



Information Shocks and Stock Market Liquidity: A Comparison of the NYSE and Nasdaq

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Purpose of Study



- Compare performance of the NYSE and Nasdaq when securities markets receive important new information
- Examine role of ECNs in performance of Nasdaq

The Event Days



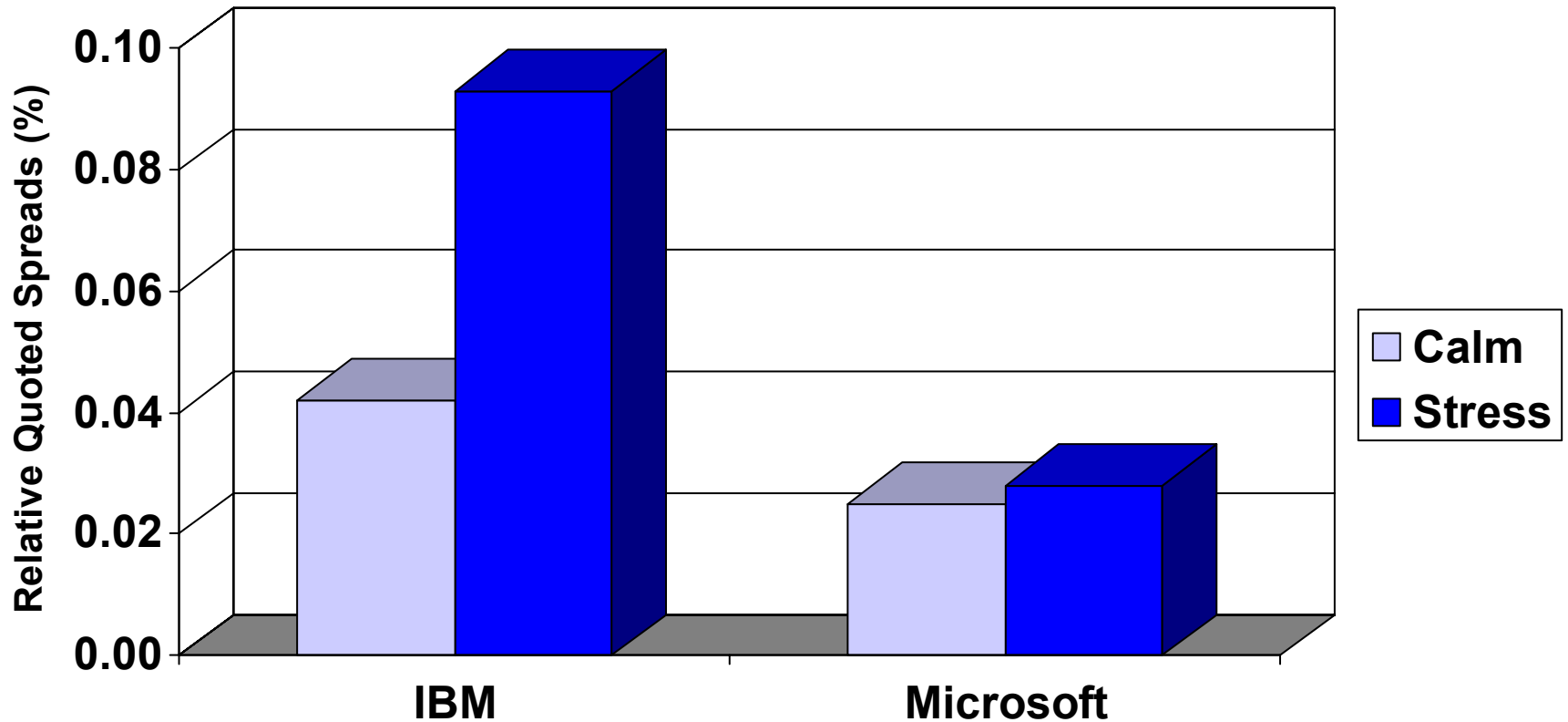
- Release of the index of manufacturing business conditions by the Institute for Supply Management (ISM)
 - **January 2, 2003**
 - Index value at **54.7** versus analysts' expectation of **50.3**
 - NYSE (Nasdaq) portfolio increased **1.36%** (**1.52%**) in **45-minute** period surrounding the announcement
 - **Largest positive 45-minute return for 2003**
 - **May 1, 2003**
 - Index value at **45.4** versus analysts' expectation of **46.2**
 - NYSE (Nasdaq) portfolio decreased **1.03%** (**1.09%**) in **45-minute** period surrounding the announcement
 - **2nd largest negative 45-minute return for 2003**

The Event Days (cont'd.)

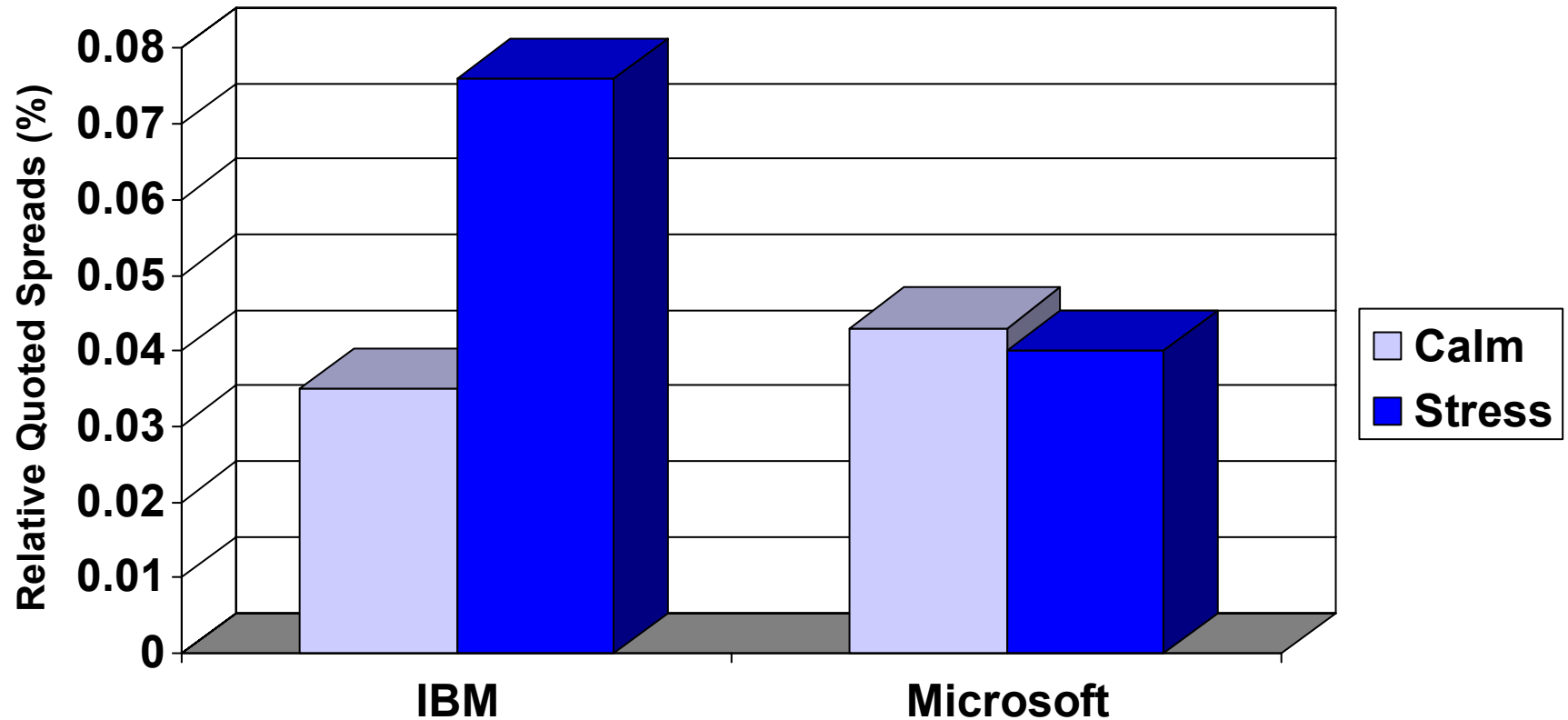


- Stress versus Calm periods
 - Stress period: 45 minute period surrounding announcement
 - Calm period: 12:30 to 1:15 pm

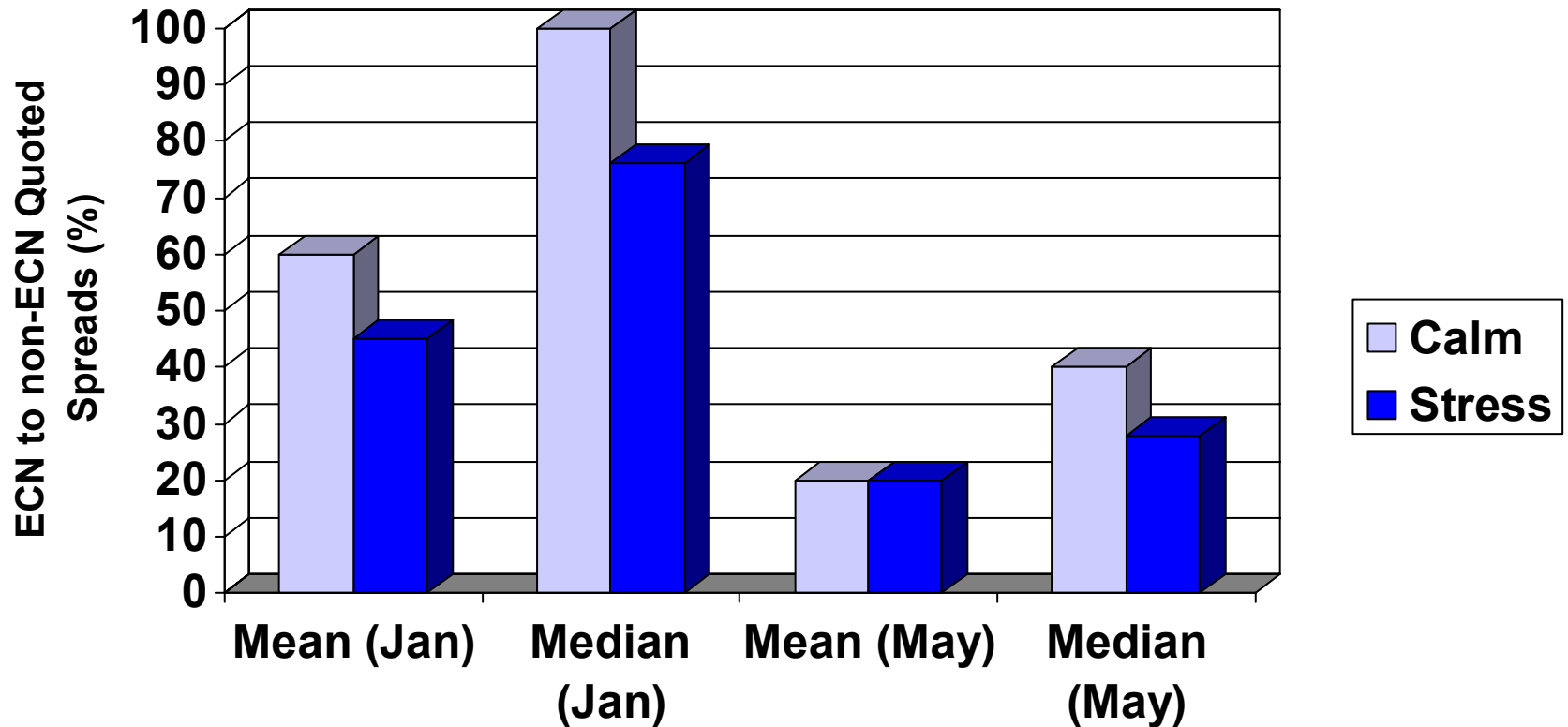
IBM versus Microsoft on January 2, 2003



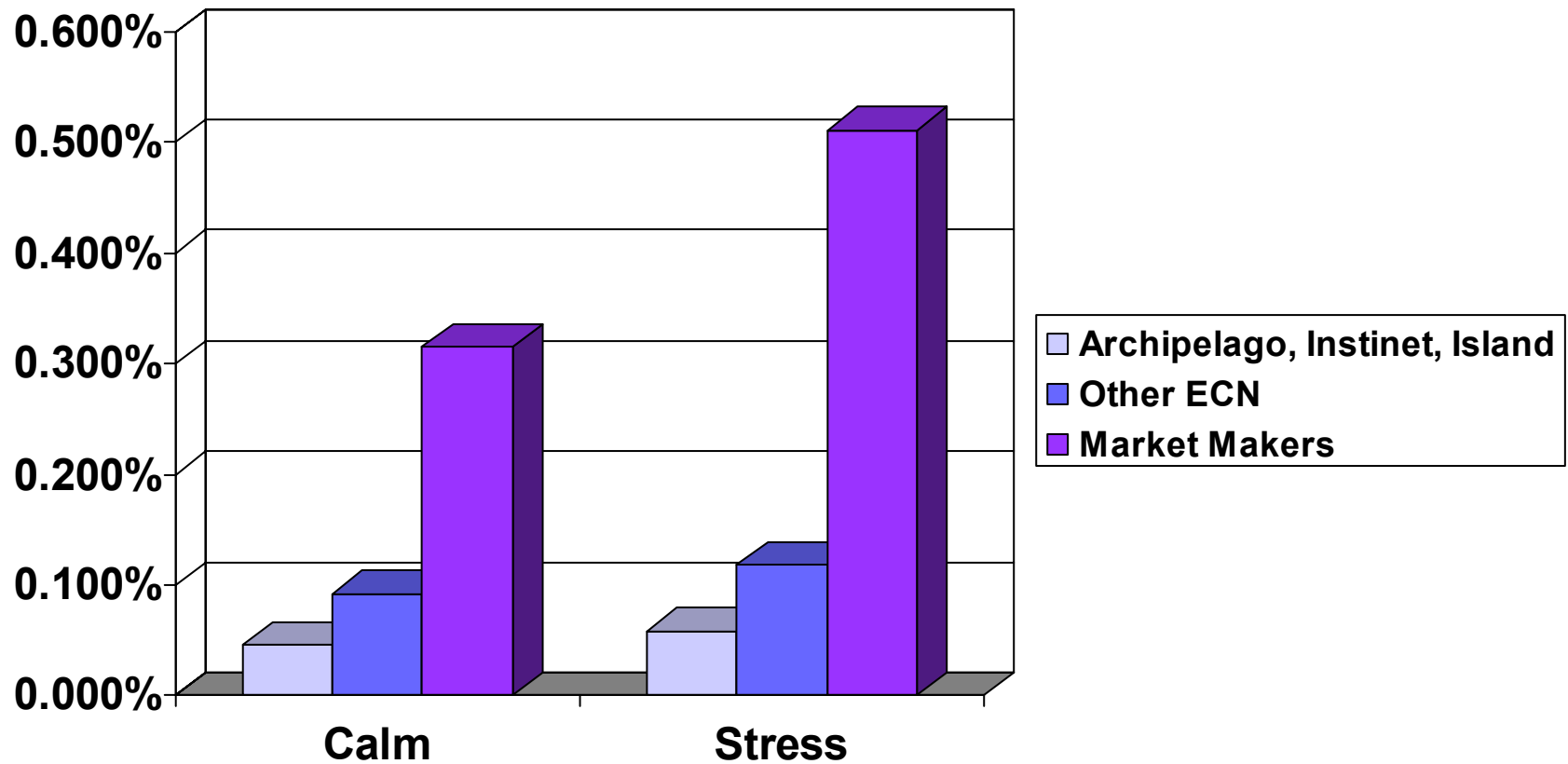
IBM versus Microsoft on May 1, 2003



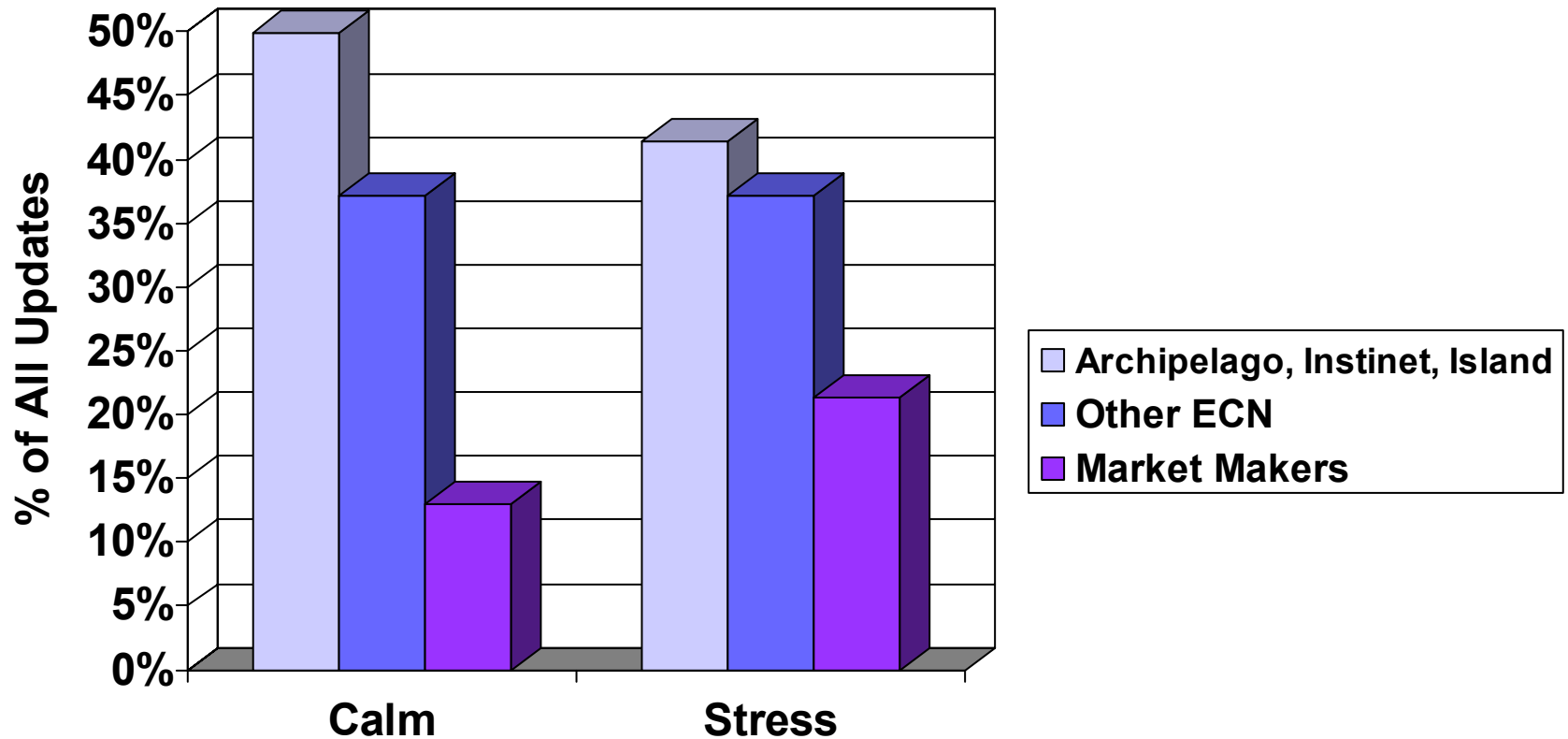
Microsoft: ECN versus Non-ECN Quotes



Quoted Relative Spreads for Microsoft, January 2, 2003



Frequency of Quote Updates for Microsoft, January 2, 2003

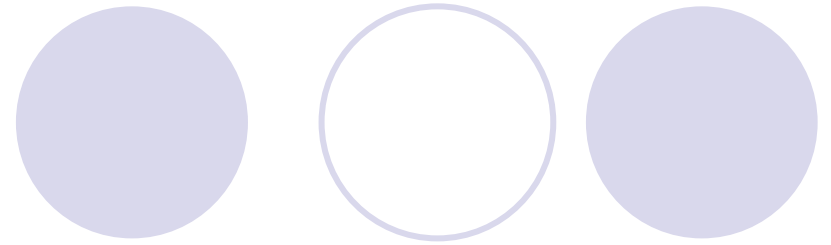


Sample



- 341 pairs of NYSE and Nasdaq-listed stocks
 - Matched on market capitalization, price per share and volatility
 - Market value of NYSE firm is more than \$300m
 - NYSE Trades and Quotes (TAQ) database
 - Nasdaq Trades and Quotes (Nasdaq) database
 - Center for Research in Security Prices (CRSP) database
 - No financials, utilities and American Depository Receipts (ADRs) are included

Sample (cont'd.)



- Summary statistics on firm characteristics
 - No difference in size and beta
 - NYSE firms have higher turnover
 - Nasdaq firms have higher volatility and price

Summary of results



- Quoted and effective spreads are lower on NYSE versus Nasdaq in both calm and stress periods
 - *Result is driven mainly by small firms in sample*
- Changes in quoted and effective spreads in the stress periods (relative to calm periods) are smaller for Nasdaq versus NYSE
 - *Result is strongest for large firms in sample*
- Ratio of ECN quoted spreads to non-ECN quoted spreads decreases in the stress period (relative to the calm period)
 - *Larger the reduction in the ratio of ECN quoted spreads to non-ECN quoted spreads, the smaller the change in spreads in the Nasdaq market during stress periods*

Comparison to Previous Work

- **Christie and Schultz; Huang and Stoll; Bessembinder; Bessembinder and Kaufman; Stoll and Schenzler**
 - Comparison of NYSE and Nasdaq-listed stocks for various sample periods
- **Barclay**
 - Impact of changes in listing location from Nasdaq to NYSE
- **Barclay, Christie, Harris, Kandel and Schultz; Bessembinder**
 - Impact of the January 1997 reforms on Nasdaq-listed stocks
- **Goldstein and Kavajecz; Jones and Lipson**
 - Impact of the June 1997 change in tick size
- **Bacidore, Battalio and Jennings; Chung, Chuwonganant and McCormick**
 - Impact of the introduction of decimalization on NYSE and Nasdaq-listed stocks
- **Huang**
 - Comparison of ECN and non-ECN quotes
- **None of the papers look at how the markets react to an information shock and compare the reactions as we do here**

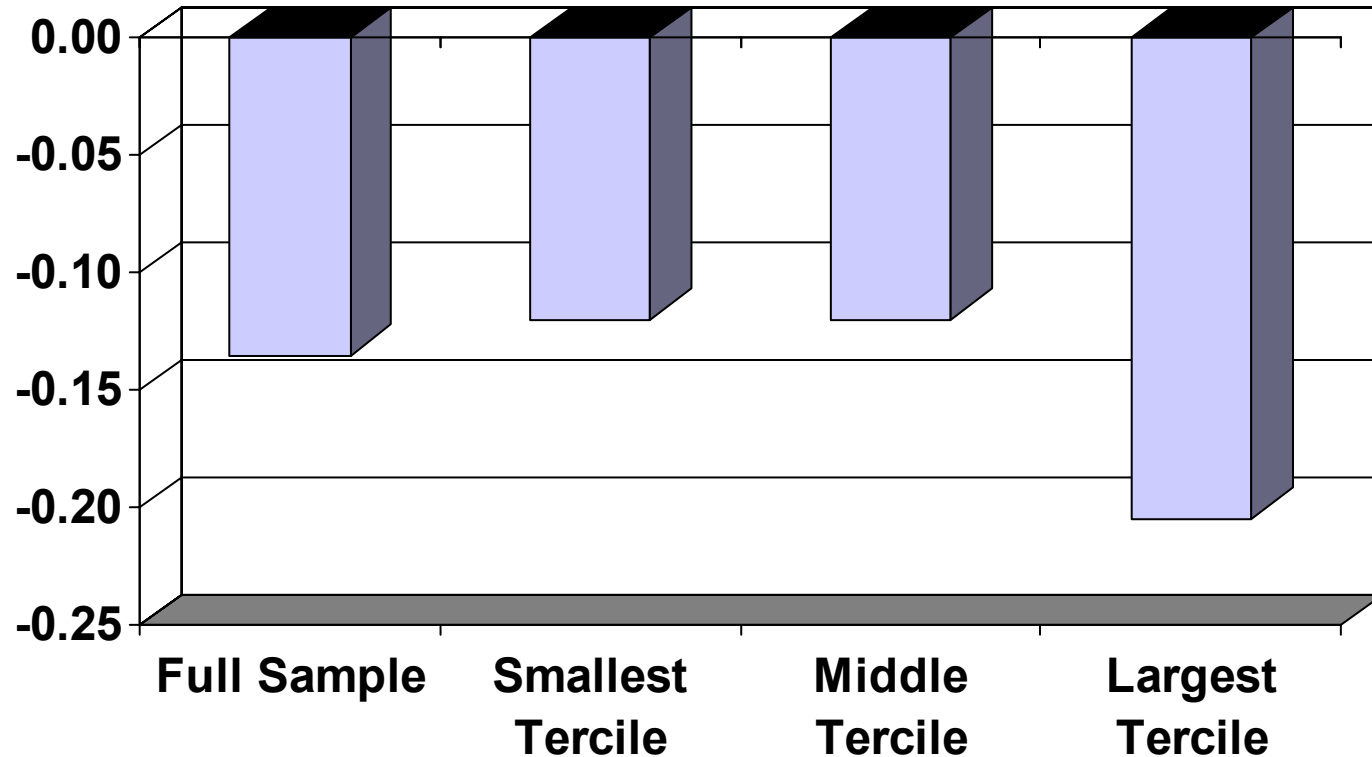
Quoted and Effective Relative Spreads on the NYSE and Nasdaq for January 2, 2003 (Table 4)

	NYSE		Nasdaq	
	Calm period	Stress period	Calm period	Stress period
Full Sample				
Quoted spreads	0.247%	0.323%	0.305%	0.398%
Effective spreads	0.174%	0.228%	0.213%	0.287%
Smallest Tercile in Market Capitalization				
Quoted spreads	0.339%	0.462%	0.452%	0.645%
Effective spreads	0.245%	0.332%	0.339%	0.466%
Middle Tercile in Market Capitalization				
Quoted spreads	0.270%	0.319%	0.345%	0.397%
Effective spreads	0.182%	0.219%	0.212%	0.268%
Largest Tercile in Market Capitalization				
Quoted spreads	0.134%	0.190%	0.119%	0.154%
Effective spreads	0.094%	0.132%	0.088%	0.0127%

Other Quote and Price Characteristics on the NYSE and Nasdaq for January 2, 2003 (Table 4)

	NYSE		Nasdaq	
	Calm period	Stress period	Calm period	Stress period
Frequency of quote updates	187	241	451	744
Quote duration	32.89	24.03	43.33	25.10
Volatility	0.00333	0.00547	0.00386	0.00715
Number of Trades	67	98	160	425

Change in spreads on Nasdaq relative to the NYSE on January 2, 2003 (Table 6)



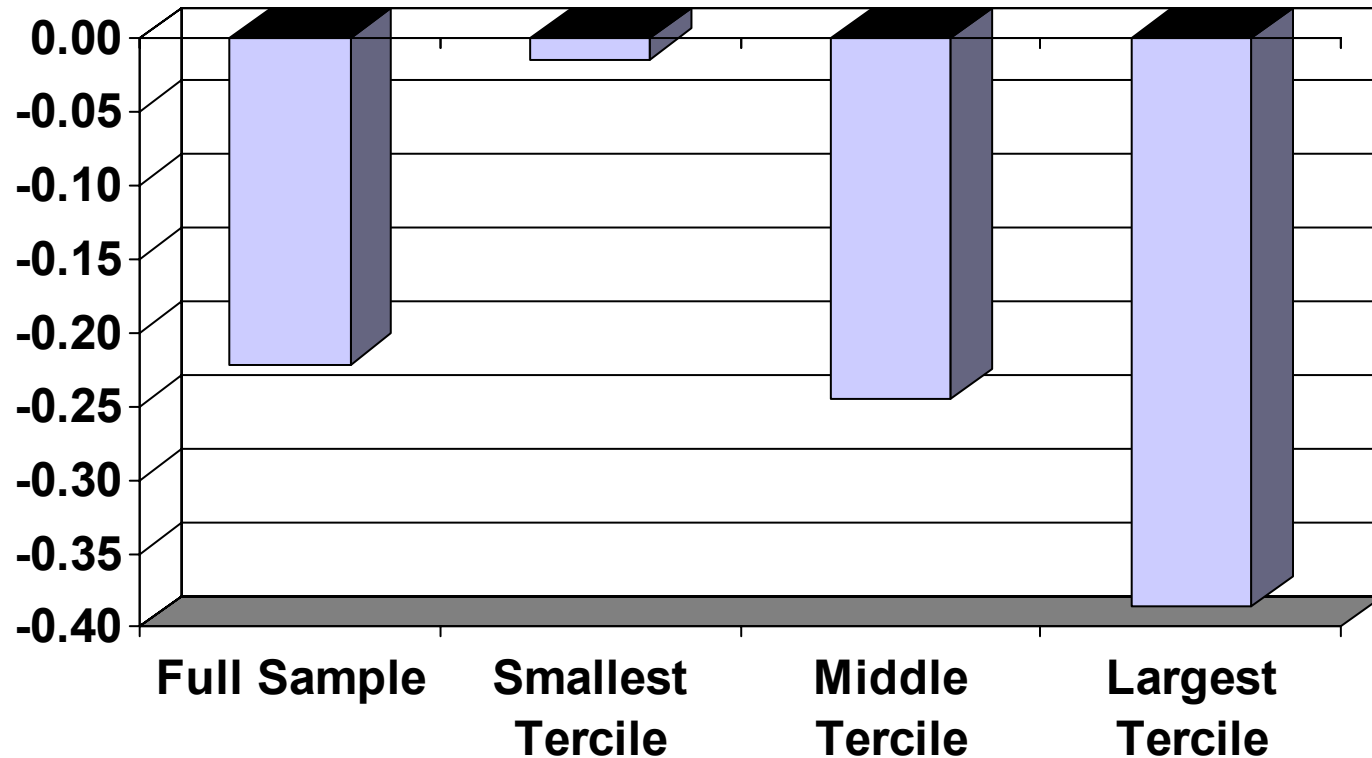
Quoted and Effective Relative Spreads on the NYSE and Nasdaq for May 1, 2003 (Table 5)

	NYSE		Nasdaq	
	Calm period	Stress period	Calm period	Stress period
Full Sample				
Quoted spreads	0.220%	0.283%	0.340%	0.426%
Effective spreads	0.161%	0.199%	0.217%	0.321%
Smallest Tercile in Market Capitalization				
Quoted spreads	0.326%	0.379%	0.556%	0.700%
Effective spreads	0.253%	0.278%	0.344%	0.555%
Middle Tercile in Market Capitalization				
Quoted spreads	0.234%	0.315%	0.334%	0.427%
Effective spreads	0.156%	0.215%	0.208%	0.248%
Largest Tercile in Market Capitalization				
Quoted spreads	0.101%	0.156%	0.124%	0.152%
Effective spreads	0.074%	0.109%	0.098%	0.124%

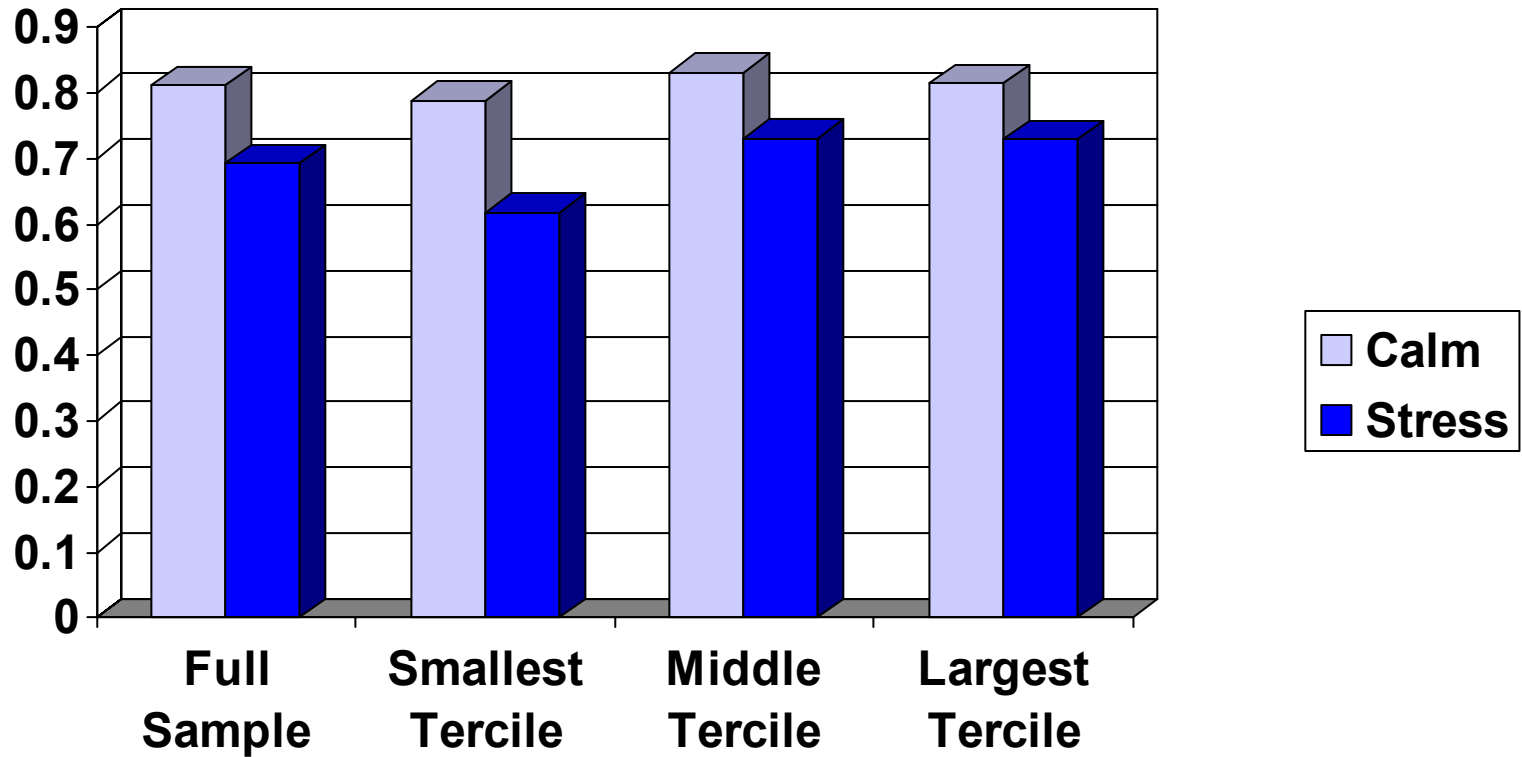
Other Quote and Price Characteristics on the NYSE and Nasdaq for May 1, 2003 (Table 5)

	NYSE		Nasdaq	
	Calm period	Stress period	Calm period	Stress period
Frequency of quote updates	169	263	248	631
Quote duration	36.21	20.36	65.17	17.56
Volatility	0.00229	0.00601	0.00280	0.00740
Number of Trades	58	110	96	345

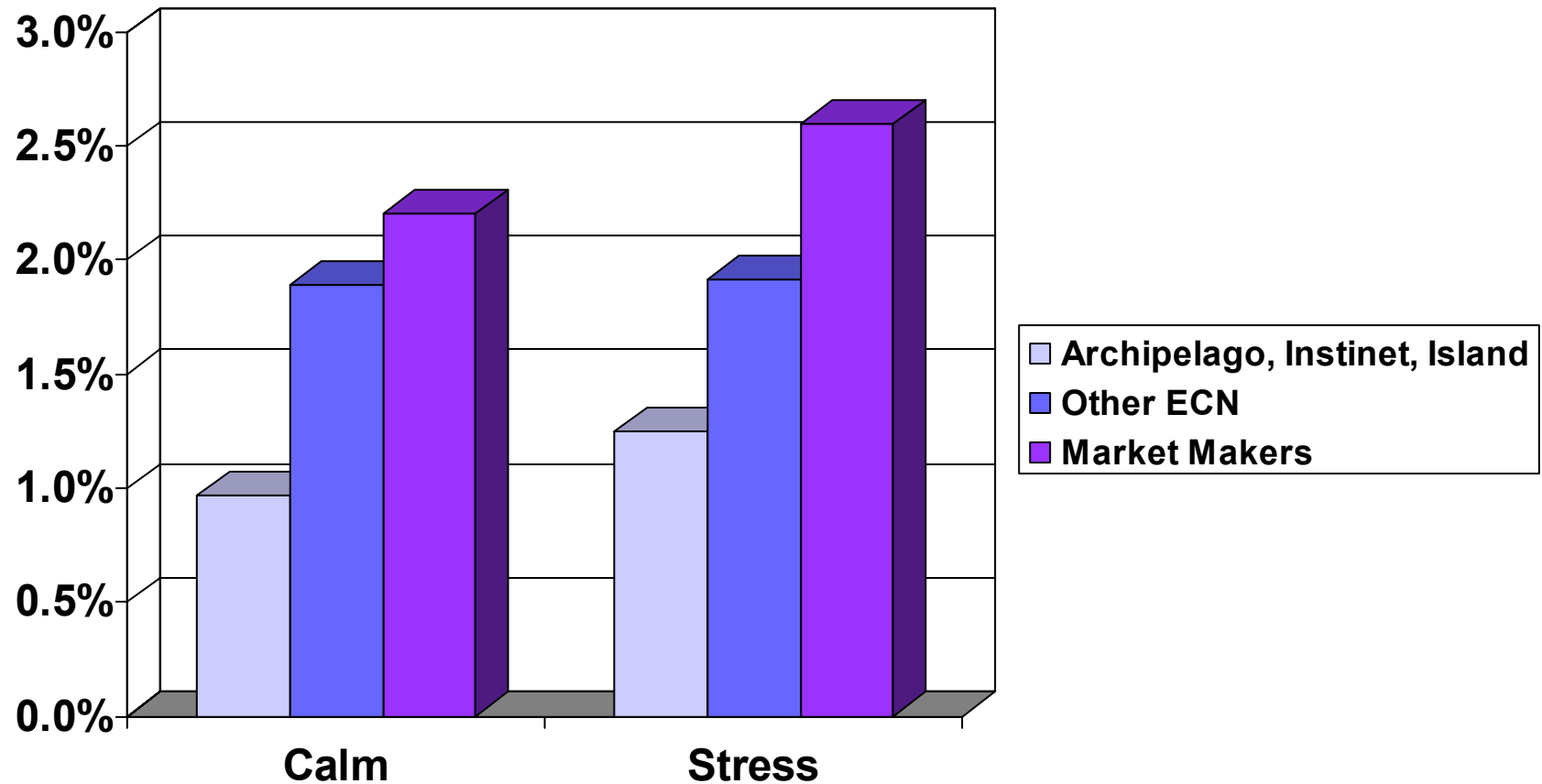
Change in spreads on Nasdaq relative to the NYSE on May 1, 2003 (Table 7)



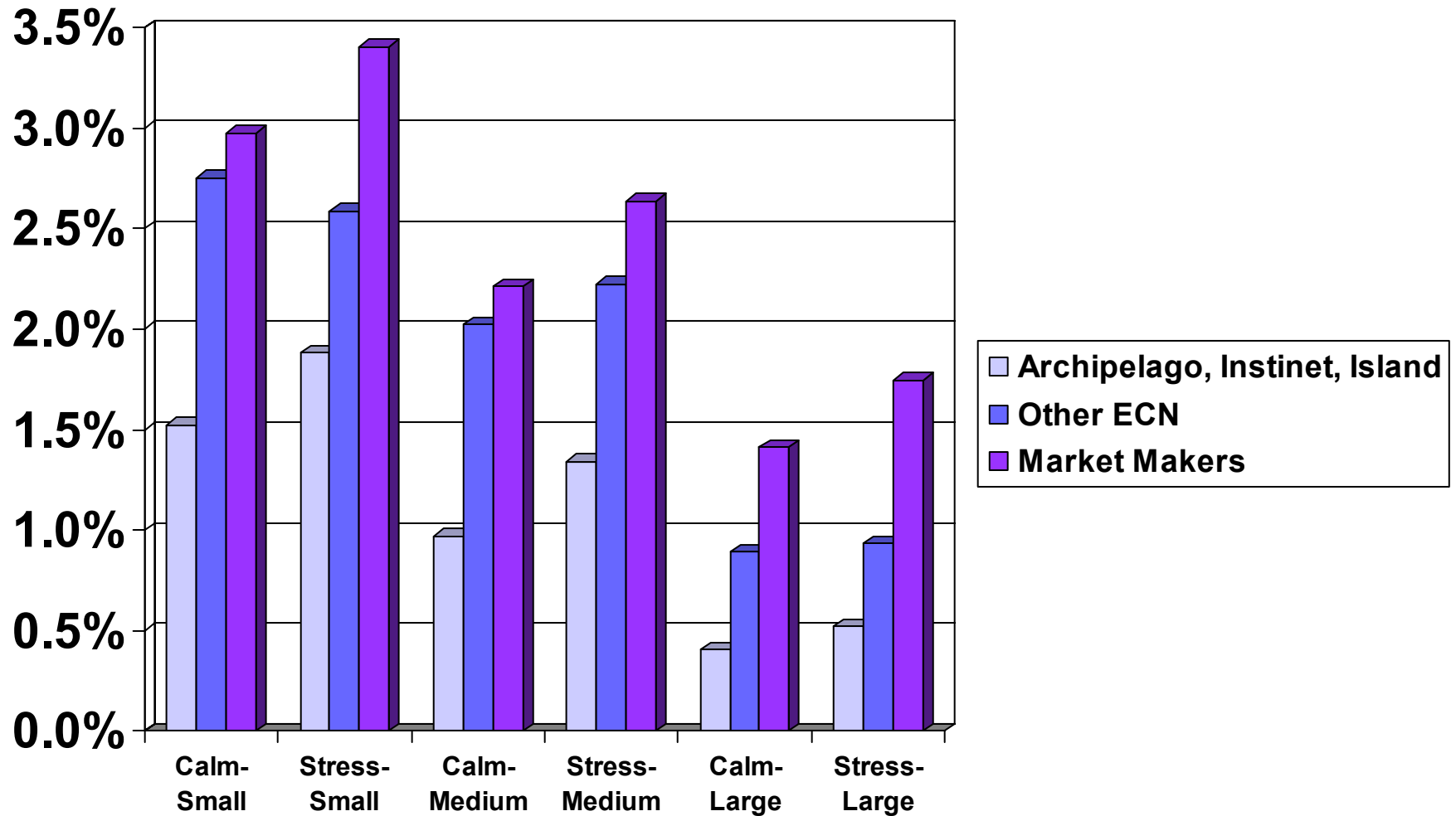
The ratio of ECN to non-ECN Quoted Spreads on January 2, 2003 (Table 8)



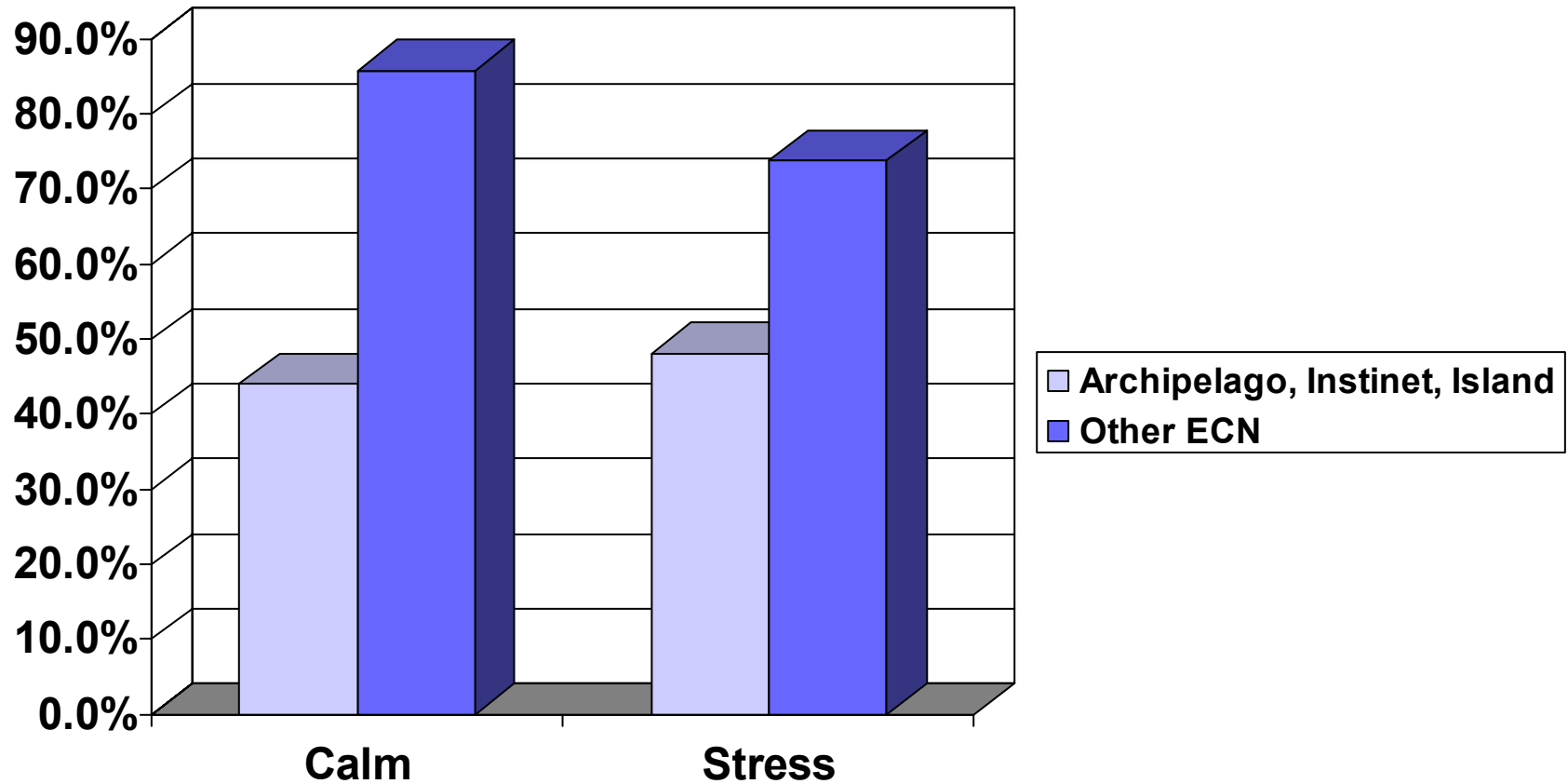
Quoted Relative Spreads for All Nasdaq Stocks, January 2, 2003



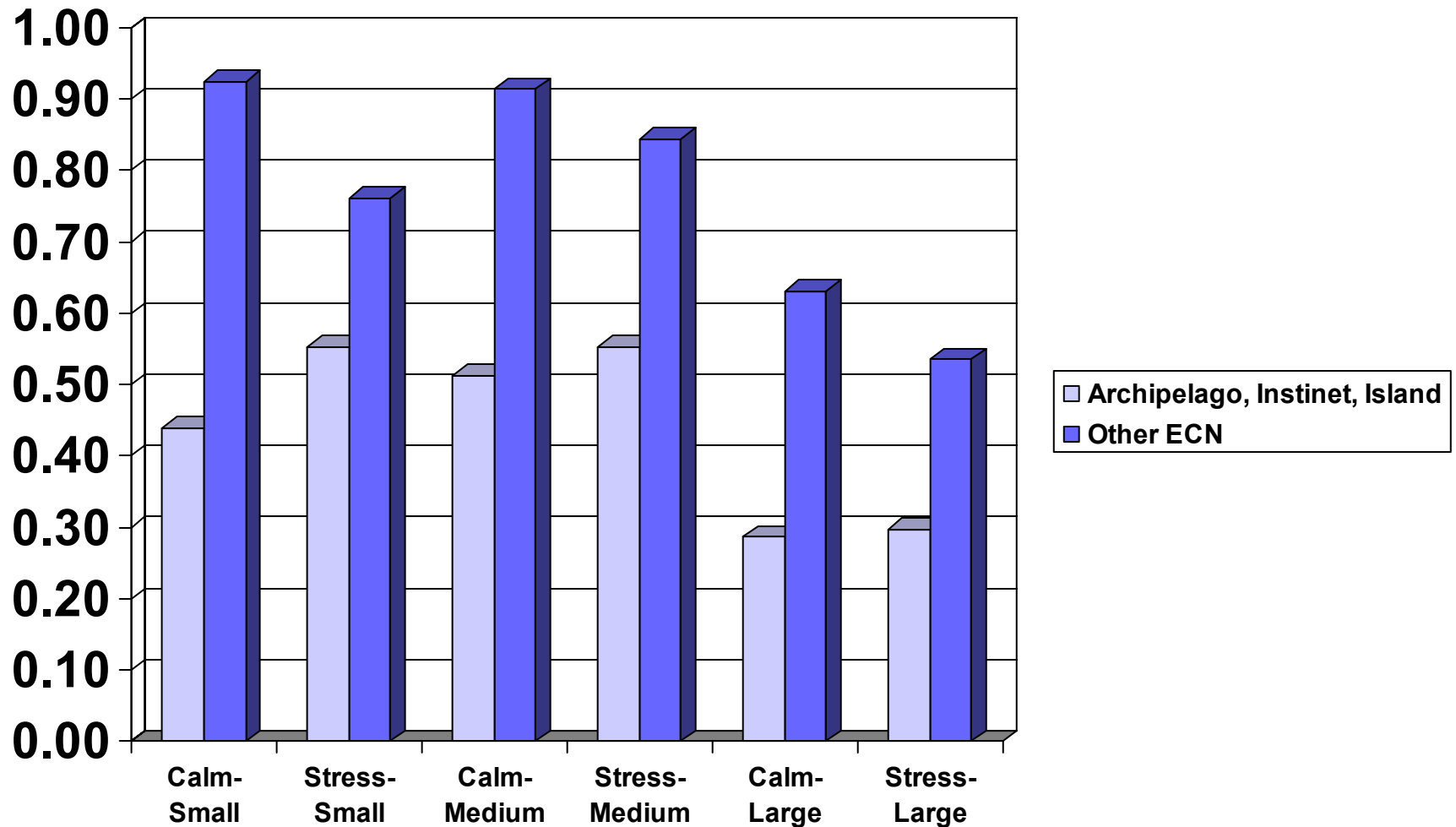
Quoted Relative Spreads for Small, Medium and Large Nasdaq Stocks, January 2, 2003



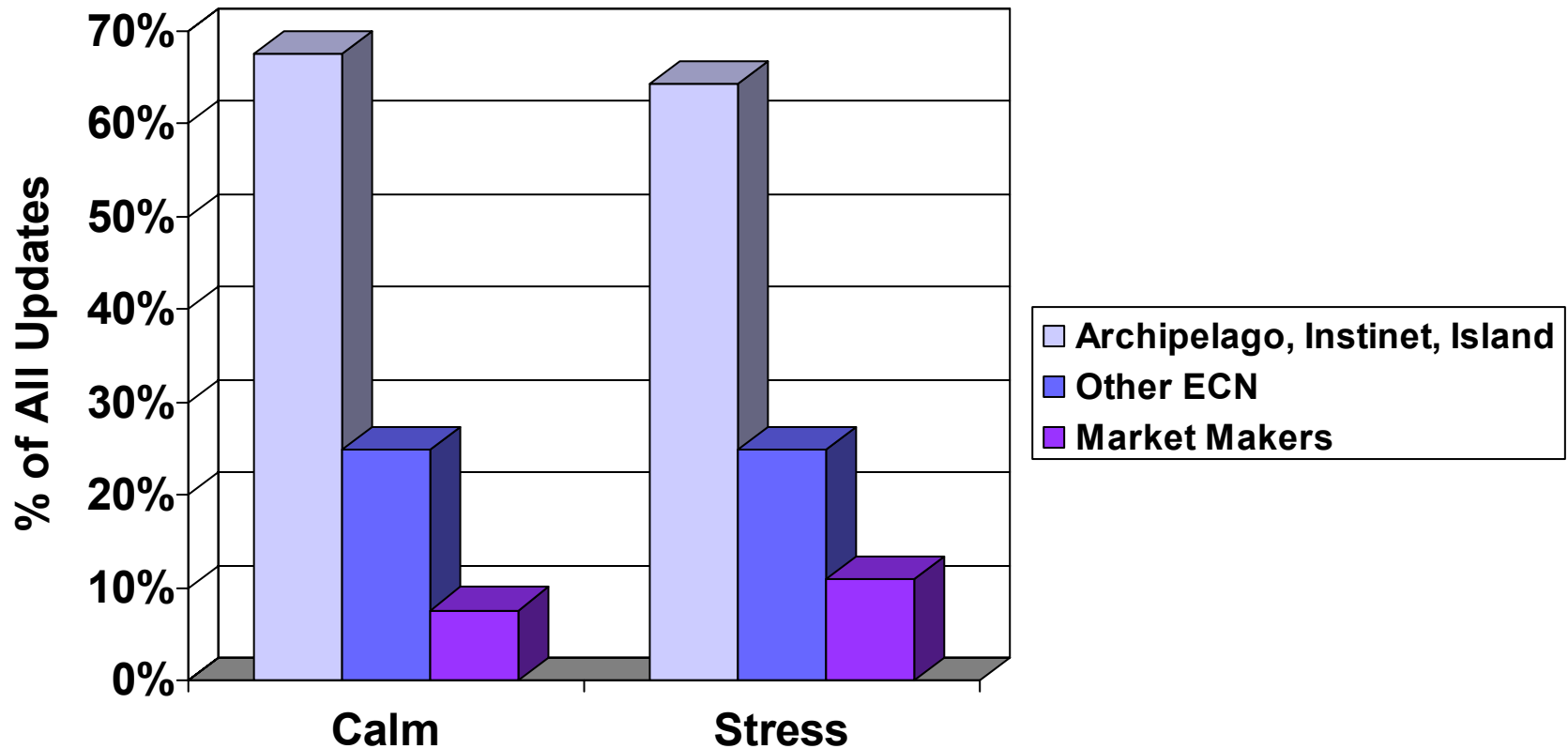
Ratio of Quoted Relative Spreads of ECNs to Traditional Market Makers for All Nasdaq Stocks, January 2, 2003



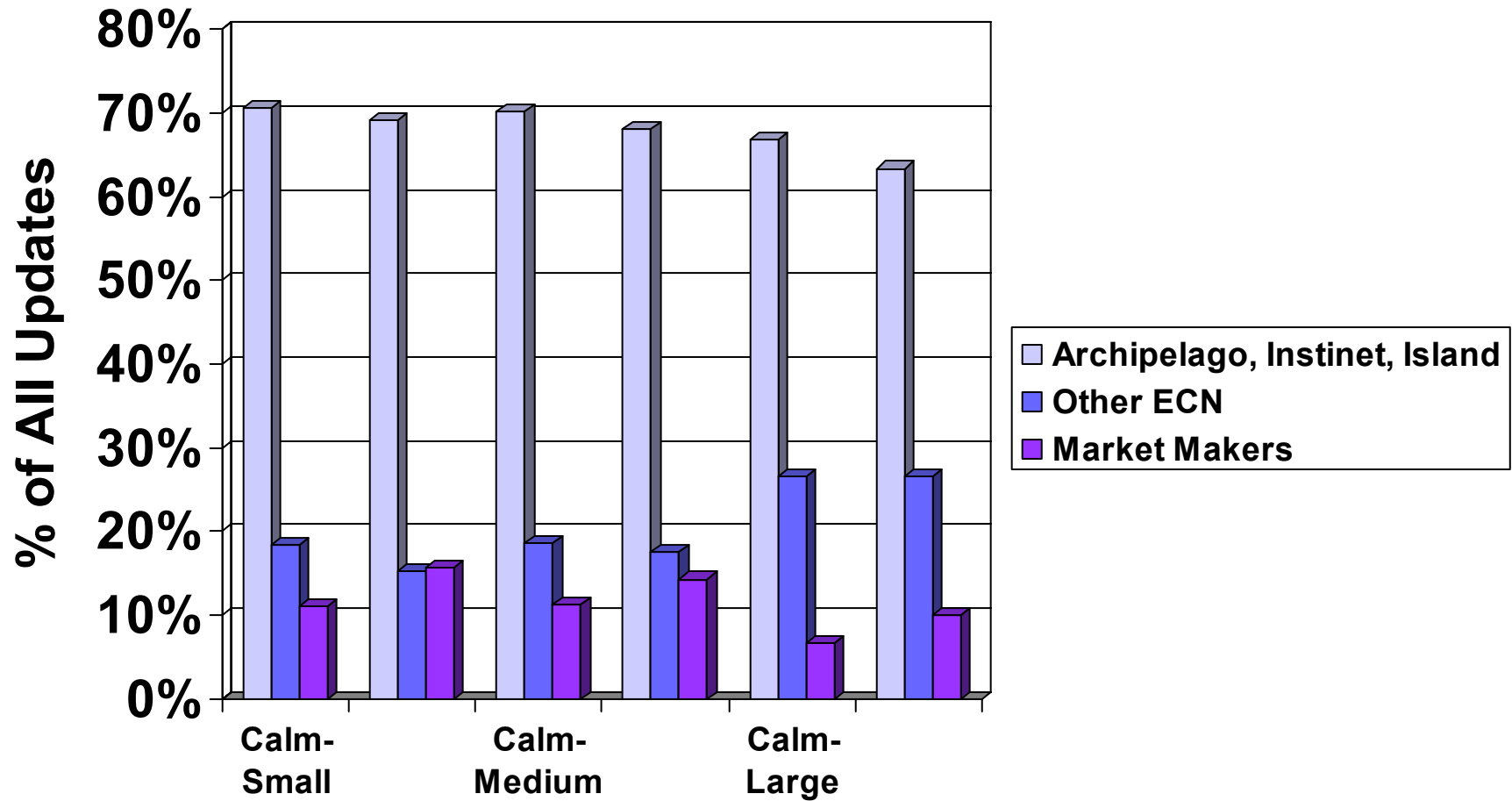
Ratio of Quoted Relative Spreads of ECNs to Traditional Market Makers for Small, Medium and Large Nasdaq Stocks, January 2, 2003



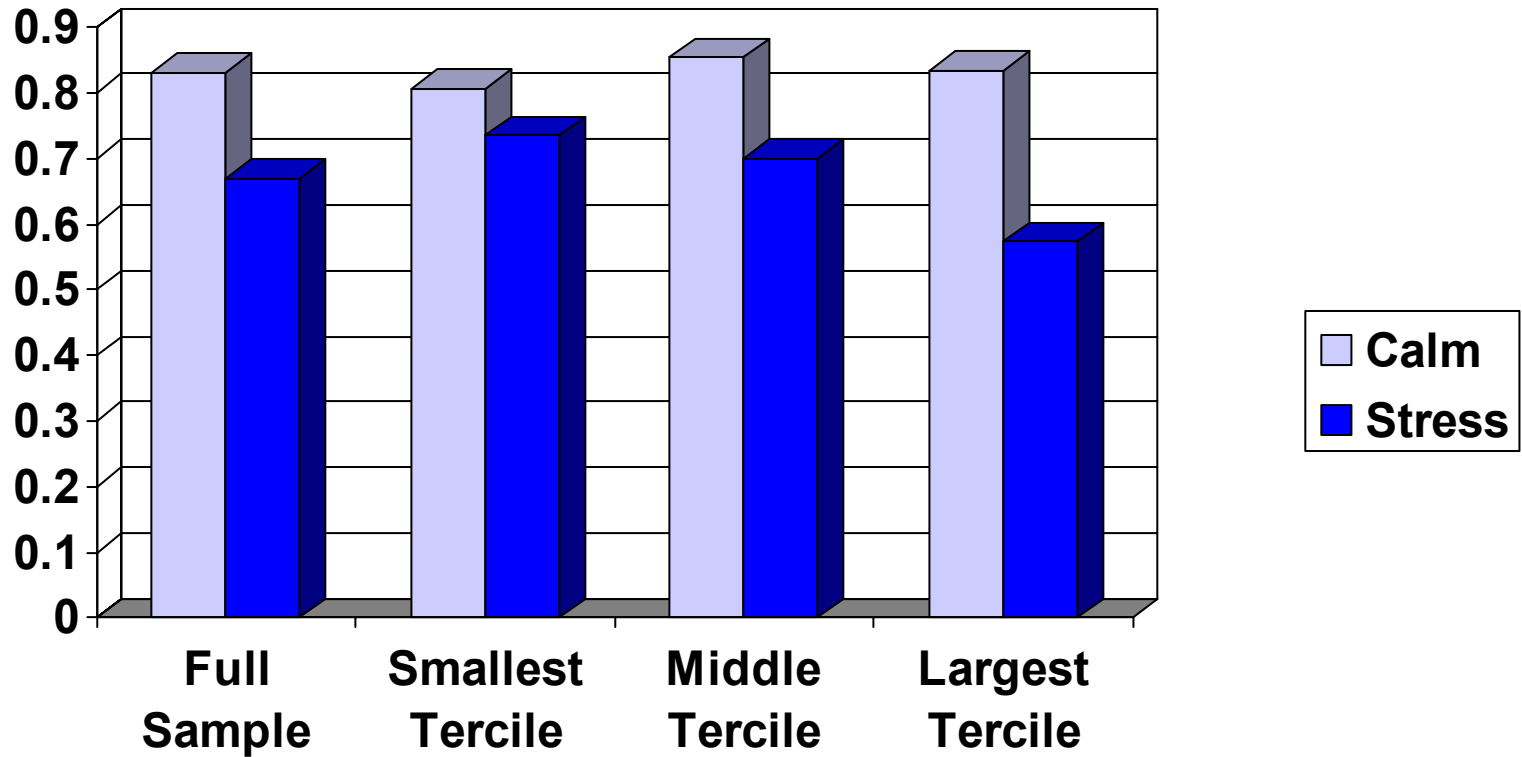
Frequency of Quote Updates for All Nasdaq Stocks, January 2, 2003



Frequency of Quote Updates for Small, Medium and Large Nasdaq Stocks, January 2, 2003



The ratio of ECN to non-ECN Quoted Spreads on May 1 (Table 8)



Relation between changes in Nasdaq spreads and ECN quotes (Table 9)

	January 2		May 1	
	Change of Spreads on Nasdaq	Change of Spreads on Nasdaq versus NYSE	Change of Spreads on Nasdaq	Change of Spreads on Nasdaq versus NYSE
Intercept	0.2655 (12.18)	-0.0523 (-1.64)	0.2252 (10.49)	-0.1142 (3.05)
Change in ratio of ECN to non-ECN quoted spreads	0.0973 (2.15)	0.1207 (1.98)	0.0892 (2.54)	0.1056 (1.93)

Conclusions



- Spreads are significantly lower on the NYSE v. Nasdaq during both calm and stress periods.
 - *but not so for large cap stocks*
- Spreads increase significantly during stress periods for both NYSE and Nasdaq securities, but more so for NYSE securities.
- Within Nasdaq, ECN spreads increase significantly less than spreads of traditional market makers during times of stress.

Future Research



- Examine larger sample of information shocks
 - *pre-2003*
 - *is better performance of Nasdaq during stress a new phenomenon?*
 - *associated with growth of ECNs?*
 - *base analysis on BBOs*
- Does price discovery differ across marketplaces during calm v. stress periods?
- How do marketplaces perform when important information arrives overnight?
 - *does efficiency with which securities open vary across marketplaces?*