COPING WITH INSTITUTIONAL ORDER FLOW

Edited by

Robert A. Schwartz
John Aidan Byrne
Antoinette Colaninno

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Preface

On April 29, 2003, the Zicklin School of Business hosted a trading conference titled, *Coping With Institutional Order Flow*. This conference was electronically recorded and later transcribed for this book. The text includes the edited transcript of the panel discussions and separate presentations by two major industry executives, Richard Ketchum[1] and Robert McSweeney.

As with the other volumes in this popular series, this book is not simply intended to be an historical record of the conference. We have edited the manuscript for clarity, perspective and context. New material was gathered in subsequent interviews with many of the panelists. Consequently, some remarks and passages in the text were altered and expanded and many footnotes were introduced. Our goal was to flesh out the dialogue and presentations and to keep the material as contemporary as possible. In doing so, we went to great lengths to preserve the essential nature of the original debate. We worked closely with the panelists in the editing process and took pains not to distort the meaning of their remarks. They have all approved the final draft of the manuscript. We thank them for their assistance and patience.

In my opening remarks at the conference, I suggested that effective handling of institutional order flow is one of the most important and difficult

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[1] At the time of the conference, Richard Ketchum was President and Deputy Chairman at The Nasdaq Stock Market, Inc.

challenges facing our equity markets today. I also suggested that if market structure is not working for the institutions, it cannot be working for retail customers. At the previous year's conference, *A Trading Desk's View of Market Quality,* we heard institutional orders being described as large pegs. The opportunities to trade were compared with little holes. How are the large pegs fitting into the little holes? Are the large pegs destabilizing the markets to the detriment of both large and small investors alike?

The big players bring their big orders to the market very carefully over extended periods of time. The evidence suggests that, at any moment, there may be a huge, unexpressed, latent demand to trade. Latent demand, in my opinion, is not a liquidity pool. Nowadays, we hear talk about linking and accessing the liquidity pools. We hear talk about integrating the order flow. But the institutions are holding their cards close to their chests. A strong market structure should enable them to step forward more freely with their orders. We need to integrate the latent demand to trade with the visible order flow. Doing so, however, is a major challenge.

The conference in 2003 had its origin in the previous year's conference on market quality. The previous year, we started with big picture items – price discovery, transparency, volatility and so forth. But again and again, comments were made about the difficulty of obtaining quality executions for institutional-sized orders. Here are a couple of statements that were made at the Market Quality conference:

Our problem with these institutional sized orders is that we have them in a market designed for retail investors.

We are all playing poker, and we keep our cards close to our vests.

If we do it wrong we could immediately look stupid.

The way that our markets are structured today, going out and searching for liquidity means giving up information.

You are bumping two different sized orders together. There has to be volatility. And it is this volatility that leads to a 46 cent cost per share on average, every time these big guys go into the market.

In my opinion, institutional order flow flies in the eye of the storm. However, from what I have observed, the market structure debates have given short shrift to the needs of the institutions, as regulators and academicians have paid far more attention to retail customers. In the regulatory mindset, large sophisticated institutions can take care of themselves – it is the small retail customers who need protection. The retail customers need protection from whom? From the institutions?

The institutions have pointed out that they are nothing more than

amalgams of many small investors. True, but this may not be their strongest argument. I would like to suggest (as I did at the preceding year's conference) that all market participants, both big and small, are in the same boat. If market structure is not working for the institutions, their trades will rock the boat, their trades will destabilize prices, and a price that is destabilized for one is destabilized for all. Consequently, market structure regulation purposed to help the little guys can backfire, especially if the little holes become smaller and the large pegs grow in size.

We express our heartfelt thanks to the sponsors who made this conference possible (see page xi). Their funding and, more importantly, endorsement of what we are doing, are deeply appreciated. Faisal Aslam helped in the preparation of this manuscript, and we thank him for his assistance. We also express our gratitude for the constant support and encouragement of Avner Wolf who, at the time, was chairman of Baruch's Department of Economics and Finance.

Robert A. Schwartz

CHAPTER 1: EVIDENCE ON INSTITUTIONAL TRADING PRACTICES

Moderator – Lin Peng, Zicklin School of Business, Baruch College
Assistant Professor
Asani Sarkar, Federal Reserve Bank of New York
Economist
Robert Schwartz, Zicklin School of Business, Baruch College
Marvin M. Speiser Professor of Finance and University Distinguished Professor
Wayne Wagner, Plexus Group
Co-Founder & Chairman
Avner Wolf, Zicklin School of Business, Baruch College
Executive Director, University International Programs[2]

LIN PENG: It is a great pleasure to moderate this panel today. Wayne Wagner could not be with us today. John Phinney from JP Morgan is here, and John we thank you for filling in.[3]

JOHN PHINNEY: I will do my best to convey the essence of the research that we recently completed on the cost dynamics associated with institutional order flow.[4]

To a retail investor, the stock exchanges look like a vending machine. An order is placed, the delivery is made and the execution comes back. The broker has completed his or her job, often within seconds. But this is not the case for the institutional trader. As we know, the order size – the 'peg' of

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[2] At the time of the conference, Avner Wolf was Chairman of the Economics & Finance Department.

[3] The presentation was prepared by Wayne Wagner with the help of John Phinney, who made the presentation. At the time of the conference, John Phinney was at JP Morgan.

[4] The analysis is based on data supplied by investment management clients of the Plexus Group. Ali Jahansouz of Plexus Group conducted most of the internal research. Meei Tsern Jeng of the University of California Financial Engineering Program also provided research.

institutional trading interest – is much larger than the 'hole' size of the exchange process.

One perspective that is shared by many is that, with all the steps between the asset managers and the specialist post, the managers can't execute efficiently. In 1994, specialists were involved in 8% of the trades. This year that number is expected to double, to almost 15% of trading.

We can illustrate the nature of a large trade. A client provided us with the complete trading records for a trade in Oracle on August 15, 2002. A momentum manager had sent a 1.8 million share buy order to his trading desk. The process unfolded as follows. The order was fed to an automated trading system. Trading began at 9:53 in the morning and the order was completely executed within 51 minutes. It required over 1,000 separate executions to complete that order. The average execution size was 1,700 shares. The single largest execution was 64,000 shares. That large trade occurred in a cluster of rapid executions when almost 190,000 shares were executed in less than one minute. The smallest execution in the block was for 13 shares. Seventeen percent of the executions were for 100 shares or less, and 44% of the total order was executed in pieces of less than 1,000 shares. There were up to 153 executions per minute.

To put this trade into context, let's examine Oracle trading on that day. The total share volume was 59,000,000 shares. Thus this particular trade represented less than 3% of total volume. After the trading was completed for the block, the price of Oracle rose to $11.46 from $10.86 when the trade was started. In trading parlance, this would be referred to as a 'DFT,' otherwise known as a 'Damn Fine Trade.'

Now let us take a peek at exactly why it was a DFT. First, the *delay cost*, computed as the difference between the opening price and the price of the first trade done, was 8 cents. The *market impact*, computed as the average execution price less the first trade price was only 7 cents per share. The *captured value* for that particular trade for that day of almost 45 cents represents the difference between the closing price and the average execution price. Thus, over the very short term, it looks like a most successful trade in terms of captured value versus cost of acquiring. It was a success from the perspective of the broker, the trade desk and especially the portfolio manager.

What does this example tell us about the nature of institutional trading? First, it shows that it is possible today to complete large liquid trades in both the central and the peripheral markets. But think about the process that it took to make that happen. It required a thousand-to-one reduction of the

manager's intent, to get trade pieces small enough to be digestible by the market. It took a significant amount of technology to automate that. The order had to be cut up to fit the average size of the hole: the exchange's – in this instance an ECN's – capability. Curiously, the 1,700 share average print in this case happens to be nearly the same as the average trade size on both the NYSE and Nasdaq.

In contrast, alternative institutional markets like Liquidnet and Harborside+ show significant size taking place, in the range of 44,000 shares for Liquidnet, and 70,000 shares for Harborside+. The issue on the table today is whether this meat grinder approach to trading institutional orders is *natural*, deriving from the desires and habits of the big investors, or whether it is *structural,* deriving from the nature of the exchange. Is it an artifact of the essentially retail nature of the exchange? That is the question that we addressed in our research project.

All too often institutional trades must be broken down and jammed through the retail sized trading window of the exchanges. This raises some questions:

- Does the breaking down of institutional trades encourage unnecessary dealer inter-positioning during the process?
- What information value is conveyed to the market as a result of this extended trading period?
- What do these search delays cost the investment professional?
- Does this structural issue, either exogenous or endogenous, impact trading costs?
- To what degree do they result in the leaking of overall performance?
- Do investors unintentionally leak performance to market middlemen?

The only way to get a very large trade-through a constricted hole is to stretch it out in time. Thus squeezing these very large trades through very small market windows results in significant delays in transmission, strategy and, of course, execution. Implementation cycles become extremely long, measured in days for many large or liquid institutional orders.

These are important issues. Do the investment managers truly understand the cost of implementing their investment ideas? Probably not. If they did, would the dynamics of trading institutional order flow change? Would the orders from the portfolio manager at the desk actually change?

Money managers need to understand the frictional costs and how they affect their ability to accumulate assets and performance returns over time.

Certainly the market places need to understand and to assess their ability to provide the facilities that are efficient, deep, liquid, and fair. Against the backdrop of the AIMR Trade Management Guidelines, trading costs really must be assessed relative to the value of trading itself.

We can serve up a bowl of statistics. We looked at the complete set of Plexus manager-supplied data for a six-month period, the fourth quarter of 2001 through the first quarter of 2002. There were almost 870,000 unique orders that were in this main rising-market sample. The follow-up sample consisted of 432,000 orders from the subsequent declining market quarter.

Included are data from 93 managers of all sizes, shapes, and styles. The data contain a high quality level of information linked together from the managers' accounting systems and order management systems.

There is a tremendous range of trade size in this universe. To avoid having our attention overwhelmed by the hundreds of thousands of small trades, or by the gigantic trades on the other end of the spectrum, we formed five trade groups. The first group contained the smallest trades. It was constructed so that one fifth of the trading dollars involved in the universe fell into this quintile. Four other quintiles of equal trading dollars were constructed, with the fifth quintile representing the largest trades in the universe. Each group should be of equal interest to investors because they each contain the same amount of trading dollars.

We want our cost assessment to show the real impact of interacting in the marketplace. We exclude from our cost analysis commissions and costs due to missed trades. We focus on (1) impact or market presence effects, and (2) trader delays (which are both tactical and liquidity seeking in nature), and (3) trading delays that occur during the search for liquidity. Using the implementation shortfall approach, we define total trading cost as execution price minus decision price. Decision price in our sample might be based on multiple orders from multiple managers within the organization at different release times. Exhibit 1 presents an interesting picture of the relationship between trade size and trading costs. The chart is fairly busy, but let me point out the extremes.

Trade Size Quintile	Trade Count		Shares (000) (Median)		Dollars (Mil) (Median)		% Avg Daily Volume (Median)		Cost (bp) (Median)	
	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell	Buy	Sell
1(small)	444,485	356,053	2	2	0.05	0.06	0.4	0.3	11	6
2	22,906	18,988	154	176	4.82	5.79	10.8	11.1	47	36
3	8,340	7,217	393	430	13.74	15.61	18.3	18.2	64	47
4	3,527	3,199	851	923	31.86	35.24	28.1	30.8	81	69
5(Large)	1,303	1,209	2,014	2,105	75.62	80.91	52.6	53.8	90	127

•Cost per dollar traded rises from 0.11% to 0.90% with size of trade.

Is this a liquidity cost (proportional to trade size) or a frictional cost (proportional to time to execute)?

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Exhibit 1. Equal Dollar Quintiles / Rising Market

The first quintile, which contains the smallest trades, represents 90% of the total number of trades. At the other extreme are the largest trades. These are very small in number, less than one quarter of one percent of our sample. If you move to the median cost in basis points, you see that the smallest trade orders are handled efficiently at minimal cost. As we move to larger orders, trading gets dramatically more expensive – almost eight times as expensive for buys. Selling is almost always cheaper, unless you move into the fifth quintile, the largest trades.[5] This represents what we call a 'fire sale condition' that results from selling large blocks of stock under panic conditions. To repeat, the distribution of the trade size is extremely wide. The median trade size in the smallest quintile is only $53,000, while the

[5] Most of the activity is driven by the buy decision, which in turn is driven by improving prospects or other good news. Most selling, in contrast, is more liquidity driven than information driven.

median trade size in the largest quintile is $77,000,000.[6] Shares, dollars, and percent of daily volume, all rise correspondingly. As I mentioned earlier, selling in this rising market was cheaper than buying, except at extreme size.

To observe the range of costs, we determined the 5th percentile cost of executions through what we would call the more challenged executions, the 95th percentile of cost. The results are shown in Exhibit 2.

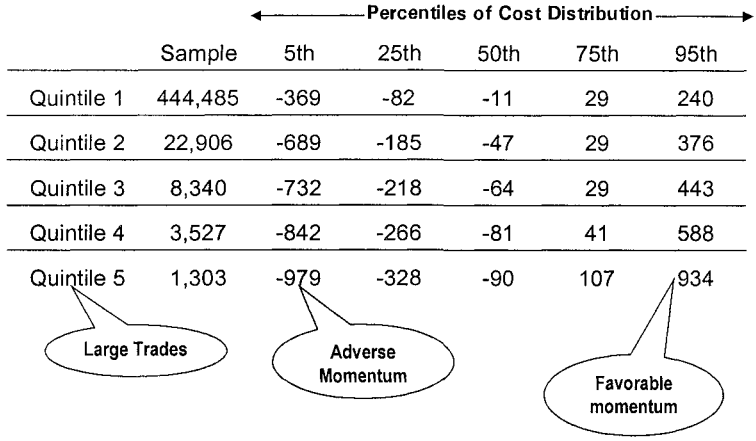

Exhibit 2. Cost Range of Institutional Buying; Equal Dollar Quintiles / Rising Market

You can see that in almost every quintile, the most costly trade executions are dramatically different from the least costly executions. If anyone wonders whether best execution and excellent trading desks add value, this particular slide answers the question. The largest trades are far more costly than smaller trades. The range of costs within quintile is very

[6] These numbers are the averages of the two-dollar figures (buys and sells).

wide, from 6% for the small order quintile to 19% for the large order quintile. The range separates those traders who demand liquidity and are willing to pay for it from those who supply that liquidity to them. To the right of the table are the traders who supply liquidity. To the left of the table are the orders of managers who are willing to pay large amounts to acquire liquidity. Suppliers and demanders of liquidity do not offset in this table; the gains from the natural liquidity providers are significantly lower than the corresponding costs on the other end of the distribution. The difference is in a rough sense the frictional cost of implementing investment ideas.

We next created a side-by-side comparison between the size distribution of our institutional trading population and the distribution of NYSE trades as reported in the 2002 New York Stock Exchange Fact Book.

Shares ()	less than 2100	2100 - 5K	5k - 10K	10K - 25K	25K - 100K	100k - 250K	250 K +
	Percentage of Orders						
Managers	46.2	13.7	9.5	10.3	11.2	5.6	4.1
NYSE *	84.9	7.6	3.9	2.6	0.9	0.8	0.02
	Percentage of Dollars Traded						
Managers	1.1	1.2	17.6	4.4	18.6	21.6	35.4
NYSE *	12.9	4.2	44.5	6.9	9.2	21.3	1.1

* Source: 2002 NYSE Factbook

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Exhibit 3. Comparison of Institutional Order Size to Exchange Trade Size (Percentage of Orders)

At the upper end of trade sizes, greater than 25,000 shares, you can see

what Bob Schwartz referred to as *latent demand.* We also call it *big block demand.* It is very significant: 22% of total institutional orders were in the big block range. Yet less than 2% of all NYSE executions fall into that size category. With respect to dollars, the differential is similar though not as egregious. Seventy six percent of the total institutional dollars are represented by that 100,000 share-and-up category, while only 31% of the dollars traded on the exchange represent that type of size. This notion of structural dissonance becomes clearer as we delve deeper into the data.

Why do managers trade in such large sizes when we all know that trading in size is costly? To approach this question, we look at what we will call 'the success of the decisions themselves.' Consider the six-month performance, which is perhaps a classic value orientation of six months or longer.

Trade Size	5 days		1 day		5 days		6 weeks		6 months	
Quintile	Pre-trade		Pre-trade		Post-trade		Post-trade		Post-trade	
	Buys	Sells	Buys	Sells	Buys	Sells	Buys	Sells	Buys	Sells
1(smallest)	0.50	0.65	0.09	0.16	0.86	0.57	3.73	3.20	-3.71	-4.12
2	0.58	0.24	0.24	-0.13	1.22	-0.16	3.26	2.01	-8.87	-9.18
3	0.39	0.03	0.29	-0.19	1.38	-0.18	3.34	1.86	-9.22	-9.70
4	0.46	-0.24	0.32	-0.44	1.47	-0.32	2.91	1.59	-10.59	-11.18
5(Largest)	0.42	-0.79	0.27	-0.34	1.16	-1.05	2.32	0.00	-11.64	-13.19
					2.21		2.32		1.55	

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Exhibit 4. Median Buying / Selling Price Changes Equal Dollar Quintiles / Rising Market[7]

[7] The good news in this table is that the median price performance on the buy orders exceeds that of the sells. All the net gain differences are positive. Within the largest-order fifth quintile, a net difference of 2.42% opens up within a week, sustains for at least six weeks, and then declines to 1.25% within six months. That is, the managers who made these buys

You can see that, in almost every case, in every quintile, the decision value is not large enough to support the costs incurred to implement these decisions over a period of six months. And remember that these results occurred in a rising market. The differential decision value is even more egregious as you go up in size.

It is tempting to think of the large trades as the ones that are most important to the managers because they are 'dripping' with informational content. However, the data do not support this view. On the basis of return capture, it seems more likely that these giant trades fall more into the category of portfolio diversifiers and longer term strategic bets. The results suggest that a penalty is incurred: the portfolio becomes unwieldy having such a large sum to manage. Based on the success of the decisions, one wonders if these trades are really necessary. Are they an inexorable part of the overhead cost of managing a very large fund?

The good news is that there is value in the security selection process. As we noted above, buys always outperform the sells,[8] except for the smallest trades over the shortest time frames. As I said before, the buy-sell differential increases with the size of the trade. For the largest trades, a 2% to 2.5% buy-sell differential establishes itself in a week and sustains itself for at least six months. That might be considered the good news. But do large trades outperform small trades after the costs of implementing the decisions? No, they do not.

The larger the trade, the worse the return across the entire distribution (Exhibit 5).

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in toto and financed the purchase with the proceeds of the sells in toto would have added value to the portfolios, excluding transaction costs. With few exceptions, the higher the quintile, the greater the differential, suggesting that the large trades are the most profitable. The not-so-good-news, however is that as the horizon lengthens out to six weeks and six months, the value of the buy decisions in the higher quintiles dissipates strongly, so that the smaller buy decisions appear to be much better decisions six months out.

[8] There are two possible reasons for this. Managers are reacting correctly to changing prospects in the companies they are buying and selling. Alternatively, institutional buying pushes stock prices up while institutional selling pushes prices down.

		← Percentiles of Return Distribution →				
	Sample	5th	25th	50th	75th	95th
Quintile 1	444,485	-22.9	-4.3	3.7	11.8	31.0
Quintile 2	22,906	-24.0	-5.0	3.3	11.8	30.5
Quintile 3	8,340	-23.1	-4.6	3.3	11.0	28.0
Quintile 4	3,527	-23.2	-4.9	2.9	10.0	25.3
Quintile 5	1,303	-24.2	-5.2	2.3	10.1	25.2

The larger the trade, the worse the return -- across the whole distribution.

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Exhibit 5. Range of 30-Day Institutional Buy Returns (Equal Dollar Quintile Medians)

Something about decision value and the ability to implement good investment ideas emerges from our data. It challenges the need for the large block trading that is taking place. It suggests that portfolios can become too large to maneuver in today's shallow markets.

To summarize, we do not see much decision value differentiation by trade size. At the fifth percentile of returns, large decisions do worse. For median returns, the large decisions do worse. And for the 95 percentile of returns, the large decisions were much worse at decision capture. Managers pay a lot more to execute these big trades, and the information value does not appear to justify the cost. The alpha appears to be 'paid away.'

We need to ask if there is something systemically wrong with the process of capturing an information edge. As large trades are forced to stretch out over time, do middlemen and other prying eyes take away some of the alpha advantage that comes from quality research? If the large decisions are not particularly driven by information, do market makers really suffer from informed trader risk? The data indicate that the information disadvantage is

not stronger for large trades than for small trades.

We next tackled the question, 'Over what time horizon, post decision, is my information edge most effective?' The results are shown in Exhibit 6.

Center cell (0.45): Median Buy Return (1.38) *less* Median Sell Return (-0.18) *Less* Median Buy Cost (-.64) *Less* Median Sell Cost -.47)

	1 Day	5 Days	30 Days	125 Days
1 (small)	0.03	0.12	0.36	0.25
2	0.23	0.54	0.42	-0.53
3	-0.02	0.45	0.37	-0.64
4	-0.25	0.28	-0.19	-0.92
5 (large)	-0.75	0.04	0.15	-0.62

- **Caveat: The sum of medians is not equal to the median of the sums! (It could be worse: doing arithmetic on quartiles!)**
- **Nonetheless: hints that:**
  - **Small to medium trade sizes perform best.**
  - **Net value of decision peaks early; turnover implications.**

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Exhibit 6. A Suspect Computation! Median % Return Differentials Less Median Round Trip Costs

The data suggest that decision value peaks very quickly: within five days of our particular sample set. Within 125 days, with our sample set, net decision value is negative in all cases with the exception of the smallest trading quintile.

Our theory is that total transaction costs are determined by the perceived value of the research triggering the decision. Investors will continue to trade until the price approaches fair value within an amount less than the total transaction cost of the most efficient trader.

Finally, we turn to Exhibit 7, which contrasts results for the up and down market samples.

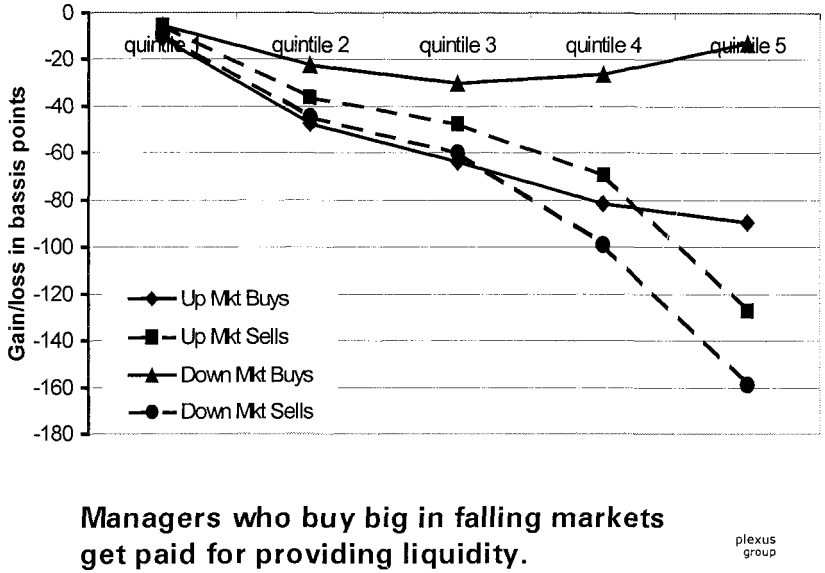

Exhibit 7. Cost of Trading. Up & Down Market Contrast

Many of you may have suspected this already, but in up markets, buying costs increase. In down markets, selling costs increase, and they are dramatically linked to trade size. Our observation is that managers who buy big in falling markets get paid significantly for the provision of liquidity.

Let's return to the original question about exogenous versus endogenous factors. Is this meat grinder approach to trading institutional orders natural (exogenous, deriving from the desires and habits of the investors), or is it structural (endogenous, deriving from the nature of the exchange)? Alternatively phrased, is it an artifact of the essentially retail nature of the exchange?

The meat grinder appears clearly in all of our data sampling. Trading costs seem to be much more related to endogenous market factors, structure, and process, than to exogenous factors derived from investor behavior. Trades get done, obviously. The question is whether what you are required to pay can be justified by the value received. Cost is inevitable. Cost represents a necessary discipline on the market. Yet do we, as investment

professionals, really understand what it costs us to implement our investment ideas?

While costs may be inevitable and unavoidable, the consequences of liquidity demand during high information moments appears to be poorly understood by professionals. Managers seem to pay up for size even though the information value may not be there, even though it may not appear to support investment returns over time. Our data hint at evidence of 'lucrative friction,' which we define as unnecessary inter-positioning, leakage to prying eyes, and the resulting increase in delay and impact costs.

Take a peek at a simple statistic. In 1982, there were about 1,000 investment managers servicing the market. Today there are over 8,300. Those are a lot of pairs of eyes watching trading action. Bob Schwartz noted this earlier. Everyone wants to play poker, and everyone is trying to out-bluff everyone else. Traders on the buy-side want to see, but they do not want to be seen. Yet advertising the desire to trade is a necessary requirement to draw out the liquidity that allows the trade to be completed. Electronic trading, ATSs and ECNs are a partial solution, but they are not the full answer. We need a trustworthy human intelligence factor at the core of the market.

We have one last point to make. John Phelan is alleged to have said, 'Technology and communication bring efficiency. Unfortunately, money is made in inefficiency.' It was a lighthearted comment. We hope that he was joking. Thank you everybody.

DOREEN MOGAVERO[9] [From the Floor]: On your first slide you showed an execution and a chart with that execution. You classified that execution as a damn fine execution. If I had had that order in its entirety as a not held order throughout the day, my customer would not have classified that as a damn fine execution to me. It would seem to me it would have been mediocre at best, as it was done in the middle of the day at a medium price on the chart. Can you tell me what you think the difference in mindset is for a human execution versus an electronic execution?

PHINNEY: The difference in perspective between your client's view and the representation made by the trader?

MOGAVERO [From the Floor]: That would be one way of looking at it (laughter).

PHINNEY: I think that is the answer. The communication of best

[9] Doreen Mogavero is President & CEO at Mogavero, Lee & Company.

execution is sometimes an art form. When we use the term DFT with a particular trade, we are judging it from the perspective of the money owner, and his prime agent, the portfolio manager. I think it is in who is conveying what to whom at the end of the day.

HENRY WAELBROEK[10] [From the Floor]: You made the point that there is really no statistically significant trader information risk in the larger block trades than in the smaller ones. I think that is a very important point for those of us who worry about creating systems that enable people to execute very large trades. We know that institutional traders are instinctively fearful of larger orders. Is this fear a product of the market structure itself? Do defects in the market structure cause larger orders to create excessive market impact because of the essentially parasitic activities of traders who front run and penny jump ahead of the institutional orders, once the orders are detected?

PHINNEY: A suggested substitution for the entire paragraph: Dealer risk is measured in principal risk to his capital. The larger the trade, the more significant the capital risk. Thus dealers would be disinclined to taking on large positions, especially when they fear more orders may lie behind it. However, our data consistently show that, on average, the search for liquidity in very large transactions consumes most of the decision value. Perhaps these large orders are not as much information-laden as they are liquidity-consumers.

PENG: Next, Avner Wolf, Asani Sarkar and Bob Schwartz will share their recent research with us.

AVNER WOLF: This presentation is on institutional order flow and market quality. In it we identify three objectives with respect to market quality: efficient price and quantity discovery, acceptable price volatility, and reasonable trading costs. We underscore two problems with respect to institutions' interaction with price and quantity discovery. First, institutions avoid active price discovery, mainly because large traders know that their orders can impact market prices. Second, buy and sell orders that could ideally meet, lie unexecuted in traders' pockets. The unrevealed institutional orders can represent a huge latent demand to trade. This second issue will be addressed shortly by my co-authors.

Market structure is not working for institutional investors. Their orders (the pegs) are large and their opportunities to trade (the holes) are tiny. The

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[10] Henry Waelbroek is Director of Research at Pipeline Trading Systems, LLC. At the time of the conference, he was with e-Xchange Advantage.

institutions slice, dice, and shred their orders. The result is high transaction costs, high volatility, and high latent demand.

To study these issues, we have considered trades of less than 5,000 shares to be retail trades, and trades of 5,000 shares and more to be institutional trades. We found half-hour volatility to be high, and that the high volatility is attributable mainly to the institutional orders, not the retail orders. We have also found that institutional order flow is two-sided (not one-sided), and that institutional trades tend to bunch in half-hour intervals.

We have measured volatility as a stock's high-low price range over a half-hour interval. We have half-hour intervals for 100 stocks (50 large cap Nasdaq stocks and 50 large cap NYSE stocks), for 20 days (in June 2001), for 13 half-hour periods a day. This gives us 100 x 20 x 13 = 26,000 observations. These observations were used to run a regression in which the dependent variable is a stock's high-low price range in a half-hour interval. Our four independent variables are:

1. A stock's market value
2. A stock's close-to-open return (the price change from the previous day's close to the current day's open)
3. The number of trades less than 5000 shares in the half-hour interval (the retail-size trades)
4. The number of trades equal to or greater than 5000 shares in a half-hour interval (the institutional-size trades)

Summary statistics for the Nasdaq stocks are shown in Exhibit 8.

	All ½ Hrs		First ½ Hr	
	Mean	Median	Mean	Median
Hi/Lo %	2.24	1.50	3.61	2.87
|Cl to Op Ret| %	1.66	.89	1.66	.89
# Trades < 5K	239.0	148	485.6	143
# Trades ≥ 5K	6.2	2.0	10.4	2.0
Ave Size < 5K	488	425	465	411
Ave Size ≥ 5K	11,837	9,600	11,041	9,446

Exhibit 8. Nasdaq Stocks

The mean percentage high-low range for all half-hours is 2.24. For the first half-hour it is 3.61. Note the relative amount of activity in the first half-hour compared to all half-hours. Look at the amount of volatility as reflected in the high-low ranges. Yesterday I spoke to Bob. I looked at the number and said, 'this is a huge number.' I asked Bob to give me a number for the volatility for the day. He picked 5%. Look at this number. Those of you who think that this is high volatility raise your hand. Be brave. Many hands are raised. Thank you.

ROBERT SCHWARTZ: How many don't think the number is high?

WOLF: Yeah, how many don't think that it is high? Very few.

Let me give you some intuitive feeling for this. If this number that we see in Exhibit 8, or the 5 % number that Bob gave me, were to translate to an annual volatility, it would be about 80%. David Krell is here, he may comment on this volatility. This means that, if a stock's price right now is

$20, it would, with fairly high probability, fluctuate between $5 and $65 within one year. This is huge. Clearly this is something that we want to look at, analyze, and understand. We found similar results for the NYSE (Exhibit 9).

	All ½ Hrs		First ½ Hr	
	Mean	Median	Mean	Median
Hi/Lo %	0.67	0.51	1.18	0.98
|CI to Op Ret| %	0.70	0.40	0.67	0.40
# Trades < 5K	42.4	30	49.0	36
# Trades ≥ 5K	4.2	1	6.4	2
Ave Size < 5K	719	682	823	806
Ave Size ≥ 5K	13,689	10,044	15,716	12,014

Exhibit 9. NYSE Statistics

Volatility is lower, but basically the results are the same. There is more activity in the first half-hour compared to all half-hours.

As to our four independent variables, we found the following. First, the Nasdaq stocks. Look at Exhibit 10.

	a	Mkt Value	Close to Open Ret	# Trades < 5,000	# Trades ≥ 5,000	$\bar{R}^2$
All 1/2 Hrs						
Parameter	0.192	-.0084	+0.189	+1.01e-06	+ .0005	
t statistic	14.32	-13.64	+3.19	+ 6.73	+ 4.49	**0.438**
(13,000 obs)						
First 1/2 Hr						
Parameter	0.228	-.0096	+0.250	+7.43e-06	+.0004	**0.419**
t statistic	5.59	-5.087	+2.035	+2.64	+1.81	
(1,000 obs)						

Exhibit 10. Half-Hour High-Low Regression Results: 50 Nasdaq Stocks

For market value, as expected we got a negative coefficient. In the two cases (all half-hours and the first half-hours), market value is statistically significant. For the close-to-open return, as expected we got a statistically significant positive coefficient. For retail trades (less than 5000 shares), we got results that are positive and statistically significant, but the coefficients are tiny, they are very small compared to the coefficient for the number of trades greater than 5000. Here it is statistically significant. Most important, the adjusted R^2s are very high. This means that these regressions are meaningful. We should pay attention to them – especially to the number of trades greater than 5000.

The results for the NYSE stocks are quite similar (Exhibit 11).

	a	Mkt Value	Close to Open Ret	# Trades < 5,000	# Trades ≥ 5,000	$\bar{R}^2$
All 1/2 Hrs						
Parameter	0.063	-.0027	+0.040	+6.40e-05	+ .0002	
t statistic	19.07	-17.91	+2.49	+16.56	+ 10.96	**0.361**
(13,000 obs)						
First 1/2 Hr						
Parameter	0.094	-0.004	+0.103	+9.46e-05	+.0003	**0.373**
t statistic	9.95	-9.23	+2.16	+5.91	+4.55	
(1,000 obs)						

Exhibit 11. Half-Hour High-Low Regression Results: 50 NYSE Stocks

Again, market value is negative and statistically significant. Close-to-open returns are positive and statistically significant. Trades less than 5000, is positive, tiny, but statistically significant. Trades greater than 5000 is positive, statistically significant, and clearly more important than trades less than 5000 (even though there are many fewer of these trades). Once gain, the R^2s are all reasonably high. Once more, we find that this regression is very meaningful.

We must focus on these volatilities. The traders among you will know that they are high. We need to look at them and to explain them. Hey Asani, what explains this? Take the baton and run with it.

ASANI SARKAR: Avner showed that the large trades produce substantially more volatility than the smaller trades. I will talk about the source of this volatility. One obvious potential source is news. News would

cause markets to be one-sided (buy orders only or sell orders only). But we find that markets tend to be two-sided – namely, there are both buy-triggered and sell-triggered trades occurring jointly in half-hour intervals. Thus, news does not appear to be the main source of this volatility.

To analyze this, we have classified trades in the usual way. Buy-triggered trades are the ones that hit the offer, and sell-triggered trades are the ones that hit the bid. With the trades classified, we count the number of large buy-triggered trades and the number of large sell-triggered trades in each half-hour interval. We then look at every possible combination of large buy and large sell trades, and count the percentage of half-hour intervals that have each specific combination.

To illustrate, let's take one specific combination – two large buy-triggered trades and one large sell-triggered trade. We count how many half-hour intervals have that specific combination. Lets suppose that X% of the half-hour intervals have this combination. We create a matrix and put this X% number in the 2,1 cell (Exhibit 12).

Percentage of Total Arrivals in the 1/2 Hr Windows

Number BUY – Triggered	**Number SELL – Triggered**							
	0	1	2	3	4	5	>=6	
0								
1								
2		**X%**						
3								
4								
5								
>=6								
								100%

The [2,1] Cell

Exhibit 12. Combinations in Matrix Formation

The total of the percentages in all of the cells in the matrix will add up to 100%.

Suppose markets are one sided. What would this matrix look like? First, assume that there is good news and only buy-triggered trades. In such a case, all of the trades would be concentrated in the first column (Exhibit 13).

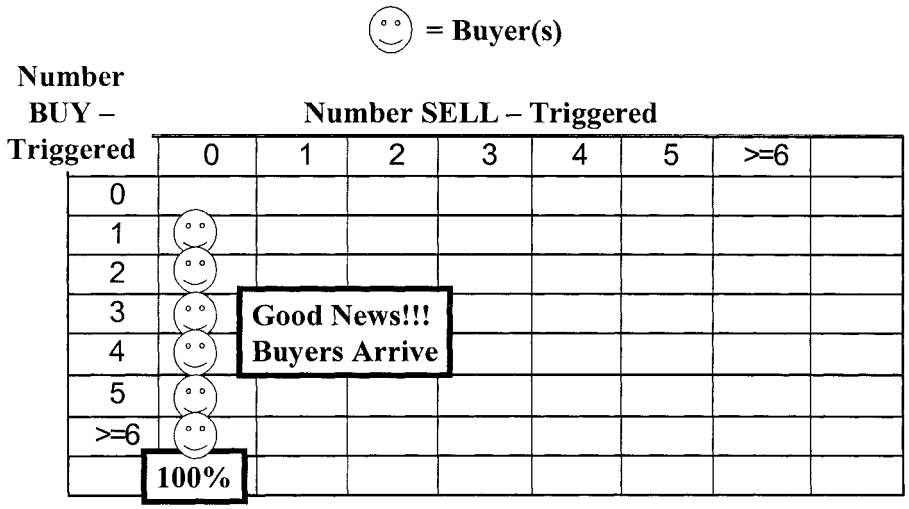

Exhibit 13. If Good News and Buyers Only

Alternatively, if the news is bad, there will only be sell-triggered trades. In this case, all the large trades would be concentrated in the first row (Exhibit 14).

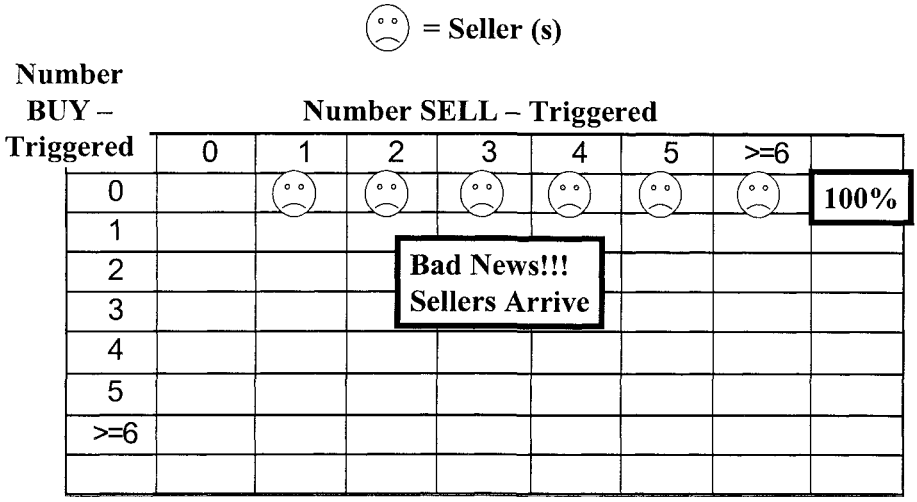

Exhibit 14. If Bad News and Sellers Only

More generally, with good news and bad news alternately arriving in different half-hour windows, the observations would be on the borders – the first row and the first column (Exhibit 15).

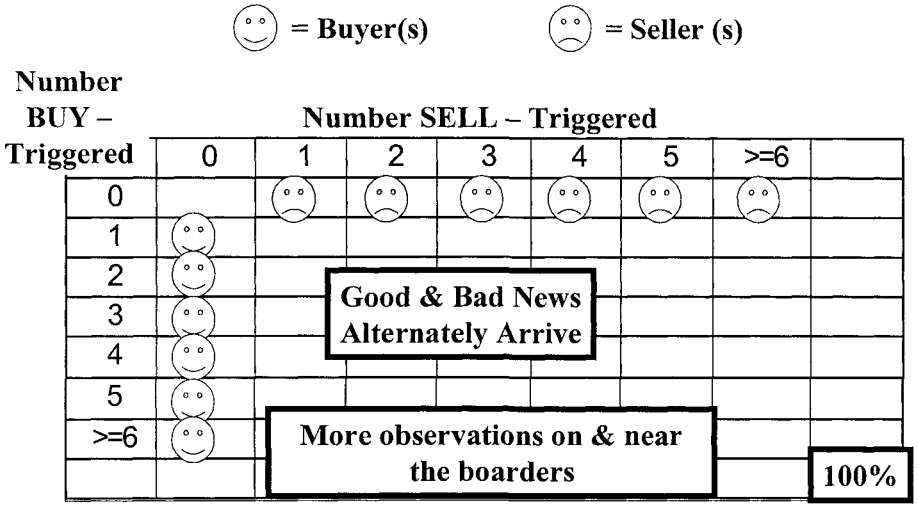

Exhibit 15. If News is Good in Some ½ Hrs and Bad in Others

What would happen if, instead of being one-sided, the orders are two-sided? In this case, we would find that many of the observations would be on and near the diagonal rather than on the borders (Exhibit 16).

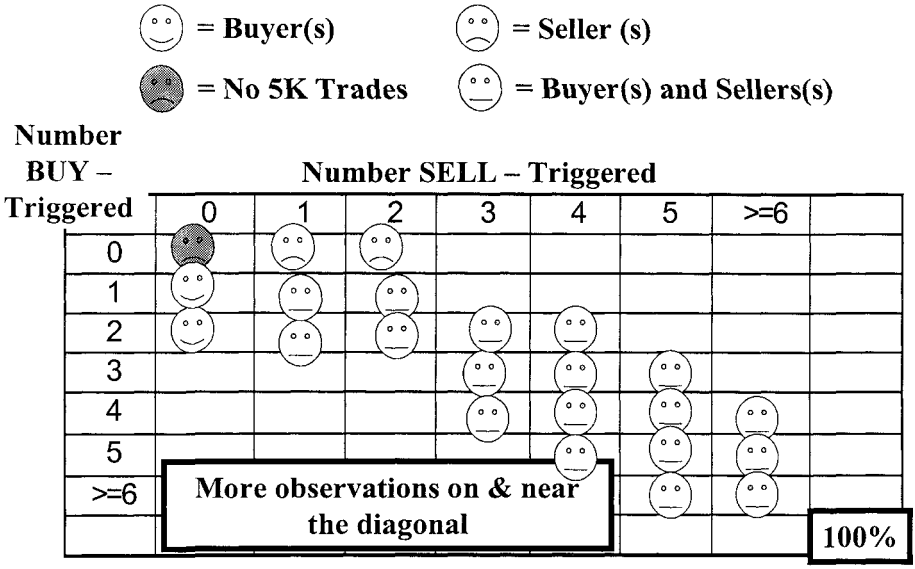

Exhibit 16. If Markets are Predominantly 2-Sided

Further, if the markets are two-sided and there is clustering, we would find that a lot of these observations would be bunched in the upper left hand corner (the 0,0 cell) and in the lower right hand corner (Exhibit 17).

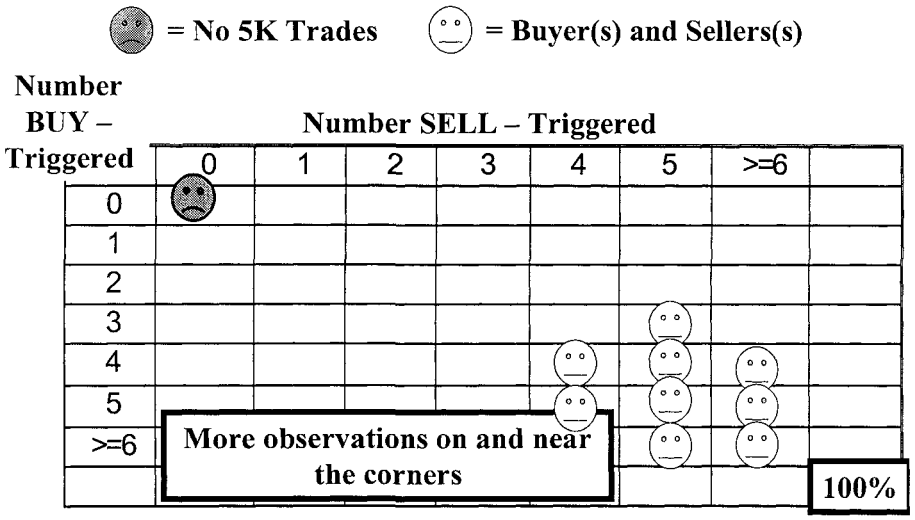

Exhibit 17. Strong Clustering

In other words, if nobody is trading, then nobody else will be trading. Alternatively, if people are trading a lot, then more people are attracted to trade.

We have these three patterns (Exhibit 18).

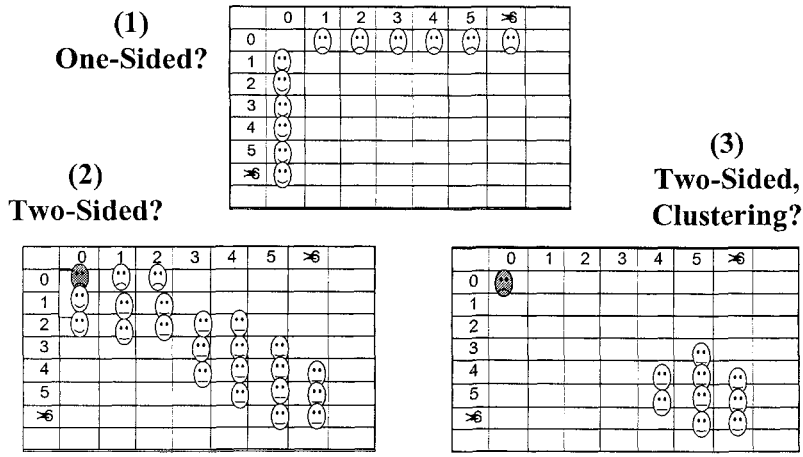

Exhibit 18. Which Pattern Did We Find?

One possibility is one-sided – how many people in the audience think that one-sided patterns predominate? Almost nobody. How about two-sided (observations on the diagonal)? How many people think that two-sided markets predominate? Only a small number as well. How about the final possibility – two-sided with clustering (observations in the 0,0 cell and in the lower right corner)? OK, more of you think it is this one. Which did we find?

The results for Nasdaq are shown in Exhibit 19.

Number BUY – Triggered	Number SELL – Triggered							
	0	1	2	3	4	5	>=6	
0	37.62%	6.52%	2.70%	1.08%	0.50%	0.23%	0.47%	49.09%
1						0.42%	0.84%	16.13%
2						0.33%	0.90%	7.88%
3	0.90%	1.16%	0.92%	0.64%	0.44%	0.34%	1.08%	5.44%
4	0.41%	0.69%	0.58%	0.51%	0.44%	0.28%	0.92%	3.77%
5	0.29%	0.39%	0.48%	0.42%	0.34%	0.29%	1.11%	3.27%
>=6	0.34%	0.60%	0.92%	1.17%	1.00%	0.96%	10.41%	15.40%
	48.80%	14.21%						

37.62% of ½ hour periods had no trade ≥ 5000 shares

10.41% of ½ hour periods had 6 or more buy-triggered trades and 6 or more sell-triggered trades

Exhibit 19. Nasdaq All Day (Actual Arrivals)

This is for all of the half-hour intervals throughout the day. This is the matrix that I was talking about. Each cell of the matrix is filled in. What we find is that the entry for the 0,0 cell (no large buy or sell trades) is 38%. The entry for the lower right-hand corner of the matrix (the 6+, 6+ cell) is close to 11%.[11] These are the two largest numbers in the matrix.

Those were the actual trades. Suppose that trades are in fact independent and unclustered. What would the expected arrival of trades then be? Hypothetically, what would the matrix then look like? The entry for the 0,0 cell would be less than 1%, and the entry for the 6+,6+ cell would be even smaller (Exhibit 20).

[11] By 6+ we mean six trades or more in a half-hour period.

Number BUY – Triggered	Number SELL – Triggered							
	0	1	2	3	4	5	>=6	
0	**0.61%**	1.54%	1.96%	1.67%	1.06%	0.54%	0.35%	7.73%
1	1.58%	3.95%	5.03%	4.27%	2.71%	1.38%	0.89%	19.78%
2	1.99%	5.06%	6.44%	5.46%	3.48%	1.77%	1.14%	25.33%
3	1.70%	4.32%	5.49%	4.66%	2.97%	1.51%	0.98%	21.62%
4	1.09%	2.78%	3.52%	2.98%	1.90%	0.97%	0.62%	13.84%
5	0.56%	1.41%	1.80%	1.53%	0.97%	0.50%	0.32%	7.09%
>=6	0.36%	0.92%	1.17%	1.00%	0.63%	0.32%	**0.21%**	4.62%
	7.84%	19.96%	25.41%	21.58%	13.72%	6.99%	4.51%	100.00%

Exhibit 20. Expected Arrivals if Trades are Independent (unclustered)

We subtract the expected values from the actual values in the matrix to get the unexpected trading frequency. The results are shown in Exhibit 21.

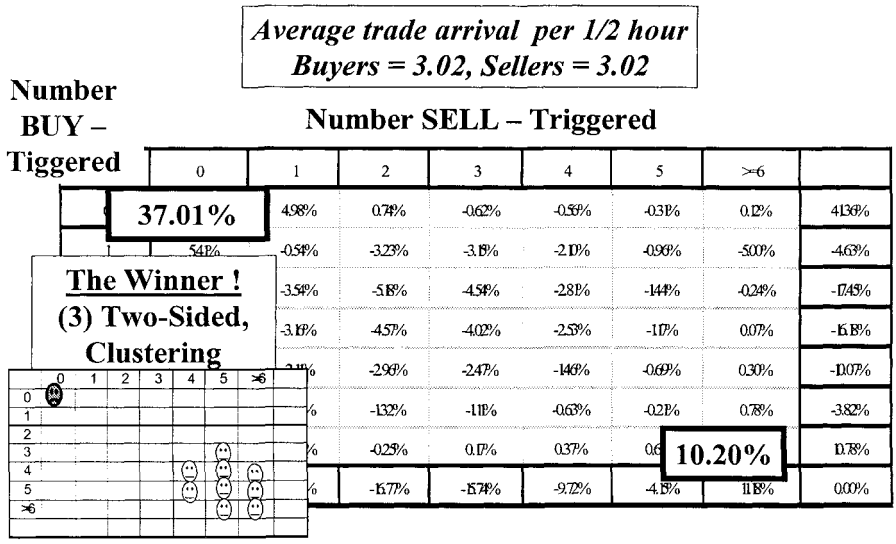

Exhibit 21. Nasdaq All Day (Actual Minus Expected)

For Nasdaq, the difference between the actual and the expected value is 37% for the 0,0 cell, and 10% for the 6+, 6+ cell. This pattern is consistent with a market where trades are two-sided with clustering. Essentially, if nobody is trading, then nobody else will trade. It is like an empty restaurant – if no one else is in it, you do not go there yourself. Alternatively, you could have the 6+,6+ cell where there is a lot of trading. This is like a good party – everybody wants to go there.

We have repeated this analysis for the first half-hour intervals only (Exhibit 22).

Average trade arrival per 1/2 hour
Buyers = 5.08, Sellers = 5.1

Number BUY – Triggered \ Number SELL – Triggered											
		2	3	4	5	6	7	8	9	>=10	
0	**34.92%**	2.13%	1.32%	0.40%	0.23%	-0.05%	0.08%	0.09%	0.10%	0.22%	44.82%
1	6.00%	2.78%	0.99%	0.67%	0.04%	0.03%	0.13%	-0.13%	-0.12%	0.27%	0.28%	19.94%
2	2.12%	0.86%	0.62%	0.00%	0.04%	-0.78%	-0.53%	-0.44%	-0.12%	0.08%	-0.07%	1.71%
3	1.13%	0.15%	-0.21%	-0.64%	-1.01%	-0.82%	-1.13%	-1.07%	-0.46%	-0.39%	0.22%	-4.18%
4	0.18%	0.47%	-0.56%	-1.58%	-1.77%	-2.05%	-2.13%	-1.45%	-0.88%	-0.45%	-0.17%	-10.49%
5	0.35%	-0.28%	-0.52%	-1.49%	-2.39%	-2.67%	-2.47%	-1.57%	-0.92%	-0.68%	-0.08%	-12.59%
6	-0.10%	-0.38%	-1.18%	-1.92%	-2.52%	-2.81%	-2.28%	-1.74%	-1.11%	-0.29%	0.44%	-13.89%
7	0.03%	-0.18%	-0.82%	-1.78%	-1.93%	-2.21%	-1.75%	-1.45%	-0.92%	-0.52%	0.09%	-11.44%
8	-0.06%	-0.30%	-0.68%	-1.06%	-1.54%	-1.58%	-0.99%	-0.94%	-0.44%	-0.38%	-0.01%	-7.92%
9	-0.04%	-0.13%	-0.49%	-0.83%	-1.06%	-0.86%	-0.81%	-0.34%	-0.20%	-0.24%	-0.11%	-5.13%
>=10	-0.04%	-0.22%	-0.58%	-0.72%	-0.87%	-0.58%	-0.15%	-0.20%	0.13%	0.17%	**11.08%**	%
	44.52%	8.03%	-1.20%	-7.97%	-12.62%	-14.02%	-2.10%	-9.32%	-4.91%	-2.37%	11.94%	0.00%

Exhibit 22. Nasdaq First Half-Hour (Actual Minus Expected)

The results are very similar. There are many observations in the 0,0 cell (no trades at all), and many more observations than expect are clustered in the 10+, 10+ cell.[12]

Lets look at the NYSE (Exhibit 23).

[12] By 10+ we mean ten trades or more in a half-hour period.

Average trade arrival per 1/2 hour
Buyers = 2.31, Sellers = 1.70

Number BUY – Triggered	Number SELL – Triggered											
	1	2	3	4	5	6	7	8	9	>=10	
0	**38.26%**	-0.39%	-0.64%	-0.27%	-0.02%	0.03%	0.03%	0.02%	0.02%	0.02%	-4.06%
1	3.89%	-3.57%	-4.23%	-2.48%	-0.92%	-0.13%	0.05%	0.07%	0.03%	0.02%	0.06%	-7.21%
2	-1.00%	-6.00%	-5.63%	-3.11%	-1.13%	-0.26%	0.03%	0.04%	0.04%	0.04%	0.13%	-17.58%
3	-2.44%	-5.09%	-4.37%	-2.50%	-0.90%	-0.09%	0.04%	0.04%	0.03%	0.03%	0.07%	-15.18%
4	-1.49%	-2.97%	-2.35%	-1.22%	-0.44%	0.04%	0.10%	0.07%	0.10%	0.03%	0.13%	-7.92%
5	-0.53%	-1.26%	-0.98%	-0.50%	0.00%	0.15%	0.17%	0.14%	0.13%	0.04%	0.03%	-2.51%
6	-0.20%	-0.39%	-0.22%	0.03%	0.13%	0.17%	0.13%	0.15%	0.09%	0.10%	0.15%	0.13%
7	0.08%	0.08%	0.08%	0.11%	0.13%	0.13%	0.07%	0.09%	0.07%	0.03%	0.12%	0.97%
8	0.10%	0.09%	0.16%	0.14%	0.22%	0.12%	0.12%	0.10%	0.05%	0.07%	0.13%	1.41%
9	0.08%	0.07%	0.09%	0.15%	0.13%	0.16%	0.09%	0.09%	0.09%	0.03%	0.03%	1.22%
>=10	0.11%	0.23%	0.37%	0.37%	0.50%	0.57%	0.44%	0.42%	0.42%	0.34%	**2.23%**	%
	36.18%	-15.39%	-17.43%	-9.68%	-2.51%	0.82%	1.26%	1.30%	1.12%	0.85%	3.38%	0.00%

Exhibit 23. NYSE All Day (Actual Minus Expected)

We find very similar results. For the NYSE all day tests, there are many more observations than expected in the 0,0 cell and in the 10+, 10+ cell. The results for the NYSE first half-hour only tests are the same (Exhibit 24).

Average trade arrival per 1/2 hour
Buyers = 3.54, Sellers = 2.64

Number BUY – Triggered	Number SELL – Triggered										
	1	2	3	4	5	6	7	8	9	>=10	
0	30.39%	0.60%	-0.02%	-0.22%	-0.02%	-0.10%	-0.04%	0.09%	0.00%	0.00%	38.94%
1	7.57%	1.82%	-1.08%	-1.52%	-0.77%	-0.37%	-0.24%	-0.08%	0.06%	-0.08%	0.00%	5.48%
2	1.84%	-1.62%	-3.10%	-3.36%	-1.72%	-0.67%	-0.51%	-0.13%	-0.06%	-0.02%	0.00%	-9.23%
3	-0.52%	-2.43%	-4.10%	-4.59%	-2.38%	-1.22%	-0.62%	-0.07%	-0.09%	0.07%	0.00%	-15.18%
4	-0.65%	-2.98%	-3.92%	-3.64%	-2.54%	-1.14%	-0.53%	-0.14%	0.33%	-0.02%	0.13%	-14.94%
5	-0.66%	-1.93%	-2.94%	-2.43%	-1.43%	-0.31%	0.06%	-0.07%	0.24%	0.08%	0.13%	-9.13%
6	-0.57%	-1.40%	-1.57%	-1.23%	-0.84%	-0.30%	-0.16%	0.20%	-0.08%	0.13%	0.11%	-5.61%
7	0.01%	-0.18%	-0.59%	-0.68%	0.13%	-0.21%	-0.08%	0.22%	0.08%	0.11%	0.33%	-0.77%
8	-0.13%	-0.04%	-0.34%	-0.39%	0.15%	0.19%	0.04%	-0.02%	-0.08%	0.00%	0.20%	-0.37%
9	-0.08%	0.07%	0.08%	0.08%	0.00%	0.05%	0.08%	0.09%	0.11%	0.11%	0.62%	1.12%
>=10	-0.03%	-0.07%	0.52%	0.73%	0.36%	1.49%	0.50%	0.61%	0.44%	0.88%	**5.47%**	
	3.73%	-0.46%	-1.67%	-1.10%	-0.24%	-2.54%	-1.52%	0.65%	1.11%	1.29%	7.24%	0.00%

Exhibit 24. NYSE First Half-Hour (Actual Minus Expected)

So, our findings of clustering are consistent for both the NYSE and Nasdaq, and for both the first half-hour and for all day. Bob will now explain what we can make of this.

SCHWARTZ: One thing that we can make of it is that the arrival of trades is not the result of news per se. Neither is it the result of a coin flip. Rather, it is caused by something inherent in the trading process. Markets are commonly two-sided. There are both buyers and sellers triggering trades. John Phinney, as you were talking, I was thinking about some of your results in this context. At a time when two large participants are trading, but not with each other, and neither may turn out to be a winner. That has implications for market structure.

We have some observations on the borders (the top row and the left hand column). To some extent, this is the result of big orders being sliced and diced. Because of slicing and dicing, I would say that our findings may be conservative. Our results, though conservative, suggest that large trades attract additional large trades. When there is action, there is indeed action!

Doreen Mogovero, I promise you that, in two panels, I will ask you about this.

Isn't it funny to be talking about a 5000 share institutional order when you guys want to trade 300,000, 500,000, or more? The big orders are much larger, but the pieces they are broken into aren't. You might ask why we took 5000 shares as the dividing line between big and small trades. It is because, if we had taken a 10,000-share cut, we would have had hardly any observations. We wouldn't have had a study. Further, not many retail customers submit orders larger than 5,000 shares.

Assume that a stock's price is 50 and that good news comes out. Large trades come in and price goes to 53. This could give us a three-point high-low range. Similarly, if it is bad news, a three-dollar price drop could result in a three-point high-low range. News certainly could explain it. But should we get this large high-low range with a two-sided market? Possibly, but if buyers and sellers both trigger trades in the same half-hour interval, we suggest that a large high-low range is attributable, not to news, but to how the orders are handled. This is the thinking that led us to our study.

The markets could be a whole lot more efficient. The big orders are not meeting each other efficiently. For a moment, lets step back from market structure per se and talk about how a buy-side trading practice may also be accounting for this. I want to give you some results from a study that I did with Benn Steil.[13] Benn and I surveyed 72 chief investment officers at major asset management firms in North America, Europe and Australia.

We asked the chief investment officers what they believe the liquidity of a market is attributable to (Exhibit 25).

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[13] Reprinted with permission from Institutional Investor, Inc. 'Controlling Institutional Trading Costs: We Have Met the Enemy, and it is Us,' Robert A. Schwartz and Benn Steil, *The Journal of Portfolio Management*, Volume 28 Number 3, Spring 2002, pp. 39-49.

scale: 5 ("very frequently," or 75-100 percent of the time) to 1 ("never")

Because buyers and sellers:

Receive similar information but disagree in their interpretations	3.97
Have different portfolio objectives	3.65
Have different cash flows at a given point in time	3.31
Receive different information about stocks	2.79

Three cheers for two-sided markets!

Exhibit 25. Why CIOs Believe That 'Markets Are Liquid'

The number one reason that they pointed to is that participants receive similar information but disagree in their interpretations of the information. *Disagreement* in the interpretation of news underlies a lot of what drives trading. The lack of agreement amongst participants on the fundamental determinants of share value is one of the relatively unstudied aspects of market structure. But by gosh, that is why we have trading. It is disagreement that leads to two-sided markets and trading.

What do the CIOs look at when they judge the quality of the executions that they get? Look at Exhibit 26.

scale: 1 ("not at all important") to 5 ("very important," or 75-100 percent of the time)

Little or no market impact	3.95
Speed	3.42
Not revealing the full size of order to market	3.40
Not revealing the identity of company or fund	3.21
Within the current market inside spread	3.06
Price better than the VWAP	2.93
Low or no commission	2.29

Exhibit 26. Factors Important to CIOs on Judging the Quality of Execution for Large Orders

The most important consideration is that their orders have little or no market impact. Market impact should be first. The second most important consideration is speed. Why speed? Is it demanded for endogenous reasons or for exogenous reasons? An endogenous demand would mean that portfolio managers have their own internal reasons for wanting to trade quickly. An exogenous demand would mean that the portfolio managers would be willing to trade at a different time, but that market structure induces the demand for immediacy. Why might market structure do this? Because of information leakage and front running.

Let's turn to three more questions from the survey that focus on time. First, in their purchase decisions, what weight do the portfolio managers give to their expectations of what price will be one day into the future, one week into the future, or up to two years or more into the future? The responses to this question are shown in Exhibit 27.

scale: 5 ("very great") to 1 ("none")

	5	3	1	Mean
One day	0.0%	12.1%	65.1%	1.53
One wk	0.0%	20.0%	53.8%	1.72
One mth	0.0%	32.3%	33.9%	2.20
One qtr	6.2%	29.2%	23.0%	2.80
One yr	34.3%	20.8%	11.9%	3.69
Two yrs or more	53.7%	11.9%	11.9%	3.94

Exhibit 27. In Stock Purchase Decisions, Weight Given to Estimate of Share Price in...

The predominant answer was not 'one day' or 'one week.' Rather, it was 'one year' or 'two years.'

Second, how much time do the portfolio managers typically take to make a buy decision? The survey responses are shown in Exhibit 28.

scale: 5 ("very frequently," or 75-100 percent of the time) to 1 ("never")

	5	3	1	Mean
Less than one hour	3.1%	13.8%	30.8%	2.05
One hour to one day	7.7%	41.6%	17.0%	2.66
Over day to one week	10.7%	27.7%	9.2%	3.15
One week to one month	7.5%	21.2%	12.1%	3.14
Over one month	15.2%	19.7%	18.2%	2.92

Exhibit 28. Time Typically Taken to Make a Buy Decision

Clearly, the PMs do not make snap decisions. The categories 'less than one hour' and 'one hour to one day' did not get many votes, not compared to the categories at the longer end of the spectrum. Look at 'a week to one month,' and at 'over one month.' 15% of the respondents checked 'very frequently' for 'over one month.' It appears that the time clock does not tick so fast for the PMs.

Third, if you believe that a stock is mispriced, what is the time expected for a price correction to occur? The responses are shown in Exhibit 29.

scale: 5 ("very frequently," or 75-100 percent of the time) to 1 ("never")

	5	3	1	Mean
less than one hr	1.6%	9.5%	60.3%	1.60
One hr – one day	3.2%	7.9%	52.3%	1.75
One day – one week	4.8%	17.5%	25.4%	2.29
One week – one mth	1.6%	32.3%	14.5%	2.81
One mth – one yr	15.9%	36.5%	6.4%	3.51
Over one year	19.7%	16.4%	9.8%	3.28

Exhibit 29. If a Stock is Believed to Be Mispriced, Time Expected for the Price Correction to Occur

The categories range from less than an hour up to over one year. On what end of the spectrum do you think the answers lie? The responses surprised me. Only 1.6% of the respondents checked 'very frequently' for 'less than one hour,' and only 3.2% had this response for 'one hour to one day.' In contrast, 19.9% checked 'very frequently' for 'one month to one year,' and 19.7% had this answer for 'over one year.' Apparently, the PMs expect corrections to be made over an extended period of time.

So, why is immediacy demanded? We suggest that the demand is exogenous, that it is a product of our trading systems. That is what we are here today talking about and thinking about. We have seen that the institutional part of the market is two-sided, and that it is common for big trades to cluster in time. The clustering of trades strongly suggests that institutional orders are portable in time.

The portability of orders, in turn, strongly suggests that, at any moment

in time, the institutions have a sizable latent demand to trade. A PM's demand to trade is latent because the order is in the trader's pocket rather than being out there in the marketplace where others can see it and interact with it. Avner, Asani and I suggest that a major market structure objective should be to bring latent demand in from the cold. We got that line from the novelist, Le Carré. Remember his book, *The Spy Who Came In From The Cold*? It was a thriller. Can we do it with latent demand? Latent demand is latent liquidity. There is a lot of potential power out there. We should bring it in from the cold.

LIN: We have a few minutes for questions.

MICHAEL SCOTTI[14] [From the Floor]: We had done that survey together when I was at Trader Forum.

SCHWARTZ: Yes.

SCOTTI [From the Floor]: It was run during a rising market. That might have some influence on why portfolio managers needed to get their trades done right away. It was a growth market. That might have been a factor. I do not know if their thoughts would be different if you interviewed them today. Maybe the traders can tell you otherwise on the buy-side, but at the time that was definitely a strong growth market. That definitely had an influence. The survey was done in 1998 and 1999. That was definitely a bubble period.

SCHWARTZ: Yes, it could be, Michael. Larry Harris?

LAWRENCE HARRIS[15] [From the Floor]: To what extent is the clustering in your matrix due to the construction of the experiment? I believe that you pooled results across all the stocks. Some of the stocks are more actively traded and some are less actively traded. The more actively traded stocks would tend to pool in the lower right corner, and the less actively traded stocks would tend to pool in the upper left corner. This could give us the clustering, but not clustering within a given stock. Rather, it could be clustering across stocks.

SARKAR: I think our sample is all large cap stocks, so pretty much all of these stocks are trading frequently. But it is a good suggestion to make the study stock specific. We could do it stock-by-stock and see if there is a cross-sectional difference between the stocks.

SCHWARTZ: Could I add to that answer? That is a well-taken point

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[14] Michael Scotti is Director, Client Relations at KV Execution Services.

[15] Larry Harris is currently a Professor at the University of Southern California. At the time of the conference, he was Chief Economist at the U.S. Securities and Exchange Commission.

Larry. The implication of trading attracting trading has a cross-sectional application. I ought to add that we are probably closer to the beginning of this study than to the end. But the idea that trading attracts trading can also explain why there is more trading in bigger stocks. The basic point that we are making holds in both the intra-stock and inter-stock dimensions, but we should disentangle the two.[16] Thanks for the observation.

PENG: Thank you for an excellent panel.

[16] Additional work that we have done since the conference confirms that clustering does occur on the individual firm level. The results are presented in Sarkar, Schwartz and Wolf, 'Inter-temporal Trade Clustering in Two-Sided Markets: An Intra-Day Analysis, Baruch College working paper, 2004.

CHAPTER 2: INTERACTION BETWEEN INVESTMENT AND TRADING DECISIONS

Moderator – Charles Trzcinka, Indiana University
James and Virginia Cozad Professor of Finance
Andrew Brooks, T. Rowe Price Associates
Vice President and Head of Equity Trading
Peter Jenkins, New York Stock Exchange
Senior Vice President[17]
George Sofianos, Goldman Sachs
Vice President

CHARLES TRZCINKA: I am from Indiana University. I am a professor in the Midwest, which means that I know precious little about markets (laughter). But we have some panelists here who will talk a great deal about their experience with trading and portfolio management.

We will pay particular attention to transaction costs: the size of these costs, their relationship to management decisions, and how far they *should* effect management decisions. I would like each of the panelists to make a statement to get us started. Let's begin with you, Andy Brooks.

ANDREW BROOKS: First, when I woke up this morning in Baltimore it was dark. I saw on my dresser the Baruch Conference pen from last year. Bob, I still have it. I am happy to have it here with me today. Second, when Bob referenced somebody who commented at last year's conference that he or she was afraid of looking stupid immediately after a trade, that person was I.

I have a couple of observations about trading, portfolio management and the portfolio process. The investment process, from our perspective, is like

[17] At the time of the conference, Peter Jenkins was Managing Director at Deutsche Asset Management.

a three-legged stool. There is research analysis, portfolio management, and trading. We should make no mistake. Trading is the tail of that dog (to mix a metaphor). Trading is the smallest part of this process. Transaction costs can be enormous over time, but getting the right stock at the right time in the portfolio is without a doubt our biggest challenge. If we are successful in that, I do not care how much I pay up to execute an order. It is very small in relation to overall performance. We embrace a process that acknowledges that, and which tries to gauge the importance of immediacy in the trading process.

The previous panel talked about the size of orders, and about whether trades should be big or small. The reality is, we are in a game. Everybody is trying to seek an advantage. If we feel we have a timely informational advantage, we have got to transact in a way that captures that advantage. We are not better or brighter than everybody we are competing against, but we might be a little bit savvier. We might be a bit cleverer. We might be a bit earlier in a process. We want to capture that alpha and get it into a portfolio.

Chuck asked, do portfolio managers think about liquidity? Do they think about transaction costs and about trading? The answer is, you bet they do. It is not surprising that it might take somebody a month to decide to buy a stock and initiate a position. Once they have done that, they want instant gratification. It is human nature. They want to capture their idea and see it. They pull the trigger because they think the timing is right, and they want to have it done. However, if it is incremental, if they are adding it to a position, immediacy is not that important.

It is critically important to the investment process to have clarity of communication and a meaningful purpose for each and every trade that you have to make. We work on that everyday in our trading process. What are we trying to accomplish? How can we communicate that effectively to the broker dealer whom we employ, or to the markets that we go into? Are we really accomplishing what the portfolio manager wants done? And, by the way, does he really appreciate what he is asking us to do?

TRZCINKA: Thanks Andy. George, what would you add?

GEORGE SOFIANOS: I bring a different perspective here. I joined Goldman Sachs a couple of years ago. My mandate was to create a new research group within Goldman to study trading costs, to do research on trading cost analysis. This was to be done both for internal purposes and for our buy-side clients.

My buy-side client constituency kind of bifurcates. I have both the portfolio managers and the traders coming to me, each interested in our trading cost research and our trading cost estimates. But they come for different reasons. This bifurcation reflects the subject of this panel. The portfolio managers want trading cost estimates because they want to incorporate them – as they should – into their investment decisions. The traders want trading cost estimates for a different reason. They want to valuate their execution quality, and the quality of the executions they get from the various executing broker venues they send their orders to.

I will focus first on the portfolio mangers and the investment decision. Andy, you gave us one particular perspective, one type of buy-side perspective, one insight into how they think of trading costs when it comes to investment decisions. I had previously jotted a couple of notes when I was thinking about this. There are at least four different ways that trading costs are and should be incorporated into investment decisions.

First, there is the case where the portfolio manager is deciding on a single stock basis. That is, he is deciding which stocks to buy to incorporate into their portfolio, and how much to buy. This decision may be made using sophisticated econometric models, or a more traditional approach. Either approach is fine. In both cases, there is an increasing awareness of what you are tying to maximize as your net returns, your net alpha. You must have a way of estimating and backing out your trading costs. Of course this reflects the change in the environment. After the end of the bull market, trading costs that used to be a relatively small fraction of portfolio performance are now a much bigger fraction of returns, either net or gross.

Another type of investor – the program trader – thinks about trading costs in a slightly different way. Take the example of where this trader is trying to mimic a particular index, let's say the S&P 500. One way the program trader is using trading cost estimates is to evaluate the tradeoff between trading costs and tracking error. For example, within a given portfolio of 500 stocks, you might calculate how much trading costs are attributed to the less liquid stocks in the portfolio. The indexer might want to drop the stocks that account for most of the costs and accept a bit of tracking error. To make this determination, trading cost estimates must be incorporated into the analysis.

The third interesting constituency includes the hedge funds and the quant traders who are there trying to arbitrage mispricings that are usually short term – between the prices of different groups of stocks. These players are

particularly sensitive to trading costs, because these costs determine how much money can be made from the arbitrage activity. Consequently, they are an important constituency for trading cost estimates and trading cost analysis.

The fourth way is to decide which instruments to use to achieve the desired exposure in stocks. For example, should we buy a basket of stocks, or buy futures, or ETFs, or options? To make decisions across the various instruments, one must have an informed awareness of trading costs for all of the alternative instruments.

The point is that trading costs are, and should be, part of the investment decision. This becomes increasingly important in an environment where gross returns are harder to realize. Furthermore, we increasingly have better estimates of trading costs to use in making these calculations.

TRZCINKA: Thank you, George. Peter, it is your turn.

PETER JENKINS: Andy's desk and our desk are very similar in nature. They are both on the active side of the business.[18] I will not repeat what Andy said, but will add a couple of points. Mike Scotti said something very important today.[19] The environment in the 90s was a lot different than it is today. What we strategized to do as portfolio managers in the 90s was totally different from the way we work an order today. Our job as traders is to balance what the portfolio managers want and what the market structures will allow us to do.

One of the differences on our desk is that today we are focusing on the numbers. This is one way to work with the portfolio team. The portfolio team's strategy should be something different than, 'I just want to buy this stock' or 'I just want to sell this stock.' Of course, that is easier said than done. Gathering numbers, and slicing and dicing numbers is very difficult. We are now looking at these numbers on a daily basis. Five year ago, ten years ago, we looked at numbers on a quarterly basis, which was fine at the time. Today, we look at every single transaction. We do this, not only from the trader's side of our desk. We are also looking at the broker's performance and at the portfolio performance as well.

I had a conversation a while back with a portfolio manager when we

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[18] Both Peter Jenkins and Andy Brooks traded for active equity managers as opposed to passive fund managers, which are associated with quant desks.

[19] Michael Scotti, is the former Director of Trader Forum, and is currently Director, Client Relations at KVX Execution Services.

were in more of a down cycle. She is in a large product group, and her orders are generally very large. I told this portfolio manager her numbers on average, and she was quite surprised. I also told her that her trading costs were low, or in the top quartile in performance. This was also surprising to her. She was very surprised by what it cost to buy those large blocks of stock.

Let me throw some numbers at you. They will give you some idea of what our job is like on the buy-side. A lot of stocks today are, unfortunately, trading below 10 dollars a share. With a ten-dollar stock, ten cents a share is 100 basis points. That my be considered average, or it might be high, but if you tell a portfolio manager that you are tacking on another 100 basis points to the cost of the position, that is alarming to him. But those 100 basis points are only your market impact. Now add on three to five cents for commissions – rates that are lower than they have ever been before – and you are talking about 130 to 150 basis points impacting performance, right off the bat.

The other day I was looking at a broker. I was looking at the performance of various brokers, and I saw one who did three trades. The average cost for the three was 100 basis points. Generally, we take a look at anything over 150 basis points. I drilled down and saw that each of the three was an outstanding trade. Each was in a low dollar stock. It did not cost the trader more than ten cents a share to buy any of these stocks. In today's environment, spreads are generally a penny in the more liquid names. But to tack on only ten cents a share in an execution – I think that most buy-side traders would say that these trades were pretty successful. Most brokers would say they were pretty successful.

I looked at these trades, and nothing jumped out at me. Not one of them cost over the old eighth to execute. And the trades were fairly large, medium liquidity type trades. It cost on average 100 basis points, and the broker did a really good job. That is something to keep in mind when dealing with these lower priced stocks that we see so many of today. There is a lot of competitive pressure out there to keep your trading costs down.

What helps the strategy I am taking is to get as many numbers as possible, and to arm our traders with the reasons why they are putting together a specific strategy. We have a long way to go. We have been working on this for the last year. It is important for traders to be looking at their numbers on a daily basis. The portfolio managers might not be looking at their numbers on a daily basis, but they are looking at their monthly

performance statistics.

TRZCINKA: Thank you, Peter. We heard that trading costs are the tail that wags the dog. I wonder if the tail is getting larger, or if the dog is getting smaller. Also, does it depend on the type of dog? Are transaction costs more important for some investment styles than for others?

BROOKS: That is a good question. I have a couple of observations. One is that we are in a period where returns expectations have been muted down in a big way. Peter referred to this. If you can control your transaction costs and minimize them, and if expected returns are in the 4% to 6% range (versus 10%, 12% or even 20% in the late 90s), that has a meaningful impact on the bottom line.

Much of the costs associated with trading are a function of turnover. I was shocked when Rep. Michael Oxley's Congressional Committee in Washington was questioning the mutual fund industry and talking about costs and things. I thought to myself, 'Wow, to investigate that and not really look at turnover and investment style'? To me, it does not make a lot of sense.

The Securities and Exchange Commission would expect money managers to acknowledge that different orders require different types of executions. Pete was talking about something that we are all struggling with. We have to look at our order flow, differentiate it, and process it accordingly. So, 1,000 shares of IBM should not be traded the same way, or priced the same, as 100,000 shares of IBM or 1,000,000 shares of IBM. A lot of firms will have all three of those orders come across their desks, perhaps not everyday, but at some point. In that analogy of the dog, it seems to me that we must apply a metric and a common sense approach to differentiating the order flow that we have.

TRZCINKA: Peter?

JENKINS: As I said before, these numbers are hitting the portfolio managers today. They are very concerned about them. The PMs are focusing on their performance, and 100 basis points can differentiate medium performance from top quartile. You can rest assured that they are turning to their trading desks. There are not a tremendous number of ideas on the investment side that will differentiate the portfolio managers and get them into the top quartile.

There is far more focus on the desk and the strategy that Andy was talking about, the turnover. In the past, I never heard portfolio managers sound concerned about portfolio managers turning over too much. It was

always the same old attitude, 'well who cares as long as the performance is there'? All of a sudden, there is this concern that maybe they should not be turning their portfolios over as much. Now they are looking at all of these different angles. What we have to work on though, and I keep coming back to this, is a strategy that is more long term in nature.

The panel before us pointed out that the PMs take a lot of time to make their investment decisions. Let's not add 250 or 500 basis points just because we want to get in quickly and make sure that something we want is in the portfolio. It is amazing how comfortable a portfolio manager feels that it is in that portfolio. They cannot stand it if an idea that has been generated, that they have done all the work on, winds up not being in the portfolio. It is our job to work with them and control that way of thinking.

TRZCINKA: George, how easy is it to measure the size of the pay out?

SOFIANOS: It is a full employment act for my group (laughter). It is a research agenda for the rest of my life (laughter). We are, however, making great progress. We know a lot about the trading costs for small orders. But as order size increases, it becomes much more difficult to measure trading costs. With the big orders, it is very difficult to measure statistically significant differences in trading costs across different strategies and venues. But we can always hope for improvement as time goes by.

There is another reason why there is an increased attention to controlling trading costs – the regulatory environment. The regulation itself is a response to market fragmentation and the market structure issues that we have been discussing in the earlier panel.

There is no doubt in my mind that there has been much greater regulatory attention to best execution over the past five years or so at all levels of the industry. At the level of the exchanges, at the level of the sell-side and the buy-side, we are being told that we need to pay a lot of attention to trading costs. We have to pay attention to how we compare trading costs, and to how we make trading decisions. There must be due diligence in satisfying our best execution obligations. This also explains why people have been focusing on trading costs, and why we need to get better at measuring them.

BROOKS: I might add one thing. In the investment process as it relates to trading, it has become much more important to have a clear understanding of what we are trying to accomplish, in both the short term and in the long term. Let me share with you an example of where this comes into play. Knock on wood, what I will tell you about has so far been a terrific investment decision. Traders today do not just sit at the desk and wait for

orders to appear. They are much more involved. They go to some of the research meetings, they read the research, and they have an understanding of what we are thinking about doing. They know whether there is a sense of urgency, whether we are waiting for the quarter to be announced, whether we are in an accumulation mode, or whether we are thinking about selling a stock.

We had a situation a little while ago where a stock missed the quarter. The price had come down quite dramatically, and I knew it was a stock we were looking at because I had been in contact with the analyst. We had owned it before and had sold it very well. After our sale, it had dropped a lot. Now we saw a very large block of stock for sale. Regardless of what the Plexus Group might tell you about size orders and what you might hear about breaking things up, there are times when you really want to do a block trade. Where you have an analyst who is on top of a situation, and you have an opportunity to buy 3½% or 4% of the company. We liked the stock, were prepared, and were waiting for the opportunity – given all of the above – to seize the moment.

We have talked a lot this morning about sourcing liquidity and letting the liquidity work for us. In order to do that in today's trading environment, you must be armed and aware of what people are thinking and doing. Effective communication and discussion between trading desks, portfolio people, and analysts, creates that atmosphere, and also the opportunity.

JENKINS: Just to add to that. That is a very important job on the desk. Deciding when to do the block trade versus using a more passive strategy and just working the order. It seems fairly simple, but any active trader sitting on the desk wants to work his or her orders to death. Just like portfolio managers want to look at every tick when their orders are on the desk. But it is important as the manager of the desk to separate out the orders where little value can be added. If you focus on it too much, you could add substantially to costs.

One of the things that we are looking at today is separating out the stuff that can either be done program style, or broken up into very small orders where the trader, no matter what he or she does, is not going to be able to add a tremendous amount of value.

TRZCINKA: Thanks Peter.

SOFIANOS: The discussion so far today has been very critical about market structure. We seem to be blaming it for all of the horrible things that are happening out there. But back to Peter's point, one of the beautiful

things about our current market structure is that we have different venues that cater to different execution needs. If you want the low touch, work over time, no rush execution, you can find it in the market. If you want the high touch, difficult trades, you can also find it in the markets. So you have the execution venues that will satisfy all of these needs.

TRZCINKA: Thanks George. Let's open it up to some questions from the audience.

RICHARD REPETTO[20] [From the Floor]: I have two questions. First, regarding the NYSE, do we have a problem? What are the things that they are doing right, what are the things that they are doing wrong? What would you like to see stay the same, and what would you like to see changed? Second, when you are executing a large size order – let's say about 500,000 shares – could you walk us through the process of how you break up orders for the Nasdaq versus the NYSE, recognizing that Nasdaq has a lot deeper penetration of the Alternative Trading Systems? .

BROOKS: Regarding your first question about the NYSE, from time to time in any environment you will see some problems. We probably have one of those times now. We, unfortunately, do not know how pervasive the problem is. Structurally there are some things that need to be changed at the Big Board.

I, for one, am fascinated by the fact that we do not seem to want to acknowledge that there is a compensation issue here. It seems to me the specialists used to earn their money by earning floor brokerage, by facilitating trading, and by making a fair and orderly market. We have taken them out of that business. Whether it is decimals or the market structure changes that have happened in the last 15 years, the specialists are now in a much more adversarial and proprietary trading model. Every structural change that has been embraced since I started in the business in 1980, has helped facilitate small orders and people who profit from volatility. There is a whole crowd of traders who profit from volatility. I am not saying that that goal is not a worthy one. Their investment style and decisions are as reasonable, and perhaps as appropriate, as ours. But we are not encouraging the specialists to minimize the intraday price ranges for the stocks that they trade. Wouldn't it be an interesting thing if we could look at paying people based on minimizing that spread, not maximizing it?

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[20] Rich Repetto is Principal at Sandler O'Neill & Partners. At the time of the conference, he was Managing Director at Putnam Lovell NBF.

I would like to see the fine faculty here at Baruch take a hard look at what has happened to intra-day volatility. By that I mean the high-low range over the last ten years. That range should be contrasted with the closing volatility. That would help us to understand if we are not, in fact, encouraging intra-day volatility. If we are encouraging that volatility, we are by extension getting worse executions. Us traders are conflicted. We are not encouraging best execution.

Regarding your second point, every order we get is a different order. Large orders, small orders, every one needs to be handled differently. The Oracle order that was put up this morning, a million eight. I do not know how long it took that person to trade that stock. I guess they got it done in the morning, because the stock closed up 45 cents. If your crystal ball is pretty good and you want to get aggressive, if you are willing to be 30% of the trading volume in the first hour because you know the stock is going higher, that is a terrific trade. I know that sometimes, but I do not think I know that very often. Sometimes you are going to break up an order, and sometimes you are going to trade it in an ECN. Sometimes you are going to trade in a Liquidnet or a Harborside+, and sometimes you are going to look for liquidity overnight. It really is a function of what you perceive the goals should be for that order. Is there a sense of immediacy? Do we know something? Do we have an advantage? Are we information-less? I have got 2,200 shares to buy of a stock that trades 30,000 a day. Do I really want to get it done right now? Should I just work it, slice and dice it, over 13 half-hour periods?

That speaks to Pete's point. If we could figure out better which orders to concentrate on and which ones to let flow through, we would be in the trading hall of fame.

TRZCNKA: Do you have anything to add to that Pete?

JENKINS: I would say that, in terms of the market structure comments, we are looking for efficiencies. We are looking for the process to be as simple as possible. There is always room for improvement. It all comes down to the ease of entry of an order. We are always fighting for that, whether it is the Nasdaq market or the New York market. There will always be room for improvement until our trading costs come down to practically nothing.

In terms of breaking up orders, we look at our costs, and our benchmark is the price when the order hit the desk. The next most important step, as Andy was saying, is creating the strategy. That probably is the most

important step. That is the point where you are going to decide whether you are going to VWAP the trade for the day, or whether you are going to break it up and trade it over multiple days. As Doreen said earlier about the Oracle trade, if the strategy was to go out there and get a block of stock, to get the thing done because the market happened to be trading up that day, then that trader made a good decision. But if Doreen had been given the order and the trader said, 'I don't like the market here, I want to buy this order over multiple days,' she would have looked poor. And the trader would have looked poor. But obviously on that particular order, that wasn't the strategy. So the trading strategy is key.

But there is no simple answer to your question. You must have this discussion with the portfolio manager. You must have your estimated costs, and decide on three or four different ways to do a trade. The trade may be totally electronic. If you decide to break an order up and go electronic, the key is to stick to the strategy at that point. The worst thing you can do is to change your strategy 15 times, every time the portfolio manager or the trader feels that the market is about to do something different.

REPETTO: I was not really asking about strategies for where to trade the stock, or for how to approach different stocks or trades as they come in. Rather, taking a look at the different market structures of the Nasdaq and the NYSE, as soon as you get the large order, do you approach the two markets differently? With Nasdaq, you have eight or eleven different execution venues while, for the NYSE, you probably have one and a half?

JENKINS: They really are two different market structures. You enter an order to New York differently than you would enter it to Nasdaq. In the Nasdaq process and the New York process, if you decide to break the order up – and I am going to use a Goldman Sachs algorithm – you will probably enter both markets in the same way. This is because you will fire in small orders over time, based on the algorithm – 100 or 200 share orders. But if you want to aggressively get something done, there are two different strategies because the two market structures are different. On the NYSE, to get to the point of sale, you will use a floor broker, who is a human being. You are not going to jam a 500,000-share order through an order delivery mechanism.

In Nasdaq, you have to create your strategy. You could use the dealer structure as George was referring to, or you could use one of these electronic networks that enters the market automatically. So, it is different structures, different strategies. But both have one similar thing. You have to break the

order up. If you enter an order into the Nasdaq market or the New York market, and it is very large, obviously as information gets out that there is a large order around, you wind up having a big price impact. It does not matter, it happens in both marketplaces.

BROOKS: My sense is that Nasdaq right now has less transparency but more depth to it. I wonder if that is because there is so much in the reserve functions that the ECNs and ATSs have. The New York, to accomplish the same thing, requires the specialists to be very strong about how they discharge their obligation to create a fair and orderly market. When you go to these two different markets, as Pete said, you have to approach them differently. You might arm a floor broker with a reserve kind of thing and you are not sure what gets out there. In Nasdaq, you could be hiding behind a quote with a lot of potential volume. It seems to me that that is part of the challenge in the market that we have going on right now. On the one hand, there is a need for more transparency and depth in the market. On the other, there is a lot of hiding of volume with participants trying to gain an advantage over others.

Every six months, somebody gets a little edge. Right now, Nasdaq is looking a bit stronger and New York is taking some heat. A year ago Nasdaq was not looking so strong and New York looked perfect. It is an ebb and flow process.

SOFIANOS: Andy, when you say that there is more depth in Nasdaq, are you referring to the cumulative liquidity across the various ECNs and execution venues out there, or the willingness of the dealer to provide capital?

BROOKS: I am referring to the accumulated liquidity that is not seen. Even SuperMontage, shows only the top of the book. If I am in Bloomberg Tradebook showing 1,000 shares and I have 200,000 behind it, nobody sees that. Yet, in a Microsoft or an Intel, if you have size to buy or to sell, you can do it really quickly on the electronic markets. They are probably more conducive to that than the auction market.

TRZCINKA: Other questions?

TIM REILLY[21] [From the Floor]: I have two questions, one for Peter and one for Andy. My first question is for you, Peter. Earlier you were saying that you look at so many numbers every day after the trade. Before the

[21] Tim Reilly is head of U.S. Portfolio Sales Trading at CitiGroup Global Markets.

trade, a lot of pre-trade products out there are somewhat subjective. It is difficult in a real-time marketplace to make a decision based on what a software program tells you. However, when you look at a pre-trade situation you were talking about the trade costs earlier – how do you balance the risk versus agency decision[22] on your desk when you are dealing with a block order or a portfolio for that matter?

You are right, pre-trade analysis is clearly important. Generally, most of the pre-trade brokerage analyses are put out there by brokerage houses, and they are somewhat similar. The expected cost is not going to vary tremendously. Nevertheless, it does vary, and when you are trading stocks that are under 10 dollars a share, a penny or two difference in the expected cost translates into a big difference in basis points. But it is not part of our process now to be looking at the expected cost for every single trade. What I would like to work towards, as I mentioned, is using these tools to speak to the portfolio mangers.

JENKINS: No, you do not want to push the decision back there. You want to alert them to the impacts cost. Obviously the time taken to make a trade is critical. If a portfolio manager says, 'I want to get this done in the next hour,' it would be helpful to have tools to say, 'in that case, the expected cost for that trade could be X.' That might open their eyes. They might say, 'Hmm, maybe 5% is a little bit too much in this environment.'

It is a whole different ballgame if a PM is making a decision based on an information event. That pushes the order into a block trade. If they have met with the company and think that something is going to happen in the short term, and they want the merchandise in their portfolio immediately, you can throw out the expected cost. When you have 500,000 shares or more and you want to get the job done in a pretty short period of time, a lot of these pre-trade analytics are very weak. But where the pre-trade analytics come in are the trades in the range of 5,000, 10,000, 25,000, or even 50,000 shares. But let's not pay a ridiculous price for this security. You have to use good balance when you employ these tools.

TRZCINKA: I have a follow-up question. How easy is it to estimate the costs?

JENKINS: George could answer that one better then me. But I am using

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[22] This refers to trading with broker capital which has inherent risk compared with an agency trade.

the tools. The brokers are putting these tools out. Most quantitative desks on the buy-side have their own tools to measure these costs as well. But I would leave that to George.

SOFIANOS: The first, as I mentioned, is order size. As order size increases, as Peter said, it becomes much more difficult to get precise estimates. You can do a statistical analysis and estimate the standard errors of your trading cost estimates by order size. You will see that the standard errors increase dramatically as your order size increases and you spread the order over the day. We have fairly precise estimates for anything say less than 15% of average daily volume.

The other difficulty I mentioned – and Peter alluded to it – involves estimating the volubility of trading costs as a function of the urgency with which you seek to trade. This is on the research agenda, but it is very hard econometrically to identify. How much more expensive is it to trade over an hour as opposed to five hours? There is a severe sample selection bias in the data. What you observe in the data are both the easy trades that tend to take an hour or so, and the hard trades, the ones that will spread over time. So, you get the inverse relationship – it appears that more patient trading results in higher transaction costs.

This is an important area of research. We are working on it. I encourage the academic constituency here to think about. It is still very hard to get good estimates of the relationship between speed of execution and trading costs.

REILLY [From the Floor]: This is my question for Andy. You referred earlier to the compensation structure on the floor of the NYSE. But consider for a moment the number of individual market centers and venues, the number of services being provided by brokers. There is a pressure on margins. There is a substantial research budget. A number of professionals need to be compensated through order flow arrangements for this. As we move from what was once a business of 5-cent commissions to 3-cent commissions and lower per share do you think that we will see a continuing elimination of brokers? I am in program trading so I see this reductions happening very aggressively. What about the number of ECNs in the marketplace? Will there be further consolidation, and how will this all play out?

BROOKS: We are in an academic setting, and in that setting I am thinking of Charles Darwin. Wall Street has an amazing ability to evolve and adapt. Certainly the NYSE has done a lot of that over the years, as has

Nasdaq and everybody else. Whenever there is a perceived need, the Street seems to have figured out a way to satisfy it. There is pressure on commission rates, pressure on capacity, and it is clear that anybody who has a volume based model calibrated on 1999 volumes is in trouble. They might already be out of the business. If you have a good product, if you have value, if you can be unique, if you can help your customers meet their goals, you are in business. You will continue to be in business, and we will pay you for that.

We have a research budget. But because we have fewer dollars, we must take a harder and a sharper pencil to everybody whom we are voting for, to everybody who we think has value added. Turnover is down. The calendar is essentially closed – all of those underwriting concessions, selling concessions – they are gone. It is a different time.

DANIEL CURRAN[23] [From the Floor]: I own a specialist firm on the Chicago Stock Exchange. I have two questions. First, asset allocation is 80% or 90% of investment performance and, in Darwinian fashion, Exchange Traded Funds have evolved. Do you see the ETFs taking a bigger share of the permanent asset allocation of the various funds? Second, why have the ECNs taken so much of the volume in the large ETFs? Why have the ECNs taken so much of the SPDR and QQQ volume?

BROOKS: Probably because they offer certainty of execution and speed of execution. The American Stock Exchange originally dominated the Qs. they came out with the product, but they have lost a lot of market share because other venues are faster, quicker, and I guess cheaper. The ETFs are innovative products. They have replaced a lot of futures trading because you do not have to roll them over every three months. They can easily be used as cash surrogates. Where they go from there, I don't know.

SOFIANOS: Can I add a comment on the ETFs? This is just something to think about, I am not sure it is the correct answer. The ETFs are a derivative security, and they are priced off of the underlying stocks. I think there is much less need for price discovery for the ETFs than for the underlying stocks. This is one reason why they are more easily traded on the ECNs.

TRZCINKA: We are starting to run out of time. I would like to conclude the panel with each of you addressing what you think the future holds for transaction cost analysis and order management.

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[23] Daniel Curran is Managing Member at Turning Point Securities, LLC.

JENKINS: We are moving into a world that is much more quantitative. Much more focused on cost. Both New York and Nasdaq have seen that.

Efficiencies drive costs. Going forward, you are going to see buy-side desks that are far more focused on putting together the right strategy. There will be less proving through the numbers something that you now hear the buy-side saying all too often, 'well it is too hard to measure my cost.' That attitude is totally out the window. It is a ridiculous statement. You can measure your costs. You can measure various types of trades. It is difficult to do, but there are firms that are giving us the data. It is our job to put that data together, to lower our client's transaction costs.

Efficiency is the other key. Large block institutional business makes up a large part of the volume on the NYSE. The separation of what should be traded in blocks and what should be traded electronically is going to be very important. We are seeing a number of technology companies going out there and competing in this area. Who will survive? I do not know. But I do know that the buy-side desks are going to be forced to do things in the most efficient way.

There is no single way to do things. Looking at numbers and trying to make your process more efficient, to bring your client's transaction costs down, will be the focus. The days of portfolios going up in a straight line, 20% or 30% every year, are gone. We are in a very competitive environment. Performance numbers are being normalized. 100 or 200 basis points cost in execution have become very important. You did not hear people talking about that in the ten or fifteen years of the straight up markets.

TRZCINKA: Thank you, Pete. What do you see coming, George?

SOFIANOS: My challenge going forward is to respond to Peter's needs and wants as he described them. I see continued improvements in the measurement of trading costs and trading cost research. I foresee cracking the difficult problem of the time dimension and its effect on trading costs. There will be a continued provision of choice of execution. We all agree that one size does not fit all. We need to provide our clients with different ways of executing different types of trades. Single stock trades, portfolio trades, direct access trades, and agency executions.

I have something on my wish list. I would like to see reduced confrontation and increased collaboration between the sell-side and the buy-side. I would like to also include the exchanges and other executing venues out there. Something that we need to focus more on is the pricing of

services between the sell-side and the buy-side to encourage more collaboration.

TRZCINKA: Andy, how about wrapping it up for us.

BROOKS: George, we would certainly encourage you in that goal, in that effort to promote a level playing field, a sense of fairness. We are going to see some changes and a continuing evolution as we try to bring the different parties together in an environment where people are competing to gain an advantage. . We have to figure out how to bring all the parties together so that everyone has a sense that they can win in this the game. That is quite a challenge.

TRZCINKA: I thank the panel very much for a very stimulating discussion. And I thank the audience.

(Applause)

CHAPTER 3: HOW BEST TO INTEGRATE THE ORDER FLOW

Moderator – Robert Schwartz, Zicklin School of Business, Baruch College
Marvin M. Speiser Professor of Finance and University Distinguished Professor
Michael Cormack, Archipelago
President
Ian Domowitz, ITG
Managing Director, Products
Fred Federspiel, Pipeline Trading Systems, LLC
President[24]
Reto Francioni, SWX Swiss Exchange
Chairman
Doreen Mogavero, Mogavero, Lee & Company
President & CEO
Michael Ryan, American Stock Exchange
Executive Vice President and General Counsel

ROBERT SCHWARTZ: I want to start by asking you some questions, Doreen. You are from the oldest market in the U.S., and it is only fair that we get started that way. From your position on the floor of the exchange, do you see that markets are two-sided?

DOREEN MOGAVERO: When you asked that question earlier in your presentation, I said that I see one-sided markets.

SCHWARTZ: You see your orders, right?

MOGAVERO: By the time an order reaches me, the choices have been made as to what my value added can be. For me, a direct access broker, the value added is in the more illiquid stocks that would naturally have more one-sided markets. That is probably where my value is added.

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[24] At the time of the conference, Fred Federspiel was CEO at e-Xchange Advantage.

SCHWARTZ: When you are trading in your one-sided market as you perceive it, who do you typically trade against, retail or institutional?

MOGAVERO: Trade against?

SCHWARTZ: Yes, who is on the other side of the trade? You are buying, who is selling?

MOGAVERO: Every stock has its own characteristics. It depends. I couldn't quantify.

SCHWARTZ: Can I respond to that? I heard it in the previous panel also. I keep hearing it. I keep hearing it with every trader. As academicians we go around and try to learn something, and the answer I always get is, it depends. It always depends. I had a grandmother who was a great cook. She made an excellent yeast cake. I asked her, how much flour do you put in it? Her answer? 'It depends' (laughter). Can you pick a specific case that we can talk about?

MOGAVERO: It depends (laughter).

SCHWARTZ: Well take the average. If you are going to get your orders executed, you need somebody on the other side.

MOGAVERO: Correct.

SCHWARTZ: Who are the cast of characters?

MOGAVERO: The cast of characters on the other side are the natural other side.

SCHWARTZ: OK. Good.

MOGAVERO: Or, the specialists.

SCHWARTZ: And if the specialist steps in that has to be temporary because those guys don't have long holding periods, right?

MOGAVERO: Correct.

SCHWARTZ: So if it is the natural other side, it would be who? Is it more apt to be retail? It depends.

MOGAVERO: It depends (laughter).

SCHWARTZ: OK, we have this worked out, it is sort of a choral thing.

MOGAVERO: I mean, honestly, every stock has a different characteristic. There is no way to generalize. This is part of the confusion in all of the data that we get.

SCHWARTZ: Well, in those little green smiley faces that we had in the previous presentation with Asani and Avner ...

MOGAVERO: I liked those slides.

SCHWARTZ: Thanks. Your customers are institutional, right? How typically do you think, when you are buying or selling, that the natural other

side is also an institution?

MOGAVERO: About 90% of the time.

SCHWARTZ: I think that is a terribly important statistic to refer to.

MOGAVERO: Probably 90% of the time.

SCHWARTZ: What do you attribute the motive on the other person's part to be? Let me give you a choice. Could it be that they have news that you are not aware of? Or could it be that they just assess their position differently?

MOGAVERO: You want the real answer?

SCHWARTZ: Yes.

MOGAVERO: It depends (laughter).

SCHWARTZ: That is what they say to each other on the floor. Do you want to trade? And the other side says, it depends (laughter).

MOGAVERO: Well, that is the answer. It depends on market conditions, it depends on the individual stock, it depends on if it is news driven. It really does depend.

SCHWARTZ: Yes. But it can happen.

MOGAVERO: It can happen.

SCHWARTZ: But, all said and done, to get trades, we need people on both sides. That is terribly important because it is the real source of liquidity. What is your view of latent demand? Is that a term that is too special to us academicians? I am referring to all that unexpressed desire to trade. You want to buy or to sell half a million shares, but what is commonly presented to the specialist? 3,000 shares, 5,000 shares? What is your view of the latency of demand?

MOGAVERO: I think it is huge.

SCHWARTZ: Huge. Could you repeat that?

MOGAVERO: Huge.

SCHWARTZ: It doesn't depend (laughter)! It is just huge.

MOGAVERO: I think it is huge.

SCHWARTZ: That came up in the other panel also. You are right, because you have the natural one-side buyer and the natural other-side seller, and you have an array of intermediaries, of which Doreen is one. Tell me if this is reasonable. We always think of intermediaries as either capital providing, or as order handlers. But to what extent is the role of intermediaries simply to get trading going? To get the latent demand to trade translated into actual trades?

MOGAVERO: I think that I can answer that. You saw it in action, Bob,

when you were on the floor. My stocks are generally less liquid. They require more trading acumen. Frequently I get a stock you can't buy. That is why they give it to me. Because they can't get it done. When I go out to trade, frequently I need the specialist to make a market. He does not become adversarial. The specialist becomes imperative in getting the trade done. What then happens is that he makes me an offer. I take it. We can get into semantics on what is a reasonable offer. What is reasonable is different to everyone. If it is reasonable to me at the time, I take the offer. Nine times out of ten, once that trade occurs, it doesn't create volatility, it creates volume. Once that volume starts, it becomes easier to get the rest of the trade done.

SCHWARTZ: Volume pulls in volume.

MOGAVERO: Absolutely. There is no question about it. Frequently, even if I paid up a quarter of a dollar, an amount that may seem unreasonable to you the trader, if I can get that in below your benchmark, the rest of it, be it the VWAP or whatever, because of the volume that I have created, you will ultimately be a winner at the end of the day.

SCHWARTZ: Ian, what do you think about this?

IAN DOMOWITZ: I think the fact that you like to hear talk like this is a far cry from your usual statement.

SCHWARTZ: What is my usual statement? It depends... (laughter)

DOMOWITZ: That is right. That is just it. It comes down to a couple of very simple things. In this context it is certainly true that if immediacy is demanded it will be supplied – at some price. There is a price for supplying it. Capital provision in the face of the demand for immediacy will not go away.

But this doesn't really address your comment about latent demand completely. Once upon a time, to the extent that there was latent demand, maybe it was thought that the capital providing intermediary was supposed to do everything about it. Just service that demand. But market structure has changed in such a way that the institutional investor has a lot of different choices.

These days, latent demand is planned for. People look at the latent demand. They structure strategies with regard to it. Sometimes this is independent of destination. Sometimes this is part of the choice of destination in order to handle that demand. That is probably the biggest single change in how latency is looked at these days.

SCHWARTZ: From the way you phrased it, I heard you juxtaposing

latent demand with the demand for immediacy. I have myself been focused, as Ian knows, on the issue of immediacy demand. I have put a lot of importance on the fact that much of the demand for immediacy is exogenous. Largely, it is not an endogenous demand. That has implications for market structure. It has implications for whether people are willing to wait for the natural other side.

The latency of demand in my view is telling us something else about market structure. It is telling us, all said and done, that if Andy Brooks wants to buy half a million shares of something, he wants to get it. If I want a six-pack of beer, I would like to go to the supermarket and buy it. But if I am worried about how to get to the supermarket, or about what might happen when I get there, then my latent demand doesn't get quenched.

DOMOWITZ: No, you just may shop around a little smarter.

SCHWARTZ: I might. But if you see that there is a big latent demand – maybe Reto Francioni wants to buy and Mike Cormack wants to sell, but each of you knows what is in your own pocket but not what is in the other's pocket, you don't meet. The work that we want to accomplish is getting the trades made. Are the trades being made? After a while, perhaps. But it is a protracted process.

MICHAEL RYAN: Can I say something about that on the OTC side?

SCHWARTZ: Sure.

RYAN: It is interesting that there is all of this perceived latent demand out there. Institutional orders (looking at what happens on our system day to day) do not interact as much as they could. A tremendous amount of disintermediation has occurred in OTC securities over the past four or five years.

When you look at that model, what has happened is that the barriers to market making have come down. And so more and more firms are out there posting bids and offers a penny apart, two, three, four cents up, on either side. They are capturing short term volatility that everyone says shouldn't be there.

At the same time, I do not think that institutional orders are necessarily interacting with one another. I talked to an institutional trader six months ago. He was rebalancing a portfolio. Rather than give the order to a broker or just put in market orders and get it all done, he sat there passively for, say, half the day. He was very pleased with the trade execution that he received.

But people are hitting bids or taking offers when they need to get that order done right now. They are afraid of being front run, or they have more

information that they want to act on. But these orders are also sitting upstairs on the trading desk, and they are not always interacting in the markets as much as they could.

SCHWARTZ: Fred, could you talk to that point?

FRED FEDERSPIEL: Sure. I am interested, Mike, to pick up on your point about institutional orders not interacting that often, even on some of the electronic systems. Your study, Bob, looked at 5,000 share trades in half-hour time segments. We have looked more broadly at very large orders. For each of the top 200 institutions, you can look at the 13F, the quarterly filings.[25] We analyzed those.

We looked at the net trading of each of the top 200 institutions. Averaged over a quarter, 65% of the trades could be done directly with an institutional natural on the other side. What we found verifies what you are saying, Bob, and what Doreen is saying that 90% of the time you have an institutional natural on the other side.

Yet the naturals are not interacting, even on the books. It says that predatory or lucrative intermediary behavior is in there capturing a lot of the counter party sides to those trades. A lot of money is being left on the table. If there was a way to pull together this liquidity that people are just unable to express (given our current normal market structure), two-thirds of the time they could be meeting each other without incurring a 100 basis point expense.

SCHWARTZ: Let me remind you of the title of the session. It is *Integrating Order Flow.* 'Integrating' has multiple dimensions. It could be integrating retail and institutional. But, on the very basic level, it is getting the natural buyer to meet the natural seller. Clearly, this is not a simple process.

MICHAEL CORMACK: Everyone wants to bash market structure and what has happened over the past 5 years...

SCHWARTZ: Gee, have I ever done that (laughter)?

CORMACK: You do sometimes. In the first presentation from Plexus, everyone talked about a VWAP order. If the market is filled with VWAP orders, by definition, Andy is never going to get that 3 million shares of

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[25] 13F filings, which were mandated by Congress when it passed Section 13(f) of the Securities Exchange Act in 1975, require institutional investors to publicly disclose specific information about their holdings in a variety of equity securities. This information includes issuers' names; a description of the classes of securities; the number of shares owned in each and the fair market value of the securities listed.

oracle done right here, right now, unless he calls a broker and asks for capital. That type of behavior reinforces this distribution of 5000 shares every half an hour.

FEDERSPIEL: The message is that there is a chance. Instead of there being a large peg and a bunch of small holes, it could be a large peg in a large hole. The problem is that the big funds just can't find each other very often. But the large holes are there.

MOGAVERO: Lets take this one step further. You cannot compare Nasdaq stocks to New York Stock Exchange stocks. Every stock is a different animal. Every stock requires a different execution. Every customer has a different personality. Every customer has a different benchmark. It is very hard to quantify what is good across the board. A VWAP is a generic execution. That is not going to work for everybody all the time.

SCHWARTZ: For sure. Reto, let me ask you how you relate to this. We hear a lot about our own market development. But there has been so much happening in Europe. Reto has worn a couple of hats. You are from Switzerland, and you had been involved in the early development of the EBS[26] system (the electronic platform of the Swiss market), which you still have. Then Reto was at Deutsche Börse where he was responsible for the development of the German electronic system, Xetra. Reto and I have talked in the past about the integration of institutional orders with retail orders. How does it work Reto, if you want to pull them together? What are the problems of doing this? Please tell us a bit about your experience.

RETO FRANCIONI: Bob, to me, this all sounds pretty complex, all that I hear in the U.S. about order execution, block orders, block versus retail and so on. I would like to comment first in macro terms about the situation in Europe. In Europe, we have a centralized market that means one electronic order book per stock all over Europe. In this order book, you get the best price, you get the best execution. You also get the best settlement, which is very important when we are talking about how to transfer flows from one stock exchange to another. Some issues here in the U.S. remind me of what we used to have in Germany. We used to have several regional stock exchanges. We went a long way to centralize this kind of market.

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[26] EBS is an acronym for Electronic Bourse Schweiz, which is the electronic platform of the Swiss Stock Exchange.

In essence, what can be said is that every national stock exchange in Europe is world champion (not European champion, but world champion) in executing domestic stocks. Especially the blue chips. You cannot get a better execution anywhere than in the home market. This is basically one of the reasons why we do not have a unified European market. On the national level, the stock exchanges are inter-linked with the settlement organizations, with the derivative markets, and with whatsoever. The stock exchange itself cannot be regarded as an isolated organization. For instance, in Switzerland, we are driven by a world-class asset management. That is why we are important as a stock exchange.

We have a world-class asset management behind us. It is basically the same all over Europe. We have a standardized price discovery procedure almost everywhere in Europe – in Milan, in Paris, in London, in Frankfurt. I am talking about order driven systems with open order books and price-time priority. These features help give better execution. We have auctions. Every day starts and ends with an auction...

SCHWARTZ: Can I interrupt for a second? By auction you mean...

FRANCIONI: An electronic call auction.

SCHWARTZ: A call auction, not an open outcry auction.

MOGAVERO: Oh no, not that (laughter).

FRANCIONI: No, an electronic call auction. We also have one auction at the end of the day. That is important for the settlement prices in the derivative markets. We have trading halts to avoid too much volatility and to be able to restart the market with an auction. If the volatility exceeds a certain size, there is a trading halt and then we run the call auction. Everybody has the opportunity to come in.

To come back to execution, you can look at the order book, it is open for every participant. For instance, in Germany, you get the best five quotes (cumulated) on both sides of the market. As a retail investor, you basically have, more or less, direct access. You have access via your broker directly to the order book. We combine retail and institutional. A participant can clearly calculate, based on this information, what immediacy means for your size and the price(s) the order is executed at. Immediacy per se doesn't mean anything. It must be immediacy for your order, for your size, and for your time.

You have much more additional information to help you decide, on a tactical level, how you want to execute your trade. I do not say, to put it bluntly, that this is the best of all worlds. But it is a good world. We have

an open single order book per stock, an open order driven system with trading halts and call auctions. This meets the mission of a stock exchange -- to give best possible price discovery and service to our users, to our members.

SCHWARTZ: Does it work well for the big trades?

FRANCIONI: Bob...wait... it depends (laughter).

MOGAVERO: Thank you.

FRANCIONI: It really does depend.

SCHWARTZ: You mean better is possible?

FRANCIONI: I can give the reasons.

SCHWARTZ: OK.

FRANCIONI: In liquid markets, you can calculate, based on what you want to execute, what the implied volatility is. You can also do the hedging. If you do basket trading or if you are linked to derivative markets, it is up to you as an investor or as a trader to decide how you want to behave. In liquid markets, blocks are not such a problem. However, in less liquid markets, there is a real problem.

The less liquid market in this respect in Germany starts after the top 30 blue chips. In Switzerland, they start after the 20 blue chips; in Italy after the 10 best or most liquid blue chips; and in Finland after just one blue chip (laughter). It's Nokia (laughter). I like Finland, by the way, but this is not the topic (laughter).

Where we have less liquidity, there has to be liquidity enhancing measurements and functionality. This is a topic per se.

MOGAVERO: If you don't mind, can I stop him right there?

SCHWARTZ: Sure.

MOGAVERO: You are talking about something that sounds vaguely familiar to me. One-price openings would be similar to a call auction, one price close would be similar to a call auction. We halt trades on a regular basis. We have A codes and B codes.[27] When a stock's price goes beyond designated parameters of normal trading volumes or ranges, the codes would indicate a trading halt. We have everything.

I had made the point that, in the less liquid stocks, a specialist becomes

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[27] The New York Stock Exchange has A and B codes for signaling unusual trading patterns in stocks. An A code kicks in when a stock is slightly out of its typical trading range; a B code kicks in when this unusual trading pattern is more pronounced. In the latter case, it indicates that the stock may need closer surveillance. That might even require the exchange and the issuer to make contact to evaluate the trading pattern.

imperative, not adversarial. You and I, Reto, are agreeing about what I am saying. Our models in effect are very similar. Except you are missing the people part, I mean, here I am.

FRANCIONI: What do you have in your centralized order book? Do you have one order book per stock?

MOGAVERO: Yes.

FRANCIONI: Or do you have fragmented liquidity?

MOGAVERO: No.

RYAN: It depends on what market you are talking about. That is true on the New York Stock Exchange, where there is virtually no regional or third market competition taking order flow away. With the American Stock Exchange, talking about equities, we trade pure equities. We also trade exchange-traded funds (ETFs). In our pure equities, our focus is on the small and mid cap markets. Many of those have much lower prices that make them a lot easier to trade. Our market share in these issues is much lower than the NYSE's percent in their market. You do see a lot on the floor of the Amex. There is one order book on the floor, but from the perspective of consolidated volume, there clearly are multiple books. That is one of the critical market structure challenges that we have.

When you look on the ETF side, which is a completely different animal, you are really not talking about the markets. The exchange is providing price discovery but, more importantly, it is really providing liquidity. Because price discovery is relatively easy to do for ETFs (as was mentioned on the previous panel), you can do it on your own. You don't need a specialist for this. So, you get fragmentation as well.

FRANCIONI: To me, one indication of a problem is the possibility for creating an intermediation between the participant and the stock exchange. For instance, ECNs and ATSs. In Europe, you do not have all these ECNs and ATSs. In the U.S. there is a huge discussion. And so the incentive to disintermediate, or to intermediate in this case, must be quite high. I ask you the question. Why is this the case? Sorry, Bob, I do not want to do your job.

SCHWARTZ: That is quite all right.

RYAN: Why do we have the model that we have?

FRANCIONI: The bigger is the incentive to come in with intermediation, the bigger is the potential to make money. Let's put it that way, for this kind of intermediary.

MOGAVERO: Also, the bigger the potential to improve the price for the

public.

FRANCIONI: Yes, but, on the other hand you said that everything is in a centralized order book. This seems to me to be a kind of trade off. Then you don't get intermediation through ECNs and ATSs and so on.

RYAN: Your question is, how did we end up here today with all of these competing market places? My own view on this is that it goes back to the 1975 Act Amendments where Congress called for a National Market System. The Act called for competition between the marketplaces at the exchange level. Since then, the SEC has been trying to thread the needle between competition and the concept of a National Market System.

A lot of the principles that were adopted in the late '70s and early '80s have really not kept pace with the advances in technology, or with market innovations. Much of that is responsible for the dysfunctional nature of our market system. So, I believe, it is a very simple answer. You follow the money. If you look at Amex listed securities, and you follow that money, a great deal of it is in market data revenue. But the formulas for sharing that revenue are overly simplistic compared to the complexities of the marketplace and the demands that are made on the primary market. In the case of the Amex, as a primary market – as opposed to regional exchanges, ECNs and ATSs – substantial expectations are placed on us by the industry and regulators to provide regulation and technology, in addition to the sizable effort that we put into product development.

While these are very reasonable expectations, our market models have really not been allowed to evolve. For exchanges, change requires a great deal of discussion with the SEC. Just putting a cynical spin on it, I believe that the SEC has artificially maintained the regional markets for many years simply to put competitive pressures, as they perceive it, on the primary markets – Nasdaq, New York, and Amex. Although an oversimplification, I think this goes a long way to explain why we are where we are today. The marketplace is built around these core principles that have not kept pace with all the technological changes and innovations.

SCHWARTZ: How about you Reto? Do you have a sense of the relative size of trading costs when you hear our discussion here?

FRANCIONI: The trading cost for a retail investor in German blue chips through an e-broker in the German market is around 20 Euros, including settlement.

SCHWARTZ: But when you look at the Wayne Wagner-type costs for institutional orders (the impact costs and opportunity costs), do you have a

sense as to... Are costs higher here? Is that a fair question to ask?

FRANCIONI: No, I am a guest here. (laughter).

SCHWARTZ: Yes, I know. Getting back to Finland...(laughter).

FRANCIONI: If you compare the European trading costs with the U.S. costs, I think the transaction costs are no longer the issue in Europe because they are so low. If transaction costs were an issue, you would have a large potential to split orders away due to the fact that you get cheaper service and better quality.

With the whole consolidation (real full mergers) of stock exchanges in Europe in the cash market (I am talking cash market and stocks), the result is zero. Every national market has its market center. You cannot bring even the blue chips to London to build up the European blue chip's lead. It is so difficult. There were some models. For instance, virt-x had one strategy to build up the cross-border component with very good incentives on the cost side. But then the settlement side came in. Then the spread at the beginning was dependent really on the participation of the big players – a consortium in virt-x – to come in with additional liquidity to narrow the spread. To come back to your question, I think the cost issue is not the only real issue in terms of how we can take liquidity away from home markets and build up a cross-border market.

SCHWARTZ: Let me ask you one quick question. Then I would like to hear what Ian has to say. One of the manifestations of the costs that institutions are facing in our markets is the slicing and dicing of their orders. Average trade size keeps going down, down, down, even while the job to be done seems to go up. It seams that slicing is going to dicing, is going to shredding. In the U.S., we all talk about it. Is that an issue in Europe? Do you have less of that?

FRANCIONI: That is a serious issue. But we have two recent developments in the value chain in Europe to mitigate the issue. Or, at least, to lower cost and to have better risk handling out of the view of the market. One is a form of internalization. It is netting in the banks. You just put the imbalance of the net into the stock exchange for execution.

The big players have huge order flows. They are therefore able to do the netting in the same stock. They buy and sell, and go with the difference to the stock exchange. This means in essence huge IT applications and investments. Also, huge order flows. They can deliver the service to all the other participants in the market. They say, route the order to my application – I will do the netting and lower your transaction costs. The first netting

reduces the flow at the stock exchange. The second netting takes place with the central counter-party. In essence, you no longer trade directly against another participant in the market. You trade, as you do in the derivative markets, with the clearinghouse. This leads to the second netting. With this netting, the difference gets out to the settlement institution.

So we have twice the netting. What does this mean? The French market for instance had this netting a long time ago in the blue chip market, but they have a clearing period of about 20 working days. So their netting percentage is about 90% in the blue chips. That has a huge potential to save money for their members. We are going to introduce it for the virt-x market blue chips in London in the next month.

This central counterpart and the internalization are one element to lower the transaction costs. But this is something for the very big players.

SCHWARTZ: Thanks. Did Reto answer your question, Ian?

DOMOWITZ: No.

SCHWARTZ: Of course not, because you haven't asked it yet. What is your question?

DOMOWITZ: Actually it isn't a question. Let me preface this by saying that I have long been an admirer of the way Europe has dealt with its market structure problems, especially in the early to mid '90s. The answer to the trading cost question is actually fairly simple. The latest available information that I helped put together with co-authors like Ananth Madhavan and Benn Steil (who are both in the audience) basically shows that on the implicit trading cost side (the kind of thing that Plexus or ITG would talk about), Europe is cheaper. There is no question, Europe is cheaper than the United States. But this is based on fairly dated information as of 2003.

On the other hand, the broker costs in Europe are extremely high. In other words the explicit costs are enormous. The next thing I want to say is that this rosy picture of national exchanges exercising monopolies is not a complete picture. You could be glib about it and just say that limit order books are not everything. That is actually true, but it is not the whole story. First of all, I do not know of a single exchange in the world, whether on the derivative side or on the equity side, that is fully automated in terms of its limit order book structure that does not have market makers participating in the system.

Back to my comment that if immediacy is demanded, it will be supplied – at some price. We tend to confuse the idea of intermediation with capital

provision. You cannot talk about an ATS being an intermediary and, in the same breath, about a market maker being an intermediary. They are very different animals. It is certainly true that we have some market structures that are built around intermediaries. The NYSE is an excellent example. We have others that are not built around intermediaries, but where intermediaries participate because the participation is profitable.

Finally, the idea that there is no competition in Europe from ATSs is flat out wrong. This is a big debate in the revision of the Investment Services Directive. Organizations such as the Federation of European Stock Exchanges are lobbying hard for laws within Europe that will actually limit ATSs. We have to remember that an alternative trading system is not necessarily a limit order book market. I would certainly agree that if you took an ECN like Archipelago and said compete in Europe with that market structure, it would be competing with other limit order books. There is nothing novel there.

At ITG, we have a crossing network that is doing well in Europe. It satisfies a certain demand, or should I say, latent demand. It is built to handle larger blocks. It does not look like a limit order book system, and yet it does compete with the national exchanges.

SCHWARTZ: What are your execution rates in Europe?

DOMOWITZ: A typical POSIT execution rate? If you think about it as an effective rate (in other words new liquidity in the system), we are talking about roughly 15%.

SCHWARTZ: OK, thanks. I wanted to ask you Mike Cormack, how you would react to this discussion. If I line the systems up, Archipelago is a lot closer to Xetra than it is to the NYSE.

CORMACK: First, I want to quickly ask Reto one question. If there is a bid on the Swiss Stock Exchange and somebody puts in an electronic order to hit it, how long does that execution take?

FRANCIONI: Virtually instantaneous for a member.

CORMACK: OK. When you compare us and the Swiss Stock Exchange to the New York Stock Exchange and the American Stock Exchange, there is a really big difference. Our system is the same as yours. It is 50 mille-seconds. To give Reto and others in the audience some perspective, that is one of the reasons why there are different platforms here. People want things like speed. They want things like anonymity. We haven't had a truly electronic limit order book exchange in the U.S. until recently. And there is a demand for one.

Does it cause issues with fragmentation? Sure. But from our perspective and from a customer's perspective, there is a lot that happens in legacy institutions, be it the New York Stock Exchange or the American Stock Exchange, because we are out there. From a European perspective, you have to understand that. I do not think that those legacy institutions would change (maybe not at all) without this competitive framework that we are now in.

SCHWARTZ: Mike, I am looking at you panelists up here. I see electronics on one end of the table, and I see the floor on the other end of the table.

MOGAVERO: Not a legacy (laughter)? We are the legacy people.

SCHWARTZ: Mike, let me ask you to get it on the table here, what do you see as the advantages of electronic? Be specific.

CORMACK: Speed.

SCHWARTZ: OK. Speed.

CORMACK: Consistency.

SCHWARTZ: Consistency is an interesting one. Can you explain that? We all know about speed. Tell us about consistency.

CORMACK: Now that the day traders are gone, speed is not quite as important (laughter). But consistency is. I used to trade for a large buy-side institution and I personally know that consistency is important. When you send an order down to the floor of the New York Stock Exchange, sometimes it gets executed right at the price you want it to. Sometimes the stock trades at your price and then you get a little bit of your order executed. Sometimes the stock trades at your price and you get nothing done. Sometimes the book gets frozen.

All these things can happen when there is a human intermediary down there with, as Andy pointed out, a profit motive. From our perspective, and from a trading perspective, I like the fact that if you are the first in, you are going to get the stock every time. The orders are always going to behave in the same way. And the system will reward people for making pricing decisions. If an institution wants to step up to the plate, as that institution did on Tradebook, and buy 1.7 million shares of Oracle, and you think it is a good time to buy, you want that certainty of execution. You want that electronic access, and you are going to suck all of that reserve liquidity out of the system. Consistency is critical to trusting how your executions are going to get transacted.

SCHWARTZ: It implies predictability. You know how your order will

be handled. What about control?

CORMACK: Control is critical as well. Going back to what some other people have said, there are a lot of reserve orders out there on various systems. Why is that? The answer is simple. Nobody wants to display the fact that they have 1.7 million shares of Oracle to buy. If they do, people will front run them. There is a free option value to knowing that a big order exists in the marketplace. You can counter this if you have complete control of that order. You can use things like reserve quantity, you can cancel, you can take a stock up, you can vaporize.[28] No one knows if you are going to come back. Control is critical.

SCHWARTZ: I would like to add another reason. I did a survey a number of years ago about equity trading practices and the desire of asset managers to receive immediate executions.[29] We (my co-author, Nick Economides, and myself) found that one of the biggest motives for using an electronic system is the anonymity that it provides. It turned out that the demand for anonymity is huge. I do not think that we get this in our legacy markets. Right?

On the other side, in the other ring weighing 211 years old is...

MOGAVERO: Don't say pounds (laughter).

SCHWARTZ: I am not talking about you. I am talking about your institution.

MOGAVERO: Yes, I know, I got it.

SCHWARTZ: Reto, you still have a floor in Frankfurt. It hasn't been turned over to table tennis or anything like that yet. But its volume is way down.

FRANCIONI: They are all niche players. What is doing this in Germany are niche players trading specific products. Warrants, for instance. But in the blue chips, 80%, 90%, 96% or maybe even more of the overall flow is through Xetra. The same is true for Swiss blue chips.

SCHWARTZ: Paris does not have a trading floor. Neither do any of the

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[28] To 'take a stock up' is a trader's description for buying stock on the offering. 'To vaporize' is another description, which means to visibly disappear from the market with the stock. The idea is that once the trader has bought the stock the market is then unaware of the trader's intentions for the stock.

[29] Nicholas Economides and Robert A. Schwartz, 'Equity Trading Practices and Market Structure: Assessing Asset Managers' Demand for Immediacy,' Financial Markets, Institutions and Instruments, Vol. 4, No. 4, 1995, pp. 1 - 46.

other major markets in Europe except Frankfurt. But we have a floor. I will put my cards on the table. I can see some value in it. I would not be happy to see the floor disappear in the coming months or next year or so. Could you talk, Doreen, about the relative advantages of floor-based vs. electronic trading as you see it?

MOGAVERO: I can address some of the issues. Speed is becoming less and less of an issue. It is almost a non-existent issue in terms of comparing us to an ECN. The Exchange has developed numerous products that allow a customer to go directly to the floor and bypass the post...

SCHWARTZ: Let me make this clear. Doreen, you are a direct access broker, right?

MOGAVERO: Right.

SCHWARTZ: Would you tell us what direct access means to you?

MOGAVERO: Sure. Direct access to most everyone means from their trading desk to the point of sale. We are an intermediary that may help you to... what is the word?

SCHWARTZ: Facilitate?

MOGAVERO: No, we don't want to facilitate. The word is 'interpret.' We want to help you to *interpret* the information that you get at the post. I can add value because the information at the point of sale can change exceptionally quickly. More than telling you that Bear Stearns is a buyer, I can probably tell you how much Bear Stearns has bought, and if the Bear Stearns broker is coming back. I can tell you lots of things about the way the broker executes the order. His style. All these things can help you decide how to execute your order.

I can provide you with speed. I carry around a small computer that will send information to you including a market look from the point of sale to your desk. I can do this as quickly as any ECN can do anything. I can send a note from me to you in Europe. I am fairly certain that the time frame is under a few seconds. Speed is an issue that we have conquered.

Consistency. I am not sure that any marketplace is consistent, and I am not sure that consistency is something you necessarily want. You may want it sometimes. Most of the time you do not want it. That is why some trades are good and some are bad. Because things are not consistent. Markets go up and markets go down. If they were flat all the time, no one would make any money.

I try to help you make the best decision as to how to execute your order. Speed is not always the best way to execute an order. Frequently, me going

out to the crowd and figuring out that there are five sellers, and maybe this is not the time for you to buy the stock, might be to your advantage.

RYAN: Can I add a response?

SCHWARTZ: Sure, Mike.

RYAN: There is a great fallacy in comparing electronic systems and floor based systems. The fallacy is that electronic systems have absolutely no human intervention, and that floor systems do not use any technology. If you come to the floor of the American Exchange (and I know this is true on the floor of the New York Stock Exchange), there is a massive amount of technology. We spend eighty to one hundred million dollars a year on our floor-based trading system technology. And that number is only going north.

A second issue enters this conversation about the comparison between traditional exchanges and the new marketplaces, most notably the ECNs. There are very significant regulatory disparities between the two. Exchanges have to be all things to everyone. We cannot treat different types of order flow differently. We cannot set up trading models that trade order flow differently. We have to basically treat everyone the same.

ECNs are broker dealers. They are not exchanges. They are regulated only in a very limited sense. They are free to develop systems and to make changes very easily. I think that Mike made a good point about one of the advantages of our system compared to the European system. It is our ability to add innovation to the marketplace.

The one problem that we do have, because of the regulatory disparities, is the inability of our traditional exchanges to respond on a timely basis. Here's a classic example from the American Stock Exchange. Four and half years ago, we submitted a proposal to the SEC to provide integrated market making in the form of specialists on the AMEX floor trading both an ETF and the option on that ETF. We fought and fought and fought to do that. By the time we received SEC approval, it actually harmed us. We had already allocated the stocks in the most significant ETFs, and the options on those ETFs, to two separate specialists. Obviously, we could not unwind that decision, but our competitors were able to assign the ETF and the option on the ETF to the same specialist. We missed that trade. But we were the ones who came up with the concept. We fought for it. Because of the regulatory burdens that are on our traditional marketplaces, we lost out on that innovation.

This is an area where a lot of attention at the commission needs to be

focused. It is here that they should create a level playing field. The concept of having competing marketplaces makes sense, but the markets must be able to compete with each other fairly, whether it is exchange versus exchange, or exchange versus ECN.

MOGAVERO: The difference between me and everybody else on this panel is that everyone else is a part of the exchange that he is representing. I am a practitioner, and my view is slightly different from what you all have. I am not into figuring out how fast something gets from A to B. All I know is how fast I can get there. And how happy my customers are. That puts me in a little different spot than most of you. I use the system, I did not invent it.

At this point in time, I have been given by the New York Stock Exchange probably five different venues to offer my customers to get into the building. That is an enormous thing. The whole theme of the buy-side panel was 'choice.' People need to have choices. The exchange has provided its customer base with lots and lots of different ways to fill their needs for execution. That is something that makes us a little different from everybody else.

You have lots of different ways that you can execute the same order if you come to the NYSE. If you go to an ECN, you must go through the box. You could not call me. This might be great some of the time, but it might also be really bad some of the time. Where I think our mindsets differ is that we have provided this choice to the customer base.

SCHWARTZ: I heard something, Doreen, in what you were saying before, that I would like to recast in the following fashion. It is amazing how much we talk about market structure. In so many industry conferences that I have been to, we talk about an order driven environment as if it had only two types of orders: limit orders that provide liquidity, and market orders that take or demand liquidity. And yet, you don't handle either of those, do you, Doreen? Your customers can put a price limit on an order, but it is not a standard limit order. It is a 'not held' order (an NH order). The NH order means that you are not held to the price existing at the time the order arrived, because you are trying to get a better price.

MOGAVERO: It can be either. Most of the orders that I get are not held, but I can receive other types of orders.

SCHWARTZ: As I see it with an NH order (and this is why I am keying in on what you said before), you are looking at the market, you are looking at the crowd of people around, and you know that there is a buyer out there,

and perhaps you also know that there is a seller out there. What I see you doing, is computing a response to the market conditions that exist exactly at the moment when you step forward to trade.

I just finished an academic paper that is based on data from the Amex that looks at just this thing.[30] We could have titled the paper 'the Economic Value of Not Held Orders.' As I see it, the question of floor versus electronic is to a large extent evolving to the following. Can what you do with your NH orders be done electronically? To some extent, Mike, you do this in Archipelago. I know that you have more complicated types of orders. Do your order types essentially accomplish this?

CORMACK: Just one qualifier, Archipelago is an exchange, and I agree with Mike Ryan's comments earlier. Yes, Archipelago and the ECN community in general have a variety of order types that facilitate different strategy implementations. We have, for instance, reserve orders, discretionary orders and pegged orders.

SCHWARTZ: Pegging is part of what I am thinking about.

CORMACK: We have so many orders, I cannot even remember all of them. But we keep developing new ones. When Archipelago is compared to Tradebook or Instinet, we are always competing on our order types.

SCHWARTZ: How do you see it Fred?

FEDERSPIEL: I disagree about what the most critical distinction is between the floor and electronics. A much more important way to look at it is in terms of cost. Specifically, how easy is it for these predatory or lucrative intermediaries to play a role? Many of the electronic systems are becoming more and more susceptible to gaming by predatory players. We have the situation now (one of the panelists mentioned this earlier) were all of these market structure decisions are being driven for retail customers. Who is looking out for the institutional customers?

SCHWARTZ: Your point is well taken, Fred.

FEDERSPIEL: A horrible example right now is the liquidity rebate that you get as a predatory broker. The rebate can be greater than it costs to front run. It only costs a tenth of a penny to jump in front of an order on some of the electronic systems, and you get two tenths back if you are successful.

We should be focused on ways to get big trades done for institutions

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[30] 'The Economic Value of a Trading Floor: Evidence from the American Stock Exchange,' Puneet Handa, Robert Schwartz and Ashish Tiwari, *Journal of Business*, 2004, vol. 77, no. 2, pt. 1, pp 331-355.

without involving predatory brokers. There are plenty of roles where intermediaries and brokers are providing a great service. They should be in at those times. But we should not be encouraging their inclusion when they are not needed. We should be able to avoid the two thirds of the time when they are not needed.

MOGAVERO: I have my own personal benchmark concerning a cost basis. We are not getting paid tremendous amounts of money these days. We are getting paid two cents, for argument's sake, as a direct access broker. If on your order I can save you two cents off your benchmark (be it VWAP, be it the opening, be it the close), I have provided you with a free execution. I can do that with a not held order. If I can improve upon your benchmark by ten cents, I have made you money. It has cost you nothing to execute that order with me. Actually you have made money.

How we operate (I can't speak for anyone else), is that every order is treated on that basis. The idea is for the customer to go home with a much better execution than the execution cost. If I can do that every time, I would be making a lot of money (laughter).

SCHWARTZ: And your customer, too.

MOGAVERO: If I can do it 85% of the time, my customer is going make a lot of money.

SCHWARTZ: Larry Harris.

LAWRENCE HARRIS[31] [From the Floor]: As we think about how to integrate the order flow across competing market centers, I wonder, what is the value of having inter-market linkages?

DOMOWITZ: We do not need inter-market linkages. So the second question is superfluous. I believe that mandating inter-market linkages creates some business models that simply do not work. We could also say that regulatory pressures are created that could be avoided.

I am a firm believer that the industry itself solves these problems. I think that is absolutely true in the OTC market. It will come to be true in the listed market. Mandating linkages given that everybody is working anyway to create efficient but voluntary linkages makes no sense. ITG routes to over 85 destinations. This is part of what we do. We link markets and we aggregate quotes. We are not the only firm in this space. And I believe that,

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[31] Larry Harris is currently a Professor at the University of Southern California. At the time of the conference, he was Chief Economist at the U.S. Securities and Exchange Commission.

as things get more competitive, this kind of energy will be expended more and more. So I really see you need to answer the second question.

CORMACK: From Archipelago's perspective, originally our business model was that of a routing ECN. We routed the vast majority of our business to Nasdaq or to other ECNs. Historically, our most successful linkages have been private linkages, the linkage that we established with Island, the ones that we established with Instinet, Bloomberg and Brut. Those work a lot better. They are a common protocol. It is a mutually agreed upon arrangement.

Entering the ITS world in listed securities is a challenge. We are the only firm on the planet that obeys the trade-through rule (laughter), and coding for that was not easy. We are routing to places that are really slow. Our proposal would be to break up those linkages and have a customer-elected trade-through opportunity. If the customer does not want to abide by the trade-through rule, he or she can choose not to. The customer can reach up and grab stock on Island that is through that New York offering. We can go ahead and do that for the vast majority of our customers. That functionality exists. It is already coded. We can still abide by that.

SCHWARTZ: Mike Robbins.

MICHAEL ROBBINS[32] [From the Floor]: Mike Cormack made the comment that one of the advantages of Archipelago is consistency. Well, knowing Doreen, one of the advantages is consistency.

MOGAVERO: Thank you.

ROBBINS: I have observed her for many years. She knows how to drill for liquidity. That is her function really. When she goes into a trading crowd, she looks for that latent supply, that latent amount of stock. She is very attuned to how to get it. She knows what is on the other side in Boeing, if it is Enzo Zapolis, or Tony Cirillo, she knows what to do. She knows how to get the liquidity, and she gets it fast. There is great consistency in somebody like Doreen. There may be consistency in Archipelago, but she has it too.

MOGAVERO: That is very nice of you. Thank you Mike.

SCHWARTZ: Have you all figured out that these two know each other (laughter)?

MOGAVERO: Actually, we are competitors. We have been for many years.

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[32] Michael Robbins is Partner at Robbins & Henderson.

SCHWARTZ: One of my first introductions to the floor was with you, Mike. Many years ago, I followed you around and watched trades get made.

I want to turn to another topic. Isn't it interesting that there is a line here on the table that separates the panelists (laugher)? On this side of the line are four people. I hope I am speaking for Fred on this (I am not sure), but at least three of the four are involved with call auctions. Right Mike?

CORMACK: Yep.

SCHWARTZ: You now open with a call, right? And Reto, nobody has more calls than the system that you built in Xetra. Ian, you have a call. POSIT is a non-price discovery match, but we can call it a call.

CORMACK: No one is surprised that you are slipping in a call auction conversation (laughter).

SCHWARTZ: In honor of the time, this is, right now, a sort of the noon pre-lunch call (laughter). I want to get all your attention focused together. Ian, your Crossing Network, is it still doing well?

DOMOWITZ: Yes.

SCHWARTZ: Okay, Mike, you are in the early stages of using a call. Do you like it?

CORMACK: Yeah, we love it.

SCHWARTZ: What are your plans? Can you share?

CORMACK: Today we run a limit order auction at 8:00 a.m. eastern, and we probably trade a thousand to three thousand names every morning. We have a lot of retail on our system. Then we have a market order auction at 9:30 a.m. eastern. This summer we are looking to roll out a market-on-close auction for OTC securities.[33]

SCHWARTZ: Closing call. All the börses in Europe end with a call. Reto, you were the pioneer in introducing the call in Xetra. Then you were subsequently followed by Paris.

FRANCIONI: We had to put in a closing call because of the derivative markets.

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[33] In January 2004, Archipelago announced the introduction of the ArcaEx closing auction for market-on-close (MOC) and limit-on-close (LOC) orders in listed and OTC securities. The system is similar to Archipelago's opening auction. Archipelago describes it as a single-price Dutch auction that indicates buy and sell orders at the price that maximizes the amount of tradable shares. ArcaEx calculates and continually disseminates the 'indicative' closing price, closing volume and the closing auction imbalances prior to the closing auction that occurs at 4 p.m. E.T.

SCHWARTZ: The derivative markets also led Paris to introduce the closing call. But it works, right? I don't want to put words into Reto's mouth (laughter), but he told me that yesterday. He said 'it works, Bob, I assure you.' Yes?

FRANCIONI: Yes.

SCHWARTZ: You get much more institutional participation at the close than at the open, don't you? So, I have a very simple, pre-lunch question. Let me set this up. The NYSE opens with a call, but it is not fully electronic. Is Bill Abrams here?[34] Every time I say that the NYSE has a non-electronic call, he replies, 'no, we use electricity' (laughter). Well, Bill, we could go a little further than that, but you do have something that resembles a call even though I prefer a call that is fully electronic. The NYSE also ends with market-on-close orders. In my opinion, that is not making full use of a call auction.

Now for my question. I want to address it to Doreen. How would you feel, Doreen, if the NYSE and AMEX were to put in a full-fledged electronic call at the close. I hope that you don't say, 'it depends.'

MOGAVERO: I am not going to say it depends.

RYAN: I am (laughter).

SCHWARTZ: Would that be acceptable to you Doreen?

MOGAVERO: I have thought about this since you and I last talked, but I have not come up with a conclusion. I believe that the exchange has a great ability to reinvent itself in any way that it possibly can. I think it is open to looking at doing anything that is suggested to it. Whether I am fully convinced that a call would facilitate a close, I do not know. I do not know if it would add to price discovery. 'I don't know' is the answer.

SCHWARTZ: Can we have breakfast together again?

MOGAVERO: Yes.

SCHWARTZ: The evidence that I have seen is that a closing call does facilitate the execution of orders at the end of the day. It gives you a better market. Mike?

RYAN: For us it does depend. When you look at the different securities that we trade...

SCHWARTZ: Where would the call be most useful? Mid-cap? Small-cap? Blue chip?

RYAN: I don't know. I would want to take a real look at it and talk to

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[34] Bill Abrams is a retired New York Stock Exchange Specialist.

the people who actually trade these securities. So it really depends. And I really am a lawyer (laughter).[35]

MOGAVERO: I am not a lawyer and it still depends.

SCHWARTZ: And we are all economists. We can always say, 'but, on the other hand…'

Our discussion has touched on a lot of issues. We could go on and on. These things never end. I have enjoyed it. I thank you, panelists. And I thank the audience. (Applause)

[35] In the Spring of 2004, both the American Stock Exchange and the Nasdaq Stock Market, Inc. introduced a closing call.

CHAPTER 4: NEW SYSTEMS FOR INSTITUTIONAL INVESTORS

Moderator – Holly Stark[36]
Matthew Andresen[37]
Paul Bennett, New York Stock Exchange
Senior Vice President & Chief Economist
Michael Edleson[38]
Alfred Eskandar, Liquidnet
Director of Marketing
William O'Brien, The Nasdaq Stock Market, Inc.
Senior Vice President[39]
Donna Vandenbulcke[40]

HOLLY STARK: This is a wonderful conference because there is so much give and take from the audience. I see a lot of people here who are on the buy-side anon the sell-side, who are with vendors and with market centers. The common denominator is that we are all engaged in the marketplace and with issues of concern to market structure. That point certainly came across this morning with the Q & A. I hope it will continue to be the case this afternoon.

I encourage questions from the audience. This is the first time I have

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[36] At the time of the conference, Holly Stark was Principal and Director of Trading at Kern Capital Management.

[37] At the time of the conference, Matt Andresen was Head of Global Trading at Sanford C. Bernstein & Company.

[38] At the time of the conference, Mr. Edleson was Senior Vice President and Chief Economist at the Nasdaq Stock Market, Inc.

[39] At the time of the conference, Bill O'Brien was Chief Operating Officer at Brut, LLC.

[40] At the time of the conference, Donna Vandenbulcke was Head of Equity Trading at Credit Suisse Asset Management.

played Phil Donahue, and I want Bob to know that this role is a little different for me. Anyhow, we have people in the room with microphones, and we are going to have some fun.

There has already been a lot of discussion and debate today about various systems that people use. We had a couple of buy-side practitioners earlier – Pete Jenkins and Andy Brooks – and we have another lone buy-side person up here now, Donna Vandenbulcke, who will talk about these systems.

To put this in perspective, when Donna and I were talking in preparation for this session, we elaborated on how different our jobs are today from what they were five years ago. They are even more different from what they were ten years ago. What we now have on the desk for buy-side traders is remarkable. Our desks are really technologically driven. It used to be paper tickets and time stamping on a clock. Now we have order management systems that integrate different things – market quotes, FIX connectivity, and electronic order delivery to ATSs and ECNs. There is just so much more to get your arms around.

That being said, there is more on the horizon, new things that we haven't seen yet. Perhaps a little later we will look into the crystal ball. All of these panelists have seen the advent and the adaptation of a lot of systems. Hopefully, we will look into the crystal ball to see what else might be coming.

Donna, let's start with you as a practitioner. With all these different tools now available, you have to be a Robo-trader these days. You have to be quick on the keyboards, have seven phones in your ear, and be flexible enough to use these systems to get what we all have a fiduciary duty to get – best execution for our customers. What are some of the challenges, and what systems are you using these days? Can you tell us that without giving away your trading strategies?

DONNA VANDENBULCKE: We are trying to stay ahead, using technology to accomplish this goal. Earlier we talked about transaction cost analysis. Our firm came in the top quartile by having all the appropriate systems and measures in place to seek liquidity. Technology is not necessarily the only key. We use, for instance, Liquidnet, which we will talk about throughout the discussion. This system combines elements of advanced technology with human buy-side to buy-side negotiated and anonymous trading. There are other steps which also take a more traditional approach.

Trading has been redefined. It is now a much more fragmented process.

And it is a managed process. We are managing soft dollars, we are managing the research votes,[41] we are managing best execution at all times. So, as the orders come through from the PM, we decide where they should go. Not every order is necessarily for an ECN, or an alternative trading system. Not every order is necessarily for a large cap. Perhaps it is for a direct access broker, which we talked about earlier. We are under the gun as buy-side traders for the TCA. That has been the buzzword for 2003.

STARK: Donna, could you just define TCA?

VANDENBULCKE: Sure, it stands for transaction cost analysis (TCA), which we spoke about earlier. There are many variations of this TCA. My wish for the future would be to have one consistent definition of best execution, and to have one TCA methodology to help us find it. We measure our transaction costs with pure analysis, but each analysis has different variables.

We are all dealing today in a tough environment, with cost pressures and cost-reduction initiatives. We have become so worried about adding value to the investment process, that now every CEO is acting like a CFO, pressing for cost reductions.[42] We, as traders, need to leverage every single dollar.

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[41] Buy-side firms typically allow portfolio managers, analysts as well as traders to 'vote' on how commission dollars are divided up among the sellside trading firms that buyside firms send their bundled soft-dollar commission business to. These votes, tallied in a somewhat democratic process, are not always accorded equal weight. Buyside traders have to manage how the commission dollars are later allocated.

[42] Vandenbulke was speaking against the backdrop of a continuing bear market, a period which encouraged introspection on the achievement of more economic value in the investment process. This goal has several related elements, including best execution of customer trades, which in itself can be assisted by sophisticated transaction cost analysis tools. However, best execution is regarded as a standard which escapes one single definition. For example, the Association for Investment Management and Research (AIMR) notes that, 'Best execution refers to a trading process firms apply which seeks to maximize the value of a client's portfolio given each client's stated investment objective and constraints.' Best execution, therefore, might satisfy one group of customers by providing speedy executions in specific sizes and prices while another group might simply be satisfied with price improvement, or simply the 'best price.' Then there are other factors in best execution, which include the certainty of execution, market impact, liquidity as well as anonymity. Several vendors provide transaction cost analysis tools, which aim to assist money managers in making more informed decisions about trading costs. For example, one approach compares the daily price of a manager's trades against the Volume Weighted Average Price (VWAP). One pioneer in the field is the Plexus Group, which in August

That becomes very tough throughout the day. That said, we as traders are not doing our jobs if we do not use technology and access every pool of liquidity.

I would like to hear some other people on the panel discuss some of the ECNs and ATSs that are out there.

STARK: Paul Bennett, would you tell us about Liquidity Quote, and perhaps about your system called Institutional Express, which the New York Stock Exchange came up with. Liquidity Quote is very new. Didn't the SEC's approval of it come on the 23rd of this month?

PAUL BENNETT: Yes, that is right. I'll talk about a couple of systems. I would also like to mention our Direct+ system because it actually was conceived of as a retail system in the heady years. Now it is being used a lot more by institutions and other traders.

STARK: Can you tell us the size parameters of Direct+ – the size of orders that can go through the system?

BENNETT: It is 1,099 shares, except for the ETFs where it is larger.

STARK: OK.

BENNETT: Roughly half of Direct+ trades – and this varies a little from day to day – is retail trade, another half is institutional, particularly program trades. It is one of our most successful products. Direct+ started from nothing a couple of years ago and now trades between 60 and 80 million shares a day. We had one peak day of 120,000,000 shares, so it is a pretty good-sized business right now. It also fluctuates a lot with volatility. When the market is volatile we get a lot more trades coming through the Direct+ system. It appears to have latched onto the need for the speed that goes with program trading, which has also grown tremendously.

The Institutional Express is something that we could have given up on at one point when it started in 2001. I do not know what could have hurt it at the onset. Maybe it was misconceived in some respects. Maybe it was people blaming decimals, that decimals surprised people. Some say that we had the parameters wrong. Anyway, it basically did not trade at all in 2001 and 2002. It wasn't until the fall of last year that it started being displayed on vendor's screens.

STARK: How many trades have taken place in Institutional Express? I have heard that the number is only about 55 since its institution.

2002 was acquired by J.P. Morgan Chase Bank. Another provider, ITG, has had a transaction cost analysis product, known as TCA.

BENNETT: I cannot tell you the cumulative total, but I can tell you the flow rate. When it started, about the second half of last year, we were doing about one trade a week. Now we are doing about one trade a day on it. So it has increased a lot. The major change was made in mid-December – we changed the parameters and dropped the minimum size from 25,000 shares to 15,000 shares. More important, the waiting time for a trade to become Institutional Express eligible was dropped from 30 seconds to 15 seconds. Liquidity Quotes will add to the attractiveness of Institutional Express. Liquidity Quotes will be a way of displaying cumulated liquidity a few cents outside of the inside quotes. The Liquidity Quotes should have depth that will probably be in the range of 15,000 shares and up on a fairly consistent basis.

STARK: Maybe we should step back and look at the impetus for Liquidity Quotes. Since decimalization, there have been a lot of complaints that markets are not as deep. Certainly a penny spread with 100 shares up is not meaningful, especially for executing institutional order flow.

BENNETT: That is right. That is probably the source of the argument that Institutional Express did not mesh with decimals. The amount of displayed liquidity is much less than it has been. The idea is to create a mechanism whereby people can actually find liquidity on the book. They are not going to find it at the inside quotes because the inside quotes are so narrow now. The inside quotes are flickering around like crazy. But if people are willing to go a few cents outside of them, I believe that they will be able to find the depth. The idea is that Institutional Express will be one way of accessing that. After you have waited the 15 seconds the floor has had its chance.

STARK: I want to make sure that I understand this properly. The Liquidity Quote will encompass orders that have been sent down through Direct+, or SuperDot, or whatever. They will also encompass specialist indications of trading as well as what might be in the crowd. Is that true?

BENNETT: Yes, it can be from all of those different sources.

STARK: Will a specialist be required to put liquidity into that quote, or is it at his or her option?

BENNETT: I do not believe that we will have a specific requirement of any minimum amount of liquidity. But it will certainly be in his or her interest to provide liquidity if it is a successful product.

STARK: That makes sense. Do you want to give us some odds as to whether it will be successful or not?

BENNETT: I would say extremely high.

STARK: OK, that is fair (laughter). Mike Edleson, wake up down there (laughter). Lets turn to SuperMontage. I sat on the Quality of Markets Committee for many years, and saw the many iterations of what finally turned out to be SuperMontage. I think, some years ago, a predecessor system was called Naqcess?[43]

MICHAEL EDLESON: That one was before my time.

STARK: I was a child then. But certainly it has gone through many permutations. It has been ballyhooed by some as being the ECN-killer. It is up and running now. Everything has been migrated onto SuperMontage since last quarter, if I am not mistaken. Do you want to tell us a bit about what is happening with SuperMontage?

EDLESON: Sure. SuperMontage was never meant to be an ECN-killer. In fact, ECNs have always been an important part of the Nasdaq Stock Market. SuperMontage is just the newest generation of Nasdaq. It is an open architecture approach to market structure. As a business, it is a tough step to take because it means we are continually spawning our own competition. But it is what we intend to do. The market is all about competition and it is what SuperMontage was set up to provide. It is intended to support the various ways that you can trade. It is not meant to provide the way for you to trade, nor is it a 'one size fits all' facility, which is what George Sofianos was pointing out before. It is meant to be an approach that embraces competition, both within the system and outside the system. That is, it explicitly allows for internalization for other ECNs. But SuperMontage has made it all come off much more efficiently. It offers far more efficient routing than we had before.

SuperMontage was intended to increase transparency, depth and liquidity. It has done a pretty good job in these areas. . It has helped with the continuing technological cost compression that is producing market quality for both retail and institutional investors. It is producing this inexorable downward cost drift. It is a pretty open system.

SuperMontage is just a starting point. When we designed it in 1999, it was meant to be a good strategy for the year 2000. It was a great strategy. It was not a 'be all and end all' strategy for 2002 when we launched it on

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[43] Nasdaq announced the introduction of NAqcess in late 1996. It was designed to replace SOES. Nasdaq said NAqcess would enable individual investors to place limit orders in Nasdaq securities at prices better than the best bid and asked prices.

December 2nd of 2002, or in 2003 where we are today. It is just a starting point.

There is an awful lot that we are doing and that we have to keep on doing, not so much for the system to be successful, but to help Nasdaq be successful as a marketplace for you to trade in. We must be able to take advantage of a wide variety of innovations. It has always been our claim that we do not have to be the ones to provide all of those innovations. It is our job to be the glue that holds all of the parts together.

We now face a more difficult challenge. It is much more difficult than it used to be for all of the competition to happen within Nasdaq. In the last year or so, driven by tape revenue as much as by other factors, a large number of issues have created major challenges with competition among a variety of exchanges. That has been the biggest hurdle for SuperMontage.

Let me tell you some of the things we are doing, and where we are heading. Some of the things I will note have already happened. The second MPID allows participants, such as program trading firms, or others who want to set up agency desks distinct from their normal Nasdaq trading operation, a way to get orders executed in SIZE without having the orders flow through one place in the company.[44] That is really new. We are still rolling it out. SIZE is Nasdaq's own little ECN. It is your own little place to have pre-trade anonymity, which was previously ruled out for all market participants, all broker dealers. This is quite a change for Nasdaq. Instead of being a market maker or an ECN, you can now just be a regular broker dealer and provide your limit orders in the marketplace. That has been going very well. We have had phenomenal growth with it, and it is continuing. SIZE is actually ten percent of what is happening in SuperMontage.

STARK: Mike, has it been rolled out for all of the stocks?

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[44] As part of its SuperMontage project, Nasdaq launched a second MPID, or 'market participant identified,' which allows market makers to post limits order anonymously using the 'SIZE' tool in the SuperMontage system. SIZE, which is not an acronym, was initially rolled out to show the aggregate size of non-attributable quotes and orders entered by market participants on a pre-trade, anonymity basis. In other words, after the trade execution, each participant's identity was revealed. In late 2002, Nasdaq had permission to provide post-trade anonymity. The idea of the second MPID in SIZE is to give market makers and participants an alternative way to post limit orders other than through ECNs, which clearly have siphoned away order flow that previously went directly through Nasdaq. Nasdaq said the second MPID would allow market makers to provide pure agency services walled off from their other proprietary trading business.

EDLESON: Yes. That is totally rolled out, and it is getting good usage. Not incredibly broad usage, but the firms are using it. I can't remember how many firms. It is not quite 100 yet. It is getting fairly deep usage from the firms that are using it. We are hoping that broadens out some.

STARK: Can I interrupt for just a second?

EDLESON: Sure.

STARK: Do you see smaller market makers – obviously Nasdaq is an amalgamation of many different sized broker dealers – using SIZE more? These are participants who find the cost of entry into making markets in a large number of stocks too high.

EDLESON: When we expanded the use of SIZE, market makers reaction was the thought 'Oh, wow, they are going to let the order-entry firms in.' And we did. So now we have, among our top 15 user groups, participants such as Mount Pleasant and Genesis. There are a lot of fairly familiar names. The computer generated trading firms – the faster model trading firms that are not market makers in Nasdaq – have been embracing SIZE. We are getting much larger growth from non-quoting market makers, who are order-entry firms too. Goldman Sachs can be an order-entry firm for a stock that they are not quoting in.

We have had huge success with people who could quote in a stock because they are already set up for it, and who are quoting in other stocks, who are now just using SIZE to do their activity in some of the more marginal stocks for themselves. That activity is a bit bigger than the activity coming form the order-entry firms. But we are not getting participation from a large number of small order-entry firms. They are not doing much more than dabbling in it. That is because there have been some switches, some technical things that needed to be done that were not turned on until just last week. But we are seeing a little more growth now that that is fired up.

What we are not seeing is an Ameritrade, or an E*Trade, or someone that has got the normal sort of flow that is going to the market makers. This has not disintermediated market makers in any way. In fact, the market makers themselves are making a good deal of use of the SIZE feature.

STARK: Do you think that will happen eventually, or do you think the cost-benefit is still for them to go to the market makers?

EDLESON: Well, they have always had the opportunity to go elsewhere. Whenever I have talked to a market maker who has said that us guys at Nasdaq are trying to steal their lunch away, I have answered 'No, that we are not.' And I add, 'All the lunch that is stealable has been stolen

already.' If you think of SIZE as an ECN, we are not the first or second, or even the eighth or ninth ECN out there. We are pretty late in the game. We are not going to be grabbing or saying, 'Wow, that is a great new trading idea.' It is just another way for people who want to use our market and who want to get a little closer to it to come in. It is just another option. It is not the one SIZE that fits all. But we would like more to come in and use it. It is part of the competitive environment. There is no reason for us not to provide it. But we have not seen any cannibalization of the residual lunch that is left for the market makers. They are providing valuable services, and as long as they continue to provide valuable services, they will keep getting that business.

We have a couple of other innovations. One that is out now, and one that is coming out fairly shortly. A new closing price. People have always viewed closing and opening as special moments in the trading day, and trying to get the right price for Nasdaq is a bit tenuous. We realize that. Once we got SuperMontage out, it turned out that we had the ability and quotes in place to try to do something good at the close and at the open. I don't want to upset Bob and say that we are not at some point going to be thinking seriously about some sort of crossing system

STARK: I was going to save that question for the later.

EDLESON: So let me preempt that. We had to make an initial step. A very quick step that we could make was rolled out on April 13th. We now have an official Nasdaq closing price that is keyed to the actual battle tested quotes that are getting used right up to the finish.[45] It does away with the

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[45] Nasdaq embarked on the introduction of its own price discovery call auction, known as Nasdaq Cross, in early 2004. This step was taken mostly in response to persistent complaints from the trading community and regulators about Nasdaq's haphazard opening and closing prices. The idea of the Nasdaq Cross is to provide more reliable price information, reflecting the truer market in individual Nasdaq securities. Up until then, Nasdaq had been using the first and last prints of the day for its opening and closing markets in Nasdaq stocks. But that had drawbacks, including the lack of reliable volume information, since the last print could reflect 100 shares, or several thousand shares. As a precursor to the Nasdaq Cross, Nasdaq launched the Nasdaq Official Closing Price (NOCP), using only SuperMontage trades in the calculation of Nasdaq closing prices. In the Nasdaq Cross, Market-On-Close (MOC) and Limit-On-Close (LOC) orders are accepted up to a cutoff time. At this cutoff time, an imbalance indicator and estimates of the closing prices are generated by Nasdaq. After this cutoff, imbalance orders are only accepted. There is then a 10-minute window leading up to the cross at 4 p.m. The crossing methodology is similar for the opening (which will be introduced later in 2004).

slow gaming that takes place at the end of the day. It does away with the old-fashioned 90-second trade reporting which in today's model seems ludicrous. We jumped on changing that one right away. We got that change within four and half months of when SuperMontage was rolled out. And we got market speed that is actually light speed.

The last thing is the open. Bob would appreciate this – we are going to have a single price open. Bob, we are going to have a single price open in Nasdaq (laughter). Okay? We have been designing it for a year and a week now, and it is going to roll out as soon as we can build it. It is going to be woven in with SuperMontage's price discovery, which is actually quite good. We had to find a way to build a single price open that is not a normal batch, but that is still woven into the knowledge, the price discovery of the continuous market. That is a tricky step. But we have got it worked out with the help of a large group of people from the industry. It should be interesting.

That is sort of it, in terms of where we are. Market share: we picked up a couple of percentage points when we rolled SuperMontage out. But there have been some compositional shifts in who is trading, and there has been a lot of activity in sub-pennies. We do not quote in sub-pennies, so we do not have access to that market. A couple of months after we were rolling out SuperMontage, sub-pennies got to be a really big deal. So, net net, our market share is actually a little down from where we were with SuperMontage, even though we got a 1.7% kick when we rolled it out. That is going to be a challenge for us. It is a challenge to go with an open architecture model. We are not insisting that people come in and use our system, but we still provide enough value to retain being a relevant portion of the critical mass of order flow. We are there now, but we have a long way to go to get to where we want to be.

STARK: Donna and I are the buy-side representation up here. One of the things that we were talking about is the kind of impact that SuperMontage has had on us. We had to admit that there really wasn't much, since we are not broker dealers, and we have to use some other portals to enter a market. Frequently that portal is an ECN. There aren't as many ECNs now, but they are still a force in the market. Bill O'Brien, in terms of market share, please tell us what is going on with the ECNs vis-à-vis SuperMontage. How important do you think they are to institutions for

getting their order flow executed?

WILLIAM O'BRIEN: As far as SuperMontage impacting institutions and dealing with their own order flow, I agree that the impact among our client bases has been fairly negligible. Regarding the ECNs assisting in order flow processing generally, one of the things that I took away from the morning that I take a contra position to, is that market structure developments over the past ten to fifteen years have worked to the disadvantage of institutional investors. The developments have been more retail oriented. That has put professional money managers and portfolio traders on the defensive. I think quite the opposite. Perhaps there was less institutional focus on best execution and market structure in 1993, but I do not think that anyone would posit that market structure in 1993 was better than it is today.

The proliferation of ECNs is a good example of how market structure changes have worked to the advantage of institutional investors. In terms of cost reduction in cents per trade, the whole reason we are talking about institutional commissions in terms of 2 cents a trade as opposed to 6 cents a trade is because the ECNs have offered direct execution ability to institutional investors. They have also pressured the more traditional avenues of execution services to keep their costs low, and to help them put their costs in a position where they could offer more competitive rates. They are able to offer institutions direct control over their orders, which puts an additional variable into the portfolio return dynamic. As a consequence, an institutional investor with superior in-house trading capability can earn an extra 25 basis points or 50 basis points over time. This not only improves return but, more importantly, it also improves relative return against the benchmark and against a portfolio manager's peer group.

Where is it going, and what new developments are on the horizon? Even though I do not have the clear crystal ball, I know that ECNs will continue to be a valuable tool. Historically, ECNs have been the most adaptive to market structure changes. They have helped their client bases meet the new dynamic posed by those changes.

STARK: Some would say that the ECNs have an unfair advantage. If Nasdaq wants to put through a change in SuperMontage, you must go through a very strenuous regulatory methodology just to tweak your system. Do you think that benefits ECNs over Nasdaq?

O'BRIEN: I take issue with that. There are a variety of regulatory classifications that you can choose to live under. There are advantages and

disadvantages to each. Nasdaq chose to operate as a for-profit exchange with all eyes pointed towards an IPO, in competition with ECNs. But I do not think that SuperMontage is a big ECN-killer. Brut is actually a big SuperMontage user, to the benefit of our clients. But if they have chosen the exchange model, they have to live under that dynamic. Does being regulated as a broker dealer give you a certain flexibility that you do not have under the exchange model? Are there advantages to the exchange model? I think Mike Cormack would say that there are, because Archipelago chose to head in that direction.

STARK: OK, thanks. Let's move on. Alfred Eskandar, tell us about Liquidnet. There might be three people in the audience who do not know what Liquidnet is. I will give you a 45 second sound byte to explain to those who might not be completely familiar with how your facility works.

ALFRED ESKANDAR: Sure. I think it is best to start with why Liquidnet is even here. I'll paraphrase Kevin Cronin from AIM Advisors in Houston, Texas Kevin once said that, until you fix the current market structure, all you can do is measure the inefficiencies. What Liquidnet aims to do is to create an efficient marketplace for institutions. There was talk earlier about latent liquidity. Liquidnet is a buy-side to buy-side, alternative trading system that recycles all the latent liquidity that is upstairs, that allows institutions to trade directly without intermediaries and without information linkage. The result is an average execution size of 50,000 shares and virtually everything gets done within the spread.

STARK: How much of your order flow is trading in exchange listed stocks versus Nasdaq stocks?

ESKANDAR: Traditionally, we did 60 percent listed stocks to 40 percent Nasdaq stocks. In the last quarter, we have seen an increase in listed activity. Now we do about 66 percent listed. About two out of three of our executions are for a listed stock.

STARK: Any idea why?

ESKANDAR: A couple. Perhaps institutional investors hold more exchange-listed positions, although it is hard to be sure. I think that the quality of the executions that they are getting, and their ability to deal 2,000,000 of a listed stock in the middle of the spread is too tempting not to. It all comes down to execution quality and speed.

STARK: OK. Fair enough. I believe that we have saved one of the best for last. Matt Andresen, you have worn lots of different hats. In your previous incarnation, you were at Island, a very large ECN. Now you are at

Sanford C. Bernstein.[46] The majority of your business is listed as opposed to Nasdaq. Are you using ECNs yourself to trade listed order flow? What do you see out there? How does your life differ from what it was before, now that you are at Bernstein? Is that too broad a question?

MATTHEW ANDRESEN: Life is a lot different at five cents a share (laughter). Better suits (laughter). I think putting me last was some kind of sick science experiment by Holly to see if I could be quiet for that long (laughter). I did it.

STARK: I am impressed.

ANDRESEN: The most important thing that anybody can do is to use Island (laughter). I am sorry that is my old shop.).

STARK: The next page (laughter).

ANDRESEN: Mike Edleson reminded me of something. He said that everything that could be stolen has already been taken. I was on a sales trip to the Southeast a couple of weeks ago. I spent a night in Montgomery, Alabama, the home of the exterior opening hotel door. I am from North Carolina so I know what I am talking about. The hangers that they used in the closet are amazing. If you go one step below a five star hotel, they have a hanger with a nub that you stick in so that you will not be motivated to take the hanger. Well, this hotel had plastic hangers with nubs (laughter). I actually nicked one anyway because I did not think that anyone would believe me. You really do have to nail anything down if you don't want it to walk out the door (laughter).

Technology, as Donna correctly pointed out, is key. It is key because it has to solve lots of complex problems. However, given my background and my current life, I do not view these things as problems. I view them as positive aspects of any healthy economic construct. My sister lived abroad in Cambodia for a couple of years, on purpose (laughter). She came back to the U.S. and went to load up on stuff before she returned to Cambodia. She went out to the drug store and came back full of vitriol about how we had too many things in America. The toothpaste aisle was an entire aisle, and there were too many choices. She was really stressed out.

I convinced her that that was actually a positive thing. You could always grab the first toothpaste you see and it would keep you cavity free. You don't need to micromanage it unless you are a very sophisticated customer.

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[46] At the time of the conference Matthew Andresen was Head of Global Trading at Sanford C. Bernstein & Co.

When you look at the marketplace today and at the market structure that we operate in, you have to step back and understand something. Just like with toothpaste, in markets there are different criteria of value. What is important to Donna is not the same as what is important to Mount Pleasant when they use SuperMontage.

The fact that there are different systems like Liquidnet solving different problems, is not a symptom of a functional error in the system. Rather, it is a symptom of a healthy marketplace. Different systems can go out there and solve different problems. You have different technologies. Aggregators like Lava, electronic markets like Archipelago and Instinet, and Liquidnet trying to pull together for the first time the big buyers and the big sellers. You even have different market structures for marketplaces. The NYSE has a floor-based model. With electronic markets, you have destination models and routing models. You even have call markets, a system that our host advocates.

I do not find all these things distressing. Perhaps they are a bit confusing, but that is our job. Our job is to solve problems for our clients. It is the client's job to come to Bob's conferences and find out what is going on. I view these things as positive, not negative, for the marketplace.

STARK: Fair enough. Donna, in terms of all the systems out there, where do you see it going? Are these systems useful? Were they created to meet a need because of how your business has changed, or because of the pressures that you have had to operate under? How do you feel about getting best execution, paying soft-dollar bills, paying client direction, and worrying about the next time the SEC will come in to see whether you are getting best execution?

VANDENBULCKE: Our main objective is to seek the liquidity. We trade a lot of small-cap stocks. If you need to get something done, it could be 50,000 shares or it could be 2 million shares. We need to find where the natural is and be less exposed. With the ECNs and ATSs there is anonymity. You are less exposed. There are so many forces that you are trading with today, whether it is a competitor, whether it is another broker, another ECN. You need to be very careful whom you give your order to. So much more is done upstairs, but the marketplace is fragmented.

STARK: Let's go back to the concept of latent demand that was discussed quite extensively in the prior panels. Alfred, I would hazard to guess that latent demand is being captured in Liquidnet?

ESKANDAR: It is. I think it would be best to go back to Economics

101 and ask, 'Why is demand latent?' If you look at the economic model, you see wholesale buyers and institutions going into the marketplace and paying a premium. The bigger they are, the bigger the premium they pay. It is unlike any other industry that we see out there. It does not make sense. But there are reasons for it. Obviously, institutions do not want people to know what they are buying or selling, and when. Hence they put out a little piece of an order and keep most of the interest latent. If you were able to recycle all that stuff and enable Donna to meet you anonymously and directly, you would have a frictionless environment. That would enable both you and Donna to achieve your objectives. That is what we are trying to do. We are simply trying to create an efficient marketplace that enables the PM's ideas to be executed frictionlessly.

STARK: How much of a role do you think the portfolio manager plays in all of this? As we discussed earlier, when a new and very large order appears on your desk, you survey the market to find the natural other side. Then you go back to your portfolio manager and tell him, 'I have good news and I have bad news. The good news is that I found the other side. The bad news is that I found the other side.' When the PMs hear that, they frequently pull their orders or say, 'Let's hold off and see what happens.' Or they will say, 'Let's not execute and see how the contra-side has an impact on the market.' How do you factor that in? Is that factored into Liquidnet?

ESKANDAR: I think they are both saying that. It is like saying, 'Holy cow, if I am the buyer,' and 'Holy something else if I am the seller.' Traders want to take ownership of their order. It comes to accountability and responsibility. As Bob Schwartz mentioned earlier, when institutions make the decision to buy something, they have a much longer horizon.

PMs don't come up with an idea in two minutes. According to Schwartz and Steil, they take a much longer period to research a stock – a week, a month.[47] In order to get that order sold, they have a much longer horizon, and a reason for buying or selling it. Perhaps the stock has already appreciated X% and the PM is looking to get out. Perhaps the PM is looking to buy shares at $10 because he thinks that it is going to 40. It is more important for the PMs to capture an investment idea and have the position, than to play a guessing game of, if I am a large buyer, why is there

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[47] 'Controlling Institutional Trading Costs: We Have Met the Enemy, and They are Us,' Robert A. Schwartz and Benn Steil, *The Journal of Portfolio Management*, Volume 28 Number 3, Spring 2002, pp. 39-49.

a large seller out there? Think about it – how else do you expect to get the merchandise?

STARK: That is a good point. Paul Bennett, I want to bounce the ball over to you now. In terms of latent demand, if there is a liquidity quote of decent size on the floor that is viewable by people, do you think that block volume will increase in New York? It has, if I am not mistaken, been turning down a bit. We talked about this at lunch, in terms of market share at the New York, which has hovered at around 80% to 87%. As the market changes, do you think that this will bring more volume back to the New York?

BENNETT: The answer is yes. Other factors also affect our market share. As I was discussing at lunch with you, much of the off-exchange volume is in the low-price stocks. For reasons that I don't have a full grasp of, people love to trade low-priced stocks off of the NYSE. There have been so many, they are more volatile, maybe because the companies are not in such great shape, are leveraged and the prices bounce around a lot. Maybe it is because even a penny is a fairly wide spread for them. Anyway, a lot of the low-priced stocks are traded in sub-decimals as well. In terms of other factors affecting the blocks, there has been the growth of program trading, which we noted earlier. A lot of people are saying, 'Gee, instead of trading it as a block, I am going to slice and dice.' This can apply to individual stocks, but to a large extent it is applied to portfolios of stocks as well. This is why it shows up in the program trading numbers. We get a lot of orders. You know, small orders, either on Direct+ or not, that then get cancelled. They keep trying and retrying. They are mostly limit orders, although there are market orders to some extent. Those two factors have a lot to do with why blocks have been trading away. The other thing is, you can get into a true clean cross – when the liquidity has already been found. You can create a market on the side for just printing that trade. That is another factor.

Getting back to Liquidity Quotes, I think that they are going to catch on. As more people start to use them, more liquidity will be attracted. It will be one of those 'liquidity attracts liquidity' things.

STARK: Sort of like Bob, Asani, and Avner's display this morning? Where you have these 5000 share blocks clustered at different times of the day?

BENNETT: Could be. Could be 15,000 shares or so, or 20,000 shares, if it is in that range. Those things will happen. But it is not going to be 50,000 or 100,000 share chunks at a time, at least not right now.

There is a lot of uncertainty about how things will cluster. I view this as people trying to learn how to re-equilibrate the system under decimals. When we had eighths and sixteenths, maybe it was not the best system in all respects. But at least some institutions like trading at those wide spreads because there was a lot of depth at the quotes. On the other hand, you should be able to trade inside of that as well. Under decimals, you have room for the one-penny increments, but at the same time we need an explicit mechanism to cluster the depth at positions outside of the quotes.

STARK: Doreen?

DOREEN MOGAVERO[48] [From the Floor]: I want to comment on Liquidity Quote as a practitioner. That is going to probably become the main quote for institutional trading in large orders. The other one is probably going to be a smaller quote size underneath.

As a practitioner, we frequently trade blocks within those parameters anyway. I am sure that they will trade in substantially larger lots than 15,000 shares. The Liquidity Quotes should give a visual display to the traders. Traders should have a comfort level knowing where the liquidity is. When I come back to them and say that there is 25,000 offered up 15 cents, they can say, 'I know that, I see it.'

STARK: Do you think that it will be more attractive if you see it, and if you can get to it electronically without necessarily going through an intermediary? One of the arguments we have heard is that perhaps one can execute faster. For instance, the 1.8 million shares of Oracle that someone did in 51. The stock closed up, so they made a decision to trade there. But it was done electronically without anyone else touching the order and risking information leakage. If there is a venue such that – you know, where Donna can push a button on her desk and actually get to that quote and take it – do you think that will help?

MOGAVERO: It definitely will help. It is going to be used a lot by traders.

STARK: Maybe it will answer the buy-side conceit of, 'I want to see everything out there, but I don't want to show mine.' Which, Alfred, maybe you are addressing.

MOGAVERO: The parameters on Liquidity Quote have come down from 25,000 to 15,000 shares to become Expressible. I am not a policy setter, I am a practitioner. But I would assume it could probably go to ten

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[48] Doreen Mogavero is President & CEO of Mogavero, Lee & Company.

seconds or less, if it were that popular.

STARK: I want to clarify something. Within Liquidity Quote, if, for example, the quote is 20 bid and 20.10 offered with 50,000 shares at the 20 bid, and someone comes in to hit the bid, can someone in the crowd still say, 'Wait, I will pay 20.02?'

MOGAVERO: Yes, that is the point. You are going to get the advantage of the speed of hitting the bid. You also get the advantage of price improvement if I, in the crowd, want to improve on that price.

STARK: Of course. But that still does not answer some of the other comments that have been made about how there really isn't price and time priority in New York. You can bid at a certain price, and you may or may not get the execution.

MOGAVERO: That gripe usually comes from the person who didn't get the better price. The person who got the better price is usually fairly happy with the trade.

UNKNOWN SPEAKER: The question is, what is the relative cost versus the relative benefit? We have gone from chunky increments of a 16^{th} or an 8^{th} or a quarter, down to a penny. Now you are giving up a time and place advantage for a relative benefit of only a penny of price improvement, when the opportunity costs of missing out on that execution can still be measured in dollars. While you are always happy to get the extra penny, when you miss out on the execution because someone has stepped in front of your order, you have to ask how much does it cost me?

STARK: Paul?

BENNETT: With the Liquidity Quote, you will have opportunities at all the price points going up, for people to come in and add liquidity.

ESKANDAR: That is my point exactly. The opportunity cost of the missed execution [for the limit order placer] far outweighs the benefit to the market order placer on the other side of the trade.

STARK: In placing a limit order at 20, you have priced the market and have provided someone with a free option. They know, if the market turns and your bid is still there at 20, that they can step in and buy at 20.01. If the market turns and they wish to flip out of their position and your bid is still there, it will only cost them 1 cent.

ANDRESEN: It is one of the interesting, unintended consequences of decimalization. It greatly reduces the premium on that option. To repeat, if I am representing 10,000 shares, and Bob comes in to hit that bid, I always have the option to improve that price by one penny and take the 10,000

shares from my own account. If it goes up, all of the upside is mine. If it goes down, I can always just match them up with my 10,000 buy.

STARK: Some of the changes that we have seen – and there have been some unintended consequences in terms of decimalization – have been very beneficial for retail investors. The speed of execution is enormous, especially with Direct+. Because spreads have tightened, with a market order you don't necessarily get marked up 10 cents, or a quarter of a point, or an eighth of a point as you used to. Still we have those round holes, and the pegs keep getting bigger and bigger. Perhaps what was good for retail investors has made it much more problematic for institutional investors to trade. Yes, Mike?

MIKE CORMACK[49] [From the Floor]: In light of what was just said about this free option value, I would like to ask Matt and Mike in particular what your opinions are on sub-penny pricing given what you just said about penny increments.

ANDRESEN: I used to be the guy who ran the first sub-penny increment market, and I would like to change that opinion now (laughter). As I said before – and this is the reason my opening comments were not so specific as some others – in any marketplace, the players will rise to meet the demands of the customers. There was a specific demand for sub-penny increments. Some of the increments were like we heard earlier in WorldCom. WorldCom was trading at 6 cents and trading a billion shares in a day. Not having a sub-penny increment did not make any sense. It is like, 'It is worth six cents. Oh, now it is worth five.' That is nearly a twenty percent change in price just on one increment. So it is irrational not to have sub-penny increments. When you go to higher- priced stocks, you might think that maybe we should split hairs and say that certain stocks at certain levels should not have sub-pennies. It is up to the market participants to figure that out. On Nasdaq, back in the mid-90s, you could still trade at 2/56, and 2/56 is a finer increment than a penny. So we have had sub-penny increments for some time.

EDLESON: Right. You cannot view a market structure characteristic as inherently good or bad. That is why competition is needed. So that markets can be free to set their own structure, and customers will vote with their order flow. If customers do not feel that they are getting quality executions in a market, they will choose not to leave orders on the book of that market.

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[49] Mike Cormack is President at Archipelago Holdings LLC.

They will trade elsewhere.

ANDRESEN: I think the New York should quote Nasdaq on that later (laughter). No market structure is inherently bad (laughter).

EDLESON: That is an important take-away. No one market is a panacea. That is why there are all these different tools. Liquidnet has a role, ECNs have a role, Nasdaq has a role, and the NYSE has a role. There are times when human interaction is essential to getting quality execution. We should not look at fragmentation as a negative, but as a positive to uniquely tailor execution alternatives to your particular strategy on a trade.

ANDRESEN: I would like to throw it back to Mike just for that one question. One thing that is true about one-penny increments right now in the Over-the-Counter market, is that they exist within systems, but not across systems. In other words, if you look at the consolidated quote, if you look on your screen, you always see the quote rounded away, unless you have a Lava-like system for seeing unrounded raw market data. The executions, however, always show up at their true, unrounded price. So you will see executions going off in between a penny spread, but you will not see the actual quotes. Mike Cormack, what are your plans at Archipelago for bridging the gap between having sub-penny possible executions and sub-penny quotes? Are you thinking of splitting those at all?

CORMACK [From the Floor]: We are looking at that pretty seriously. . At Island it is sub-penny, right? So we are looking at that. We do not want our own clients to be sub-pennied if you will, and we are looking at that. We probably round just as you see in a QDS or the data feeds.

ANDRESEN: Life is all about expectations. Suddenly being pennied doesn't look so bad (laughter).

STARK: Andy, you have a question?

ANDREW BROOKS[50] [From the Floor]: Just a thought. At some point, when we talk about market structure and competition, we have to legitimize things. Sub-pennies are illegitimate, except for a 5-cent stock. Maybe a 20-cent stock. But certainly not a thirty-dollar stock. Sub-pennies are confusing, they are distracting, and they bring no value to anybody. It is ridiculous for order flow to be directed to somebody because his or her bid or offer is better by a sub-penny.

STARK: Andy, do you think that should be regulated by...

BROOKS: You bet. And the guy who wants to do it is right here next to

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[50] Andrew Brooks is Vice President and Head of Equity Trading at T. Rowe Price Associates.

me – Mr. Ketchum[51] (laughter). Does anybody else in the audience think this? Raise your hand. Do you think that sub-pennies should be regulated out? Thank you. I do, absolutely, without a doubt. There is no economic benefit to anybody from sub-pennies, except if you have a 5-cent stock. I agree with you on that Matt.

ANDRESEN: One thing that has always made the debate problematic is the issue of fees from exchanges and fees from marketplaces, which are all in sub-penny increments. Fees are always taken into account in routing decisions. The old saw we used to have with Nasdaq when I was at Island was that, if sub-pennies do not matter for quoting, how can they matter for our access fees?

STARK: That is another discussion.

UNKNOWN SPEAKER: A tenth of a cent on a ten thousand-share order is ten dollars. Does that have value to someone, or does it not?

STARK: Sure, it is basis points. Rich?

RICH REPETTO[52] [From the Floor]: First I want to say that we are seeing the sterilized version of Matt Andresen (laughter). That was the most uncontroversial opening speech I've heard from him in a while. Anyway, I want to see if I can unleash some of the old Matt (laughter). The big issue, and I brought it up this morning, is with the NYSE. You just went through a scenario where you talked about a free put option in a penny world. I do not agree that all this fragmentation is a positive thing. We have gotten to a high level of frustration from the buy-side traders. They are at a pretty extreme level of disenchantment here. What would you, Matt, as a guy who drove changes in the Nasdaq market, propose to the man to your right to overcome some of the NYSE's structural problems right now? And then what would the NYSE say in response?

STARK: This is going to be good (laughter).

ANDRESEN: Since our desk does about two percent of the NYSE volume everyday, I will defer to his judgment on how to treat us nicely (laughter).

STARK: Oh, Matt. I am disappointed. Let us take this to the next step. Will there be other systems out there? Archipelago is now an exchange, and one can trade listed stocks electronically. Sorry Mike, but do you see them

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[51] At the time of the conference, Richard Ketchum was President and Deputy Chairman at The Nasdaq Stock Market, Inc.

[52] Rich Repetto is Principal at Sandler O'Neill & Partners. At the time of the conference, he was Managing Director at Putnam Lovell NBF.

making inroads?

ANDRESEN: That is the key question. When are we going to see, if ever, true volume move off the floor? One thing I would say about the NYSE, is that they now have eighty percent market share. But in terms of the sort of publicly available volume you see, it is closer to ninety percent or above. The question is, when is volume in the non-Nortells and Lucents going to move off the floor and go somewhere else?

I have always said, and I still believe, that that is not a question of anything changing at the New York, or anything changing at another network. The issue is the way in which those networks are regulated. Right now, through the Intermarket Trading System (ITS), there is a trade-through rule. The rule says, and it makes perfect sense on first pass, that 'no marketplace may consummate a transaction at a price inferior to one displayed elsewhere.'

This seems to make perfect sense. However, when you actually get into the teeth of it, you find that it does not always work so well. The reason is that an advertised price is not the sole criterion of value. Has anybody here ever bought anything at a 7-11 store? I am going to pick on you; you are economically irrational (laughter)! But of course you are not. It was 2 a.m, you were thirsty, and you did not want to wait eight hours until Sam's Club opened, and then pay 50 bucks to join and then get a six-gallon thing of Coke. You wanted what you wanted at that time (laughter). Because of all of these different things that we have heard – there are these different systems solving different problems – to lump all of them into one box of value is an irrational construct. What you will eventually see is the trade-through rule being de-fanged, or being changed in some way that will better allow for competition with the electronic markets.

Example: Let's say the Amex is bid at 40 cents and Archipelago's bid is at 39 cents. Well, you as a seller might say, I don't really want that 40-cent bid. Perhaps the implicit or explicit costs of interacting with that 40-cent bid outweigh that penny of supposed price improvement. If you know you can go to Archipelago and get an immediate execution and an acknowledgement back in under a second, that might be worth more to you. It might be better than just getting routed to the 40-cent bid and maybe not getting an execution, or not finding out what happened for 90 seconds. Those are costs that are just as real as the advertised price. They are just as real as the explicit cost of execution.

Until we accept that there are other criteria of value, I do not think that

you will see anybody able to move off of the dominant market center.

STARK: Do you think that will work for individual investors? We have talked about differences in the markets in terms of how it is useful for individuals versus institutions. Most institutional traders sitting on a buy-side desk might not want to tap the 40-cent bid on the Amex. You might want to go to the 39-cent bid in Archipelago because you know you are going to get it, that there is not going to be a delay. Because you know that you are getting best execution because immediacy and size are much more important to you

ANDRESEN: That is a great point. One of the problems that buy-side institutions are wrestling with now – and I talked about this with Donna – is that there is no definition of best execution. Sometimes the vision that she feels subjected to is more of a retail design than an institutional design. It places her in the position of trying to push an enormous order, a basketball, through a garden hose. A 100-share bid is not important to the end result of one of her orders. The retail concern is a canard.

If a retail customer trades at E*Trade, or at TD Waterhouse, or at any of these places, almost inevitably the order ends up either with a wholesaler who guarantees the NBBO, or who uses some kind of technology system that routes to the NBBO. I am unaware of any retail brokerage system that takes any chances with routing away from the NBBO.

STARK: Especially with Nasdaq stocks. Nasdaq has a Manning obligation, and they cannot risk being away from the NBBO with a retail order. On the regulatory side, they could be in a lot of trouble.

ANDRESEN: That is right.

STARK: We are just about out of time. Let's go down the row with some closing statements. Unfortunately, I do not have a crystal ball with me. I know that you can buy anything in New York, but I couldn't find where to buy one of those (laughter). But what do you see coming in the future? Mike, what do you see in the future from Nasdaq?

EDLESON: I see a continuing attempt to unleash the latent liquidity within. It may not come from us interacting directly with the institutions. It will come through our trying to make it easier for the people the institutions do business with to do that for them. You will see the next generation of features we provide so that the people whom you do business with can do a much better job for you. The job should be done with as much transparency and depth as can be provided in the marketplace. We are not going to try and shoehorn you into one particular approach, but you will see us

continuing to push in that direction.

STARK: Bill?

O'BRIEN: One trend that you will see on the buy-side is increased reliance on order aggregation technology. The fragmentation of markets has created a need for trading applications that offer direct access to multiple markets through a single trading application. This need can now be met through vendors such as Lava, Sonic and BRASS. These can provide a single point of access to all relevant pools of liquidity. While this trend has not permeated the buy-side community to a single degree as of yet, it is nevertheless a trend that will ultimately supplant reliance on a single market center technology. .

Exactly how the buy-side obtains this technology will also be an important trend to monitor. Portfolio traders will have to weigh the pros and cons of having such technologies provided to them by their traditional sell-side brokers, or obtain it directly from vendors. When receiving such technology through a traditional broker, there are pros, such as the payment for the technology through commission dollars and assistance with implementation. There are cons, such as higher explicit commission costs for 'execution-only' trading, consolidation of the electronic commission dollar and order flow through one sell-side firm. And then there is a resulting decline in the relationship between the institutional account and ECNs, as ECNs see order flow from such applications in the name of the broker dealer vending the technology. How firms weigh the positives and negatives of how to tap into order aggregation technologies will drive how the buy-side interacts with the Street through the next decade.

STARK: Alfred, how about you? Is Liquidnet going to expand its horizons? I think you are already in London, are you not?

ESKANDAR: We are. We are actually trading five different international equities right now and are doing it quite successfully. We are happy with that. One statistic came out of today I am very please with: Among the top 200 institutions, there is about 65% overlap, if you can compare the 13Fs.[53] That is absolutely wonderful news for us and I am very happy to hear it. What that tells us is that there is an efficient and plausible way for institutions to interact directly and actually achieve something meaningful. The Exchange has been incredible at maintaining its market share. That is because it has not had a competitor come and hit its sweet

[53] 13Fs is the tally of individual mutual funds largest positions by stocks.

spot – the block trade execution. I believe that we are making a dent, and that the dent will get bigger and bigger. With 141 institutions, we are doing six and a half million shares daily in listed and Nasdaq volume, which is great. If you take into account the network effects and double that size by yearend, the network effect will grow exponentially. It is nice to have a mathematical principal working with you.

STARK: Fair enough. Matt?

ANDRESEN: Like I touched on at the beginning, I do not worry a lot about problems being solved. The great thing about free markets and capitalism is, as long as there is a market incentive to produce something that solves a problem, someone will step up and solve that problem. What every buy-side trader can take to heart is that someone is going to crop up like Liquidnet and solve the institutional order-matching problem. A way will be found to feed in one large order and to find another large order.

For the first time, we now have an electronic exchange in Archipelago. We have an aggregator in Lava that takes all of these different pools of liquidity and ties them together in one place. There are readymade tools that you can get right off the shelf that will solve these problems. If a new problem arises, whether it is the free option problem we talked about or something else, I am sure that there are enough smart, motivated people out there for someone to appear and come up with something slick.

STARK: Fair enough. Paul, how about you?

BENNETT: I lack a crystal ball like the rest of us. There was a lot of discussion about penny stock trading. One thing to remember is that we have had a terrible corporate environment. There are a lot of companies whose stock prices have gone way, way down. I think that we are in a disequilibrium now. In the next couple of years, I believe that we will see companies deciding where they want their stock price to be. I know that it is not easy to recombine your stock with a reverse split and get it back up to 25 or 30 dollars or whatever. However, there are incentives to do that, and this will change a lot of the low price stock trading that is getting so much attention now.

With respect to block trading and in general, we are seeing a larger proportion of program trading. And there is a lot more slicing and dicing. Liquidnet is great in terms of putting huge blocks together where that can be done. But the alternative to Liquidnet is the chopping into small pieces that we see a tremendous amount of now.

STARK: Do you think that will continue?

BENNETT: It will. It is a real force of technology. That technology is spreading from the sell-side to the buy-side and out. It will be a feature of where we are headed.

STARK: OK, Donna. I have saved you for last because you are the person we all care about in this conference. You are the buy-side trader.

VANDENBULCKE: My vision is more consolidation, or at least more partnerships on the sell-side. It is virtually impossible to have every ECN and ATS on my desk. Perhaps Liquidnet will do some kind of joint agreement or partnership with a Lava or a Harborside+. This way, every trading desk can have some kind of access. Then we will really be able to leverage it all together in a much stronger way.

STARK: Thank you. That concludes our time, and I want to stay on time. I thank the panelists.

CHAPTER 5: THE EVOLUTION OF THE MODERN NASDAQ

Richard Ketchum, New York Stock Exchange
Chief Regulatory Office[54]

RICHARD KETCHUM: It is a pleasure to see so many friends gathered together in one place. It is encouraging to know that the number of people who really care about markets is steadily growing. Before I begin, let me first say that a combination of emotions makes me feel like I should pause for a moment. For one thing, I want to treasure the 'bring back the old Matt Andresen' theme. In and of itself, it is a great image. For another, I want to say, 'we thought it over, Bob, you are right, we are going to switch to periodic, single priced auctions and just get rid of the rest.' (laughter).

I do not know whether it is the worst possible nightmare or the greatest opportunity for a market structure jock like myself to speak after Holly Stark's panel. First, here is a warning to all of you in the audience who listened to the previous speakers: What you will hear in the next half hour has been discussed in the last hour because the range of subjects I tend to talk about is limited. But it is a dream to have the last word on each and every one of those issues.

It is de rigueur here – remembering that I come from Nasdaq – to step back and say that I will talk mostly about what I see are the developments and the concerns related to the Nasdaq market. It is worth stepping back. There are a lot of issues to look at in Nasdaq right now: the trading of Nasdaq securities, the impact of decimalization, the impact of fragmentation.

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[54] At the time of the conference, Richard Ketchum was President and Deputy Chairman at The Nasdaq Stock Market, Inc.

We must focus on where change needs to occur.

Right now, the Nasdaq market is operating better than it ever has before. That certainly is not by any means solely – or even close to solely – because of Nasdaq. Nevertheless, I believe that the basic model of the Nasdaq Stock Market has proved itself to be right. It is providing value both to institutional investors and to individual investors. By that model, I do not mean a single piece with market makers posting continuous, two-sided quotes. I also mean linking the ECNs into that market, the ability for other markets to compete, and the ability for various different crossing systems to operate within our structure.

Our basic model is an open market structure that allows networks to work within a fundamental regulatory framework that insures best execution. But the structure does not put participants into a straight jacket to obtain best execution. My opinion is obviously with some prejudice, and, of course, there are other models. But it is uncontestable that a great thing about competition is that it offers choice – meaningful choice for issuers and for people who participate in the markets.

Think of the current environment, the amount of innovation, the various needs of institutional investors and the different kinds of individual investors. The only way to meet all of these needs is to provide an open, competitive environment where regulation is based on basic expectations of fairness and basic concepts of best execution. We cannot require people to all 'get there' by them all going through an identical, single hole.

Today, we are in a dramatically different place than we were before. Right now, for Nasdaq's active stocks, actual spreads are narrower, effective spreads are narrower, and executions are, not surprisingly, faster. All of that results from choice and from providing automatic execution. It results from an environment where you not only can display – and are required to be accountable for the price you display – but where you can also bury reserve size to encourage liquidity.

Among the list of critical issues that need to be addressed in the market today, first and foremost, is the discriminatory and unbalanced effect of access fees. Some excellent points were made earlier about these fees that I entirely agree with. When you have a basically open model with limited regulatory requirements that insure fairness, it is a good idea to get out of the way. We must allow people to choose where they are going, and what provides the best value for their money. The only place where regulation genuinely provides a role – aside from protecting against fraud, disclosure,

and a lot of other things that deserve a great deal of focus– is in a situation that is fundamentally discriminatory, a situation that fundamentally drives the way people participate in the market. I suggest to you that access fees do that, and have done that for the last five years. They will continue to do that until the SEC, as the only universal regulator, addresses them.

Why do I say this? Essentially, there are two basic rules that need to be observed on access fees. The first is that they need to be applied on an all-or-none basis. The idea that some participants must provide free access to their quotations to other marketplaces and participants, while other participants do not provide similar free access, fundamentally does not work. The concern that the SEC and others had at the time access fees were approved – that you have to be cautious and sympathetic to business models – may have been an issue a few years ago. However, I think it is fundamentally and intellectually wrong today.

There are multiple functions that a market maker – or anyone else who supplies liquidity – provides in a marketplace today. There are multiple functions that an ECN provides as well. A market maker or an ECN tries to provide liquidity within its own control. ECNs do that by crossing orders. Market makers do that by crossing orders and by providing liquidity. Market makers have the ability to profit at higher levels when they provide that liquidity and post two-sided, continuous markets. With proper disclosure, that makes excellent economic sense, and it is a good idea.

The second way they all participate in a market and provide benefits to the customers is by displaying orders and allowing them to be accessed. Market makers and ECNs do that in the same way: by displaying an order and being subject to automated execution. Market makers, however, do it in a slightly different way from ECNs. They do not get the chance to have their systems looked at and they do not get the chance to make sure that the order is still there. Yet an ECN can do this. If one is displaying an order, it should not matter who you are, or what you happen to be registered as. It should not matter whether your are an ECN, an ATS, a market maker, an order-entry firm or, indeed, anyone else who participates in the market place.[55]

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[55] The context of these remarks is the complex market structure in operation at the time of the conference. Nasdaq's SuperMontage, for instance, had three algorithms that determined the standing of orders in the system: price/time, price with ECN fees and price/size. Under this system, ECNs tended to search among their own linked systems in the execution of orders before turning to market maker liquidity and to the SuperMontage. Market makers typically

The fundamental result of this not occurring is the feeding of orders to people who are able to charge access fees, and it leads those orders away from people who are not able to charge access fees. That just does not make sense from a competitive or any other standpoint. Within that context, a second concern that obviously is a little parochial from our perspective –but which I think is equally of concern with respect to the operation of how access fees work today – is that it would be perfectly logical to allow everyone to compete on access fees if they all could charge them. In this manner investors could choose where they could go on an access-fee-by-access fee basis.

The world is not quite that simple, of course. People were driven by a best execution obligation to sweep up all those trades. The ability for markets to charge a materially different fee when they have linked access through a marketplace that provides a link – versus what they charge their own customers – is discriminatory. This results in an environment that simply does not make sense from a regulatory standpoint.

What comes out of this, other than order routing decisions that might not otherwise be made? A couple of issues stand out as worrisome. The first, and one of the best examples of the absurdity of a disparate access fee environment –or indeed an access fee environment where those fees can rise to substantial levels– exists in the Nasdaq market today with locked and crossed markets. It is now a recognized, accepted and sensible arbitrage strategy to extract access fees through locking and crossing markets.

That might simply be part of life if everybody was an active trader operating in the same way in the marketplace. Fortunately, although it is great to have those active traders, that is not the case. We have individual investors; we have firms that service individual investors; we have institutional investors making order routing decisions, and the rest. It is a simple, basic fact that when firms servicing individual investors have locked and crossed markets, their systems shut down. This means that they have dramatically additional processing – or investors don't get their execution –

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had priority executions on SuperMontage because of these algorithms. In early 2004, the Securities and Exchange Commission approved a Nasdaq plan to give ECNs the same standing as market makers on SuperMontage in return for capping ECN access at three-tenths of a cent per share.

or they have to wait for their execution, and the like.[56]

The solution might be that the firm should execute even though it is faced with a locked and crossed market. Perhaps they should just guess what the best market is or make a probability determination of what can occur. That was truer before access fees, but it might still be a reasonable approach. The simple result is that the firms are, just by defying probability, guaranteed to execute a large percentage of trades at economically unattractive prices.

This could be good for some individual investors. However, if you do that that over a long period of time, you probably will move away from an environment where there are guaranteed executions, or liquidity provided by market makers on Nasdaq or specialists on the New York Stock Exchange. (The NYSE, incidentally, is discovering the wonderful world of automatic executions on small orders). I am not sure it is a sensible market structure or a regulatory determination. It certainly is not one that is likely to increase individual investor confidence in the market today.

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[56] Market makers were among the most prominent opponents of the access fee policy at the time of the conference. Indeed, market makers took exception to the fact that while ECNs were permitted by the SEC to charge access fees, market markers were not allowed to do so. The Security Traders Association (STA), a trade group representing sellside and buyside professionals, issued a scathing attack on access fees in a White Paper. The paper noted that the 'convulated rate structure' used by markets, 'whereby users receive rebates adding liquidity and are charged fees for absorbing liquidity have led to negative behaviors.' The STA gave an example of a customer who was interested in selling a stock that was quoted at 10.00-10.05. 'Traditionally, the customer would execute its order by accessing the 10 bid. In today's rebate scheme, the broker would be better off entering a sell order in an ECN at 10, instead of hitting the existing bid, and creating a locked market (10 best bid -10 best offer) thereby receiving a rebate and, in the process, possibly depriving the customer of an execution,' the STA noted. As of early 2004, however, these controversial rebate practices seemed headed for the dustbin of history... The SEC's proposed Regulation (Reg) NMS on access fees recommended capping access fees at one-tenth of a cent per share and also proposed banning the 'pattern or practice of locking or crossing the quotations in any security.' At one-tenth of a cent, many observers agreed that rebates would be dramatically reduced, if not effectively eliminated. Significantly, Reg NMS also proposed universal market access rules to promote non-discriminatory access to the best prices posted by market centers. Reg NMS would permit market makers to charge access fees, though, of course, this could ultimately be made redundant by the recommend de minimus fee cap. Nevertheless, as of mid-2004, some commentators had cautioned that the Reg NMS proposals might not be implemented in whole or in part. Individual proposals, such as the access fee plan, might be enacted but the overall outcome for Reg NMS was not clear as of writing.

Aside from that, even from the standpoint of an institutional investor trying to deal with order routing systems, to make decisions and to justify where he or she has executed, it is extraordinarily difficult to do this in an environment where the fundamental quote information is not useful. It is not useful because of a continuing presence of locked and crossed markets even if they are short and periodic. It is particularly not useful if it is being created because of artificiality – access fee policies – imposed on the marketplace.

Aside from access fees and locked and crossed markets, a triage of issues facing an open electronic environment like Nasdaq's comes together on the question of linkages. This ties together the questions of accessibility and access fees. With respect to most markets in Nasdaq – aside from the question of choosing not to execute against a better price because of access fees – things are working pretty well today. There may be some benefits to having linkages between markets as more choice becomes possible in the Nasdaq market. Many participants choose to be in markets other than Nasdaq. The accessibility of the ECNs is reasonably good for just about everybody who wants to participate in those markets. Albeit, that still means that the basic common denominator – persons who do not have access to ECNs – are out of luck when there is no linkage. That in itself is somewhat problematic.

The second concern mentioned by the panel is a real one. That is the question of meshing manually handled markets, albeit extremely efficiently manually handled markets, with an auto-ex reserve size environment similar to Nasdaq's. This concern had to be addressed by firms last year because of the participation of the American Stock Exchange in Nasdaq securities. It seems to be, at a minimum, a concern where issuers have chosen to be listed in a marketplace that provides auto-execution. Therefore, it makes no sense for people to operate unlinked, and to provide no ability for others to receive automatic execution, even with respect to links that you as a participant provide.

While competition is always valuable, and the American Stock Exchange is a good competitor, it makes no sense to operate in an unlinked environment. It creates compliance risks for the firms, and confusion and dissatisfaction for customers, both large and small. It is a flawed approach without meaningful abilities to access that market in a timeframe that people in the marketplace have come to expect and demand.

At a minimum, it is time for the SEC to step forward and to acknowledge

this much: in an environment where best execution and trading is defined by milliseconds, it is unacceptable to have the same best execution requirements in markets that choose not to provide the same automatic executions as a marketplace characterized by automatic executions.

It is time for the SEC to step up and to acknowledge that there should be different standards. People have wide discretion in determining how to handle their customer orders with respect to a market that will not operate in an environment that is at least the standard – and the norm – of the marketplace where the securities are listed.[57]

The next issue on the list that deserves comment is sub-pennies. I got a good statement on this one from Andy Brooks. I was glad that he nominated me as regulator of the year. I would generally agree with the points made by Matt Andresen. If, in fact, sub-pennies are being used as a competitive mechanism, then sub-pennies matter economically. We should respect that. On the examples that Matt provided with WorldCom and other stocks that are traded in pennies, the research we have done and the statistics that we have analyzed, show that that is absolutely the case. Sub-pennies are fairly random, they occur at all ranges of all mils, and they appear to be a genuinely competitive mechanism.

In our research, when we look at stocks that are priced higher than a dollar – or priced more than a little bit above a dollar – our research showed that sub-pennies are not being used that way. The way sub-pennies are mostly being used in the marketplace today is, for example, to place them at 01 and 09 if not mils in front of that interval. This is being done in order to take advantage of the fact that a number of order routing systems, particularly the most successful one with respect to Lava Trading, prioritize based on those sub-pennies.

There is not pennying, but milling in our marketplace. If one knowingly permits this to happen from a regulatory standpoint, one should at least acknowledge and accept what it boils down to. From a basic position of choice, the economic benefits of the competition exceed the fact that you are

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[57] American Stock Exchange specialists did eventually provide automatic executions of sorts against their quotes in Nasdaq securities when these quotes were at the market's best bid and offer. That was the arrangement in place soon after the conference. The maximum order size was 1,000 shares for stocks which traded an average of 10 million shares each day in the previous quarter. Still, the Amex specialists had laid down a list of exemptions for automatic executions in Nasdaq securities.

putting, not only individual investors, but any investor who chooses not to be actively hooked into the system on a second-by-second basis, at a fundamental advantage. They are playing at a whole cent level, while other people are playing at a sub-penny level. The use of sub-pennies should be closely studied so it can be determined if they result in genuine benefits.

If some people continue to operate with sub-pennies and have order routing systems that take account of them, inevitably everybody will go to sub-pennies. It will be economically and competitively impossible for Nasdaq not to do it as well. But close your eyes and try to think of three reasons why a market maker may want to provide guaranteed executions for individual investors when the quote is at 20.03.[58]

Nasdaq cares a great deal about this next issue. It might not jump out immediately at those on the sell-side or to the institutional investors, but it deserves some thought. It is a particular cross that we and the primary markets must bear. It is the question of how to deal with regulatory responsibility and regulatory expense in a marketplace that has become, from an execution standpoint, increasingly commoditized. It is an issue that the New York Stock Exchange and the American Stock Exchange have faced. Last year, Nasdaq paid about $75,000,000 for regulation. We do not necessarily do that because the NASD is inefficient. That's for others to evaluate. We do it primarily because there are a variety of expectations that the marketplace and the SEC have imposed on how stocks are surveilled and regulated today.

Those expectations are that you do not just look at the end of the story with respect to an execution that occurs in a black box. Instead, you roll back and understand how the orders were handled from the time the investors either begin to put them into the system, or to hand them off to an intermediary at the branch office. The result is that we have order audit trails.

We look at how orders are handled at the trading desk and down on the floor of an exchange. We have physical exams and a variety of algorithms that attempt to identity situations that suggest that an order may have been

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[58] Reg NMS proposed banning subpenny trading in stocks priced above $1. This came as critics noted that subpenny trading resulted in predatory practices by some firms jumping in front of orders for relatively miniscule amounts. For example, if an investor placed an order at $20, another investor could then place another order in front of that for $20.0001. This latter investor could actually gain priority over the former investor for one mil.

handled improperly. Those orders can go to a lot of places. They go from an investor to a marketplace, or to a trading desk. They may then get entered into an ECN. They may be retrieved from that ECN and continue on to another ECN or marketplace. In between, a sell-side firm, which is obviously one of the largest ECN customers, is doing a variety of activities in multiple ECNs and multiple market places.

It is not good enough to say that everybody does some regulation. We need to step back and ask how that is going to occur. Nasdaq – and I would suspect some of the other exchanges – cannot continue in an environment where they pay tens of millions of dollars more than other participants that compete in the same marketplace. We have placed a petition on this matter with the SEC and have also presented informal interpretive advice. We are asking the SEC whether things like an order audit trail and in-person examinations are no longer important to them. If so, we will stop providing them. We will continue and try to compete with the money that we are able to save on those regulatory tasks.

Regulation is a very self-interested and focused issue. But as an investor and participant in the marketplace, I would say that it comes close, particularly in an increasingly cynical world, to something we ought to care deeply about. Regulation will not be performed in the future the same way as it is today. It will not operate from cradle to grave. It either will be moved to a neutral regulator or otherwise reinvented, or transferred to the SEC; or it will be spread out across the markets and cease to become an arbitrage item in which markets can compete as they rebate tape revenue. This has to be resolved now from the Nasdaq point of view. If not, there will have to be a fundamental reevaluation of how Nasdaq operates from the regulatory side.

I will turn to one question on the listed side. The comments made earlier were intriguing. One of the great things in the U.S. marketplace is that issuers and other people have a choice. I have always said, and profoundly believe, that Nasdaq makes the NYSE a better marketplace. The NYSE certainly has made us a better marketplace. Many of the changes we have made over the last few years were in large part made because of our recognition that our customers must have a choice.

Our regulators are able to look at other market models when they talk to us about how our market should evolve. There is a fundamental problem, however, in our ability to compete in listed securities. The problem should be looked at by the SEC. It is not a question of whether ITS is a good or an

inefficient public linkage.[59] It serves a purpose and it does have value. It is not a question of whether the NYSE should change its model. That is entirely a question about its ability to compete and how it competes.

An important related question is how the trade-through rule should be applied across all markets today. The impact of this rule varies but is meaningful in a variety of ways. I have always preferred that people be subject to best execution obligations and to fundamental obligations on how they handle customer orders. I prefer that people who have control, and who are able to make decisions themselves, be able to do that based on their own judgment of where they can find the most liquidity and the best price.[60] A trade-through rule requires you, because of the time frame involved to gain an execution through ITS, to suspend all those judgments and to follow a course that may not make sense even in your own interests or in your customer's interest. ITS was a means to enhance and to encourage competition 25 years ago when the world was very different. Now, ITS needs to go away.

That does not mean that everyone – including the specialists down on the floor –should not have an obligation, when handling a customer order (and that customer is not making decisions himself), to make rational decisions. It does not mean that everyone should not have an obligation to have to defend where that order is sent. But, in a situation where markets are not providing automatic execution, it seems to me that it is time to move away from a trade-through rule.

We should start depending on fiduciary and best execution requirements. We must move past the trade-trough rule to an environment where people can compete, whatever their model. We do not want competition fundamentally discouraged by a linkage system designed for different reasons, in a different time, a long time ago. And yes, I was one of the people who designed it. I will take responsibility for that.

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[59] ITS is the acronym for the Intermarket Trading System for trading listed securities. The ITS includes the NYSE, NASD, Amex, CBOE and the regional exchanges.

[60] With the publication of the SEC's Reg NMS proposals, Nasdaq lobbied to allow investors the right to choose the fastest trade execution over the best price, a step that would require the reform or repeal of the trade-through rule. Nasdaq, which did not have a trade-through rule as of writing, notes that it has narrower spreads and more liquidity on a comparable basis than the NYSE. Nasdaq also supported the 'opt-out' recommendation in Reg NMS.

The last piece I will mention is also terribly important. But I will not go into it because Mike Edleson touched on it. What I continue to have the greatest concern with is how Nasdaq opens its markets. I am particularly concerned with our opening four specific times during the year – the four derivative expiration times – because of the increased importance that people then place on receiving that opening price. We need to move to an environment that allows market makers to more effectively engage in pricing efficiency during the last half-hour before 9:30, using their quotes and, having the ability to provide automatic execution during that time. Secondly, we must provide a mechanism where prices can cross in the marketplace. It is not an easy thing to do in the context of an open competitive environment. We want to do it in a way that continues to allow people to quote aggressively. But we will be coming out with an opening process that Mike covered with you today. We would very much like the input of all of you because we want to get it right.[61]

Now my closing statement. People can feel good about the direction markets have gone in, and what has been accomplished over the past few years. Big steps have been taken to encourage competition, to increase transparency and, most importantly, to increase assurance that customer orders will be handled and executed in an appropriate way. I am proud to have been a part of these developments at Nasdaq. I am proud to have worked with many of you and with the SEC in helping to shape the markets. We are moving in the right direction. Unfortunately, a lot more steps now have to be taken by the SEC as a universal regulator in a fragmented market environment. It is our responsibility to keep speaking out on this. It is the responsibility of other markets as well. It is time, indeed it is past time, for action.

Thanks everybody. I would be glad to answer any questions.

(Applause)

BENN STEIL[62] [From the Floor]: Rick, I agree with you one hundred

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[61] Nasdaq introduced a Closing Cross in early 2004 and planned to launch an Opening Cross later in the year. The Closing Cross disseminates data about order imbalances and possible clearing prices coming up to the 4 p.m. close. Nasdaq then executes the market-on-close, limit-on-close and offsetting orders at a single price. The Opening Cross, which would establish the official opening price, would use the same basic mechanisms as the Closing Cross.

[62] Benn Steil is the Andre Meyer Senior Fellow in International Economics at the Council on Foreign Relations.

percent on access fees. But I am wondering whether you framed the solution in the best possible way. Rather than going to the SEC and saying, 'SEC, would you please ban this practice,' could you not frame it as a competitive quality issue? Could you not ask the SEC for the right to regulate your own market structure? If you look at the evolution of Nasdaq's market structure over the past seven years, I would argue that most of the problems that you have had are attributable to the SEC having micro-managed the change. Not enough power was vested in Nasdaq to make changes in accordance with your own interest in promoting your own efficient marketplace.

None of your ECN competitors allow their subscribers to charge access fees for hitting their limit orders. Yet, you do not have the right, when those ECNs participate in your market, to say, 'No, I am sorry, the rules on our market are consistent across all our participants. You cannot charge access fees in this marketplace, just like broker dealers and institutions do not charge access fees in your marketplace.' You should be able to say this, not because the SEC has banned it, but because you have made the decision that that is not the best way to operate your marketplace.

KETCHUM: That is a great question. We have certainly thought about it. To be fair to the SEC, it would be wrong to say that they did not give us some ability to do that. With the order handling rules, we were given the ability to set conditions concerning how we would agree to link ECNs in the marketplace.[63] The ECNs had obligations that came out of that legislation as well. Our problem has been two things. One, we would love the SEC to say, 'well, they have listed on your market, you get to decide the fundamental principles.' I suspect – I am just guessing, but Mike Cormack is here so it is probably a good guess – that the Pacific Stock Exchange, the Cincinnati Stock Exchange,[64] the Boston Stock Exchange, and anybody else would be much less enthused about our doing that.

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[63] Under the terms of the Order Handling Rules (OHR), it was agreed that ECN liquidity would be displayed in the National Quote Montage. Of course, the aim of the rules was, in large part, to promote more price quote transparency in the public marketplace. The rules therefore required that ECN liquidity also be accessible to all market participants through a link via Nasdaq's SelectNet system.

[64] On November 7, 2003, the Cincinnati Stock Exchange changed its name to the National Stock Exchange (NSX).

While I would like to think that we would do it fairly, they would probably be uncomfortable about it. That is our fundamental problem. Since the beginning of the order handling rules, people have had a choice about where they printed their trades and where they showed their quotes. That has made it very difficult for any market to say no. In retrospect, I do not think that we have done all that we could. Perhaps we should have set a requirement that went beyond the SEC requirement of some equivalence. Perhaps we should have demanded that any execution access fee within the system be the same as outside. I think that we were wrong not to do that.

In a different environment, we probably could have done it. Perhaps we should do it today. Perhaps, at a minimum, we should take a stand and say that we are not interested in anyone participating in our market, whether or not access fees are a good idea, who is charging access fees that are egregiously different than what they charge their own best customers. That is something I think we can do. To be honest with you, I do not think that they have the ability to take down access fees without the other markets and the SEC agreeing to it. That may be because I am gutless, but that is the honest judgment behind not doing it.

Thank you.

(Applause)

CHAPTER 6: OVERCOMING RESISTANCE TO CHANGE

Moderator – Benn Steil, Council on Foreign Relations
André Meyer Senior Fellow in International Economics
Theodore Aronson, Aronson+Johnson+Ortiz
Managing Principal
David Colker, Cincinnati Stock Exchange
President & CEO
Michel Finzi[65]
Lawrence Harris, University of Southern California
Professor[66]
Bernard Madoff, Bernard L. Madoff Investment Securities
Chairman
Donald Weeden, Weeden & Company
Chairman

BENN STEIL: Overcoming resistance to change is the focus of this panel. All of my panelists have been agents of change in our industry.

Gentleman, let's jump straight into our favorite issue, market structure. An article in the Sunday *New York Times* by Gretchen Morgenson, 'Is The Big Board Getting Creaky,'[67] had two very interesting quotes that seem to be in opposition to each other. I would like some comments. The first quote is from Richard Grasso, Chairman and Chief Executive Officer of the New York Stock Exchange. He says, 'If we were doing business today the way we were doing it five years ago, we'd be out of business. If you catalogue

[65] At the time of the conference, Michel Finzi was Managing Director at Instinet.

[66] At the time of the conference, Larry Harris was Chief Economist at the U.S. Securities and Exchange Commission.

[67] 'Is The Big Board Getting Creaky?' by Gretchen Morgenson, New York Times, 27 April, 2003.

all the changes we have made in our systems, we are the only model that gives open outcry, highly automated, almost instantaneous execution. We have been enormously flexible and accommodating. Everything is on the table for change except self annihilation.'

We have another quote in the story from Peter Jenkins of Deutsche Asset Management in New York. You heard from Peter this morning. His quote had something different to say: 'There haven't been a lot of innovations from the New York Stock Exchange. Really nothing has changed. They haven't come up with the tools for the institutions to make their process more efficient.' I am confused. Who is telling us the truth (laughter)? Bernie Madoff, I would like to start with you.

BERNARD MADOFF: I guess they both are telling the truth (laughter). It is probably unfair to say that the exchange hasn't made significant changes over the years, because it has made changes. It has made changes from a technology standpoint, and in the speed at which it executes trades, particularly for the small orders. The exchange is much larger today than it was years ago. But, of course, the exchange has not made all the changes necessary.

I also think that Peter is correct when he says that the basic exchange model and the way that it operates is pretty much the same. That, however, is not surprising. The hallmark of that exchange, or of the auction market, is to operate the way it does. Nevertheless, the reality of life is that, once you have an auction market – and the New York Stock Exchange does conduct an auction market – you cannot get trades to execute as quickly as they should. The one thing that everybody in the industry has always asked the exchange to do – and it has absolutely refused to do it – is to give a totally automated execution, which is what you are getting on a number of the regional exchanges, in the Nasdaq marketplace, and in the Third Market, or the Intermarket, as it is referred to.

STEIL: Don Weeden, what is your perspective on this?

DONALD WEEDEN: I never thought you would ask (laughter). I agree with Bernie that both Dick Grasso and Peter Jenkins are right. In a sense, both facts are creating a problem in the listed market, and I can point out why. New York has finally said that we are not going to let the little guys hang around as second-class citizens. We are going to try to get all of the order flow coming in directly to us. The exchange is doing that through LiquidityQuotes, the Institutional Express, Direct+, and by having lower costs on the NYSE DOT system. All of those things are encouraging. Both

brokers and institutions come to them directly. And they are not worrying about whether Chicago has anything left over or not.

The main problem with the New York Stock Exchange for the people we are all familiar with – the institutional buyers – is the NYSE's monopoly specialist system. That system long ago was basically an agency system. The specialists made most of their money by handling limit orders that would be put on their book. They made $4.00 a hundred shares. That was when commissions were fixed at about $50.00. Now, about ten percent of their total revenues is done on an agency basis, and, if you take figures from NYSE specialist LaBranche & Co., about 90 percent is from revenues on principal transactions.

What does that mean? It means that a 25-year-old is being paid according to how much money he makes as a principal – that is, he's making money on the spread by being in between a seller and a buyer – while going home with no inventory every night. That fellow is aggressively trying to be a principal because that is the only place where he makes money. That might not be so bad except for one thing – he has a monopoly in a marketplace that still gets about 80 percent of the market. So he has no competitive incentive to serve the customer, rather he is an adversary. Secondly, he has no competition. Consequently, the institutions are frustrated because when they either go in through Weeden and Co.[68] or others, there is no interaction between the specialist and the broker who is trying to find a suitable execution for his customer. Thus, our institutional customers are saying to us that they would prefer to do the transaction anywhere else.

In addition, the systems for flowing orders into the market are not quite what Bernie would like, which is automatic execution. At the NYSE, an execution takes place after the specialist, who has a monopoly and no competition and is making all of his money as a principal, decides to make the trade. He looks at what comes in, and makes a judgment as to how he is going to act. Sometime he acts quickly, and sometimes he freezes the market. What happens during freezing? That is something you could ask

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[68] Weeden & Co. was originally founded in San Francisco in 1922 as a bond house by members of the Weeden family. The firm subsequently became a major participant in the Third Market in listed stocks as well as a critic and competitor of the NYSE. Donald Weeden himself has been publicly outspoken through the years about the NYSE system. (see Weeden & Co.: The New York Stock Exchange and the Struggle Over A National Securities Market, Donald E. Weeden, a book privately published by Weeden in 2002.)

somebody else about. I am not that familiar with it.[69]

So, I agree with Bernie that both fellows are correct.

STEIL: Ted, from the institutional perspective, would you join Pete and say that there have been no significant changes in market structure? Would you say that there have been no real changes that would have helped institutions over the last few years? Or, might you be a little more charitable?

THEODORE ARONSON: I would be a little more charitable. When I look at this panel, I am humbled to be part of it. But I have the strength of character to fight that, and some of my answers will be more germane. But on this topic, I leave it to the experts, Benn. I would rather hear what they have to say.

STEIL: Well, Dave Colker, Mr. Expert. Cincinnati is one hundred percent electronic. How come you haven't captured more of the market?

DAVID COLKER: If I knew that I would be a lot richer. I agree with both Don and Bernie that both quotes are right. But that means I would prefer for obvious reasons not to give a public critique of a company that has a 90 percent share of every market where I am competing. I would prefer to talk about the positives, if that is OK.

STEIL: That would be perfectly acceptable.

COLKER: What do the non-primaries contribute to the marketplace? The ease of access that we experience today, the technological sophistication in the marketplace that we enjoy today, these are a direct result of, and a tribute to, the non-primary markets. We simply have to do a better job just to survive. That creates an enormous imperative for innovation. It has led to a lot of the improvements that we take for granted today. Not just on the technological side, but also on the market structure side and on the cost side.

Here are some examples. Cincinnati, with Don Weeden's help back in the late '70s, was the first exchange to eliminate its physical trading floor and replace it with a highly efficient electronic trading floor. The Pacific Stock Exchange created the net continuous settlement program for clearing trades (another tremendous achievement). The regionals in general initiated

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[69] Some have described this phenomenon as 'freezing the book.' This reputedly was conducted by NYSE specialists, sometimes for several minutes, to help them smooth out order imbalances. Some critics have contended that the specialists were using this 'freezing' for their advantage, widening spreads in some stocks during the break in trading. The NYSE has imposed non-regulatory halts when there were problems because of these order imbalances.

automatic execution. They then took automatic execution a step further and combined it with price improvement, something you still today cannot get on the primary market.

Cincinnati, with Bernie's help, automated the Intermarket Trading System. We became the only exchange to link electronically with ITS and to grant automatic executions to specialists and other market centers. Further, the regionals initiated competing specialist systems that are important, given Don's comments on the unitary specialist shortcomings. We have also driven transaction costs and market data revenue fees down significantly by utilizing the operating leverage that comes with trading efficiency. The point is, competition works.

A monopoly does not serve the securities industry any better than it does any other industry. There is simply too much pressure on any business that dominates an industry to preserve the status quo and to resist change. The future depends on our developing and encouraging an environment that promotes competition. The environment must give businesses like the non-primary markets a chance to succeed if they are able to create value.

STEIL: Larry, you have experienced the New York Stock Exchange from the inside. You know how it works. You have studied market structure. How would you rate the NYSE on innovation? Where do you think it scored well, and where perhaps has it fallen a bit short?

LAWRENCE HARRIS: Before starting, I have to disclaim my comments. I speak only for myself and not for the Commission, its members, or my colleagues on its staff.[70]

The NYSE has innovated in many significant ways to improve the flow of information to and from the floor and, to a large extent, to facilitate the exchange of information on the floor. The exchange spent much money doing this, and it has been quite successful. The two perspectives that you identified in your introduction represent different views about the type of market that can be employed in the United States or elsewhere.

Dick Grasso wants to preserve the exchange's current advantage. He will not do anything that will lead to the demise of the exchange. An extraordinarily liquid market currently exists on the floor of the exchange, in part because traders on the floor can exchange information that is not easily exchanged in an electronic environment. .

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[70] At the time of the conference, Larry Harris was Chief Economist at the U.S. Securities and Exchange Commission.

As was noted earlier today, traders exchange information about what additional size, if any, customers have to do and whether their clients are well informed. This information is only exchanged credibly in an environment where brokers can stake their reputation on the quality of the information that they explicitly or implicitly deliver to the other side. . The result is an extraordinarily liquid environment, especially for large uninformed traders who are honest with their brokers.

But the slowness of the NYSE's system has made it extraordinarily difficult for people who run electronic environments to be able to compete. In particular, the reason that the ECNs have not made any headway against the NYSE is that they cannot get an instant cancellation of an order that has been submitted to the NYSE. The NYSE market structure does not permit quick cancellations that might interfere with the operation of its floor-based trader system.

The ability to obtain an instant cancel, say from Nasdaq, allowed ECNs to represent liquidity both in their system and also at Nasdaq. This allowed the ECNs to get a toehold into the exchange business that they otherwise could not have obtained. They would say to the brokers and the buy-side traders, 'If you display through us, you will also be displayed in Nasdaq and you will be OK.' Wherever the trade first took place, they would cancel the representation of that order in the other venue. In this manner, the ECNs were able to participate in the liquidity at Nasdaq while their markets were still too small to attract much liquidity on their own.

A lot of people who want direct access would like the same service from the NYSE. But there is a fundamental tension between their interests and the interests of the exchange. On one side, people are asking for immediate cancellations. These are the service providers. The NYSE, by refusing, is, in effect saying, 'No, we have a different type of system and it is very effective.' The exchange is indeed one of the world's most liquid markets, if not the most liquid equity market. Naturally, it wants to defend its markets. The two points of view are irreconcilable. The question that confronts us is, how can we organize competition so that we can get the greatest benefits from competition while keeping people from interfering with legitimate models? That is a very difficult question.

STEIL: Thanks, Larry. Michel, with you I am going to move the subject toward the OTC market. Let's talk a bit about the OTC market. If you look around the world at the major developed markets, it seems that no matter how they are structured you see this kind of equilibrium where about

seventy percent of the volume is executed through some sort of central auction mechanism. This seems to be true whether it is the NYSE or any of the major European exchanges.

But the OTC market in the United States is very different. Instead of having 70 percent on an exchange as it were, and 30 percent upstairs executed by market makers, you have the Nasdaq auction mechanism doing only about 19 percent of volume (we are talking about SuperMontage). You have Instinet and Island doing 29 percent and Archipelago doing 15 percent. A number of other systems are doing small percentages. And, the rest, about 30 percent is done upstairs by market makers. Why is the OTC market in the United States so fundamentally different, and is this evidence of a problem? If so what should be done about it?

MICHEL FINZI: I do not think that it is a problem per se. It is just what we have here in the United States. Your comments would suggest that SuperMontage is itself one of several ECNs that handle volume in the market. I would contend that it is just one venue in a virtually interconnected market. If you look at the volumes that are handled across these interconnected liquidity pools, it tends to settle down to a global average of 70 percent of the business being executed through the common platform.

The big difference is that in a lot other markets, whether it be Euronext or the NYSE, about 70 percent of the trades are reported through the exchange mechanism, and 30 percent, for whatever reason, is actually crossed upstairs based on specific broker requirements or client requirements. When I think about the U.S. market structure, I look at a virtually interconnected central limit order book that has several liquidity venues rather than just one.

STEIL: Don, you have a comment?

WEEDEN: I would add that cost drives a lot of order flow away from Nasdaq into other venues like Instinet.

I probably should state for the record that my opinions are my own and not my firm's, just so I don't get in trouble with my partners (laughter). If Dick Grasso calls up and tells my managing partner, 'Weeden was really saying some bad things about us.'[71]

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[71] Weeden subsequently noted in a later interview that his somewhat lighthearted remark was merely describing how he viewed the business style of Dick Grasso, a CEO who had a hands-on reputation at the NYSE. He did not mean or infer that Grasso had at any time called Weeden & Co. to criticize its actions. However, Grasso, an activist CEO through his

Anyhow, there is a cost difference between Nasdaq and other market centers. If we as an institutional broker in an OTC stock want to go into the market, we find that we can place the order in Instinet. Instinet more or less looks around, and they have very good communications linkages to all of the other markets. Instinet will help us to find the best market, and allow us to sweep the market, or whatever, at a lower cost than we can do by accessing Nasdaq.

That is nothing against Nasdaq's market. In fact, the other systems out there are all dependant upon Nasdaq and the Nasdaq market makers. Let's not forget that. Because Nasdaq is the only venue that is actually making markets, as opposed to just being order collectors as Instinet is. Neither Instinet, Island, nor anybody else, has market makers.

STEIL: Bernie, do you have a comment?

MADOFF: Since every one is making disclaimers, I would say that my views are my own, not necessarily those of my brother and my two sons (laughter).

I am always confused when everyone starts throwing around market share numbers. I am not sure how this happened, but as one of the five firms that started Nasdaq in the 1970s, I must point out that when people say that Nasdaq only does 19 percent of the volume, they are looking at the SuperMontage market share. Those of us who are market makers do not understand this. We would take the volume that SuperMontage does on top of the volume that the market makers do and say that Nasdaq does 50 percent of the volume.

The issue is where the trade is printed for the sources of revenue generated, as Don was saying. But I do not think that there is anybody involved in the market who looks at Nasdaq only doing 19 percent of the market share. Whether we report a trade-through Cincinnati – which we do not – or somewhere else, is not an issue to us. It is an issue to those venues because they are getting CTA[72] revenue.

NYSE career, would on occasions reportedly make phone calls, some unpleasant, to various trading firms to dispute and challenge them on the conduct of their listed trading business and public affairs.

[72] CTA is the Consolidated Tape Association, which is one of three pillars of the National Market System. The other two are the Intermarket Trading System (ITS) and the Consolidated Quotation System (CQS).

Nasdaq is a market maker system. If the market maker is involved in a trade, is does not matter whether the market maker is doing one side of it through an ECN, or if, from my own trading account, I am doing an execution that may have started out by Schwab sending me order flow. In this case, I am doing the other side of the trade-through an ECN, but I consider it a trade that was done by a market maker, a trade that was done over the Nasdaq system. And I pay no attention to this 19 percent of market share issue.

STEIL: We have a question or comment from the audience.

ANTHONY FORTUNATO[73] [From the Floor]: I have a question to follow up on Larry and Don's comments. The ECNs made a lot of strides in the OTC marketplace. The executions are faster, and there is a lot of liquidity. The liquidity may come in 100 share amounts, 200 shares, 99 or 63, but you can still get 100,000 shares of Microsoft done pretty easily. Do you think that Archipelago's move into the electronic trading of listed stocks will take market share away from large liquid names like Lucent, Nortell, IBM, and Altria?

HARRIS: The buy-side loves to promote new trading systems. People who have ideas about trading systems go out and try to sell those ideas, and they ask if those ideas will be accepted. The buy-side says, 'Of course they would. We would love to see this!' Then the developers go out and spend millions and sometimes tens of millions of dollars to build those systems. They open up the new systems and the buy-side looks at them and says, 'Boy, this is a crackerjack system, this is absolutely wonderful.' But they don't trade there. Why don't they trade there? Because they cannot get anything done. When they are the first ones in the system, they can't trade because nobody else is there. Nobody wants to be first.

Archipelago, along with all other new trading systems, has this problem. New markets must be very attractive to traders to overcome the tremendous liquidity advantages that an incumbent exchange has. The NYSE has a tremendous advantage because everybody is there. Liquidity attracts liquidity.

That said, I do not want to make it sound that I favor new systems over old systems. Remember, the NYSE serves many clients very well. The problem that we face is that there are many types of clients. It is possible

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[73] Anthony Fortunato is Vice President, Sales and Trading at ITG.

that many systems can co-exist efficiently serving different clientele if they are linked together by arbitragers who move liquidity from one to the other. Whether that is the case or not depends on the relative advantage that the various systems present to their clientele, compared to the benefits of simply trading in one place and taking advantage of the tremendous liquidity that concentrated trading provides.

STEIL: Don.

WEEDEN: I want to go back to Archipelago. Cost and speed are two things that will attract people to your market. I also agree that the comfort level developing in electronic markets among institutions would be logical. . This is going to be in your favor. But I also agree with Larry. I seem to be agreeing with everybody, that is not my normal... (laughter).

I agree that it is going to be tough to get the liquidity, to get the critical mass on Archipelago. I would suggest to the SEC that they might help in terms of correcting the ITS. The ITS is a mis-functioning, antiquated, inappropriate facility for connecting all of the market centers. It was one of the mandates of the 1975 Exchange Act Amendments. It is biased towards New York. It unfortunately is ignored by many of the players. Consequently, there is an inability for Archipelago, which might attract legitimate orders (orders at a certain price with priority over orders in any other market) to be recognized. If you cannot be recognized, or will not be recognized, then those people who would want to help that market will tend to go back to the most liquid market.

Without changing ITS, the SEC – which had a mandate to do that – is in a sense maintaining the system as it is today. That is unfortunate. One of the other mandates was to develop competition among market centers, between exchanges and upstairs market makers, and to satisfy Aunt Millie who puts her order in at a given price before anybody else does. Unfortunately, we have not gotten to that national market system, and it has for 27 years been in the hands of the SEC to do that. They have not done it yet.

MADOFF: Have you ever thought of requiring the NYSE to have an automated execution ability similar to what you have on Cincinnati and Nasdaq? I understand the NYSE's argument has been that there may be better bids and offers in the crowd, and therefore we cannot allow you to just execute against our quote. If you took a poll of almost every retail investor, and certainly probably every institutional investor, he or she would say, 'I would be happy to forgo possibly getting a better price by somebody who chose not to show that price in the crowd, so my order could be executed

against a stated quote that is there.' That would be the case for all the institutions, who would say, 'I want to send an order down, I want to get an immediate execution.' Automated execution would certainly appeal to the other ITS participants like ourselves, who are not interested in necessarily reaching out to execute a trade in the crowd.

When the specialist reaches out to the crowd, the order is going to be executed or not, depending on whether a person is standing in the crowd with a contra-side order in his or her pocket, and either likes the other side of the trade or doesn't like the other side of the trade. If you instituted automated execution –and we have been asking and others have been asking the commission to move that along for years – it would be a great step forward that would help everybody. It would certainly improve the ITS, which everybody complains about.

I have been operating in ITS since it started. I was on the original committee. There is nothing wrong with ITS. It is not this terrible system as it is characterizes by everybody. All you need do to have it operate well is to force the person on the other side to have an automated execution. We do 200,000 trades a day. Not all of them go through ITS, but a substantial amount do. We are perfectly happy with the way the ITS system works.

HARRIS: Mandated change, such as you described for the NYSE, would put the government in a position that many of us might not be entirely comfortable with. The government would be telling the NYSE how to conduct its business and what its business should be. Lots of people are uncomfortable with that. I suspect, as much, that you would be uncomfortable if the government came in and modified your market structure in favor of other people's considerations. To accept this position is to decide that the NYSE is a public utility that should be regulated with what many people consider to be a heavy hand.

As a regulator, I believe that regulation can serve a very important purpose. The purpose of regulation, in my view, , is the solution of agency problems and externality problems. These are the words that economists use to describe situations where competition does not work well when left to itself. The problem that we have with competition among exchanges is what economists call the order flow externality. If you do not recognize the problem in the context of this term, I am sure that you recognize it as the notion of 'liquidity attracts liquidity.' Is the NYSE the dominant exchange because it has the best market structure – because its floor provides excellent service for the vast majority of people – or because it has the order flow

which attracts other traders?

The reason that liquidity attracts liquidity has a lot to do with the reason why people crowd around the cheese cart in a supermarket. You have probably seen this. Somebody is giving away cheese on a toothpick, and suddenly a crowd forms. The reason why the crowd forms is that people like to pick something up for free. What are they picking up for free at exchanges? They are picking up liquidity. The offer to trade is an option that is granted to the market as a whole. Here is where the externality comes into play. The externality is that the people making those orders, regardless of whether they are dealers or limit order traders, are giving away something for which they are not compensated.

The clearest way to see this, as was discussed in an earlier panel, is to understand the pennying strategy (some people call it the quote matching strategy). I bid 20. Somebody steps in front of me at 20 and a penny. They subsequently get filled by an incoming sell order. Then they face this asymmetric distribution. If price subsequently rises, they make money to the extent of the rise. But if the price drops, they turn around and quickly sell to me, the bidder, at 20. At that point, I end up owning something that is losing.

My position in this is also asymmetric. If price is rising, I probably have not traded and wish that I had. If values are falling, I end up trading and wish that I hadn't. I have given up something. I have given up the option value of my order, and I am not compensated for that. That is the externality that is leading to the competitive problem.

One solution to that externality problem would be to find a way to get people to internalize the benefits that they are offering the market when they offer liquidity. The standard way to get people to internalize is to pay them for it. This may sound to you like it is coming from outer space, but it is actually reasonably well grounded. It is certainly well grounded in economic theory. The market as a whole benefits when people offer liquidity. Therefore, the market as a whole should find a way to subsidize those people who provide liquidity. Not because we simply want them to offer more liquidity, but because there is an externality: They are not offering as much liquidity because they are not being compensated for what they are giving away for free. One way to do this is to pay people for the time multiplied by the size that they display at the best bid or offer. You pay them for being at the best bid or offer. Perhaps you pay them a little extra if they advance the price. You pay them according to time X size exclusively at the best bid or

offer.

Where would we get the money to do such a thing? One way is to collect the money from everybody who trades. We actually have a large pool of money that is sitting out there that potentially could be dedicated to this cost: the market data revenue. This revenue is collected from everybody who has a real-time terminal, which includes many – though not all – traders.. We also have other, similar revenues in the system. For instance, listing fees are monies that are in some sense collected from all of the beneficiaries of trading, and they could be used to subsidize and thus solve the externality problem.

I have described an elegant solution to an extremely difficult problem. The solution would create an awful lot more exchange competition because it would give people who create new exchange systems a chance to demonstrate their utility. Under this proposal, people will be compensated for putting an order into a new system if that order provides the best available price. They, therefore, may keep their order in the system and the system may thus attract additional liquidity.

Perhaps it sounds like what I have just described is from the moon. Perhaps you view this as a great economic, academic solution, stuff like that. It is not as wacky as it seems. We have a serious problem with market data revenues right now. It would appear that there is far too much money in the system. People have been manipulating market data revenues by shredding their trades and doing wash trades. Something needs to be done about these problems. We potentially could solve the enforcement problems associated with the present distribution system for market data revenues while at the same time solving the externality problem.

If we did that, systems like Archipelago or Island or some new system, the XYZ ECN or ATS, would have a much greater ability to compete against any other system, including the NYSE. In doing so, we would not be favoring anybody. We would just be solving an economic problem that makes markets less competitive than we desire..

MADOFF: You are more radical than I am (laughter).

STEIL: I want to move to another issue related to exchanges. Then I will move on to some buy-side trading issues.

David, I know you had some comments, so maybe you could combine them with my specific question for you. A few weeks ago, the issue of exchange governance came back on the agenda when Sandy Weil was nominated to be a director of the NYSE. You probably remember when,

back in 1999, Richard Grasso said that the NYSE would become a public listed company. He said that we would all be buying and selling shares in the exchange by Thanksgiving of 1999.

Subsequently, the members made it clear that he did not have the votes to do that. As you are aware, a lot of European exchanges have in fact done just that. They have de-mutualized. They have become publicly listed companies. Last year, Fidelity became the major shareholder of the London Stock Exchange and of Deutsche Boerse. My question for you is, from your long experience in the exchange world, how should exchanges be governed? Who should own them in the interest of serving investors and the companies that list on the exchange?

COLKER: I am not sure that I can give a real clear answer to that because I am not sure I know the answer. I do know that we are very focused on the needs of our members. Whether or not to demutualize is a question that everyone is asking today. The answer is up in the air. Even if we do go that route, we still have to think about the value that we provide to the people who choose to use us.

There are obvious advantages in moving toward the more business-like structure of a demutualiztion exchange. But there are problems with that too. It is unclear now which dominates, the advantages or the problems. Everyone is debating the issue. I wish I could give you a clearer answer. I am not sure that I understand myself what is the best route to follow.

I want to add something to the ITS conversation.

STEIL: Sure.

COLKER: The problem with ITS really comes down to the fact that unanimity is required for change. I think it was a good system when it was first set up. But because all competitors have to agree before any change can take place, the reality is that it is a recipe for stalemate. I agree with Bernie that requiring automatic execution would be a tremendous step forward for the system. The NYSE is capable of doing that today. They give it to their DOT customers. There certainly is a possibility there.

The other thing that could be done is to expand the de minimus exemption to the trade-through rule. It has worked quite well in the ETF world. If we were to expand that to the active stocks, we could get away from the now anachronistic trade-through rule and push the responsibility for best execution back onto the broker. Let the broker decide what package of criteria to use. Let him decide whether it should be price, or speed of execution, or certainty of execution, that best serves his customers. Those

two changes – automatic execution and the expansion of the de miminus exemption to the trade-through rule for all active listed stocks – could dramatically improve ITS.

STEIL: I want to bring Ted and Michel in on institutional trading practices, and then we will get some questions from the floor.

Ted, on March 12th, House Financial Services Chairman Mike Oxley held hearings into mutual fund trading practices. His particular focus was on the use of soft dollars by buy-side institutions. Also, recently, the Financial Services Authority in the United Kingdom produced a document on the subject that very well may become regulation in the U.K. If it does, it would offer a dramatic solution to what the FSA saw as the conflict of interest in soft dollars. That is, they said, if a buy-side firm could purchase non-trade execution related services in a market directly, then they should do so. If, alternatively, they choose to bundle their trades, they should be obligated to put a fair value on the execution portion and refund the non-execution portion into the client's portfolio.

As you can imagine, that concept was not popular with either the buy-side or the sell-side in the U.K. What is your view about soft dollars and about whether Congress or the SEC should become involved in regulating the practice?

ARONSON: In our trading room in Philadelphia we have, courtesy of Weeden & Co., a calendar that is dated May 1, 1975. I cherish this calendar because I was there. If you had told me at the time that, 28 years later, we would have a soft dollar industry that by various estimates is in the billions of dollars – those are hard dollars, not soft dollars – I would have bet you big money that you would be wrong. But boy, oh boy, was I wrong. We Americans pride ourselves on our market savvy, on the depths of our markets, and on the intellect of our regulators. On this one, the U.K. Myners Report, beat us hands down.[74]

From my side of the aisle, soft dollars remain a major embarrassment for the buy-side. Oh yes, it is enabled by the sell-side and it is acquiesced to by clients. But it is time that the buy-side fesses up to this awful practice. We have discussed competition here today and have talked about sub-pennies.

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[74] The U.K. Financial Services Authority's 2001 Myners Report is a review of the U.K. pension fund industry conducted by Paul Myners. He is the former chairman of Gartmore Investment Management, a U.S. owned fund management company. The report highlighted serious questions about the transparency of executions costs and bundled commissions.

Sub-pennies? Now we are trading based on rebates, the squishy soft-dollar notion of rebates to money managers. It should be outlawed. But better than having Larry Harris add it to his agenda at the SEC, we could outlaw this really quickly if the owners of the money – the clients – insisted that it go away.

STEIL: Michel, would you take such a negative view of this practice?

FINZI: Not particularly. But I want to ask a point of clarification. Soft dollars is a broad category. By soft, do we mean, for instance, bundled commissions?

STEIL: That is a fair question. In many cases people use the term soft dollars to mean paying brokerage fees that are in part diverted to third parties as payment for other services. Sometimes it just means bundled brokerage. In other words, you are paying for more than the trade execution when you execute a trade. Let's take the broader definition; bundled commissions.

FINZI: Let's just try to boil it all down. First, when I buy products and services, I actually like to know the price it is worth. . When somebody is willing to price a product or service, whether it is the cost of a terminal, even that microphone on the desk today, whatever it is, I would like to have a choice of how I pay for it. When I get into discussions with buy-side clients, regularly and around the globe, clients say, 'I can't necessarily pay for this service with hard dollars, but if I have a fully-disclosed soft-dollar relationship where I select my broker dealer based on their consistent demonstrable execution quality, that is not so bad.'

Where my reaction is a little bit more like yours, Ted, is when you start looking at bundled commission dollars and what these pay for. I would throw this out to the buy-side, but let me take a stab at it first. From what I hear from the buy-side community, they typically use commission dollars as the currency to pay for seven or eight products and services: distribution of funds; IPOs; and research (which is whatever is allowed under the terms of Reg. FD, including meetings with management); capital commitment; soft-dollar obligations, generally. There is probably a portion of the commissions apportioned for electronic services. There is also probably some client recapture, some client generated order flow, or business that has to be done with minority brokers. Increasingly, when I look at this I think of soft dollars in specific terms. How, for instance, is the information providers bill paid? Usually, I find that the providers of soft-dollar services tend to assign a price tag for these services.

In my opinion, what is more insidious, is the sell-side traditionally pricing all of their other value-added services, including IPOs, research, distribution of funds and capital, but refusing to put a price tag on them. On the other hand, if you talk to independent research providers, they struggle in this area. . They will say, 'You know what, this content we provide is worth $100,000.' But the client then turns around and responds, 'You know what, I can't pay for that product, I don't have any more room in my soft-dollar budget. Let me try to get you some votes.'[75] If you tally up the number of votes that the research provider actually receives, you will find, in some instances, that they equal something like a million dollars in commissions. Consequently, there is a ten-fold difference between an explicitly priced product of $100,000 and the sum assigned in the voting methodology.

To me, this sounds like the sell-side saying, 'You pay me what you think I am worth in terms of the value that I bring to the process.' In this day and age, particularly over the past six to 12 months, the specific value that a buy-side client owes the sell-side is measured in an expressed dollar amount, and the currency is measured by shares times commission rate. As volumes and commission dollars have decreased, it seems to face the buy-side with an interesting problem: 'Do I pursue paying my soft-dollar obligations, or do I pursue best execution'? This is particularly difficult when some of those obligations have to be paid through exclusive direction of order flow.[76] On

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[75] At issue is the ambiguity inherent in pricing research and other products and services in soft-dollar arrangements. Michael Finzi draws a contrast between bundled commission payments in full-service brokerages and the explicit forms of soft-dollar payments to independent firms. In his example, Finzi is referring to the decision-making process typically used by buy-side firms in deciding the amount of commission dollars to spend at full-service brokerage firms. Full-service providers typically bundle an array of services for buy-side accounts, services such as research , capital commitment and IPOs. However, full-service firms do not price these items individually. Independent firms, in contrast, usually bill the buy-side firms for their research, putting an explicit price tag on it. Finzi seems to make the case that full-service brokerages have a competitive and financial advantage over independent brokerages. Consequently, he contends that the buy-side can, in effect, arbitrarily pay what it wants for sell-side products and services. In his example, he contends that if $100,000 worth of explicitly price independent research was put to a 'vote' it would garner ten times what is was worth, or $1 million. Reduced trading volumes, of course, would make the assignment of commission dollars even more problematic and raise more questions about the vagueness of the prices charged for services.

[76] This refers to so-called directed brokerage services in the U.S. This occurs when a firm, or an individual broker, recommends specific funds because these funds send some of their

that front, I am right with you. Generally, I am a big bundled commission guy. But in the middle, when it relates to soft dollars, it seems OK to me generally as long as the soft dollar price is explicit, is agreed to, is fully disclosed, and the buy-side firms are doing everything they can to negotiate these relationships with broker dealers who are measuring their costs to the extent that that is possible.

STEIL: Is disclosure enough?

ARONSON: Disclosure will go a long way, but it is not enough. If Bernie is running a firm with his brother and his two sons, they can call it whatever they want. They can call it a commission, a shenaniganza, or whatever they want. In the real world in which I operate, in the institutional world, it is more than disclosure. We need set policies pertaining to these issues. There is too much money involved. It is too slushy.

FINZI: I definitely agree that there should be some regular set of standards. There should be some review. There was a fairly exhaustive review that looked for certain improprieties here in the U.S. some time ago, but I do not know what they found.

STEIL: In this review in 1997, the SEC did an industry sweep and found some pretty unsavory things. For example, over two-thirds of institutions had soft dollar arrangements with their broker dealers that were entirely undocumented even though they are required to be. The SEC found that one third of buy-side institutions had illegal services being provided by their brokers. Given how expansive the SEC's definition of research is, it takes a lot for that activity to be illegal. Going forward, how do you believe the Commission should deal with the question of soft dollars?

HARRIS: It is hard to ask for more integrity from accountants, from auditors and from CFOs when the accounting system itself lacks integrity. No sensible accounting principles would allow expenses to be buried in performance by washing trades through soft dollars. The purpose of accounting is not only disclosure. It is also the organization of information in a way that is useful for people that allows them to use the information in the cheapest possible way.

Soft-dollar accounting exists largely because it allows fund managers to take money off of the expense line and wash it into fund returns that are far

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trading business to the firm or to the broker. This practice is controversial and has attracted more attention from the SEC, which embarked on a probe in this area since the conference. There are concerns that some investors may be paying funds higher costs than appropriate.

more volatile. That lacks integrity. This problem should be addressed..

STEIL: Do you believe, Larry, that government agencies should be able to set their own fees unilaterally, or should they be set by Congress (laughter). Just trying to be helpful Larry.

WEEDEN: I will get you off the hook.

HARRIS: Please do.

WEEDEN: The topic of this panel is resistance to change. Are we going to try and answer that?

STEIL: Please do.

WEEDEN: In my 40 , or 45 years of industry experience, I would say that the resistance to change has eased off immeasurably among the brokerage and the institutional community. Cost and performance are driving all of us to use technology in a way that we have never used it before. Back in the early '70s, the whole community, including the buy-side, resisted that change. They were very comfortable with the way things were done. They liked the fixed-commissions. Technology was just beginning to rear its ugly head, and they were uncomfortable with it. They could not handle it.

Today, the driving force for change is technology that is supported by both the buy-side and the sell-side. All of the organizations that you have seen up here today that have been demonstrating their wares are a reflection of that. There are certain changes, however, that require not individual or exchange or brokerage innovation, but that require a coming together of differences of opinion. The hey day for this was in the middle 70s, when we got the New York and the American Exchange to join forces with the NASD to create NSCC[77], which was an extraordinary innovation. It saved the whole industry a tremendous amount of money. Europe is fussing with that right now, and they do not know what to do about it. The SEC forced NSCC on those people.

The end of fixed commissions was forced on the industry by the SEC. The National Market System was mandated by Congress in the hopes that the industry would tell the SEC how to implement an NMS. Unfortunately the industry was divided and the SEC lost interest. That kind of change will only come about if the SEC recognizes their responsibilities in that field.

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[77] NSCC is the National Securities Clearing Corpo©ration, a subsidiary of the Depository Trust and Clearing Corporation (DTCC).

That is not an innovation that we as individual firms can provide. It is essential that we move in that direction to reinstate the confidence that the American people have in our marketplaces.

MADOFF: I agree with Don, although Larry gave an answer to my automatic execution issue, that I could have predicted because we have discussed this privately over the years. I am the last one who wants the government to tell me what to do. Larry knows that. That being said, Don is correct that many of the great changes that have made the industry the way it is today were made because the SEC got involved. Through moral persuasion, or changing rules and regulations, the SEC forced these changes to take place. You reach a point where various market centers, for their own preservation and for their own self-interest, need the SEC to intervene to force these changes through. It is always better to not have them make changes with a rule or legislation. You always have unforeseen consequences when they do that. Market structure is not an exact science. It is very delicate. It is very difficult. The great changes that were made over the years, whether in the clearance end of the business, or whether in market structure issues, were made when we could sort of tinker with them, when we had the room to change things on the fly, as needed. The SEC over the past ten years has been incredibly proactive and incredibly helpful in moving all of these things along. The early SEC did not do that. People like Larry who gave intellect to the SEC on certain issues and made them comfortable with making some of these changes, and the current staff, have been excellent at moving this ball along.

But over the past couple of years, there has been almost a moratorium on market structure issues. That has to change. If the SEC does not address issues like access fees, and some of these other issues, and if they do not address them very soon, then I really have concerns about the survival of this industry. The profitability of the industry is dramatically off. I was not necessarily opposed to decimals, but they brought unintended consequences.. But they also seemed to have been unforeseen by people on the buy-side. Everybody on the sell-side understood what would happen when you went to pennies.

There are issues that absolutely must be addressed now. This will never happen without the SEC being very proactive.

HARRIS: The SEC has to promote competition, among other things. We deal with two different types of competition. There is the competition among traders for best price. We would like that to be as efficient as

possible. Many people believe that a tightly integrated national market system would be the best way to promote that competition. We also try to promote competition among exchanges and exchange service providers, brokers, ECNs, ATSs and others.. That competition is inconsistent with notions of a well-integrated national market system. That is the tension that we live with at the SEC.

The SEC is considering many very serious problems in market structure: The access fee problem, the access standards problem, sub-penny pricing problems, and so forth. Without revealing anything, I can tell you that these concerns are being heard within the commission and by the staff. They are being debated daily. On a personal basis, I am pressing as hard as I can to make sensible changes happen. I have already revealed to you my preferences for sensible change. That is, to close the agency problems and the externality problems that unfortunately, to a large degree, effect competition in the exchange services area.

We are running out of time, so I will leave it at that.

STEIL: Thank you Larry. I am sure you would all like to join me in thanking our panel for an extremely stimulating discussion.

(APPLAUSE)

CHAPTER 7: NYSE MARKET STRUCTURE AND SERVICES

Robert McSweeney, New York Stock Exchange
Senior Vice President

ROBERT MCSWEENEY: The theme of this conference is of great interest to all investors. That's because structural and product changes that respond to one group of investors will have an impact on all investors. The focus today is on serving the needs of institutional customers. In this context, nuances in market structure can have a dramatic effect on execution costs.

Today, you have listened to a variety of market practitioners and industry professionals. These participants have examined a segment of the investment community – institutional investors – which accounts for a significant share of the NYSE's order flow. Serving the interests of institutional customers is clearly critical to the NYSE's continued success.

Today's conference included presentations from the perspective of NYSE members, as well as our competitors. Certainly, while there will be no industry unanimity on the ideal market structure, I suggest that the litmus test of this might be summed up in the question of, whose interests are being served by each infrastructure's policies and procedures? In the end, the best market structure serves the interests of all investors. The best structure offers them the highest possible standards of executions.

This afternoon, I will talk about the principles that serve as the foundation for the NYSE's market structure. Let me begin by stating an anomaly. While institutional order flow represents the most significant component of NYSE volume, it is actually through the lens of the least sophisticated investors that we craft our policy decisions.

The strength of our capital markets derives largely from the fact that we are a nation of investors. As such, the bifurcation of institutional and retail order flow would have a dramatic impact on the price discovery process and, consequently, on execution costs for all investors.

In a severe and prolonged bear market, in which all segments of the industry are looking to cut expenses, commoditization of the execution process and internalization are tempting avenues. But there is a price to be paid in terms of the availability of liquidity, execution costs and market volatility. The NYSE believes that the blending of retail and institutional order flow, with an agency representation of those orders that have a potential for significant market impact, creates the most effective price discovery dynamic.

Our price discovery dynamic is coupled with a specialist function that brings together buyers and sellers, where 87% of price discovery does not involve dealer participation. The specialists have accountability for dampening volatility by their stabilizing intervention. Both of those components – the specialist system and the floor crowd – are fused into a centralized agency auction where transparency is promoted, and where the principle of placing the customers' interests over that of the dealers' is paramount. We can continue to build on our foundation of liquidity by enhancing transparency with an array of market information products designed to radiate data from the point of sale.

The eBroker hand-held devices allow floor brokers to provide instantaneous market looks at supply and demand. The OpenBook product, which has over 9,000 subscribers, provides a summary of limit orders at each price variation residing on all specialist workstations. A new Broker Volume product gives T+1 and monthly summaries of NYSE entering firm executed volume, accessible by stock, firm, and market sector. We will soon introduce the ability for floor brokers to use cell phones at the point of sale to speak with customers and trading desks on a pilot basis.

These initiatives reflect a significant departure from the past. They are designed with the objective of providing all customers with fast, meaningful market information as a tool for effective decision-making. We have also leveraged technology to provide our brokers and specialists with order management software to serve customers better, and to promote the effectiveness of straight-through processing.

Perhaps our most dramatic information product is the LiquidityQuote.[78] Our Institutional and Upstairs Traders Advisory Committees told us that one of the most critical issues confronting them is the loss of market transparency in a decimal environment. The depth of the inside quote has diminished 67% due to the expansion of the number of price points. LiquidityQuote will restore pre-decimal transparency for NYSE-listed stocks by creating a dual-quote: a continuous and firm data product that auto-quotes the inside market, while the specialists display custom-size accessible liquidity quotes. The LiquidityQuote combines interest on the limit book, disclosed in the trading crowd and committed for the specialist's account.

LiquidityQuote will be dramatic. For the first time, customers will be able to trade-through the inside market, both electronically and through a floor broker. They will be able to lock into liquidity, while giving better-priced orders on the book the benefit of the liquidity price. The non-fading firmness of the quotes is guaranteed because we are making the LiquidityQuote eligible for our Institutional Express execution service. If the quote has been displayed for at least 15 seconds, and if it is for 15,000 shares or more – as most will be –, an Xpress[79] order can lock into the

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[78] The NYSE's LiquidityQuote, which is an enhancement to the exchange's OpenBook, was originally designed to show market information beyond the best bid and offer. The aim of this model was to provide more transparency, as noted in this section by Robert McSweeney. This transparency would in theory benefit institutional investors, a group which criticized the lack of transparency following the switch from fractional to decimal trading in the U.S. equity markets. LiquidityQuote is part of Institutional Xpress, a service introduced to provide institutional orders more anonymity and speedier electronic executions. LiquidityQuote is an aggregation of liquidity from the limit order book, the trading crowd and the specialist as principal. However, by late 2003, both LiquidityQuote and Institutional Xpress had been criticized by many buy-side traders. Indeed, volume and activity on Institutional Xpress was negligible. Some buy-side traders said that they would rather accept a 'minimum price improvement' in exchange for more certainty of order executions. The NYSE, in response, had reportedly been considering a minimum increment for price improvement of limit orders as well as automatic executions on certain highly liquid stocks.

[79] Xpress, or Institutional Xpress. In theory, institutional investors accessing the LiquidityQuote for an InstitutionalXpress order execution could get their orders price improved. Indeed, aggressively priced contra side orders on the book can also get price improved. However, in practice, many institutions are critical of these systems. For example, if the LiquidityQuote is displaying a better price than the inside price available outside the system, an institution would get price improved via the InstitutionalXpress

liquidity, freeze out same-side market interest, and be afforded the opportunity for price improvement as well.

We will introduce this new product and execution service, approved by the SEC on a six-month pilot basis, in the 28 listed component stocks of the Dow Jones Industrial Average on June 16 in 2003. We then intend to expand to the 93 listed components of the S&P 100 index as well as a sample of S&P 400 mid- cap stocks.[80]

Vendors will display this data in readily accessible montages as well as on the OpenBook page. We anticipate that the advertisement of liquidity will draw additional liquidity. It will further facilitate handling block-size orders, and will promote limit-order display. LiquidityQuote will change the trading crowd dynamic when you combine this with eBroker market looks and cell phone access to the point of sale. Many passive go-along strategies could become more decision-oriented as the pace quickens.

The NYSE's order-execution services are designed to provide customers with a broad platform of choice as to how to access our auction. Depending on an order's size, a stock's characteristics, and a customer's desire for price improvement, that menu includes:

Electronic routing of orders of up to 3 million shares to the specialist through SuperDOT.

Automatic execution up to 1,099 shares through Direct+.

Access to liquidity of 15,000 shares or more through special Institutional Express procedures.

Anonymous routing directly to the point of sale through AnonymousDOT or electronic routing to an agency broker through our Broker Booth Support System or the eBroker hand-held.

Today, 99% of the NYSE's order flow is delivered electronically. All of our execution services are critiqued in their design, with an assessment of their impact on promoting the display of limit orders, as well as incenting the representation of latent interest in the trading crowd. This enhances liquidity and provides optimal price discovery.

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service, presuming the institutional order immediately received that superior LiquidityQuote price. However, critics say that there have been critical impediments to receiving superior prices in the LiqudityQuote system, notably a 15-seconds time delay for execution.

[80] As of late 2003, the NYSE still planned to file for permission from the SEC to expand this program to include the roster of stocks mentioned by McSweeney.

Creating a one-dimensional drag and click, auto-ex environment, or an order match and routing facility, would be relatively simple for the NYSE. But this would not differentiate the NYSE from other markets, as demonstrated by the proliferation of these electronic market models. For these other electronic models, success is measured in getting the bid or offer instantly. However, just as in the purchase or sale of a wide array of goods and services, there is value to be gained in negotiation. The value is manifest in significant cost savings.

Because other market models do not duplicate the price discovery dynamic of the NYSE, they would have you believe that best speed is best execution. For some market participants who are involved in day trading, statistical arbitrage or derivative-linked strategies, this may be true. But for most investors, the cost savings afforded by several seconds of auction exposure are too significant to forego. This holds true for institutional order flow measuring all-in execution costs, as well as for retail order flow of a few hundred shares. Our Direct+ service was designed as an ECN alternative. Interestingly, its 80-million shares of average daily volume is comprised mainly of professional flow. Why? The retail broker dealers do not want to miss the opportunity for price improvement in their pursuit of best execution.

The importance of the trading crowd is predicated not only on the benefit of fiduciary judgment in the timing of trades based on a professional assessment of the ebb and flow of supply and demand. It is also predicated on the recognition that most investors, understandably, will not display significant size on the book due to the market impact that attends disclosure. The flexibility and judgment of floor brokers provides more timely and astute reaction to supply and demand than a reserve book or predetermined indications. Therefore, the floor-based auction will continue to exist as long as it provides that value.

What is our value proposition? The NYSE provides the most competitive quotes in our listed stocks. We create the NBBO 94% of the time. In NYSE-listed stocks, the regional exchanges meet that standard less than 2% of the time, and Nasdaq –including the ECNs – only 3% of the time. Also, the NYSE auction creates price improvement for 28% of the orders, of which more than half are improved at prices greater than the mid-point of the quote spread.

Some market participants may guarantee some customers, some of the time, an auto-ex at a mere one-cent better than the National Best Bid and

Offer, or 20% of the spread.[81] Those guarantees are only for the most liquid stocks where the opportunity for a dealer turn is probable and an NYSE lay-off is possible. Also, those guarantees are generally offered only for retail order flow, or when the firm has a contra-side proprietary interest.

On the NYSE, half of our price improvement occurs at prices better than the mid-point of the spread. This creates significant price savings for all customers. None of our competitors' pricing algorithms match that value. NYSE quote sizes are also more substantial than those of our competitors. The NYSE auction also creates a dynamic where there is a 67% probability for enhanced depth over the displayed size.

Although SEC Rule 11Ac1-5[82] execution quality statistics cover only about a third of NYSE volume, they represent an important initiative in public disclosure. However, a few caveats are worthy of attention, and we believe that further refinement will make them even more meaningful.

Some markets contort those statistics. Invariably, they find someone to endorse an 'apples and oranges' comparison of effective spreads. They will lump $4 stocks with $40 stocks while using cents rather than basis-point analysis. Why? Because when you do an apples to apples comparison in basis points, the results reverse, showing the NYSE to be superior. Some use the cherry-picked retail flow and compare it to the NYSE overall order flow including momentum and program-related trades. When you compare effective spreads for the same type of order flow, again, the NYSE is superior.

here is another caveat. When a market, ECN, or 'facility' of a market claims to do a certain percentage of listed volume, be sure to clarify if that is strictly NYSE-listed, or if it is combined with Amex ETFs where price discovery is in the futures or component stocks. Also, be sure to clarify how much is actually executed on that market, ECN, or 'facility,' as opposed to simply being re-routed or internalized. Those numbers often need a reality-check when up to 80% is routed away, usually to the NYSE.

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[81] For example, if the bid-offer is 20.10 and 20.20, in this case 20% of the spread would equate to a bid of 20.11in an 'auto-ex' – an automatic execution – sell order when it is one-cent better than the NBBO.

[82] SEC Rule 11Ac1-5 requires market centers to publicly disclose details of their monthly execution statistics on orders up to 10,000 shares. The companion SEC Rule11Ac1-6 requires these centers to publicly disclosure details of their order routing arrangements quarterly.

For institutional orders, studies of U.S. execution costs conducted by the Plexus Group and by Elkins McSherry and others consistently find that the NYSE has the lowest all-in costs. The most striking component of these analyses is the comparison of volatility. The critical element missing in the 'auto-ex-is-best' position is the inherent volatility associated with that type of trading. Consider two differentiating factors: not a modicum of time for price improvement, and no specialist accountability for stabilization.

The specialist stands at the center of our agency auction. He or she coordinates the best bid and offer; facilitates a unified opening and closing price; brings buyers and sellers together; and dampens volatility by trading against the trend. The NYSE's investigation of specialist activities, which is presently the subject of considerable commentary, reflects our rigorous surveillance program. I can predict without hesitation that, if one or more specialists are found to have violated our rules, there will be severe consequences. All of the details will be fully and publicly disclosed.

The specialists' dealer - proprietary – trades amount to only 15% of NYSE buy and sell volume, but they are critical to ensuring fair and reasonable pricing, particularly in volatile markets. Even in the most active Nasdaq transfers, comparative studies show significant declines in volatility, particularly within five minutes after openings.

Notwithstanding the important contributions made by specialists to market efficiency, there is certainly room for improving the consistency of performance across individuals. There is also an opportunity to further incent superior performance through the stock allocation process. We presently have a committee that includes institutional traders, upstairs traders, and floor brokers working with the staff, to develop:

Additional and diverse measures of specialist performance.

A process for expeditious dispute resolution.

Increased accountability in the stock allocation process.

Some critics will point to the NYSE's investigation and say that we would be better off with a pure electronic system. But there is always a human component to order processing and, therefore, a potential for abuse in any market structure. That is why the quality of each market's regulatory infrastructure is so important. That is why the NYSE devotes one-third of its staff to its regulatory group.

The fact that a variety of venues are providing alternative structures creates a competitive tension that is good for investors. Institutional investors will source liquidity wherever it resides. Promoting that

competitive environment requires an effective National Market System.

We are pleased that the SEC continues to focus on industry practices associated with internalization, payment for order flow, and market data revenue rebates. We believe that these practices conflict with agency responsibilities and best-execution principles. Also, warranting SEC attention are the competitor subsidies associated with ITS free-access linkages. These subsidies are no longer needed with modern order-routing technology and Consolidated Tape Association revenue sharing that is based on tape prints rather than information value. This revenue-sharing model, unfortunately, promotes payment for order flow and other agency conflicts.

The NYSE, as always, is committed to the following principles:

The customers come first.

If the interests of the least sophisticated investors are served, then all others will be well served.

The market that creates the best prices deserves the order flow.

At the NYSE, we will continue to evolve our market structure. We will continue to leverage technology with agency representation so as not to short-cut the price discovery process. We will continue to focus on market quality and customer needs in order to earn the order flow that we are privileged to serve. Thank you for this opportunity to share my perspective.

ANTHONY FORTUNATO[83] [From the Floor]: I may be wrong but I believe I read recently that Direct Plus was going to expand to 3000 shares and potentially 10,000. Am I correct in that assumption, and is that on the way?

MCSWEENEY: Anthony, what we are looking at is expanding Direct Plus only for the ETFs, not for the floor equities, and we probably will begin that very shortly with an expansion to 3000 shares. We have approval from the SEC to go to 10,000 but only in the ETFs.

ROBERT SCHWARTZ[84] [From the Floor]: Can you tell us specifically how the LiquidityQuote will be set in relation to the bid and offer that are on the book, and how you will determine the spread between the liquidity quotes and/or the size the quotes are to be good for?

MCSWEENEY: That is a very good question. This has been the subject of a lot of dialogue with our constituent committees and with the specialists

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[83] Anthony Fortunato is Vice President of Sales and Trading at ITG, Inc.

[84] Robert Schwartz is Marvin M. Speiser Professor of Finance and University Distinguished Professor at Zicklin School of Business, Baruch College, CUNY.

and market performance committee at the exchange. The decision at this point is to leave it to the specialists' judgment to design those so as to fit the unique and individual characteristics of each particular stock. We intend to look at how those are being displayed, and to use that as a way to assess performance in terms of the spread as well as the size of the specialist's contribution to the liquidity quote.

SCHWARTZ [From the Floor]: Is Liquidity Quote the type of a product which others could add additional information to? Could other trading facilities provide a larger aggregate liquidity quote for the market? Or is this impossible because of the nature of liquidity quote?

MCSWEENEY: Our product will be branded on the vendor montages, so that you will be able to see NYLQ with an indication of the price and size of the bid and offer. But that montage will also show the bid and offer of each other market center. So, yes, the aggregate liquidity quote can be greater than the NYSE quotes.

RICH REPETTO[85] [From the Floor]: Is there any, with the sort of over hang right now of the investigation, do you have any time frame on when we could expect to hear findings from the investigation?

MCSWEENEY: It wouldn't be appropriate for me to comment on that.

MIKE ROBBINS[86] [From the Floor]: Bob, can you tell us about the time schedule on using cellular phones on the floor?

MCSWEENEY: Yes, Mike, we have received approval from the SEC to implement that particular initiative on a six-month pilot basis. Right now, our staff in the floor facilities area is in the process of signing people up, so I would imagine that this would probably take place within the next four to five weeks. It might be a little longer, but it is not going to be an extended period of time.

MICHEL FINZI[87] [From the Floor]: A quick question on the Liquidity Quote product. If it is in some sort of attributive montage, if you send a marketable order to purchase a security which is being offered, do you have any sense of how long that marketable order will take to get executed against the quote? Is it auto-ex, or is it going to have the opportunity for price improvement, and, if so, is it going to be an improvement on the current time that it takes to get a market order executed?

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[85] Rich Repetto is Principal at Sandler O'Neill & Partners. At the time of the conference, he was Managing Director at Putnam Lovell NBF.

[86] Mike Robbins is Partner at Robbins & Henderson.

[87] At the time of the conference, Michel Finzi was Managing Director at Instinet.

MCSWEENEY: It is going to flow right into the current agency dynamic, and will be auctioned for potential price improvement, so it will not be auto-ex.

FINZI [From the Floor]: Do you have any sense of whether it will be 3 seconds, 5 seconds, or what?

MCSWEENEY: It will probably be between 10 and 20 seconds based upon the average of the turnaround time now.

Thank you. I appreciate the opportunity to have addressed this audience.

CHAPTER 8: BEST EXECUTION: A CANDID ANALYSIS[88]

Robert Schwartz, Zicklin School of Business, Baruch College
Marvin M. Speiser Professor of Finance and University Distinguished Professor
Robert A. Wood, Fogelman College of Business, University of Memphis
Distinguished Professor of Finance

Any criterion that can make a bad execution look good (or a good execution look bad) must be questionable.

Candide, portfolio manager for Voltaire's Best Possible World Fund, has just received several trade reports. 5,000 shares bought at $35.10 at a time when the market was offering 4,000 at 35, and another 1,000 was available at $35.10. 'Excellent,' she exclaimed. 'Just think of all the free research I have received from that broker, and also those New York Knicks tickets that he sent me.' 10,000 shares sold at $28 at a time when the market was showing a bid for 8,000 shares at $28.30. 'Wonderful,' she bubbled forth, 'I sold all those shares immediately.' 100,000 shares bought in 20 tranches over the course of five trading hours at an average price of $42.15 (the volume weighted average price for the period was $41.75). 'I'm thrilled,' Candide explained, 'just wait until you see what the VWAP will be tomorrow!'

Do these trades satisfy a 'best execution' criterion? What is 'best' is best viewed in the eyes of the beholder. If you are like Candide, the answer is

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[88] Reprinted with permission from 'Best Execution: A Candid Analysis,' Rober A. Schwartz and Robert Wood, Journal of Portfolio Management, Volume 29 Number 4, Summer 2003, pp. 37- 48.

'yes.' But any criterion that can make a bad execution look good (or a good execution look bad) must be questionable. The bottom line is, best execution is a multifaceted concept that is difficult to define and even more challenging to measure. In large part this is because the quality of executions received by participants depends, not only on their individual needs and trading decisions, but also on the characteristics of a specific trade or package, on the stock being traded, on the objective of the entity that requested the execution, and on conditions existing in the market as the order is being executed. Best execution also depends on the overall efficiency of market structure.

Recent developments in computer technology, analytic skills, and data availability have facilitated transaction cost analysis and order management. An ability to quantify transaction costs and to use smart order routing systems, however, does not necessarily allow one to quantify and to obtain best execution. Transaction costs are typically measured ex post (i.e., after the trade), and smart order routing systems can only attempt to control transaction costs. Best execution depends on knowing ex ante (i.e., before the trade) what execution costs will be and, if taken literally, means that the very best of all possible trades has been made.

'Best execution,' is a broader concept than transaction cost analysis. For one thing, a best execution obligation carries with it a fiduciary responsibility. The Association for Investment Management and Research (AIMR) further elaborates as follows:[89]

'When one looks closely at the chain of responsibility as trades go from the idea to completion stage, it can be seen that responsibility for securing best execution is shared by many. These responsibilities can be thought of as being hierarchical: investment management traders operate within parameters established by managers, brokers follow instructions specified by investment management traders, and exchanges execute their procedures according to the submissions of brokers.'

In this paper, we address issues concerning 'best execution,' not transaction cost analysis per se. We underscore the virtual impossibility of quantifying best execution, and further emphasize that the responsibility for delivering it is shared with the exchanges and other providers of trading services.

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[89] AIMR [2002], page 3.

Trading is commonly thought of as a zero sum game; namely, one participant's costs are another's returns (e.g., liquidity demanders pay the spread, and liquidity providers receive the spread). This is too simplistic. For one thing, execution costs discourage both investing and trading, a net loss for the market in aggregate. Similarly, participants whose limit orders do not execute incur opportunity costs that have no counterpart in someone else's receipts. Execution costs, which ex ante are fairly unpredictable themselves, increase portfolio risk and, therefore, the expected rates of return that asset managers require. Lastly, trading produces prices and other information for the broad market; to the extent that execution costs blur this information, the broad market, once again, loses. Consequently, it is important from a public policy point of view to control transaction costs and, at first sight, best execution may appear to be a noble, and achievable goal.

Best Execution has been a holy grail in the United States since the enactment of the U.S. Congressional Securities Acts Amendments in 1975. In mandating the development of a National Market System, the 1975 Amendments stated, as a goal, that investors' orders be provided the opportunity to be executed, consistent with efficiency and *best execution*, without the participation of a dealer.

At the time the Amendments were passed, institutional participation was far less than it is today, and the best execution requirement was fashioned primarily with regard to retail order flow. Currently, however, attention has turned to institutional investors, a group for whom the requirement is appreciably more difficult to fulfill. As a consequence of the greater difficulty of specifying best execution criteria for large orders, the concept of best execution, for institutional investors, is now being applied more to the efficiency of investment/trading *procedures,* than to the costs, per se, of specific transactions.

Increased attention is also being given to transaction cost analysis in the European arena, and 'best execution' is now gaining attention on both sides of the Atlantic. In London, publication of the Myners Report in March 2001 has lead to a protracted debate about (1) whether or not traditional fund management contracts give managers adequate incentives to minimize transaction costs and (2), if not, what to do about it.[90]

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[90] See Myners [2001]. For further discussion, see Brealey and Neuberger [2001] and Neuberger's discussion in Schwartz, Byrne and Colaninno [2003].

But what does the term, 'best execution,' mean? The U.S. Congressional Act did not say, and a widely accepted empirical definition has not since been developed. The problem is multifaceted. First, market impact costs and opportunity costs are virtually impossible to measure with any kind of precision on a trade-by-trade basis.[91] Second, good benchmarks for assessing trading performance are difficult to define. Additionally, different kinds of orders require differential handling, depending on the needs of a trader, the size of an order, and the liquidity of the market for the shares being traded. In other words, the execution that is 'best' depends on the particulars of the specific case at hand. Further, how does one measure best execution for orders that are broken into smaller pieces for execution over an extended period of time? And how does one specify a common set of best execution procedures to apply to a broad, diverse population of participants? In the next section, we look more closely at the difficulties encountered when trying to apply the concept of best execution.

MEASUREMENT PROBLEMS

We start by taking a simplistic view. Assume a market characterized by a sizable number of small, priced orders, and let us focus myopically on a single moment in time when an incoming order arrives and triggers a trade. In this environment, best execution means that the incoming order executes at the best counterpart price available (i.e., that a sell order transacts at the highest posted bid, and that a buy order transacts at the lowest posted offer). If all orders are consolidated on a single book, best execution is assured by the price priority rule of order execution (namely, that the most aggressively priced orders trade first). If the marketplace is geographically fragmented, best execution requires that a newly arriving customer can, through intermarket linkages and/or integrated quotation displays, find and execute against the most aggressive counterpart quote in the broader market.

In the situation just described, a snapshot picture is taken to determine whether or not a participant has received best execution. The

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[91] More meaningful measures can be obtained by averaging measurements over a substantial number of trades.

snapshot is the configuration of prices across markets at the specific moment in time when the trade is made. Emphasized in this picture is the size of the bid-ask spread and the depth of the book at the bid and offer quotes.

Exhibit 30 presents the transaction record for a one-hour trading interval (12:00 pm – 1:00 pm on September 24, 2002) for Lucent Technologies Inc.

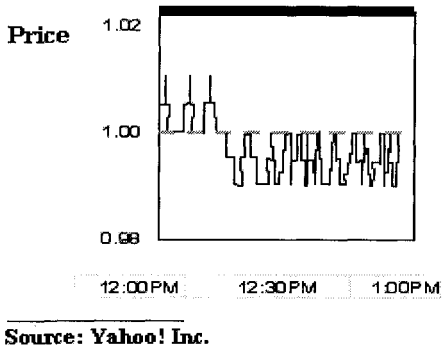


Exhibit 30. A One-Hour Trading Interval for Lucent Technologies Inc., 12:00PM – 1:00PM, September 24, 2002

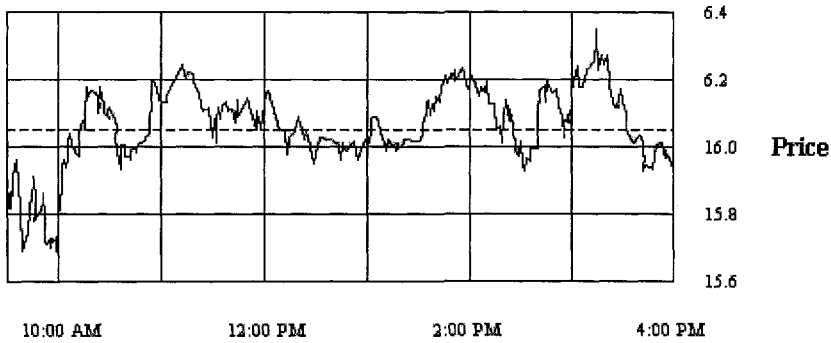
We can infer a key part of the snap shot picture from the graph, namely, the bid-ask spread. For the first part of the interval, transaction prices were bouncing between $1.00 (which presumably was the bid) and $1.01 (which presumably was the offer). For the remainder of the interval, prices appear to have been bouncing between a bid of $0.99 and an offer of $1.00.

Two observations can be made: (1) the tighter the spread, the lower the execution cost that is borne by market order buyers and sellers, and (2) the spread is readily measured. In light of both of these observations, it is not surprising that market centers, regulators, and academicians have focused with particular intensity on the size of the spread as an indication of market quality. More is involved, however. Of considerably greater importance than the tightness of the spread, is the *location* of the quotes relative to an underlying consensus value. But, unfortunately, consensus values are not

observable and, consequently, relatively little attention has been given to price discovery.

Now move away from the static setting. Let a participant also decide just when to step forward with an order and trade. This is the dynamic environment within which professional buy-side and sell-side traders operate. Namely, they time their trades in accordance with current market conditions.

The bid-ask bounce is apparent for Lucent because, given that it is a $1 stock, the penny tick size is meaningful (1 percent). Let us next consider a full day chart for a higher priced stock. Exhibit 31 presents a chart of the full one-day transaction record for Amazon.com on September 24, 2002.



Source: Yahoo! Inc.

Exhibit 31. Transaction Record for Amazon.com on September 24, 2002

The interesting feature of the chart is the amount of price variability that it reflects. Volatility, in fact, is so appreciable relative to the spread that traces of the spreads (the bouncing back and forth between two relatively stable values) are not apparent in the full day chart.[92]

[92] For a discussion of the magnitude of intra-day volatility and further references, see Ozenbas, Schwartz and Wood [2002].

The high-low range for Amazon on September 24 is a striking 4.94%. During the six and a half hour trading day, several price run-ups and drops occurred that each exceeded 1.25%. However, for the day, the open-to-close price change was only 0.38%. Price was not trending, it was swinging around. What explains the volatility?

To some extent, the answer, undoubtedly, is the advent of news concerning the company, the industry, and/or the broader economy. It is unlikely, however, that news releases can justify the magnitude of price velocity (the size of the changes and the frequency with which they occur) seen in Exhibit 31. Market realities such as the bid-ask spread and market impact also play a role. But more importantly, we point to a third factor: price discovery. We suggest that, to an appreciable extent, the price volatility evidenced in Exhibit 31 reflects the dynamic process by which the market searches for the price that best reflects the broad market's desire to hold shares of Amazon.com.

Price discovery, because it is a complex, dynamic process, makes best execution far more difficult to measure. The question is no longer one of simply obtaining the best possible price for an incoming order at the time of its arrival. The trader must also pick the best possible time to step forward with the order and trigger a trade. But what is the best time? Against what value should an execution be assessed? The bottom line is, in a dynamic environment, a performance benchmark is required. With a benchmark, best execution does not mean getting 'the best price;' it means matching or bettering the benchmark.

What should the benchmark be? Two are currently being widely used by traders in the U.S. and Europe: the volume weighted average price (VWAP), and the average of the low, high, open and close prices (LHOC). Both measures are averages. As averages, both are saying that the relevant benchmark is the price at which a 'representative share' has traded during a relevant interval of time (e.g., a trading day). According to the benchmark, any participant who bought below the average or who sold above the average has traded well.

However, many questions can be raised concerning these benchmarks. For one thing, they create an incentive for traders to time their orders with respect to the benchmark, a practice that can lead to higher trading costs. For instance, a buyer, seeing that prices are rising towards the end of a day and knowing that continued purchases could drive his or her average buying price for the day above the performance measure, will simply wait for the

next day before buying more shares. The next day prices may be even higher but, if so, so too will be the benchmark. Consequently, the trader can receive high scores on both days from the rating system even though effective trading costs are higher. The same is true for a seller who sees price fall as the day progresses. If the price decline continues into the next trading day, the seller may beat the benchmark on both days by postponing sales to the second day, even though he or she sells at lower prices on the second day then could have been obtained on the first.

Another commonly noted problem with the performance benchmark is that a full day price history is not applicable if, for instance, a buy-side trader receives the order from his or her portfolio manager in the later part of the afternoon. Should the benchmark reflect only the prices from the time the buy-side trader has received the order until the end of the day? The problem then would be that the trader's own execution increasingly defines the average, as the window over which the average is computed tightens around the trader's order. The same problem exists when prices over the full day are used, but the market for the stock is thin and the trader's order is large. That is, the execution of a 500,000-share order for a stock that, on average, trades 300,000 shares a day, is bound to have a sizable impact on the benchmark that it is being assessed against.

There is another problem with the VWAP and LHOC benchmarks: there is no reason to believe that an average realized transaction price in a continuous market, however that average is measured, reflects any consensus value that the market is trying to discover. Because of the vagaries of the order flow, a stock's share price may be higher than its unobservable consensus value at any given moment and, at some other moment, the stock's price may be below its unobservable consensus value. And deviations can persist for some time. We have no reason to expect that, over the course of a trading day, the average realized trade price and the average consensus value will have converged.

In light of these problems, attention has now turned away from assessing best execution with reference to the transaction costs incurred for a trade, to assessing the investment/trading procedures that have been followed. As Ananth Madhavan of ITG has stated, 'The bottom line is, the AIMR guidelines do not prescribe how firms should measure best execution. Rather, they focus on the procedures by which firms check that client portfolios are in fact being properly handled. It is not a trade-by-trade process. Rather, what AIMR is looking for is that managers, traders, and

brokers put into place a set of processes that will ensure that considerations involving trading are carefully looked at during day-to-day operations.'[93]

Natan Tiefenbrun of Instinet put it this way: 'We (Instinet) have defined best execution as a very holistic term. This is all part of the best execution obligation. I think that is right. It should be a holistic term. This is what we should be very focused on – how to get a money manager to look at the entire process, from end to end. How do we minimize all of the frictions that exist between the portfolio manager and the trading desk, and between the trading desk and a broker? How do we mitigate the conflicts of interest that exist?'[94]

Viewing best execution as a procedure is a meaningful development, and some progress might be anticipated. However, problems remain. In particular, the definition of best execution procedures cannot be formulated without reference to the participants to whom they are applied. What is best is different for a buy-side participant vs a sell-side participant, for an active fund vs an index fund, for a broker dealer intermediary vs a market center, and so forth.[95] Moreover, procedures should not be specified in such detail that agents are micromanaged. If agents are not given some leeway to make their own decisions, what is their value added?

REGULATORY CONSIDERATIONS

The ambiguities involved in assessing trades with regard to best

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[93] Comments made at the Baruch College Conference, *A Trading Desk's View of Market Quality,* April 30, 2002. At the same conference, Minder Cheng of Barclays Global Investors presented details of a specific assessment procedure that is used by his firm. The discussions are in Schwartz, Byrne and Colaninno [2003].

[94] Remarks made at the Baruch College Conference, *A Trading Desk's View of Market Quality,* April 30, 2002. The discussion is in Schwartz, Byrne and Colaninno [2003].

[95] Wayne Wagner, speaking at the April 30, 2002 Baruch College Conference, stated this as follows: 'But it gets complicated. These decision processes are all very different. Consequently, what represents best execution for a hedge fund that wants immediate execution, may not apply to Minder (Cheng) who is mostly running index funds and therefore is interested in achieving lowest possible costs. It is also different for a momentum manager who simply has to get the shares that his portfolio manager has decided on into the portfolio, no matter what the cost.' The discussion is in Schwartz, Byrne and Colaninno [2003].

execution criteria have not discouraged regulatory authorities from pursing the objective in an attempt to insure quality executions for public participants. Recently, the Financial Services Authority (FSA) in the U.K. released a Discussion Paper (Financial Services Authority [2001]) that reviews policy and invites public comments on the matter. The document presents a broad array of questions concerning the implementation of a best execution requirement.

Our own discussion of best execution has focused largely on the impracticality of applying the criterion to institutional trades. Interestingly, the FSA (much as the Securities and Exchange Commission in the U.S.) is primarily focused on best execution as a 'consumer protection tool,' where 'the consumer' is a retail customer. Accordingly, the assessment of best execution, for the most part, fits into the 'snap shot' approach that we discussed in the previous section of this chapter. Namely, best execution is judged by matching a transaction price against other prices that exist at the time a trade is made.[96] Overlooked in the snap shot is the timing of order placement, including the submission of institutional orders in smaller tranches over extended periods of time.

Although a focus on the retail customer is understandable, best execution criteria are applied to all trades. Indeed, it would present another level of complexity to stipulate just what trades are, and what trades are not, subject to a best execution requirement. Consequently, if best execution criteria are not implementable for institutional orders, one might question the advisability of imposing the requirement for any orders. A reasonable alternative may simply be for firms to disclose to their customers the procedures they follow when placing their orders (this is suggested in the FSA's discussion paper), and to let competition take care of the rest. This thought is also echoed in the U.S. by the AIMR Report.

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[96] In reviewing current policy on best execution, the FSA's Discussion Paper (FSA [2001]) states, '...when dealing in securities traded on the Stock Exchange Electronic Trading System ('SETS'), to meet the best execution requirement, firms should achieve a price (whether on SETS or an alternative execution venue) which at least matches the best price available on SETS)' (Page 13). The document continues, 'However, in markets where there is no single or central exchange such as an over-the-counter ('OTC') market, the practice that is followed to substantiate the achievement of best execution is to obtain three quotes from different market makers (and then to select the most favourable price)' (Page 13).

In the U.S., in November 2001, the Association for Investment Management and Research (AIMR) issued its report on best execution. In the introduction, the Report states that, 'Therefore, it is not feasible to define a single measurement basis for best execution on a trade-by-trade basis. Instead, the Guidelines focus on establishing processes, disclosures, and documentation, which together form a systematic, repeatable, and demonstrable approach to show that best execution compliance is consistent and effective.'[97] The Investment Company Institute (ICI), in its comment on the AIMR Report, puts this more strongly: 'We recommend that the (AIMR) Guidelines clarify that best execution is not a quantifiable concept and that statistical measurements can be only one part of the overall assessment that firms may make in examining best execution.'[98]

In assessing best execution, U.K. regulatory authorities give primary importance to the prices at which trades are made. Next in line is the timeliness of trades.[99] In Annex B of the Discussion Paper, the FSA presents brief summary statements about best execution from regulators in thirteen different countries.[100] Five of the thirteen summaries include explicit reference to the time dimension.[101]

The regulators' focus on timeliness may be consistent with their focus on retail customers, but institutional participants commonly work their orders patiently in an attempt to get better prices.[102] In the U.S., the AIMR Report listed, in addition to the proper control of trading costs, that 'firms need to (1) determine client trading requirements; (2) select appropriate trading techniques, venues, and agents; (3) control the pace of liquidity search to avoid excessive market impact; (4) protect the interests of the clients and the proprietary information of decisions made by investment managers; and (5) monitor the results on a continuing and periodic review basis.'[103]

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[97] See AIMR [2001], page 2.

[98] Letter to the AIMR. See Lancellotta [2002].

[99] Other considerations noted in the FSA's Discussion Paper include counterparty risk (see the discussion starting on page 26).

[100] The statements were extracted from the Forum of European Securities Commissions [2001].

[101] Phrases contained in the quoted references were 'within a reasonable period of time,' 'as rapidly as possible,' 'without undue delay,' 'within a reasonable time period,' and 'as fast as possible.'

[102] For further discussion, see Economides and Schwartz [1995].

[103] See AIMR [2001], page 3.

As noted, the practice of patient order timing is not comprehended in a snap shot assessment of best execution.[104] The FSA, as reflected in the following quote from its Discussion Paper, recognized this point in the context of its discussion of intra-day liquidity variations:

At certain times of the day, dealing volumes may be low and wide spreads (the difference between buying and selling prices) may appear. At such times, it could be advantageous not to deal. However, the private customer may not be sufficiently well informed and in this case, the best execution rule (for example, the SETS price in the case of the U.K. equity market) does not provide any protection. Indeed, the SETS minimum could be a sanction for a poor price (even if that price were the best available at that time). This problem is most pronounced at the market open...' (Page 18).

We would amend the statement to refer, more broadly, to price discovery, rather than to the bid-ask spread (which may also be viewed as a relevant factor).

Our final comment about a regulatory authority imposing a best execution requirement is that the quality of executions achieved very much depends, not just on the order placement decisions of individuals, but on the efficiency of the marketplace that the individual participants are operating in.[105] At the extreme, if a market becomes hyper-continuous under stressful conditions, best execution for an individual becomes a vacuous concept.[106]

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[104] The FSA Discussion Paper (FSA [2001]) notes that 'Timely execution is put forward as an important objective of customers, which it is argued, obviates the need for extensive researching of price. The argument is that the customer's requirement for immediate execution takes precedence over price: in this case, the customer is seeking speed of execution at the expense of foregoing the exercise of researching alternative prices' (Page 34). The FSA also notes, in an explicit reference to institutional customers,that '...execution may not be possible in a single transaction but a series of transactions might be necessary. With a large order, the choices for execution may be between '(a) immediate execution and possibly incurring a significant price impact; or (b) patient execution...where the risk is that the price moves against the investor (who suffers an opportunity cost)' (Page 35).

[105] In its discussion of best execution obligations, AIMR [2001], also noted that markets and exchanges should '... continually... seek to develop faster, more efficient, and more reliable systems and structures to ensure that their market place maintains fair, transparent, and equitable trading practices.'

[106] By hyper-continuous, we mean that trades are occurring with such high frequency that transaction-to-transaction price volatility is so accentuated that price discovery breaks down.

More generally, we suggest that the regulators focus, not on the handling of individual orders per se, but on the quality of prices discovered for the broad market, as orders are aggregated and turned into trades.

ADVICE FOR THE BUYSIDE TRADER

The landscape is changing rapidly for buy-side traders. Market structures are evolving, and technological capabilities for connectivity and order management are exploding. In both the U.S. and Europe, transaction cost analysis is becoming considerably more prevalent and sophisticated. What implications does all of this have for the buy-side trader?

1. Minimization of trading costs has not been the only objective of institutional participants. The widespread practice of bundling trade execution services with soft dollar products (such as research and the proverbial New York Knicks tickets) that are paid for with commission dollars, in the opinion of many, has resulted in excessive execution costs and has imposed a competitive barrier for new, alternative trading facilities that offer lower trading commissions.[107] Enforcement of best execution practices may help to rectify these problems. As Ted Aronson of Aronson+Partners has remarked, 'For the first time in 27 years, there will be a significant, and I mean significant, decrease in the use of soft dollars, in the related sins of directed trading, and all that sort of stuff. That will be the most important result of the AIMR task force guidelines.'[108]
2. The challenge of handling institutional sized orders will continue to be formidable. Breaking into the flow of the continuous market and getting anything close to best execution will remain difficult. The very care that institutions take in approaching the market with their large orders makes it hard for them to meet and to provide liquidity to one another.

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[107] For further discussion, see Schwartz and Steil [2002].

[108] Remark made at the April 30, 2002 Baruch College Conference. The discussion is in Schwartz, Byrne and Colaninno [2003].

3. Star wars technology in market centers and trading rooms is not a panacea. Electronic order book markets that are the main trading platforms throughout the European equity markets may be efficient at handling retail order flow, but they do not generally gather the liquidity that institutions require. Electronic linkages also accelerate the speed with which events can take place. This means that one trader's order can tap into a liquidity pool with lightening speed, but still loose out to a competing order that has arrived a few nano seconds ahead of it. Electronic connectivity enables buy-side trading desks to access liquidity pools with minimal broker dealer intermediation; nevertheless, intermediaries are still needed and liquidity pools are still fragmented.[109]
4. The proper timing of orders by a buy-side trader can lead to less costly, more profitable, trading. Conventional thinking among both practitioners and academicians is that some traders, being patient, are willing to be liquidity providers and place limit orders, and that others, being eager to trade quickly, place market orders which are liquidity demanding. However, professional traders commonly use a switching strategy. Namely, the buy-side trader, upon receiving an order from the portfolio manager, may initially be patient, hoping the market will come to him or to her. However, if market conditions indicate that price is about to move away, the buy-side trader will switch from being a liquidity supplier to a liquidity demander. He or she will step forward with an order and trigger a trade. This is what market timing is all about, and the evidence suggests that it is profitable.

   Specifically, Handa, Schwartz and Tiwari [2002] used a fifteen minute market imbalance measure (a ratio of buy-side or sell-side trading activity to total trading activity) to reflect current market conditions. They found, using data provided by the American Stock Exchange, that orders handled on a not held

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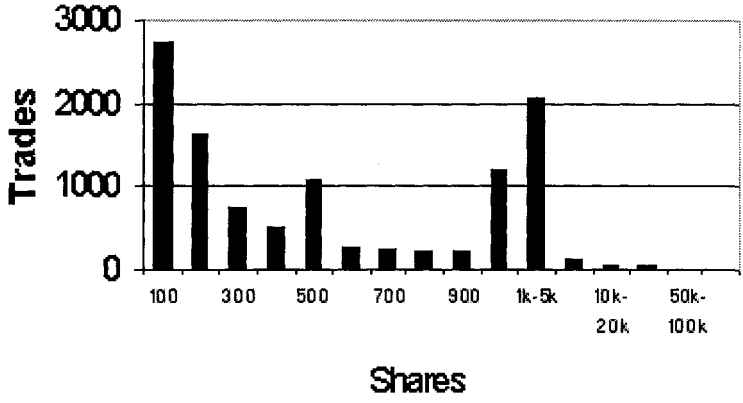
[109] Wayne Wagner stated it this way: 'Love them or hate them, institutional traders still need market makers. It is a relationship built upon mutual need: Searching for liquidity, bringing companies to market, providing research, referrals and soft-dollar services,' Wagner [2002].

(NH) basis by floor brokers were timed in relation to current market conditions, and that this timing resulted in lower market impact costs.

5. As discussed above, institutional traders commonly break their orders up for submission to the market over an extended period of time. This creates overhang in the market and helps set the stage for momentum trading. The net result is a diminution of order size and acceleration of order arrival. The order flow may fracture and the market can become hyper-continuous. This disruption of price discovery makes the work of the buy-side trader considerably more difficult.
6. We have been advised that some institutional investors tend to avoid trading at, and close to, market openings. One can readily understand why: the big traders want to know the prices, not set them, and they have less confidence in the quality of price discovery at and near the opening. Ozenbas, Schwartz and Wood [2002] have observed a strikingly high level of volatility in the first half-hour of the day in the New York, Nasdaq, London, Frankfurt and Paris markets. This is the time when markets are most apt to become hyper-continuous. Ozenbas, Schwartz and Wood [2002] also observe strikingly low volume at the opening half-hour in London, a market that is heavily institutionally dominated.
7. In the U.S., the decline in tick size from eighths to teenies in 1997, and especially from teenies to pennies in 2000/2001, has dramatically impacted the amount of liquidity available from limit orders and, hence, the trading strategies that must be employed to obtain best execution.[110] Small tick sizes result in smaller quantities being displayed by limit orders since the option premium created by posting a limit order decreases as the tick size is reduced. While the tick size has been small in Europe for some time and the markets have adjusted to this reality, the tick size reduction in the U.S. is still controversial.
8. A good picture of what can happen is presented in Exhibit 32, which displays transaction information for the Nasdaq stock,

[110] For further discussion, see Chakravarty, Wood and Van Ness [2002].

Cisco, for the 9:00 a.m. – 10:00 a.m. interval on January 22, 2001.



Source: Global Instinet Crossing

Exhibit 32. Trades of Cisco Systems Between 9:30-10:00 AM on 1/22/01

In the Exhibit, order size is on the horizontal axis and the number of prints is given on the vertical axis. Over 2500 prints of size 100 shares are shown as having been made in the interval, an average of one 100 share print every 1.4 seconds. During the period, nearly 8 million shares in total traded in nearly 10,000 trades, with an average trade size of 819 shares throughout the half-hour period, the spread was generally 1/8 or 1/16 of a point, and the difference between the 9:30 a.m. price and the 10:00 a.m. price was ¼ point. However, prices over the thirty-minute interval ranged from a high of 40 63/64, to a low of 40, nearly a $1 (or 2%) swing. It would be a considerable

stretch to claim that informational change accounted for the price swings and that, throughout the period, price was being well discovered. Rather, we interpret this as evidence of fractured price discovery that can occur when a market becomes hyper-continuous. When the currents are too treacherous, best execution is not a viable goal. Understandably, many buy-side traders prefer not to navigate in these waters.

9. An unduly small tick size may further exacerbate a hyper-continuous market. Small tick size makes it easier for participants to step ahead of limit orders on the book. Stepping ahead undermines the importance of time priorities. In turn, this discourages the placement of limit orders and reduces the liquidity provided by the book.[111] Orders on the book provide a 'liquidity barrier' that confines the range over which prices will fluctuate with the arrival of new orders in the absence of news. Accordingly, smaller tick size can lead to greater intra-day price volatility if traders are not careful.

   If institutional traders do not employ strategies that reflect a diminished liquidity barrier, they risk having their orders break through the barrier. When this happens, other traders may step aside to see how far price will rise or fall. Further, we have been advised that some traders, looking to game the markets for profit, will intentionally break through the liquidity barrier so as to benefit from the resulting disequilibrium. In either case, volatility is increased and price discovery distorted. Markets are particularly susceptible to this behavior at and near the open, before market clearing values are reasonably well discovered.

10. The performance of buy-side traders is increasingly being measured with reference to VWAP and/or LHOC benchmarks. These benchmarks are fallacious. Buy-side traders and their portfolio managers should understand explicitly that trading practices designed to beat an erroneous benchmark can be costly. Further, they should recognize that price discovery can go awry, especially when a market becomes hyper-continuous. Buy-side traders are understandably averse to discovering price. This

[111] This point was first made by Harris [1996].

aversion is reflected in the rapid growth of VWAP trading, which, ironically, may increase their trading costs, as noted above.

THOUGHTS FOR THE PROVIDERS OF TRADING SERVICES

Competitive and technological pressures are causing the landscape to change dramatically for exchanges and other providers of trading services. In this section, we offer various thoughts relating to the development of market structure. These are formulated with a primary focus on the national market centers. However, they also have implications for the operations of alternative trading systems (ATSs).

1. Improving market quality is the overriding objective for a market center. The important question is how to implement the objective. It is inappropriate to focus myopically on factors such as the bid-ask spread simply because they are readily measured. An assessment of intra-day price volatility, a variable that may capture a broader array of transaction costs, is also advisable. The approach taken in Ozenbas, Schwartz and Wood [2002] is to focus primarily on the magnitude of price volatility during the first half-hour and the last half-hour of the trading day. On an ongoing basis, price discovery is particularly difficult during these periods, and an assessment of market quality is most meaningful at a time when the market is under stress.
2. A market center has its own best execution obligation. Namely, it has the obligation to reduce trading costs for the broad spectrum of investors that are its customers. To meet this obligation, order flow from the disparate groups of investors that inevitably characterize a market, must be appropriately integrated. Only if this is accomplished, will good price discovery be achieved. Price discovery is a primary function of a market center, and improving the quality of price discovery is of paramount importance.
3. Closely related to price discovery is 'quantity discovery.' Large investors should be able to find each other and trade. Even if a

stock is trading at a price that appropriately reflects an underlying, consensus value, institutional investors may have undisclosed orders at the price simply because of the cautious way in which they bring their orders to the market.

The quality of price discovery and of quantity discovery should be assessed with reference to two variables: (1) the level of intra-day price volatility and (2) institutional order size. The extent to which institutions show only small parts of their orders to the market should be closely monitored and assessed by the market centers. The coexistence of high intra-day volatility and small institutional order size would indicate that market quality is low, and that best execution is inordinately difficult to achieve.

4. Electronic limit order book markets may be good trading platforms for the retail order flow for liquid, large cap stocks, but the economic structure of a continuous, order driven market breaks down when the order flow it receives is low. Even for big cap stocks, 'plain vanilla' electronic markets do not offer sufficient liquidity for large orders. While allowing for hidden orders helps, further market structure is needed for handling institutional order flow.[112] Additional structure is now provided in the U.S. and European markets: (1) by the inclusion of crossing (either on an exchange as does Deutsche Börse; (2) by an ATS such as POSIT, Instinet or E-Crossnet); (3) by the use of price discovery call auctions (predominantly by the European exchanges); and (4) by new, electronic negotiation systems (such as Liquidnet in the U.S.).
5. The accelerating onslaught of technology will continue the trend toward hyper-continuous trading. With penny ticks in the U.S., quotes are changing so rapidly in the most frequently traded stocks that the eye cannot follow them.[113] Providers of trading services need to offer technology that will accommodate strategies adapted to the environment of rapid quote changes.

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[112] Hidden orders are orders that have been submitted to a market (e.g., an electronic limit order book) but that are not openly displayed at the trader's request. In Europe, hidden orders are commonly referred to as 'iceberg orders.'

[113] Chakravarty, Wood and Van Ness [2002] find stock quote updates of up to 257 per minute for AOL following the introduction of decimal trading on the NYSE.

For example, a smart limit-order could be configured to morph itself automatically depending on market conditions. Such a limit order would be programmed to raise or to lower its bid or offer price, to change its size, or to convert it into a marketable limit order or a market order, depending upon changing market conditions.

6. Consolidation has a second important dimension. Along with the spatial integration of orders, good market structure also calls for an appropriate temporal integration of orders. Temporal fragmentation can be every bit as damaging to market quality as its spatial counterpart. The inclusion of predetermined meeting points in time, be they crosses or price discovery calls, enables participants in general, and institutional traders in particular, to meet in an orderly fashion and to provide liquidity to one another with minimal price dislocation.

   Our previous discussion of Exhibit 32 and the information it contains about the first half-hour of trading in Cisco on January 22, 2001, highlights a reality of the continuous market. Orders execute against each other at fluctuating prices in trades that are generally bilateral. When the trades are small and are separated from each other by only a second or so, the price fluctuations simply are not efficient adjustments to new information. Rather, aside from bid-ask bounce, they are a manifestation of chaos.

   During the opening thirty minutes of trading for Cisco on January 22, price discovery appears to have been in disarray. Far better would it have been for the traders in Cisco to have had the opportunity to meet at a single point of time, and to have had their orders execute at a single price in one large, multilateral trade. Unfortunately, they were not able to do so because there is no single price call auction facility in Nasdaq's market mechanism.

   Multiple call auctions are included in the European equity markets, and the calls are attracting meaningful order flow. Nevertheless, we have been advised that institutional participants continue to avoid trading in the opening minutes. Presumably, they prefer to wait until prices are more clearly established before stepping forward with their large orders. We suggest that further attention be given to the architecture of the existing call auctions

to assure that they have appropriate functionality for institutional investors.

7. As discussed above, institutional investors in both the U.S. and Europe have expressed the need for a good benchmark against which to assess the quality of their trades. As we have pointed out, however, the standard benchmarks (VWAP and LHOC) do not do the job. Traders should not be assessed against an average of a day's worth of poorly discovered prices. Rather, they need well-discovered prices that they can have confidence in. Pooling multiple orders in a properly structured call auction is the best way to produce these prices. Yet, since continuous trading will never be totally replaced by call markets for actively traded stocks, further development of trading cost metrics is needed. Interestingly, with the introduction of closing calls in the European markets, we have heard from some sources that confidence is beginning to build in the closing price.[114] If this continues, more orders will be attracted to the closing auctions. In a virtuous circle, this will, in turn, reinforce the quality of price discovery at the close. At some point, the closing price may earn its status as a **widely accepted** benchmark value. If volume also builds for the opening (and possibly intra-day) auctions, these calls will also produce values that could be used as benchmarks. The benchmarks produced in the call auctions could then be treated as 'safe harbor' values for the best execution obligation.
8. Currently, much attention is being given to the introduction of new electronic technology for order routing and information dissemination. This technology makes it ever easier to find the other side of a trade. Hence, the need for intermediaries is diminished. But intermediaries will continue to be needed to resolve imbalances, to facilitate handling large orders for big cap stocks, to make the mid cap and small cap markets viable, and to play a special role for all stocks when markets are under stress.
9. Three trading modalities are required for an efficient market model: (1) the limit order book, continuous market, (2) call

[114] Pagano and Schwartz [2002] found that the introduction of a closing call in the Paris market did improve the efficiency of price formation at the close.

auctions, and (3) a market maker, quote driven component. Combining these three modalities into an efficient hybrid is far from simple. To some extent, the objective may be attained with ATSs providing separate modalities as niche players. Of course, strong central exchanges can also provide the requisite interfaces and run the modalities. Whatever, market quality improvements are needed and, for some time to come, achieving a maximally efficient hybrid marketplace will remain a challenge.

CAVEATS FOR PUBLIC POLICY

The health of its equity markets is critically important to a nation. Economic growth depends on the ability of firms to obtain financial capital at reasonable cost, and the cost of equity capital depends on market quality. The collapse of a market under stress can have dire consequences for a national economy. For these reasons, issues concerning equity market operations and best execution have attracted considerable government attention in the U.S. and European arenas. Furthermore, solid justification exists for regulatory intervention with regard to insider trading violations and other abuses of power and position.

Nevertheless, government involvement with market design has raised many questions. We share the concerns. Market architecture is highly complex. There is a lot involved about which students of the market do not know or agree. The very measurements of market quality and best execution are subject to ambiguity. Market structure changes commonly have unintended consequences, especially in a rapidly evolving technological environment. And when a government mandated structural change goes awry, government recognition, understanding, and appropriate corrective action, if ever taken, may not be forthcoming for years. It is far better to let alternative markets make their own decisions, reap their rewards, and accept the consequences of their mistakes as they battle for order flow in a competitive environment.

Is government intervention required to ensure sufficient competition in the industry? How competitive is the current environment? On the one hand, we see technology innovation expanding the geographic reach of trading facilities and, increasingly, competition is taking place in a global environment. We also see the arrival of new firms and new trading

modalities in the U.S. and Europe. On the other hand, major resistance to technological change persists, meaningful innovations are rare and far between, and the obstacles faced by a technology pioneer are daunting.

Because of network externalities, nothing is more important for the quality of a market than whether or not that market receives order flow. Consequently, it is extraordinarily difficult for a new entrant to put competitive pressure on an already established market. Regardless of its inherent efficiency, a newcomer simply may not get the order flow required for its potential to be realized. This being the case, the established market has a weakened incentive to innovate, and is more apt to follow the dictates of vested interests.

And so, the vibrancy of competition and the ineffectiveness of competition combine to make good public policy extremely difficult to formulate. We advise minimal governmental intervention with regard to market architecture. For those who would like to see government play a more active role, we offer the following caveats.

1. Government agencies like to monitor that which they regulate. This leads to particular attention being given to performance characteristics that can easily be measured. Consequently, too much attention is given to readily observable aspects of market quality (such as bid-ask spreads), and insufficient attention is directed to more amorphous matters (such as the accuracy of price discovery).
2. Eight exchanges in Europe have harmonized certain key features of their market structures. It is indeed desirable to synchronize various design features across different market centers. However, it is hazardous for a government agency to mandate structural change, especially across multiple markets. As noted, a mandated design feature is not easily withdrawn if it is found to be undesirable. A regulatory authority will commonly point elsewhere and try to fix the problem with further regulations. An unfortunate consequence is that, once government involvement in market design starts, the process tends to become self-perpetuating. Some observers in the U.S. believe that this has been happening in the States. To date, the European governments have taken a less proactive role and, thus far, there is no SEC of Europe.

3. With regard to fostering greater competition, considerable regulatory attention is commonly given to 'fairness.' Under the rubric of fairness, it is argued that participants should have equal access to markets, that the 'playing field' should be level, that markets should be transparent, and so forth. Unfortunately, all participants are not equal, and free markets are not necessarily fair. In the U.S., the SEC has sought, in the name of fairness, to protect retail customers. However, the point has been widely made that an institutional investor, be it a mutual fund, pension fund, or other, is itself little more than an amalgam of many small individuals. Furthermore, all too often, a market that itself is being threatened by competitive pressure uses the 'fairness' argument. Rather than strengthening its own efficiency, the beleaguered player seeks protection through regulatory intervention.
4. Vested interests and technological inertia exist. To these, we add a third: the regulatory process can also stymie innovation. In a competitive environment, innovations need to be made in a timely manner, but obtaining necessary regulatory approvals is often a lengthy process. Furthermore, the power to deny change conveys the power to dictate change.

   Our final caveat is that it is important not to loose faith in the efficacy of free market competition. As equity markets on both sides of the Atlantic continue to evolve, it is the force of competition, not the intervention of government, that should be looked to, to induce markets to provide an environment that will make best execution more readily achieved by all.

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Participant Biographies

In 1984, **Theodore R. Aronson** (MBA, BS, Wharton), founded Aronson+Johnson+Ortiz (formerly Aronson+Partners and Aronson+Fogler). AJO is an institutional investment advisor with $15 billion under management. Ted joined Drexel Burnham Lambert in 1974 while still a graduate student. He was a member of the Quantitative Equities Group, which provided innovative practical applications of Modern Portfolio Theory and quantitative portfolio management. This group managed the Revere Fund, the first actively managed fund registered with the SEC to employ Modern Portfolio Theory. Prior to forming AJO, Ted founded Addison Capital Management. Ted is a Governor (vice chairman) of the Association for Investment Management and Research (AIMR) and both a CFA charterholder and Chartered Investment Counselor. He chaired AIMR's Trade Management Guidelines Task Force. Ted is a trustee of Spelman College and a member of its investment committee. He was a Lecturer in Finance at The Wharton School and is a frequent speaker on Wall Street issues, especially innovations in trading methods to minimize transaction costs — including a session at Salomon Brothers' training program. (Salomon's training program was immortalized in Michael Lewis' Liar's Poker. When Ted spoke, however, he was *not* pelted by spitballs!).

Paul Bennett joined the New York Stock Exchange as senior vice president and chief economist in June 2001. Mr. Bennett manages the NYSE's Research division. He also supports the Exchange's business lines and Office of the Chairman by developing and supporting research into the

structure of equity markets, supervising analysis within the Exchange related to its various business and public-policy activities, participating in and hosting conferences, and supporting Exchange-related research. Mr. Bennett also is responsible for the NYSE's ongoing interaction with the academic community. He holds a Ph.D. in economics from Princeton University and a B.A. in economics from the University of Chicago. He has published numerous papers on finance, economics, and securities markets.

Andrew M. Brooks is a Vice President and Head of Equity Trading for T. Rowe Price Associates. Joining the firm in 1980, Andy serves as a Vice President of the T. Rowe Price Equity Income, Value, Capital Appreciation and High Yield Funds. Andy earned a B.A. from Union College in Schenectady, New York. He is a past President of the Baltimore Security Traders Association and a past Governor of the Security Traders Association. He also has served on both the New York Stock Exchange's Institutional Traders Advisory Committee and Market Performance Committee, as well as NASDAQ's Trading Committee. Andy currently serves as a member of the Investment Company Institute's Equity Markets Task Force and is on the board of NOIP.

David Colker is President and CEO of The Cincinnati Stock Exchange, the first all-electronic stock exchange in the country. Mr. Colker began his career with the Exchange in 1984. After serving in a variety of official capacities, Mr. Colker became President in 1998 and added the title of CEO in 2000. During his tenure as President and CEO, the Cincinnati Stock Exchange has experienced significant growth. The Exchange is now the third largest stock market in the country. Prior to joining the Cincinnati Stock Exchange, Mr. Colker was an attorney with the law firm of Taft, Stettinius & Hollister in Cincinnati, Ohio. Mr. Colker, who was born in Huntington, West Virginia, graduated *cum laude* from Deerfield Academy in 1969, and he has earned degrees in both finance and law from the University of Virginia. Mr. Colker also completed the Advanced Executive Program at Northwestern University's Kellogg Graduate School of Business in 1995.

Mike Cormack is president of Archipelago Holdings, Inc. As president, Mike oversees the sales and client relation efforts, trading support and strategic initiatives. Prior to his position as president, Mike served as national sales manager. He came to Archipelago from American Century Investments, where he was manager of equity trading. Mike has a strong background in both trading and technology. His technical experience is exemplified by his prior position as co-head of the executive committee for

the Financial Information Exchange (FIX), the electronic communications standard in the global financial marketplace. He has also participated as a member of the NASDAQ Quality of Markets Committee, a group that helps to shape NASDAQ policy. Mike currently serves on the Transact Tools Board of Directors. Mike holds a bachelor's degree in economics from Johns Hopkins University.

Ian Domowitz is Managing Director, Analytical Products and Research, at ITG Inc., and a member of the company's Management and Executive Committees. Prior to joining ITG, Dr. Domowitz was the Mary Jean and Frank P. Smeal Chaired Professor of Finance at the Pennsylvania State University. He was previously the Household International Research Professor of Economics and taught in the Kellogg Graduate School of Management, Northwestern University. He is the author of numerous research articles in the areas of finance, econometrics, statistics, and industrial organization, including work on the design, organization, and regulation of electronic trading market structures. He has served as a consultant to government and international organizations, including the Federal Reserve System, the Commodity Futures Trading Commission, the International Monetary Fund, and the World Bank, as well as to various securities exchanges and trading organizations. A former member of the NASD's Bond Market Transparency Committee, he also served as chair of the Economic Advisory Board of the NASD. Dr. Domowitz received his Ph.D. in economics from the University of California.

Alfred Eskandar heads Liquidnet's marketing and public relations activities. Prior to joining Liquidnet in 2000, he helped launch Securities Industry News (S.I.N.), the leading publication for securities services professionals. Thomson Financial Services (TFS) acquired the publication in 1996. Alfred spent the next four years developing an international executive conference business, as well as heading up business development for the operations, trading and technology division of TFS's Investment Marketing Group. Alfred has 10 years of financial media experience and holds a BBA in Finance and Economics from Baruch College.

Reto Francioni has been Chairman of the Board of the SWX Swiss Exchange since April 23, 2002. He is also Member of the Board of EUREX. Prior to assuming his current post, he – together with Matthäus Schmidt as co-CEO of the Board – was head of Consors Discount Broker AG, Nuremberg, and also bore responsibility for the international expansion and management of the European group. Earlier in his career, he was named in

1993 to the Executive Board of Deutsche Börse AG, where he was responsible for its entire cash market division and, as of 1999 became Deputy CEO. During that time frame, Deutsche Börse AG witnessed the genesis of Xetra, as well as the start of the exchange's thrust towards internationalisation. Dr. Francioni studied law in Zurich and subsequently held management positions in the securities and banking sector of Switzerland and the USA, as well as in the directorate of Hoffmann LaRoche AG, Basel.

Lawrence Harris, Fred V. Keenan Chair in Finance, specializes in financial economics, econometric modeling and forecasting. His research centers on security market structure, price-volume relations in financial markets, the measurement of effective bid-ask spreads from common stock transaction data, and on other uses of transaction data in financial research. He was the first visiting scholar at the NYSE, 1989-90. For the 1988-89 academic year, Harris served as Economic Fellow in the Office of the Chief Economist of the Securities and Exchange Commission in Washington, D.C.

Peter Jenkins is Senior Vice President, Institutional Client Group at the NYSE. He is a member of the Investment Company Institute's Equity Market Task Force, the Institutional Traders Committee of the Security Traders Association, the New York Stock Exchange's Institutional Traders Advisory, the Trader Forum Advisory Board, and the National Organization of Investment Professionals. In addition, Jenkins serves on the boards of W.R. Hambrecht & Co. and the James E. Olsen Memorial Foundation. Formerly, Jenkins served as the Chairman of the Securities Traders Association Institutional Committee (1977 and 1988) and served two consecutive terms as Chairman of Institutional Traders Advisory Committee at the New York Stock Exchange. He served as Vice Chairman for the NASDAQ/AMEX Institutional Organization of Investment Professionals in 1999 and served on the Board of Directors of the National Organization of Investment Professionals.

An active member of the industry, Jenkins was selected by Arthur Levitt, Chairman of the SEC, to participate in an industry panel on market transparency and was also selected to participate on a committee of representatives from the Investment Company Institute with SIA representatives to form a joint opinion on market transparency. He was chosen by William Lupien to provide input on a new electronic trading system called Optimark and chaired the advisory committee on the issue. In addition, Jenkins led an industry group of buy-side traders to gain direct

access to Selectnet and worked on the Liquidnet advisory board to help establish the new ATS. He set up a new and improved Institutional Committee for the STA and became the second chairman of the committee. Jenkins has testified before the House Subcommittee on Finance on 'The New Electronic Market' and the Subcommittee on Securities and Investment on the merits of decimalization.

Richard Ketchum has been chief regulatory officer of the New York Stock Exchange since March 8, 2004. He reports to the Board Regulatory Oversight & Regulatory Budget Committee. Mr. Ketchum, 53, spent 12 years at the National Association of Securities Dealers Inc., (NASD) and Nasdaq. He served as president of Nasdaq for three years and as president of NASD for seven years. Prior to working at the NASD and Nasdaq, Mr. Ketchum was at the Securities and Exchange Commission (SEC) for 14 years, eight of those years as director of the division of Market Regulation. Since June 2003, Mr. Ketchum has been General Counsel of the Corporate and Investment Bank of Citigroup Inc., and a member of the unit's planning group, Business Practices Committee and Risk Management Committee. Mr. Ketchum earned his J.D. from the New York University School of Law in 1975 and his B.A. from Tufts University in 1972. He is a member of the bar in both New York and the District of Columbia.

Bernard L. Madoff has been a major figure in the National Association of Securities Dealers (NASD), the major self-regulatory organization for U.S. broker dealer firms. The firm was one of the five broker dealers most closely involved in developing the NASDAQ Stock Market. He has been chairman of the board of directors of the NASDAQ Stock Market as well as a member of the board of governors of the NASD and a member of numerous NASD committees. One major U.S. financial publication lauded Bernard Madoff or his role in "helping to make NASDAQ a faster, fairer, more efficient and more international system." He has also served as a member of the board of directors of the Securities Industry Association. Reflecting the growing international involvement of the firm, when Madoff Securities opened a London office in 1983, it would become one of the first U.S. members of the London Stock Exchange. Bernard Madoff was also a founding member of the board of directors of the International Securities Clearing Corporation in London. Bernard and Peter Madoff have both played instrumental roles in the development of the fully computerized Cincinnati Stock Exchange. Peter Madoff has been a member of its board of governors and has served on its executive committee. They have helped

make the Cincinnati Exchange the fastest growing regional stock exchange in the United States. These positions of leadership not only indicate the deep interest Madoff Securities has shown in its industry, they also reflect the respect the firm and its management have achieved in the financial community.

Robert J. McSweeney, 52, was named senior vice president, Competitive Position, at the New York Stock Exchange in January 2002. Mr. McSweeney is responsible for analyzing and enhancing the NYSE's competitive position with respect to its market quality, market structure and execution services. In addition, he is responsible for the exchange traded funds and fixed income business lines. He reports to NYSE President Catherine R. Kinney. Mr. McSweeney joined the NYSE in 1974. He serves on the Listings & Compliance Committee as well as the EBP Committee overseeing pension investments, and has been an officer at the NYSE for more than twenty years. He received a J.D. from New York Law School, a B.A. from Villanova University, and completed the Advance Management Program at Harvard Business School.

Doreen Mogavero has been a member of the NYSE since 1980. Her securities industry experience includes corporate buybacks, institutional block trading, risk arbitrage and convertible arbitrage. Her series registrations include the 7, 63 and 12. Doreen was recently appointed to the Board of Executives of the NYSE and also serves as one of only two floor representatives appointed to a subcommittee of the Independent Board called the Regulation Enforcement and Listing Standards Committee. She previously served as the Vice President of the Organization of Independent Floor Brokers (OIFB) and Treasurer and Trustee of the Floor Members Emergency Fund (FMEF). Doreen was a member of the NYSE Hearing Panel for 22 years and has served 12 terms as an NYSE Floor Official. Doreen has appeared as a guest market commentator on CNBC and CNN-FN. She frequently speaks and participates in panel discussions at industry conferences. Doreen is the New York Area Coordinator for the National Italian American Foundation (NIAF). She is involved with the Financial Women's Association of New York (FWA), is a member of the Security Traders Association of New York (STANY) and is currently a member of the Security Traders Association (STA) Trading Issues Committee.

William O'Brien is Senior Vice President, Market Data Distribution for The Nasdaq Stock Market, Inc. Mr. O'Brien is responsible for the management and business direction of Nasdaq's real-time market data

products, including TotalView, Nasdaq's premier data entitlement. He is also responsible for Nasdaq's role as securities information processor for the UTP Plan, and serves on the UTP Plan Operating Committee as Nasdaq's market representative. Prior to his Nasdaq appointment, Mr. O'Brien was Chief Operating Officer of Brut, LLC. As COO, Mr. O'Brien participated in the management of all, strategic, operational and administrative affairs of the company, and helped lead the company through its acquisition by Nasdaq in September 2004. Mr. O'Brien originally joined Brut as Senior Vice President and General Counsel in September 2000, with responsibilities that included management of Brut's legal affairs, regulatory strategy and compliance area.

Previously, Mr. O'Brien was Vice President and Assistant General Counsel at Goldman, Sachs & Co., where he was responsible for providing legal and regulatory compliance coverage to the firm's prime brokerage, securities lending, equity financing and soft-dollar business units, as well as working on related custodial, clearance, settlement and operational issues. Before joining Goldman Sachs he was an Associate at Orrick, Herrington & Sutcliffe LLP, practicing in their Market Regulation Practice Group and working with a variety of broker dealer clients, including the operators of electronic communication networks and other alternative trading systems. Mr. O'Brien graduated *cum laude* from both the University of Notre Dame and the University of Pennsylvania School of Law.

Lin Peng is an assistant professor at the Zicklin School of Business, Baruch College, City University of New York since 2002. Professor Peng received her PhD in Finance from Fuqua School of Business, Duke University. Her research is in the area of asset pricing and market microstructure, with particular focus on the role of learning and information on the dynamics of price, volatility and return co movements. Her most recent research has focused on the role of investor attention on asset return co movement and predictability. In addition, she has written papers on corporate governance and executive compensation. She has published in top finance journals such as Journal of Financial and Quantitative Analysis. She is also a frequency referee to many top finance journals.

Rich Repetto's research coverage universe consists of the eBrokerage, Execution Venues, and eSpecialty Finance Sectors. Mr. Repetto has received numerous accolades for his equity research coverage. The Wall Street Journal (WSJ) selected him for its 'Best on the Street' 2003, 2002, and 2000 All Star Analyst Teams. For 2003, the WSJ ranked Rich #1 in

stock picking for the Securities Brokerage industry. In 2002, he was one of six analysts cited by the WSJ for stock picking in two industry categories, Securities Brokerage and Internet. For 2003, Forbes.com/StarMine ranked Rich the #10 overall stock picker among 3,200 research analysts, and Rich was the only analyst to be ranked in the top ten for two consecutive years. (Rich ranked #2 overall stock picker in 2002). Forbes.com/StarMine also ranked Rich the #1 stock picker for the Capital Markets industry in 2003.

Prior to joining Sandler O'Neill, Mr. Repetto was a Managing Director and analyst responsible for eFinance and eBrokerage at Putnam Lovell NBF. This position followed his work at Lehman Brothers, where he established the firm's research coverage of the Internet Financial Services Sector in May 1999 and was part of the top-ranked Institutional Investor specialty finance team. Prior to his work at Lehman Brothers, Mr. Repetto had a 10-year career at Mobil Oil Corporation in sales and marketing. Mr. Repetto holds a B.S. in General Engineering from the United States Military Academy and an MBA in Finance from the Wharton School of the University of Pennsylvania. He is a Chartered Financial Analyst (CFA) Charter Holder and a member of the New York Society of Security Analysts (NYSSA) and the CFA Institute (formerly, Association for Investment Management and Research (AIMR)).

Michael Robbins entered the securities industry in 1955 after graduating from Princeton University. He became a member of the New York Stock Exchange in 1962 after seven years in sales and research at Eastman, Dillon & Company. He served as a Floor Governor and as a member of the Board of Directors of the Exchange from 1992 to 1998. Robbins was the co-founder of Robbins & Henderson and he remains active as Chairman of that firm.

Michael Ryan joined the American Stock Exchange® in November 1998 and is Executive Vice President and General Counsel. Mr. Ryan is responsible for all aspects of the legal functions at the American Stock Exchange. In addition, Mr. Ryan focuses on day-to-day operations of the American Stock Exchange and is part of the Office of the Chairman, working directly with Chairman and CEO Sal Sodano and President Peter Quick on the long-term strategic focus of the American Stock Exchange's three business lines. Between April 1997 and November 1998, Mr. Ryan served as Counsel to the Chairman of the National Association of Securities Dealers, Inc. where he reported to Chairman & CEO Frank G. Zarb. Prior to joining the NASD, Mr. Ryan spent four years at the U.S. Securities and Exchange Commission in the

Divisions of Market Regulation and Corporation Finance. Before attending law school, Mr. Ryan worked as a Senior Accountant with Price Waterhouse & Co. between September 1985 through July 1988. Mr. Ryan earned his JD from the Catholic University School of Law in 1991 and his B.S. in Accountancy from Villanova University in 1985. Mr. Ryan is a member of the bar in Maryland and a certified public accountant. Michael, his wife, Lynne Adduci, their daughter Claire and son Matthew, reside in Ridgewood, NJ.

Asani Sarkar is a senior economist at the Federal Reserve Bank of New York. Previously, he has been a Visiting Assistant Professor of Finance at Columbia University and an Assistant Professor of Finance at the University of Illinois, Urbana Champaign. Dr. Sarkar has published numerous articles on the microstructure of equity, fixed income, and futures markets. His papers have appeared in, among others, the Review of Financial Studies, the Journal of Financial and Quantitative Analysis, the Journal of Empirical Finance, the Journal of Futures Markets and the Journal of Financial Intermediation. Dr. Sarkar received his Ph.D. from the University of Pennsylvania.

Robert A. Schwartz is Marvin M. Speiser Professor of Finance and University Distinguished Professor in the Zicklin School of Business, Baruch College, CUNY. Before joining the Baruch faculty in 1997, he was Professor of Finance and Economics and Yamaichi Faculty Fellow at New York University's Leonard N. Stern School of Business, where he had been a member of the faculty since 1965. Professor Schwartz received his Ph.D. in Economics from Columbia University. His research is in the area of financial economics, with a primary focus on the structure of securities markets. He has published numerous journal articles and eleven books, including *Equity Markets in Action: The Fundamentals of Liquidity, Market Structure and Trading,* Wiley & Sons, 2004, and *Reshaping the Equity Markets: A Guide for the 1990s,* Harper Business, 1991 (reissued by Business One Irwin, 1993). He has served as a consultant to various market centers including the New York Stock Exchange, the American Stock Exchange, Nasdaq, the London Stock Exchange, Instinet, the Arizona Stock Exchange, Deutsche Börse, and the Bolsa Mexicana. From April 1983 to April 1988, he was an associate editor of *The Journal of Finance*, and he is currently an associate editor of the *Review of Quantitative Finance and Accounting,* the *Review of Pacific Basin Financial Markets and Policies,* and *The Journal of Entrepreneurial Finance & Business Ventures,* and is a member of the advisory board of *International Finance.* In

December 1995, Professor Schwartz was named the first chairman of Nasdaq's Economic Advisory Board, and he served on the EAB until Spring 1999.

At the time of the conference, **Holly Stark** was Principal and Director of Trading at Kern Capital Management. Holly managed Kern Capital Management's trading desk and was responsible for developing execution strategies designed to maximize returns while minimizing transaction costs. Prior to joining Kern Capital Management in 2000, Holly was with Dalton, Greiner, Hartman, Maher & Co. (DGHM) for ten years where she was responsible for all trading activities. For eight years prior to DGHM, Holly was with Dillon, Read Capital, Inc., the predecessor firm to DGHM. Through her current and past participation on advisory committees at the NASD, New York Stock Exchange and The Investment Company Institute, Holly is actively involved with the changing structure of today's capital markets. Holly earned her Bachelor of Arts from Rutgers College in 1978.

Benn Steil is the André Meyer Senior Fellow and Director of the Maurice R. Greenberg Center for Geoeconomic Studies at the Council on Foreign Relations in New York. He is also the Editor of *International Finance* (Blackwell Publishers); a co-founder and director of Efficient Frontiers LLC, a markets consultancy; a nonexecutive director of the virt-x stock exchange in London; a member of the European Shadow Financial Regulatory Committee; and a member of the Advisory Board of the European Capital Markets Institute. Until November 1998, he was Director of the International Economics Programme at the Royal Institute of International Affairs in London. Prior to his appointment at the Institute in 1992, he held a Lloyd's of London Tercentenary Research Fellowship at Nuffield College, Oxford, where he received his PhD in Economics.

Dr. Steil has written and spoken widely on securities trading and market regulation. His research and market commentary are regularly covered in publications such as the *Financial Times, Wall Street Journal, New York Times, International Herald Tribune, USA Today, The Economist, Barrons, Business Week, Forbes, Fortune, Time, Newsweek, Securities Industry News, Financial News, Traders Magazine,* and Reuters and Bloomberg online. Among his books are a critically acclaimed study of *The European Equity Markets* and a major text on *Institutional Investors*, as well as edited volumes on cross-border antitrust (*Antitrust Goes Global*) and the economics of innovation (*Technological Innovation and Economic Performance*). Most recently he published a major policy study entitled *Building a Transatlantic Securities Market*, which has been widely reviewed

in the North American and European financial press, and has been the topic of numerous conferences in North America and Europe. He is currently writing a book entitled *Financial Statecraft*, on the role of financial markets in U.S. foreign policy. His other areas of published research include derivatives, risk management, decision theory, and international trade.

Charles Trzcinka, Ph.D, holds the James and Virginia Cozad Chair of Finance at Indiana University's Kelly School of Business. Dr. Trzcinka is regarded as an expert on financial markets and investments. In addition to publishing numerous scholarly articles, he is frequently quoted on matters pertaining to individual investors. His monographs and articles dealing with mutual funds and institutional money management have received widespread attention in the national press (New York Times, MONEY Magazine, USA Today, Business Week, Forbes) and in 1998 he testified in Congress on mutual fund competition. He is the author of the 2003 Forbes Stock Market Course, a well-known guide for individual investors.

Dr. Trzcinka received a Ph.D. in financial economics from Purdue University in 1980. His academic and professional assignments, among other things, have included: professorships at SUNY Buffalo for nearly twenty years and New York University; Director of the U.S. Commerce Department's MBA program in the People's Republic of China; and, Senior Economist with the Office of Economic Analysis of the United States Securities and Exchange Commission. He has been consultant to a variety of investment organizations, including the Virginia Retirement System, Richards & Tierney, and the New York State Attorney General's Office. He also has published extensively in well-respected financial academic journals such as the Journal of Finance and Journal of Financial Economics. Dr. Trzcinka is a member of the American Economics Association, American Finance Association and the Association for Investment Management and Research. He is an associate editor of the Journal of Corporate Finance and the Financial Review.

Wayne Wagner is a co-founder of Plexus Group, a Los Angeles based firm that provides implementation evaluation and advisory services to U.S. and Global money managers, brokerage firms and pension plan sponsors. Mr. Wagner and Plexus Group were chosen as the 1999 Consultant of the Year by Plan Sponsor Magazine. Investment News named him one of the 'Power Elite 25' for 2001. Plexus Group is an independent subsidiary of JPMorgan Investor Services Company, a division of JPMorgan Chase. Mr. Wagner is author and editor of The Complete Guide to Securities Transactions: Improving Perform-

ance and Reducing Costs, John Wiley & Sons, 1989. His most recent publishing effort is a popular investment book written with friend Al Winnikoff entitled MILLIONAIRE: the simplest explanation of how an index fund can turn your lunch money into a fortune; Renaissance Books, 2001. He has written and spoken frequently on many trading and investment subjects. He has received two Graham and Dodd Awards from the Financial Analysts Journal for excellence in financial writing. Mr. Wagner served as a Regent of the Financial Analysts Seminar and served on the AIMR Blue Ribbon Task Force on Soft Dollars and the AIMR Best Execution Task Force. Mr. Wagner was a founding partner of Wilshire Associates and served as Chief Investment Officer of Wilshire Asset Management. Earlier, Mr. Wagner participated in the design and operation of the first index funds at Wells Fargo Bank. In an earlier century Mr. Wagner earned a MS in Statistics from Stanford University and a BBA in Management Science/Finance from the University of Wisconsin.

Don Weeden has been active in the securities business since 1956 initially as a principal with the then leading third market firm, and presently as general partner of Weeden Securities Corporation. He has recently authored a book recounting the struggle over a National Securities Market during the 1960's and 1970's.

Avner Wolf is the Executive Director of University International Programs. Professor Wolf received his PhD from Columbia University in Finance. His research is in the derivative Financial Markets and Market Microstructure. He has published numerous papers in academic as well as in professional journals and worked with Financial Institutions world wide on a variety of projects on derivatives.

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