo	1998	Visitor/Media center
Vienna	1998	Currently unused
Dublin	2000	Currently unused
Athens	2001	Conference space

Market Structure Differences

NASDAQ

- Screen-based
- Competing market makers, ECNs
- Capital commitment from multiple firms
- Quote- and order-driven
- Continuous order flow
- Market participants have direct interaction with Buyside community

Auction Market

- Floor-based
- Single specialist
- Order-driven
- Capital limited to single firm
- Trade halts (order imbalances)
- Specialist order book

Providers of Greater Capital

Our inclusive structure creates greater liquidity for issuers and investors by combining ECNs with our network of market makers.

None

Archipelago
B-Trade Services LLC
INET
Trak

One



Many



ECNs

**Auction
Markets**

NASDAQ

Electronically Linked

NASDAQ[®]

Market Structure Advantages

NASDAQ's inclusive structure includes market maker firms, ECNs, regional stock exchanges and order entry firms. There are over 265 market making firms, linked electronically that provide capital support to the trading of NASDAQ securities.

Market Participants

- Competing Market Makers
- Greater risk capital to facilitate order flow
- Speed of Execution
- Certainty of Execution
- Liquidity at times of Market Duress
- No Limit to the number of participants
- Facilitators of an orderly market



ECNs

- Provide order matching; agency role vs. principal role
- Provide institutional access
- Create added competition
- Bring competitively priced orders into the marketplace
- Enhance liquidity



Multiple Competing Market Makers Providing Liquidity and Stability

Average market makers per NASDAQ stock: 20.6

Market Participants for- Top 10 Stocks by Market Cap

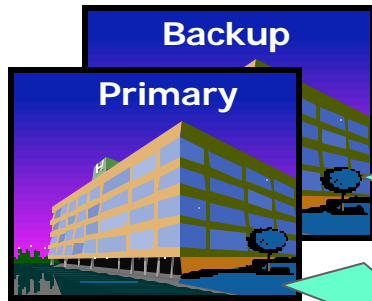
- Microsoft (MSFT) 93
- Intel (INTC) 97
- Cisco (CSCO) 99
- Dell (DELL) 91
- Amgen (AMGN) 81
- Qualcomm (QCOM) 79
- Oracle (ORCL) 95
- eBay (EBAY) 69
- Yahoo! (YHOO) 84



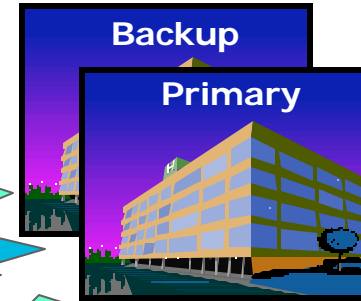
How Does the Market Work? NASDAQ Infrastructure

NASDAQ Infrastructure

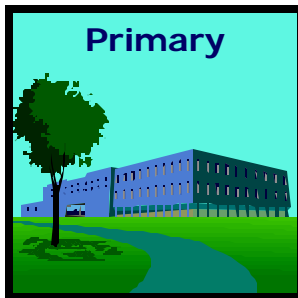
Market Makers/ECNs



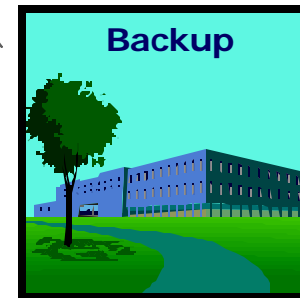
Market Data Vendors



**NASDAQ
Network**



NASDAQ Data Center



NASDAQ Data Center

Market Operations and Quick Facts

NASDAQ Operations and Technology include:

- 2 Data Centers in Connecticut (primary) and Maryland (backup since 1986)
- Disaster Recovery for market systems
- Exceptional reliability - in 2003 we achieved:
 - 99.993% uptime for our trade execution platform
 - 100.000% uptime for our data feeds

A Window on NASDAQ Trading

Trading Hours

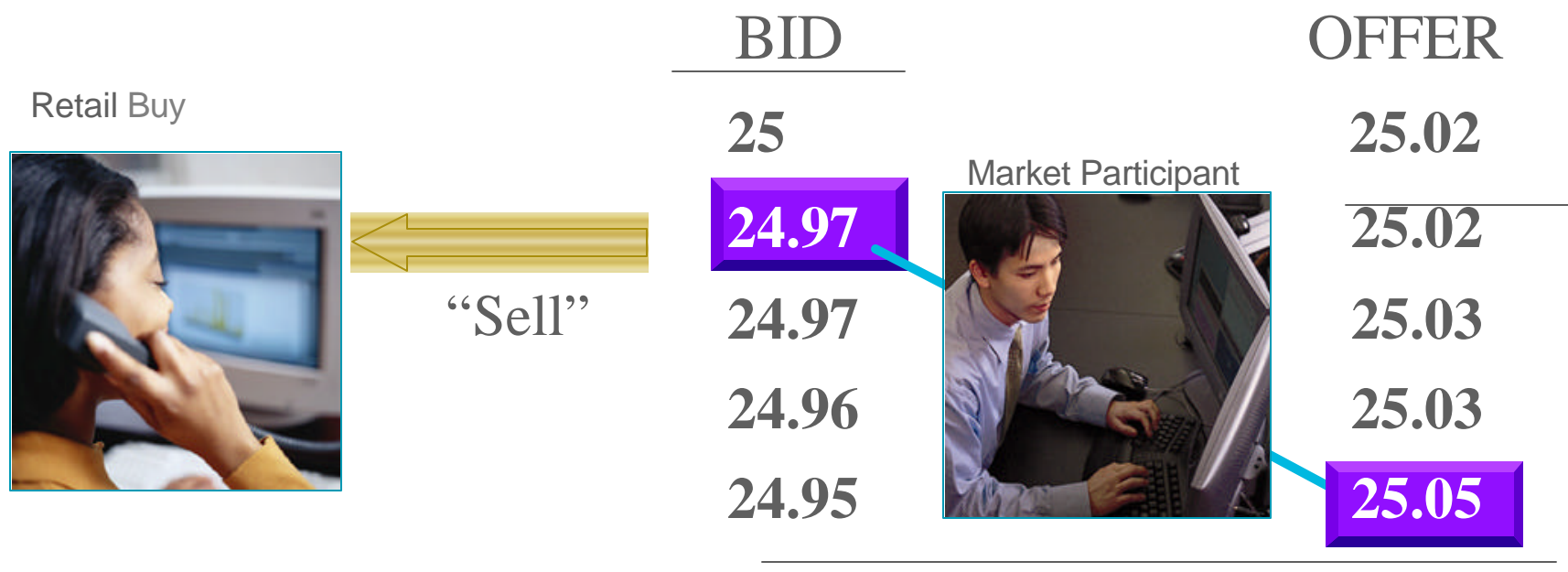
- Official market hours - 9:30 a.m. - 4:00 p.m. ET
- Early NASDAQ trading session - 8:00 a.m. - 9:30 a.m. ET
- NASDAQ systems remain open until 6:30 p.m.
- 4:00 p.m. closing price is official close
- Daily volume includes after-hours trades up until 6:30 p.m.
- For purposes of releasing news:
 - NASDAQ systems open from 8:00 a.m. - 6:30 p.m.
 - StockWatch has the authority to halt trading during these hours pending dissemination of material news.

Trade Execution on NASDAQ

BID PRICE		Spread – Difference between best bid and best ask	ASK PRICE	
POSITION TO BUY			POSITION TO SELL	
MM1	25		25.02	MM4
MM2	24.97		25.02	ECN1
MM3	24.97		25.03	MM3
ECN1	24.96		25.03	MM2
MM4	24.95		25.05	MM1

Every Market Maker must register to trade a stock with both a bid and offer price. In 1997, ECNs were also included as market participants.

Retail "Buy" Order



Market Order - Investor wants to buy 200 shares at the market:

Regardless of where the market participant is in the quote montage, the market order must be executed at the best bid or ask. In this case 200 shares are bought at \$25.02.

Limit Order - Investor wants to buy 200 shares at \$25.01:

Limit order handling rules dictate that the limit order must be entered into the quote montage. In this case the market participant moves their bid to \$25.01 and shows 200 shares to buy.

What the Individual and Professional Trader Sees

- Live Trading Demonstration

4 The portfolio manager immediately receives confirmation of her orders's execution.



Portfolio Manager

1 The portfolio manager calls her trader to buy 500,000 shares of ABCD Company.

Symbol	Bid Price	Ask Price	Bid Size	Ask Size	Time
ABCD	25.00	25.00	100	100	10:00
ABCD	24.95	25.00	50	200	10:01
ABCD	24.90	25.00	100	300	10:02
ABCD	24.85	25.00	100	400	10:03
ABCD	24.80	25.00	100	500	10:04

Total View



Trader

2 The trader easily sees the depth of the market aggregated at all levels.

Through NASDAQ Market Center, the trader enters the order across multiple levels of the market. He executes part of the order internally; purchases the 200 shares from the broker; and buys the balance from other market participants.

ECN

NASDAQ's open architecture encourages ECNs to interact with market makers.

NASDAQ Market Center

Symbol	Price	Volume	Time
ABCD	25.00	300	10:05
ABCD	25.00	100	10:06
ABCD	25.00	100	10:07
ABCD	25.00	100	10:08
ABCD	25.00	100	10:09
ABCD	25.00	100	10:10

Trades reported through ACT (Automated Confirmation Transaction Services – real-time trade validation)

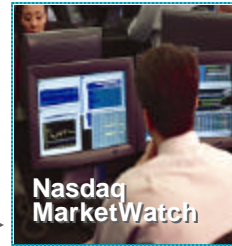


ACT

3

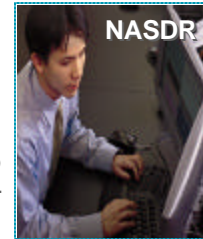
4

A NASDAQ MarketWatch analyst monitors trades to maintain market integrity.



Nasdaq MarketWatch

At NASD Regulation, analysts monitor long-term trading patterns to maintain market integrity.



NASDR

1 An investor decides to sell her 200 shares of ABCD Company and places the order with her online broker.

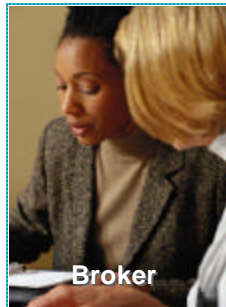


Individual Investors

NASDAQ.com

2

Investors get better execution because of NASDAQ's speed and the large orders reflected in the market when their order is entered.



Broker

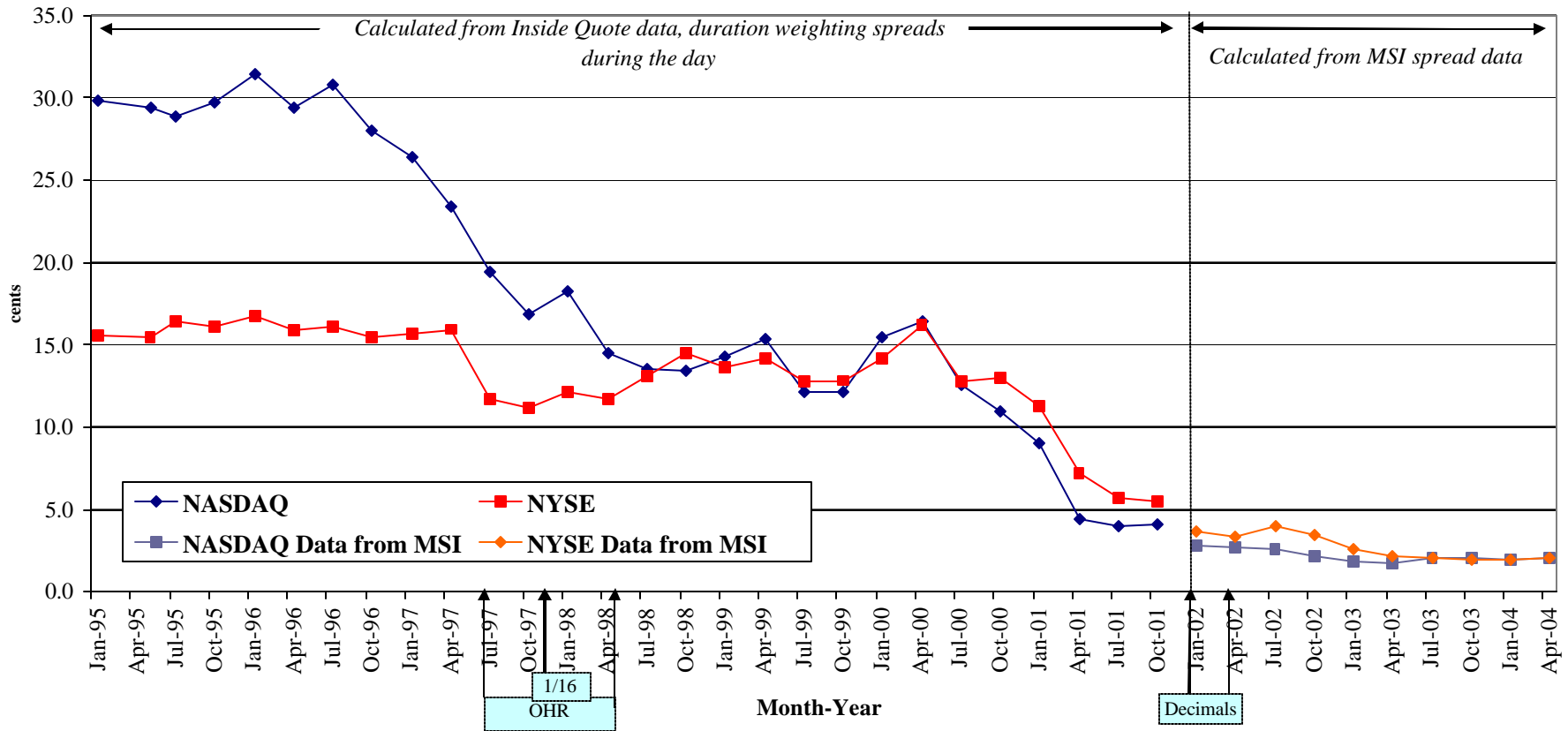
4 The investor immediately receives confirmation that her trade was executed at the best price available.



Trade Quality

A Long-Term View of Quoted Spreads

Quoted Spread, Volume Weighted Across Stocks
NASDAQ vs. NYSE: 1995 - 2004
All Issues



Leading Wall Street – Continuity Planning

Contingency Planning – A Success Story

- In support of our critical role in the nation's financial infrastructure NASDAQ is leading the capital markets in terms of terrorism preparedness and contingency planning
- The outcome of NASDAQ's long standing planning, investment, implementation, and testing of continuity initiatives has been evident in all recent events
 - The terrorist attack on September 11, 2001
 - The blackout on August 14, 2003
- Resiliency during such large-scale events is due to our world-class program, which makes redundancies an integral part of virtually every facet of the business
 - Our Mid-Atlantic backup site has been in place for 17 years
- Disaster Recovery testing is conducted bi-monthly with both market participants and external exchanges
 - 27 scheduled tests were conducted in 2003
 - NASDAQ has led two market-wide disaster recovery tests in 2004

NASDAQ Ability to Support All U.S. Equity Market Centers

In the event that NYSE is not operational to trade its securities for an extended period of time, NASDAQ has the capability to trade all NYSE securities concurrent with all NASDAQ securities



- Functionality was initially provided by the interMarket system accessed through the Computer Assisted Execution System (CAES)
 - NASDAQ migrated trading of Exchange-listed securities from CAES to the NASDAQ Market Center in March 2004
-
- In the NASDAQ Market Center, customers are able to trade virtually any security listed on a U.S. market with one trading screen
 - In addition, more robust functionality including new order types and expanded access points has been added

The U.S. Capital Markets – A Time of Change

Questions?