

**WHAT HOLDS ONLINE MARKETS BACK?
AN EXAMINATION OF
U.S. STOCKBROKERS'
RULE 11AC1-6 REPORTS**

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ABSTRACT

Information technology enables the development of new markets and new channels to reach customers. Research on electronic markets proposes that transactions will become increasingly computerized in transparent, direct access market systems that will diminish the role of intermediation. Yet, in a range of industries many well-funded online markets, including numerous failed "B2B exchanges", have not attracted sufficient activity. What hinders the development of e-markets? Examination of new SEC-mandated Rule 11Ac1-6 disclosures from 11 U.S. brokerage firms reveals complexity and significant entrenchment of intermediated trading venues. Inter-mediaries received over 80 percent of customer orders in Nasdaq stocks, and over 50 percent of orders in NYSE stocks. For Nasdaq trading, 87 percent of customer orders in the sample were routed to market centers that are either owned by the broker (vertically integrated) or that make payments back to the broker ("payment for order flow"). Only 12 percent of the orders are routed to open markets provided by electronic communications networks (ECNs). For trading in NYSE stocks, 45 percent of orders are routed to market centers (other than the NYSE floor) that are owned by the broker or that make payments. Just 3 percent of orders in NYSE-listed securities are sent to electronic markets. Despite potential merits, online markets in many industries will struggle to attract activity because established intermediaries utilize practices such as "internalization", which are shown to influence where customers' trades take place. A lesson for other online marketplaces is that attractive, alternative institutional arrangements (e.g., equity stakes) and services to those in place must be developed in order to expand activity in their systems.

WHAT HOLDS ONLINE MARKETS BACK? AN EXAMINATION OF U.S. STOCKBROKERS' RULE 11AC1-6 REPORTS

1. Introduction

In a range of industries, many well-funded online markets, including numerous failed “B2B exchanges”, have not attracted sufficient activity. Forrester Research projects the number of online marketplaces will shrink from about 1,000 in early 2001, to 180 in 2003. While many complex factors influence the success or failure of an electronic marketplace, it is clear that enabling a transaction online is not sufficient for becoming a viable institutional market. What hinders the development of e-markets?

This paper is an examination of new, mandatory data disclosures on the use of markets by securities brokers in the U.S. This paper addresses two questions: Which brokerage firms use which market centers? and What explain firms' choices among competing markets? The results indicate that the market center¹ a customer's trading order is sent to (by the brokerage firm) is strongly influenced by the type of broker (i.e., discount vs. full-service), the type of order, and the broker's ownership and payment for order flow arrangements with the destination market center. Results from the securities markets carry important lessons and implications for development of technology in other marketplaces

¹ Market centers, as defined by the SEC, include exchanges, specialists, market makers, and Electronic Communications Networks (ECNs).

and industries as open networks are developed and promoted to bring supply and demand together on screens rather than physical locations.

1.a. Brokers' Choice of Markets

Information technology in the U.S. securities industry handles trading functions from posting stock quotes and prices, to order routing, to trade processing. The structure and regulation of the industry promotes competition between stock markets such as the New York Stock Exchange (NYSE), Nasdaq, and regional stock exchanges such as the Chicago Stock Exchange, and alternative trading systems such as Instinet, Island, and Posit. In fact, 15.5 percent of total trading volume in NYSE-listed stocks in 2001 occurred in market centers other than the NYSE, and the five largest electronic communications networks (ECNs) accounted for 34 percent of Nasdaq volume. Clearly, brokers have choice in order routing destinations, and can send their customers' orders to a number of different market centers. The broker, however, is obligated to ensure "best execution", which the U.S. Securities and Exchange Commission (SEC) generally interprets as trade prices no worse than the prevailing quotes in the market.

Examination of new SEC-mandated disclosures from 11 U.S. brokerage firms reveals complexity and significant entrenchment of intermediated trading venues. Despite potential merits, online markets in many industries will struggle to attract activity because established intermediaries utilize practices such as "internalization", which are shown to influence where customers' trades take place. A lesson for other online marketplaces is that

attractive, alternative institutional arrangements must be developed in order to expand activity in their systems.

1.b. SEC Rule 11Ac1-6

Beginning in the third quarter of 2001, the SEC's Rule 11Ac1-6 (Rule 6) required brokers to disclose quarterly their order routing practices in U.S. equities. The following information is now available on brokerage firms' websites:

- 1) the identity of the market centers that receive 5% or more of customers orders.
- 2) indications of ownership in trading firms or trading systems, and payment for order flow arrangements.
- 3) the percentage of orders in the following categories: market, limit, other (stop orders, short selling, etc.).

In few other industries is such detailed information on transactional arrangements and behind-the-scenes B2B volumes disclosed.

2. Prior Research on Competing Markets

A number of studies have analyzed financial markets on the basis of their structures and levels of computerization (e.g., order-driven, quote-driven, floor-based or screen-based). The usual dependent variables are measures of market quality and efficiency including

transactions costs, bid-ask spreads, and trading volume as a proxy of liquidity. Bartolini and Cottarelli (1997) compared the efficiency of alternative auction designs for auctioning U.S. Treasury securities. Domowitz and Steil's (1998) empirical study of data from the period 1996-1997 found lower trading costs for institutional investors using automated trading systems rather than using the traditional marketplace, the NYSE floor market, or trading through a Nasdaq market maker.

A concern in using empirical trade reporting data is that the order types and complexity are not controlled, and may differ across the trading mechanisms being compared. For instance, smaller, less-complex orders are often sent to electronic markets, giving the automated systems an apparent advantage. Bakos, Lucas, Oh, Simon, Viswanathan, and Weber (2001) developed a controlled experimental study to make controlled comparisons of order routing and trade execution results of different types of brokers. They placed 192 actual market orders to buy or sell 100 shares in the mid-1999 using accounts opened with six different brokers. These orders were simultaneously submitted to three types of brokers: (1) phone/voice brokers, (2) "brand name" online brokers, and (3) deep discount online brokers. The results of the trade and the destination market center were recorded. The authors were interested in which markets brokers used to execute the orders, and which markets provided the best trading prices.

Figure 1 shows a market display for IBM, indicating that the last trade was at \$111.98 per share for 200 shares executed on the Boston Stock Exchange. Assuming a market buy order was submitted and the current bid and ask quotes were in effect, this trade would reflect a 2 cent price improvement over the Ask quote of \$112.00.

IBM	INTL BUS MACHINE	459200101	NYQ USD	IBM.NB2	22JAN02	12:12
Last BOS	12:12	Status	Quote.Time	Bid NYS	Ask NYS	Size
↑111.98	-2.27	/R /	12:12	111.90	112.00	30 x100
111.93	-1.99 %	VWAP	News	Open	High	Low
111.94	Volume	113.0685		114.25	114.26	111.68
111.92	200	Blk.Vol	DJ.News	Cls:18JAN02		Post&Panel
111.93	5265300	1994200	05:55	114.25		
P.E	Earnings	Yield	L.Blocks	SpecI.Trade	Spec.Vol	Spec.Typ
26.26	4.35	0.49 %	96	111.73	100	141
Dividend	Div.Dat	Ex.Date	Yr.High	Yr.Low	Options	Headlines
0.56	10DEC01	07NOV01	126.3900	87.4900	WAYPX	

Figure 1: Market display for IBM at 12:12 pm on January 22, 2002. The highlighted area on the left indicates the last trade. The right area shows the bid and ask quote are both from the NYSE are good for at least 3,000 shares and 10,000 share respectively.

Orders to buy or sell NYSE-listed stocks placed with traditional voice brokers were overwhelmingly routed to the NYSE, while orders handled by the two brand-name brokers were most likely to execute on one of the five U.S. regional stock exchanges, such as the Chicago Stock Exchange or the Pacific Exchange (the other three are the Boston S.E., the Philadelphia S.E., and the Cincinnati S.E.). Deep discount brokers used third market dealers to execute the order we sent them, and often receive “payment for order flow”, which is usually one to two cents per share. The dealers make this payment from the trading revenues they realize by buying stocks on average at lower prices than they subsequently sell it.

Table 1: Trade results from 96 market orders placed with two different brokers in each of three different categories. (from Bakos et al., 2001)

BROKER TYPE	Destination Market Center			Price Improve-ment %	Avg Condit-ional Improv-ement (¢/sh)	Average Improvement (¢/share)	Added Cost
	NYSE	Regionals	Third Mkt				
Voice Broker	87.5%	12.5%	0.0%	68.8%	8.23	5.66	-
Brand-Name Online	9.4%	59.4%	31.3%	59.4%	7.24	4.30	1.36
Deep Discount Online	0.0%	3.1%	96.9%	40.6%	7.21	2.93	2.73
All Brokers – Listed Stocks				56.3%	7.64	4.30	

The study found that brokers used different market centers. Furthermore, and that the order routing choices made by the online brokers, and the deep discount online brokers in particular, did impact the trade prices received by customers.

3. Data and Results

The Rule 6 data for 11 major brokers in third quarter 2001 reveals that market use is correlated with by type of broker, order type, and ownership and payment arrangements. The broker categories are detailed in Table 1.

Table 1: 11 brokers fit into three categories

Deep discount brokers		Brand-name discount		Full-service brokers	
TDW	T.D. Waterhouse	ET	E-Trade	GS	Goldman Sachs
AMTD	Ameritrade	FID	Fidelity	LEH	Lehman Bros.
DTK	Datek	SCH	Schwab	MER	Merrill Lynch
				MS	Morgan Stanley
				SSB	Salomon Smith Barney

As Table 2 indicates, only the order types handled by the full-service broker differ significantly. Customers of full-service firms place more market orders and other category order than the other two broker categories. Other type orders include stop orders and short sale orders.

Table 2: Order types by three broker types

	Limit	Market	Other
NYSE-All	30%	44%	25%
Deep Discount (3 firms)	44%	42%	13%
Brand Name Discount (3)	43%	51%	7%
Full Service (5)	15%	42%	44%
Nasdaq-All	40%	43%	17%
Deep Discount	51%	36%	13%
Brand Name Discount	55%	38%	8%
Full Service	24%	51%	25%

In total (Table 3), the 11 brokers reported the use of 25 different market makers, six ECNs, and nine exchanges.

Table 3: Market centers reported by 11 brokers as order flow destinations.
 Three categories indicated: exchanges, market makers, and ECNs

<u>Nasdaq-Listed Securities</u> Exchanges	<u>NYSE-Listed Securities</u> Exchanges
Nasdaq SuperSOES*	NYSE*
Chicago Stock Exchange	American Stock Exchange
Market makers	Boston Stock Exchange
Bear, Stearns & Co.	Chicago Board Options Exchange
Bernard Madoff	Chicago Stock Exchange
Cantor Fitzgerald	Cincinnati Stock Exchange
CIBC World Market	Pacific Stock Exch
Fleet Trading	Philadelphia Stock Exch
Goldman Sachs	Market makers
Herzog, Heine, Geduld	ABN AMRO
ICapital Markets LLC	Bernard L. Madoff
Knight Securities	Hull Transaction Services
Lehman Brothers	Knight Capital Markets
Merrill Lynch	Raymond James
Morgan Stanley	Salomon Smith Barney
National Financial Services	Speer, Leads, & Kellogg
NDB Capital Markets	Third Market Corp.
Prudential Securities	ECNs
Robinson Humphrey	Island ECN
Salomon Smith Barney	REDIBook ECN
Schwab Capital Markets	
SoundView Technology Group	
Spear, Leed & Kellogg	
Susquehanna Capital	
ECNs	
Archipelago ECN	
BRUT ECN	
B-Trade ECN	
Instinet ECN	
Island ECN	
REDIBook ECN	

* = Counted separately from other exchanges in the category.

For Nasdaq trading, 87 percent of customer orders in the sample (rows #2, #5, and #7) were routed to market centers that are either owned by the broker (vertically integrated) or that make payments back to the broker (“payment for order flow”). Only 12 percent of the customer orders were routed to open electronic markets (ECNs). For trading in NYSE stocks, 45 percent of orders (rows #2, #5, and #7) were routed to market centers (other than

the NYSE floor) that are owned by the broker or that make payments. Just 6 percent of orders in NYSE-listed securities that were routed away from the NYSE were sent to electronic markets. (Rows #1 and #2).

Table 4 (last page) indicates that in Nasdaq stocks, brokers are nearly 7 times more likely to route an order to a market center that they have equity ownership in or a payment arrangement. While overall 45 percent of orders in NYSE-listed stocks went to the NYSE, full-service brokers use the NYSE almost exclusively, while the discount brokers rarely send customer orders to the NYSE. For the NYSE stocks, the deep discount and brand name discount brokers are three and four times more likely to route an order to a market center where they have equity ownership in or a payment arrangement.

Firms within the three categories of brokers (Table 5) tend to have similar order routing practices. An exception is Datek, which developed and continues to own a stake in the Island ECN, and routes 32 percent of its NYSE stock orders and 84 percent of its Nasdaq orders to Island. Schwab and Fidelity own specialist-dealers on regional stock exchanges, and send more orders to those exchanges than E-Trade which send NYSE-listed stock orders to market makers that pay 1-2 cents per share back to E-Trade for the order flow.

Table 5: All orders in NYSE and Nasdaq Stocks

NYSE-listed Securities	Deep Discount Brokers			Discount Brokers			Full-Service Brokers					Total
	TDW	AMTD	DTK	ET	FID	SCH	GS	LEH	MER	MS	SSB	
ECN-No Ownership	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ECN-w/ Ownership	1%	0%	32%	0%	0%	1%	0%	0%	0%	0%	0%	3%
NYSE	3%	0%	0%	0%	15%	19%	86%	100%	100%	100%	76%	45%
Exchange-w/o	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%
Exchange-POF/own	19%	50%	0%	35%	66%	73%	0%	0%	0%	0%	0%	22%
Market Maker-w/o	0%	0%	68%	0%	19%	0%	0%	0%	0%	0%	16%	9%
Market Maker-POF/own	77%	50%	0%	65%	0%	7%	14%	0%	0%	0%	0%	19%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

Nasdaq	TDW	AMTD	DTK	ET	FID	SCH	GS	LEH	MER	MS	SSB	Total
ECN-No Ownership	0%	0%	5%	0%	0%	0%	0%	0%	0%	10%	0%	1%
ECN-w/ Ownership	15%	0%	84%	0%	5%	0%	2%	0%	0%	0%	0%	10%
Nasdaq SuperSOES	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Exchange-w/o	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exchange-POF/own	11%	16%	0%	40%	0%	4%	0%	0%	0%	0%	0%	7%
Market Maker-w/o	0%	0%	4%	0%	23%	0%	8%	26%	11%	0%	44%	11%
Market Maker-POF/own	74%	84%	0%	60%	71%	96%	90%	74%	89%	90%	56%	71%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

Table 6 compares the 11 brokers handling of limit and market orders in NYSE stocks. Overall, 30 percent of customer orders are limit orders and 44 percent are market orders. Datek customers place 72 percent of their NYSE orders as limit orders, while Merrill Lynch customers use 72 percent market orders. Overall, the order flow destinations are not significantly different for limit orders than market orders.

Table 6: NYSE-Listed Stocks: Limit orders and market orders

LIMIT ORDERS %:	21%	40%	72%	41%	43%	44%	16%	34%	15%	1%	7%	30%
	TDW	AMTD	DTK	ET	FID	SCH	GS	LEH	MER	MS	SSB	All
ECN-No Ownership	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ECN-w/ Ownership	0%	0%	36%	0%	0%	3%	0%	0%	0%	0%	0%	4%
NYSE	5%	0%	0%	0%	11%	20%	85%	100%	100%	100%	84%	46%
Exchange-w/o	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	1%
Exchange-POF/own	20%	50%	0%	35%	70%	72%	0%	0%	0%	0%	0%	22%
Market Maker-w/o	0%	0%	64%	0%	19%	0%	0%	0%	0%	0%	9%	8%
Market Maker-POF/own	75%	50%	0%	65%	0%	5%	15%	0%	0%	0%	0%	19%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

MARKET ORDERS %:	56%	50%	21%	47%	52%	53%	46%	36%	72%	7%	47%	44%
	TDW	AMTD	DTK	ET	FID	SCH	GS	LEH	MER	MS	SSB	
ECN-No Ownership	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ECN-w/ Ownership	0%	0%	23%	0%	0%	0%	0%	0%	0%	0%	0%	2%
NYSE	2%	0%	0%	0%	7%	13%	77%	100%	100%	100%	72%	43%
Exchange-w/o	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	1%
Exchange-POF/own	18%	54%	0%	37%	74%	78%	0%	0%	0%	0%	0%	24%
Market Maker-w/o	0%	0%	77%	0%	20%	0%	0%	0%	0%	0%	21%	11%
Market Maker-POF/own	80%	46%	0%	63%	0%	9%	23%	0%	0%	0%	0%	20%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

In Nasdaq-listed stocks (Table 7) overall, 40 percent of customer orders are limit orders and 43 percent are market orders. Datek customers place 74 percent of their Nasdaq orders as limit orders, while Merrill Lynch customers use 71 percent market orders. The order flow destinations are significantly different for limit orders than market orders only for ECNs, which receive 16 percent of limit orders and 9 percent of market orders.

Table 7: Nasdaq-Listed Stocks: Limit orders and market orders

LIMIT ORDERS %:	39%	40%	74%	54%	51%	59%	14%	43%	16%	24%	24%	40%
	TDW	AMTD	DTK	ET	FID	SCH	GS	LEH	MER	MS	SSB	All
ECN-No Ownership	0%	0%	3%	0%	0%	0%	0%	0%	0%	35%	0%	3%
ECN-w/ Ownership	36%	0%	90%	0%	11%	0%	1%	0%	0%	0%	0%	13%
Nasdaq SuperSOES	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exchange-w/o	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exchange-POF/own	12%	16%	0%	41%	0%	6%	0%	0%	0%	0%	0%	7%
Market Maker-w/o	0%	0%	3%	0%	24%	0%	3%	41%	2%	0%	25%	9%
Market Maker-POF/own	52%	84%	0%	59%	64%	94%	96%	59%	98%	65%	75%	68%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

MARKET ORDERS %:	41%	50%	16%	31%	44%	38%	21%	42%	71%	60%	60%	43%
	TDW	AMTD	DTK	ET	FID	SCH	GS	LEH	MER	MS	SSB	All
ECN-No Ownership	0%	0%	10%	0%	0%	0%	0%	0%	0%	32%	0%	4%
ECN-w/ Ownership	0%	0%	53%	0%	1%	0%	0%	0%	0%	0%	0%	5%
Nasdaq SuperSOES	0%	0%	22%	0%	0%	0%	0%	0%	0%	0%	0%	2%
Exchange-w/o	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exchange-POF/own	17%	18%	0%	45%	0%	0%	0%	0%	0%	0%	0%	7%
Market Maker-w/o	0%	0%	15%	0%	21%	0%	1%	18%	15%	0%	50%	11%
Market Maker-POF/own	83%	82%	0%	55%	78%	100%	99%	82%	85%	68%	50%	71%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

As more Rule 6 filings are available, it will be possible to examine changes to firms' order routing practices over time. Initial indications from the 3Q 2001 data are that brokers have strong incentives to send customer to market center that reward them for the activity. The result for online market is difficulty overcoming the inertia of established institutional arrangements.

4. Interpretation and Conclusions

Information technology has enabled the development of new financial markets, and new online B2B exchanges in many industries. Participants in markets can expect to benefit as transactions will become increasingly computerized in transparent, direct access market systems that reduce or eliminate intermediation costs. Yet, many online markets, including

those targeting the steel industry (e-steel.com) and the hotel industry, have not attracted sufficient activity. What non-technology barriers are hindering the development of e-markets?

Examination of new SEC-mandated Rule 11Ac1-6 disclosures from 11 U.S. brokerage firms reveals complexity and significant entrenchment of intermediated trading venues. The data show that the market receiving customer order from broker are predominately owned by the broker or are paying the broker for the business.

For Nasdaq trading, a customer order is seven times more likely to be sent to a market center that is either owned by the customer’s brokerage firm (vertically integrated) or that make payments back to the broker (“payment for order flow”). Market maker intermediaries received 82 percent of all customer orders from these 11 brokerage firms, and only 11 percent of the orders are routed to open electronic markets (ECNs).

Table 8: Nasdaq Summary by Market Center Type

Type of Market Center	Percentage of Customer Orders	
Exchange with POF Arrangement	7%	
ECN with ownership	10%	
Market maker with ownership or POF	71%	
Sub Total “Related” market center		87%
Exchange without POF or Nasdaq SOES system	1%	
ECN without ownership	1%	
Market maker without ownership or POF	11%	
Sub Total Unrelated Market Center		13%
TOTAL		100%

For trading in NYSE stocks, 45 percent of orders were routed to market centers (other than the NYSE floor) that are owned by the broker or that make payments. Intermediaries in the form of market makers and regional stock exchange specialists received

51 percent of all orders, and just 3 percent of orders in NYSE-listed securities are sent to electronic markets (ECNs).

Table 9: NYSE Summary by Market Center Type

Market Center	Percentage of Customer Orders	
Regional Stock Exchange with POF Arrangement	22%	
ECN with ownership	3%	
Market maker with ownership or POF	19%	
Sub Total "Related" market center		44%
NYSE	45%	
Regional Stock Exchange without POF	1%	
ECN without ownership	0%	
Market maker without ownership or POF	9%	
Sub Total Unrelated Market Center		55%
TOTAL (does not total 100 due to rounding)		99%

As evidence in the U.S. equities markets illustrate, practices and institutional arrangements such as ownership and vertical integration and payments develop that make order flow difficult to attract away from established market centers. Online markets in many industries will struggle to attract activity because established intermediaries utilize practices that are shown to influence where customers' trades take place. A lesson for other online marketplaces is that attractive, alternative institutional arrangements (e.g., equity stakes with incentives to contribute more order flow) and services to those in place must be developed in order to expand activity in their systems.

Markets increasingly compete for customers, and research into electronic markets proposes that transactions will become increasingly computerized in transparent, direct access market systems that will diminish the role of intermediation. One of the more successful online B2B markets is the Intercontinental Exchange, based in Atlanta. Its Chief Executive Jeffrey Sprecher noted that initially "absolutely no one" in the electric power, gas

and oil markets wanted to trade in the forward and futures markets online. "Everybody thought they were already getting the best prices," he said, and they feared that posting prices on the Web would destroy that competitive advantage.² However, to implement online markets successfully require substantial resources to overcome these concerns and win activity away from entrenched institutional arrangements in markets.

² Tedeschi, R. "Some Business-to-Business Marketplaces Showing Staying Power," *New York Times*, July 16, 2001, pp. D1-3.

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Table 4: Summary by Broker Type

<u>NYSE-Listed</u>	All Orders				Limit Orders				Market Orders			
	DeepDisc	BrandName	Full	All	DeepDisc	BrandName	Full	All	DeepDisc	BrandName	Full	All
ECN-No Ownership	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ECN-w/ Ownership	11%	0%	0%	3%	12%	1%	0%	4%	8%	0%	0%	2%
NYSE	1%	12%	92%	45%	2%	10%	94%	46%	1%	7%	90%	43%
Exchange-w/o	0%	0%	2%	1%	0%	0%	1%	1%	0%	0%	1%	1%
Exchange-POF/own	23%	58%	0%	22%	23%	59%	0%	22%	24%	63%	0%	24%
Market Maker-w/o	23%	6%	3%	9%	21%	6%	2%	8%	26%	7%	4%	11%
Market Maker-POF/own	42%	24%	3%	19%	42%	23%	3%	19%	42%	24%	5%	20%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

<u>Nasdaq-Listed</u>	All Orders				Limit Orders				Market Orders			
	DeepDisc	BrandName	Full	All	DeepDisc	BrandName	Full	All	DeepDisc	BrandName	Full	All
ECN-No Ownership	2%	0%	2%	1%	1%	0%	7%	3%	3%	0%	6%	4%
ECN-w/ Ownership	33%	2%	0%	10%	42%	4%	0%	13%	18%	0%	0%	5%
Nasdaq SuperSOES	2%	0%	0%	1%	1%	0%	0%	0%	7%	0%	0%	2%
Exchange-w/o	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exchange-POF/own	9%	15%	0%	7%	9%	16%	0%	7%	12%	15%	0%	7%
Market Maker-w/o	1%	8%	18%	11%	1%	8%	14%	9%	5%	7%	17%	11%
Market Maker-POF/own	53%	76%	80%	71%	45%	73%	79%	68%	55%	78%	77%	71%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%