

## Previously

### *Role and operations of markets*

- Bring buyers and sellers together
- Facilitate price discovery and clearing
- Markets compete for listings and trades

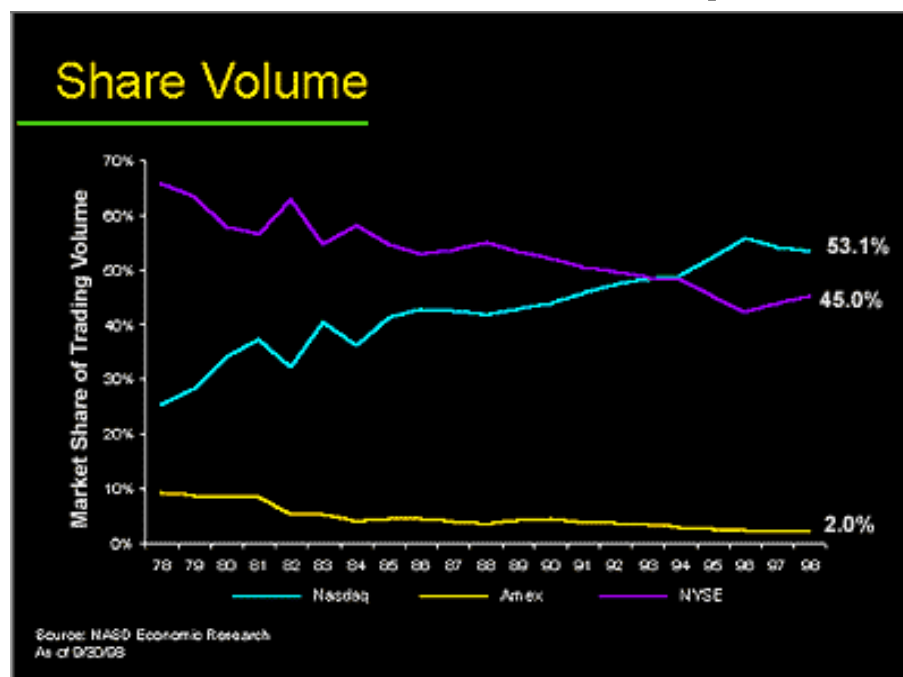
### *Types of markets*

- Order-driven
- Quote-driven
- Hybrid

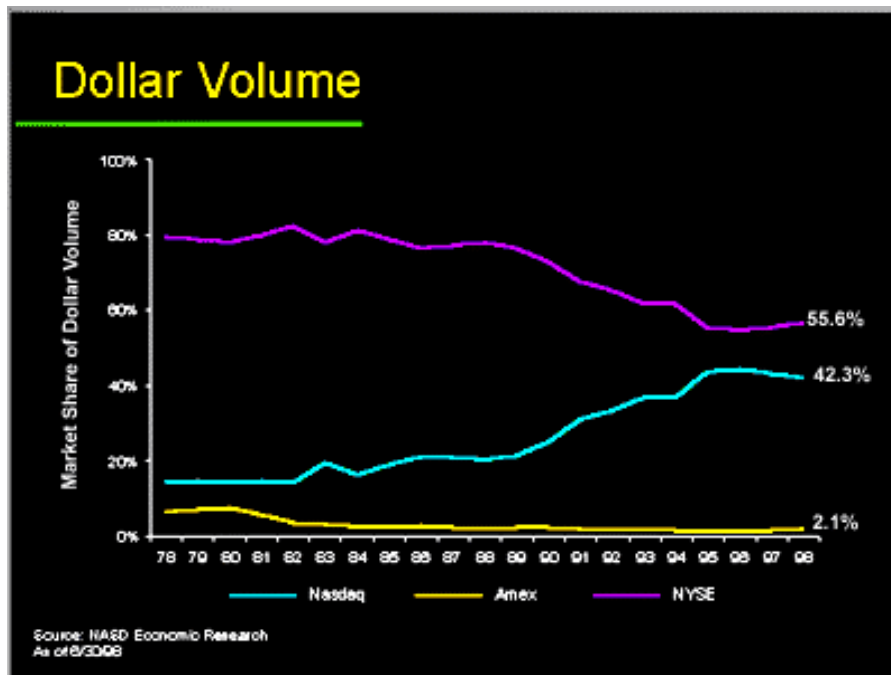
### *The structure of the market affects the cost*

- Explore more on NASDAQ controversy

## Comparison of NYSE and Nasdaq



## Comparison of NYSE and Nasdaq



## Costs of Trading: Focus on Nasdaq

### Auction versus Dealer Markets: NYSE vs. Nasdaq

- Much recent discussion related to a Christie & Schultz paper that found many Nasdaq stocks that are almost never quoted on odd eighths
  - Some of these included the most actively traded Nasdaq stocks (e.g., Microsoft, Intel, . . .)
- Much civil litigation and regulatory activities
  - Dept. of Justice and SEC rulings in late 1996
  - Final settlement in 1998 for more than \$1B

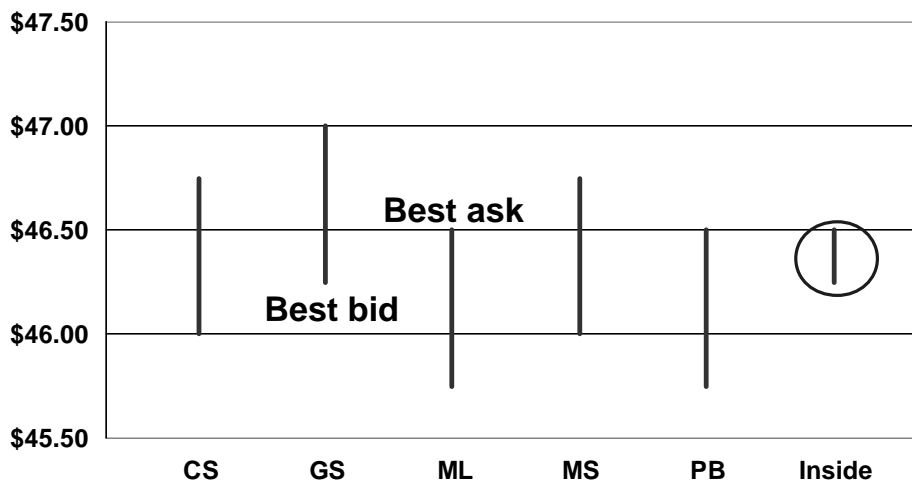
## Quote Rounding: Avoidance of Odd Eighths

If you never use  $1/8$ ,  $3/8$ ,  $5/8$ ,  $7/8$  in either bid or ask quotes, the minimum spread is  $1/4$

- This "convention" can be used by multiple traders to create a minimum inside spread, even when most dealer spreads are much larger
  - e.g., Goldman Sachs might quote a stock at 46.25 bid, 47 ask
  - Merrill Lynch might quote the same stock at 45.75 bid, 46.50 ask
  - Both have a  $3/4$  point dealer spread, but the inside spread is  $1/4$  (at least)

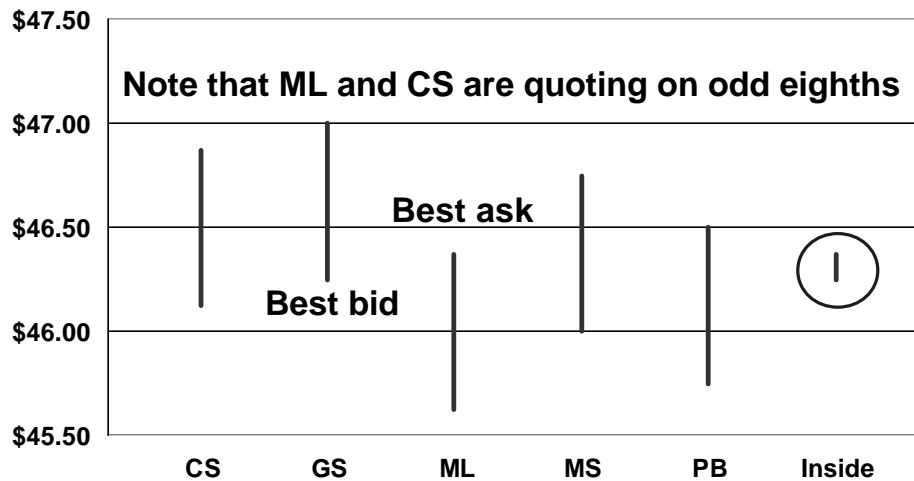
## Quote Rounding: Avoidance of Odd Eighths

Example of Nasdaq Dealer and Inside Spreads



## Quote Rounding: No Avoidance of Odd Eighths

Example of Nasdaq Dealer and Inside Spreads



## Quote Rounding: Avoidance of Odd Eighths

Note that when any dealer adjusts his quotes by moving just 1/8th, the inside spread is much more likely to be 1/8 than 1/4

- For many active Nasdaq stocks there are as many as 40-60 market makers posting quotes

## **Preferencing**

**1) Vertical integration - Merrill Lynch market makers execute retail trades from ML at current inside quotes**

- Even though ML dealer quotes might not be on either side of the market

**2) Payment for order flow - market makers without retail networks pay retail brokers who are not vertically integrated about \$0.03 per share for trades**

## **Preferencing**

**Argument is that this reduces the cost of seeking buyers/dealers**

- Don't have to make multiple phone calls to execute deals
  - Except for Small Order Execution System (SOES), which executes trades at posted inside quotes against dealers posting those quotes, and systems like Instinet, SelectNet, etc., all other orders are executed by telephone confirmations

**It also reduces the incentive to compete by changing quotes, since it won't necessarily generate more order flow**

## Evidence: Christie & Schultz *JF* (1994a,b)

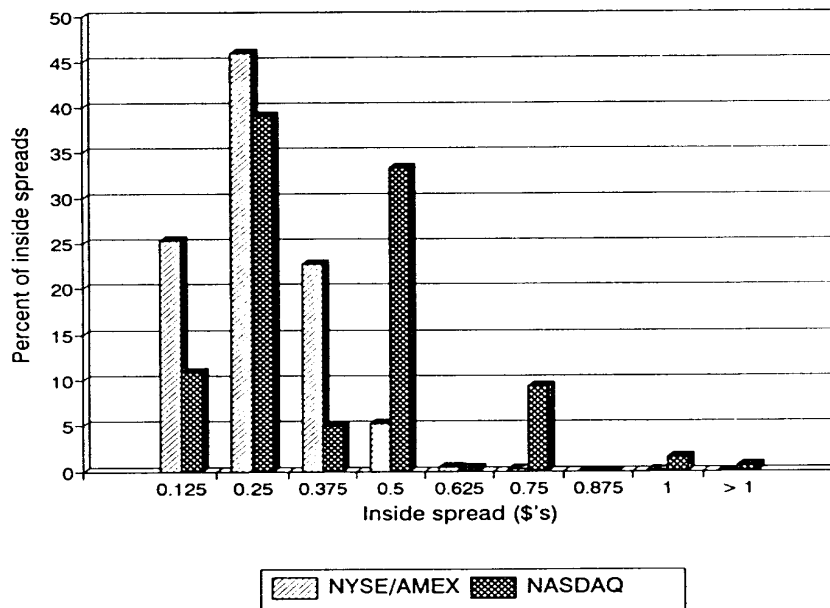
### 1994a:

- Many large & active Nasdaq stocks almost never trade on odd eighths
- Spreads are likely to be larger as a result
  - e.g., you can never see a spread of 1/8

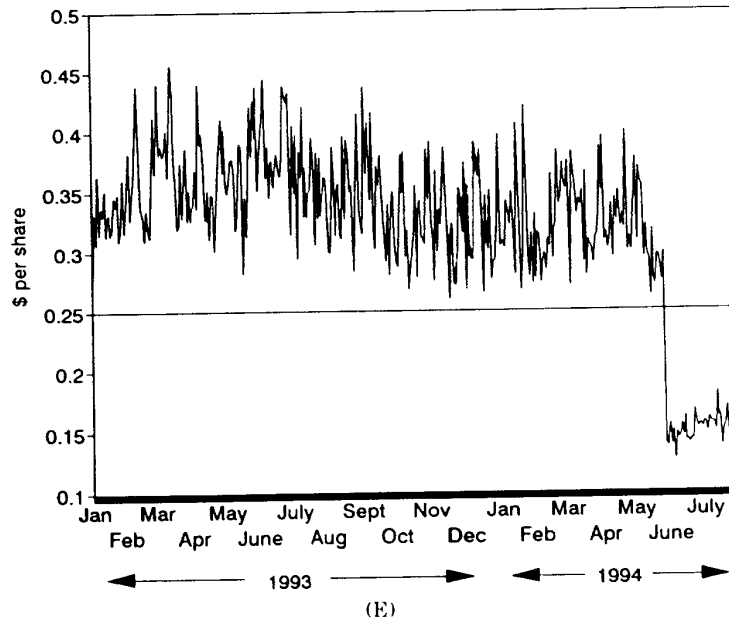
### 1994b:

- When the prior paper received publicity, five top Nasdaq stocks immediately switched from a 1/4 inside spread to a 1/8 inside spread
  - Was it unprofitable afterwards?
  - Or, too profitable before?

## Evidence: Christie & Schultz *JF* (1994a)



## Evidence: Christie & Schultz *JF* (1994b)



## Evidence: Huang & Stoll *JFE* (1996)

Compared several costs of trading Nasdaq stocks with a matched sample of NYSE stocks

- Quoted spreads were higher
- Effective spreads were higher
  - Difference between the trade price and the midpoint of the bid-ask spread, times 2
  - This shows that inside the spread negotiation on Nasdaq does not offset higher quoted spreads

## **Evidence: Huang & Stoll *JFE* (1996)**

**Effective spreads were higher for all size trades**

- **Difference was largest for smaller trades**
- **Nasdaq quotes are required to be good for up to 1,000 shares, so proponents argue it is optimized for greater "depth"**
  - **ability to trade volume without affecting the price**
- **It is not surprising that larger traders can make market makers compete more effectively than small traders, but information costs should be larger**

## **Evidence: Bessembinder *JFE* (1997)**

**Quoted and effective spreads were higher for 300 matched Nasdaq (compared with NYSE) stocks**

- **Higher spreads are related to odd eighths quoting behavior (price rounding) on Nasdaq, but not on NYSE**
- **Price impacts are bigger on Nasdaq**
  - **More fragmented market?**



## **Evidence: Barclay *JFE* (1997)**

**Quoted and effective spreads fell for 472 Nasdaq stocks that moved to the NYSE or Amex**

- **Biggest changes were for Nasdaq stocks that rarely traded on odd eighths**

**Why do firms that could have lower spreads (apparently) stay on Nasdaq?**

- **Avoid listing fees**
- **Asymmetric - hard to leave NYSE**
- **Nasdaq runs ads promoting these prominent companies**
- **MCI is hired to handle Nasdaq's network business**

## **Evidence: Kandel & Marx *JFE* (1997)**

**They argue that competing market makers might choose an equilibrium where inside spreads equal the cost of market making plus twice the minimum tick size**

- **Minimum tick size is 1/16th up to \$10 per share, and 1/8th over \$10 per share**
- **K&M find much more use of odd eighths for stocks below \$10 (but above \$5) per share**
- **They conclude that average quoted spreads are higher by about \$0.20 per share when odd eighths are avoided**

## **Evidence:**

### **LaPlante & Muscarella *JFE* (1997)**

**They examine block trades on Nasdaq compared with similar NYSE stocks**

- **More price pressure**
  - **Less zero tick trades than on NYSE**
- **Smaller blocks on Nasdaq**
- **Larger effective spreads on Nasdaq**
- **Overall, Nasdaq market has less depth**
  - **Of, at least, the stocks traded actively on Nasdaq have less depth than those identified as similar on the NYSE**

## **List of Changes**

### ***Market mechanism***

- **Quote Rule (SEC Rule 11Ac-1)**
- **Limit order display rule (SEC Rule 11Ac1-4)**
- **NAQCESS**
- **Periodically evaluate order routing/preferencing**

### ***Improved auditing and surveillance***

- **Formation of NASD regulation division**
- **Independent board**
- **Random taping**
- **Better tracking of members records**

## List of Changes

***Dealers must include in their published quotes any better priced orders they have entered into an electronic communications network***

***Substantial amount of trading in Nasdaq listed securities is done on ECNs by the dealers***

- They sometimes had better prices in ECNs

## Limit Order Display Rule

***Dealers must modify their quotes to represent the price and size of customer limit orders that would improve or equal their bid or offer.***

***Increased competition between dealers and investors***

- Tighter spreads, down 30%, inside spreads down 24%

## **Action on Limit Orders**

***Within 30 sec. the dealer must do one or more of:***

- **Display equal or better limit order**
- **Execute the limit order**
- **Deliver limit order to NAQCESS**
- **Place limit order with qualifying Electronic Communication Network (ECN)**
- **Send the limit order to another dealer who will do one of the above**

***Exemptions: customer request, market opening, block orders, all-or-none orders***

## **NAQCESS**

***To replace SOES***

- **Will accept and consolidate limit orders**
- **Created to satisfy changes in limit order display rules**

## **Order Routing/Preferencing**

***Preferencing may be implemented***

- Explicitly by contracts
- Implicitly by sharing information systems

***In either case, new rules require “regular and rigorous” evaluation of agreement to assure that customers gets the best terms***

***While this is nebulously stated, it does increase the potential liability for brokerages***

## **NASD Regulation Agency**

***Previously done by a division of NASD***

- Who are NASD members?

***Independent agency headed by a board with 50% of the members from the industry and 50% from outside the securities industry***

***Responsible for rule enforcement, member regulation, and market regulation***

## **Nasdaq Reforms: Barclay et al. (1998)**

### ***Examined new order rules***

- **Mandatory display of limit orders & ECN quotes (SOES shuts down)**
- **Reduction of minimum quote size (1/20/97)**
- **Relaxation of Excess Spread Rule (ESR)**
  - Applied to all on 1/20

### ***Order handling rules applied to 50 Stocks on 1/20/97 & 50 more on 2/10/97***

- **Selected by trading volume**
  - 1/2 of top 20, 8 out of 21-100 and every 100
- **Rest on 10/13/97**

## **Nasdaq Reforms Barclay et al. (1998) Quotes and Trades**

### ***Inside spreads decreased***

- **1/20: 0.38 to 0.24, 2/10: 0.34 to 0.23**
- **Larger decrease (0.15 v. 0.04) on less active**

### ***Effective spreads decreased***

- **1/20: 0.26 to 0.18, 2/10: 0.23 to 0.17**
- **Larger decrease on smaller trades**
- **Appear similar to NYSE spreads (H & S (96))**

### ***ECN quotes matter***

### ***ESR does not effect spreads***

### ***Quoted depth is unaffected***

- **"Quote Book" costs fall more on small trades**

## **Nasdaq Reforms Barclay et al. (1999) Spread Patterns & Quote Location**

### ***Spread patterns***

- **U-shape for NYSE; Nasdaq gradually narrows, then fall sharply in final 30 min**
  - Now Nasdaq falls quickly after open (narrows slightly around close)

### ***Quotes revised more frequently***

- **Due to ESR, limit orders, and ECNs**
- **Individual dealers**
  - Removal of ESR widens spreads
  - Order handling rules narrow spreads
  - More frequent updates, active on one side
  - No reduction in the number of market makers

## **NYSE/Nasdaq Post Reform Bessembinder (1998)**

### ***Still more expensive than the NYSE***

- **Quotes are wider (1.03% v. 0.78%)**
- **Effective spreads (0.95% v. 0.64%)**
- **Realized spreads (0.34% v. 0.15%)**

### ***Difference are smaller for smaller trades***

- **New rules helped smaller trades most**

### ***Quote rounding (no odd sixteenths)?***

### ***Preferencing?***

## Summary

### **Preliminary conclusions from the Nasdaq experiment**

- **which was forced by the DoJ and SEC**
- **spreads are down 30%**
- **effective spreads are down 24%**
- **these effects seem to exist even for inactively traded stocks**
- **number of market makers has not fallen in these stocks (yet)**
  - **you might expect market makers to withdraw if trading became unprofitable**

## Conclusions

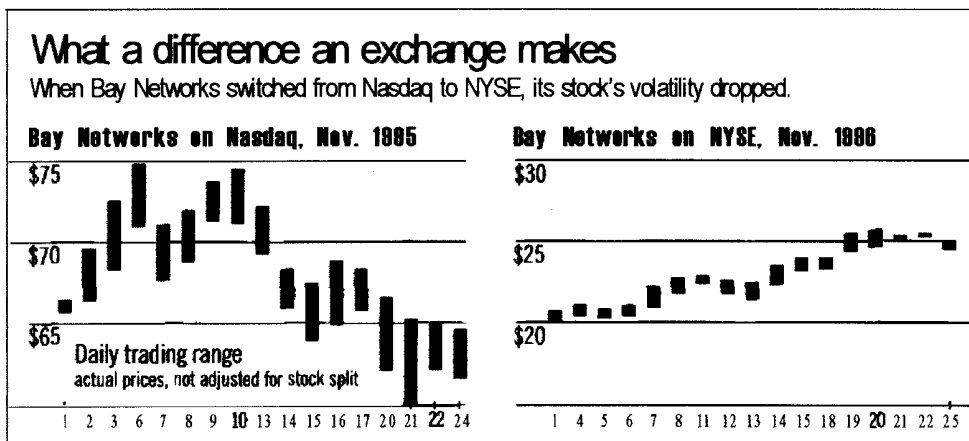
- 1) It looks like the auction market on the NYSE has greater liquidity (lower transactions costs) than the linked dealer market of Nasdaq**
- 2) It looks like the NYSE practice of letting customer limit orders transact with other customers, for an order handling fee, reduces transaction costs on average**
- 3) Most of these results were not known before the spate of recent papers (& lawsuits)**



## Questions

- 1) Why would a firm like Microsoft, MCI, or Intel remain on Nasdaq when it looks like trading costs would be lower on the NYSE?
- 2) Are there some traders who might prefer Nasdaq to the NYSE? Why?
- 3) What incentives would any of the existing Nasdaq actors (e.g., market makers) have to propose a change in the microstructure to move toward an auction system? What ever happened to the Nasdaq/AMEX merger?

## NASDAQ Volatility



## **Today**

**Examine the recent Nasdaq controversy to explore how rules affect costs**

- **Odd-eighths avoidance**
- **Preferencing**
- **ECNs**

**Where should you place your orders?**

- **Need to know the rules and how they affect your order placement strategy**