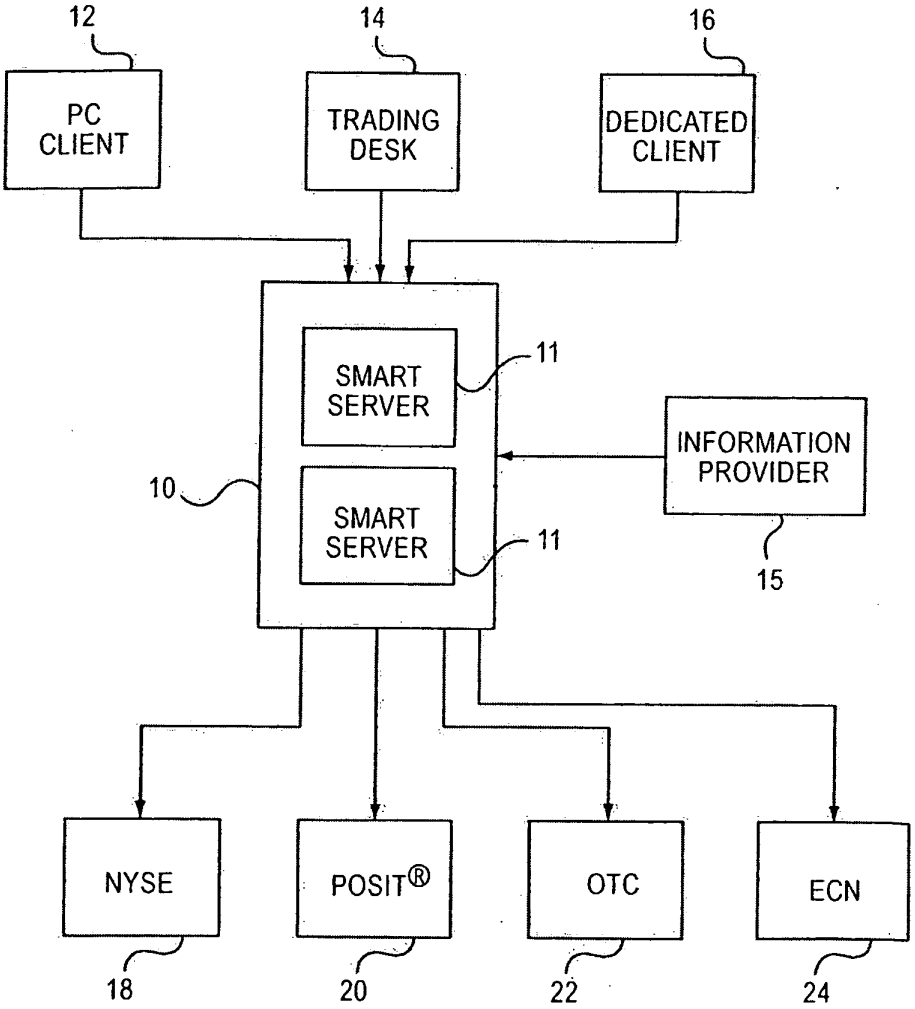

12
14
16
PC CLIENT
TRADING DESK
DEDICATED CLIENT
SMART SERVER
11
INFORMATION PROVIDER
10
SMART SERVER
11
15
NYSE
POSIT®
OTC
ECN
18
20
22
24

FIG.1

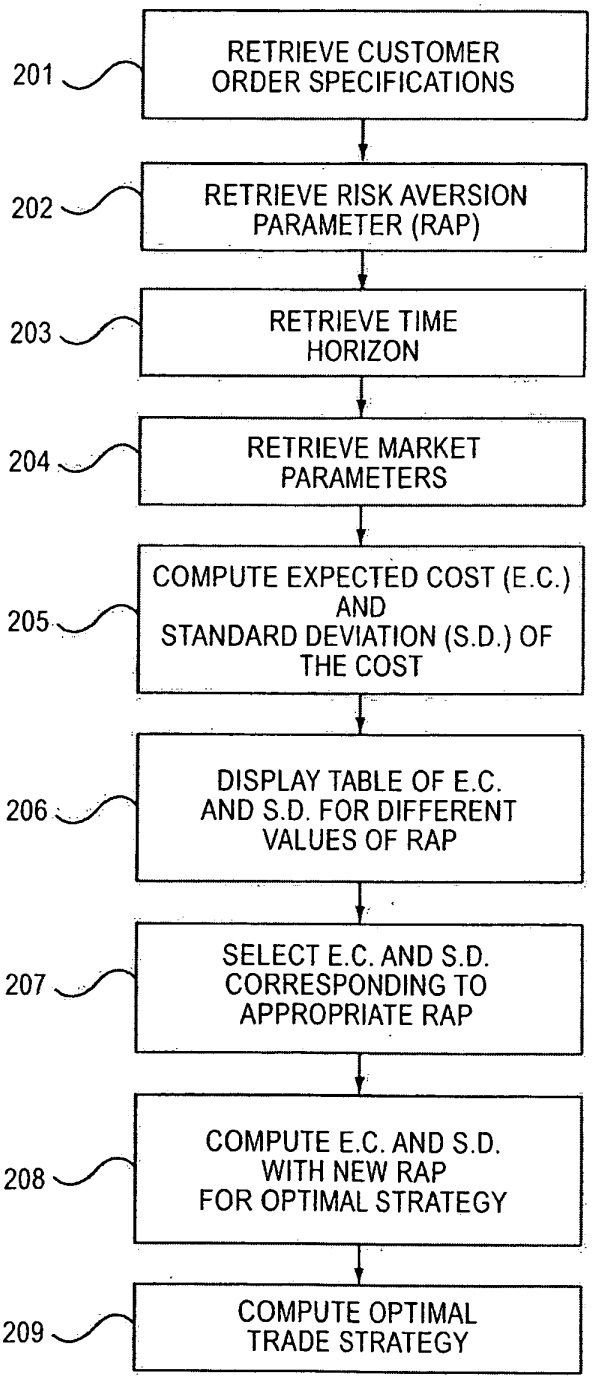

201
RETRIEVE CUSTOMER ORDER SPECIFICATIONS
202
RETRIEVE RISK AVERSION PARAMETER (RAP)
203
RETRIEVE TIME HORIZON
204
RETRIEVE MARKET PARAMETERS
205
COMPUTE EXPECTED COST (E.C.) AND STANDARD DEVIATION (S.D.) OF THE COST
206
DISPLAY TABLE OF E.C. AND S.D. FOR DIFFERENT VALUES OF RAP
207
SELECT E.C. AND S.D. CORRESPONDING TO APPROPRIATE RAP
208
COMPUTE E.C. AND S.D. WITH NEW RAP FOR OPTIMAL STRATEGY
209
COMPUTE OPTIMAL TRADE STRATEGY

FIG.2

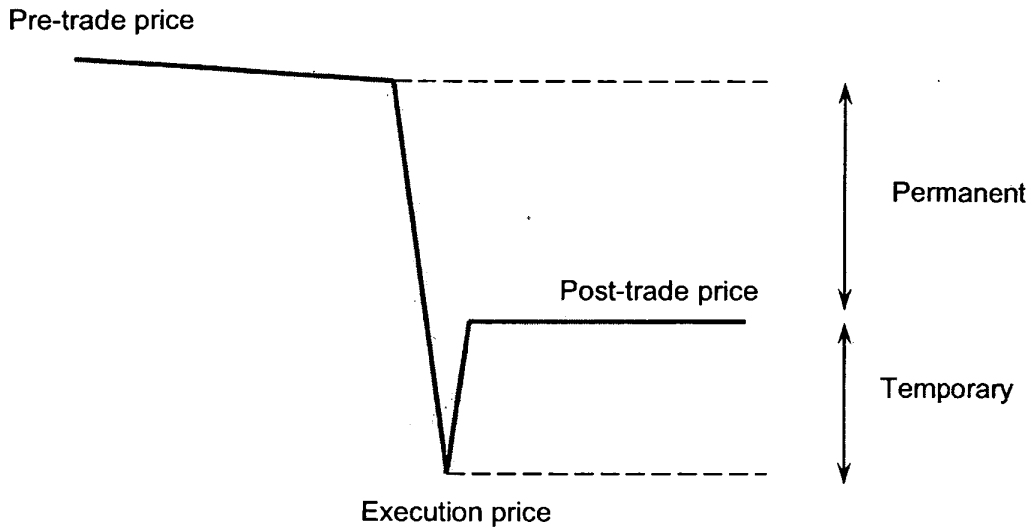

Pre-trade price
Permanent
Post-trade price
Temporary
Execution price

Figure 3

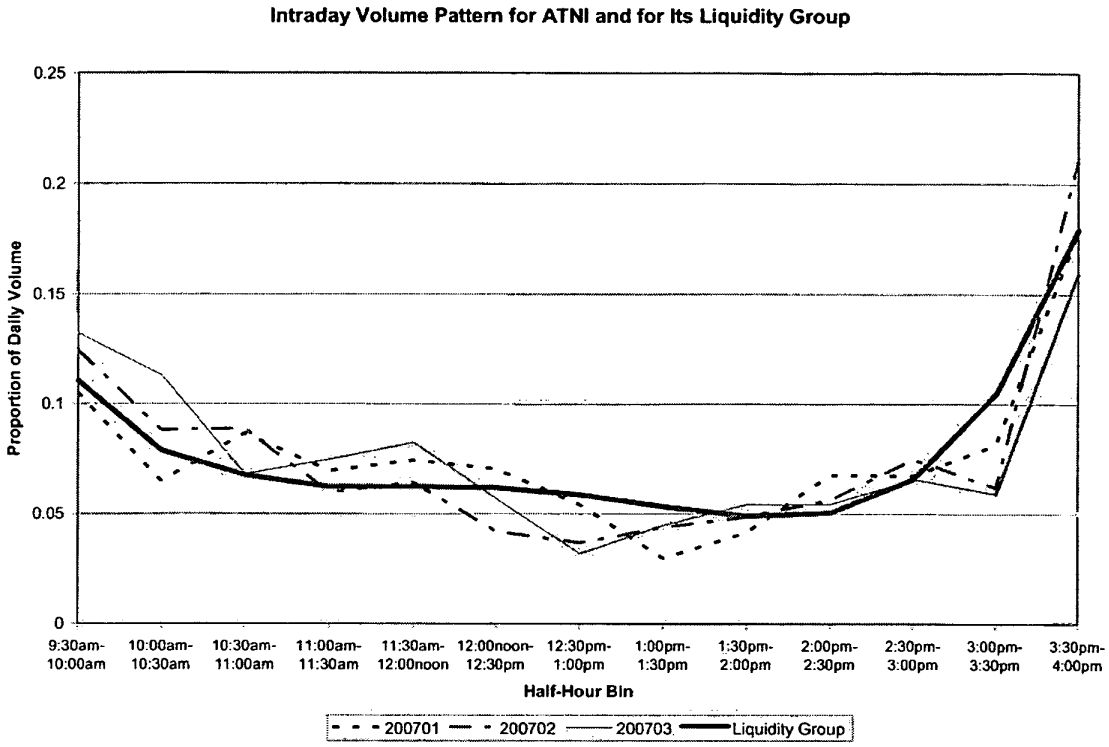

Intraday Volume Pattern for ATNI and for Its Liquidity Group
Proportion of Daily Volume
0.25
0.2
0.15
0.1
0.05
0
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00noon
12:00noon-12:30pm
12:30pm-1:00pm
1:00pm-1:30pm
1:30pm-2:00pm
2:00pm-2:30pm
2:30pm-3:00pm
3:00pm-3:30pm
3:30pm-4:00pm
Half-Hour Bin
200701
200702
200703
Liquidity Group

Figure 4

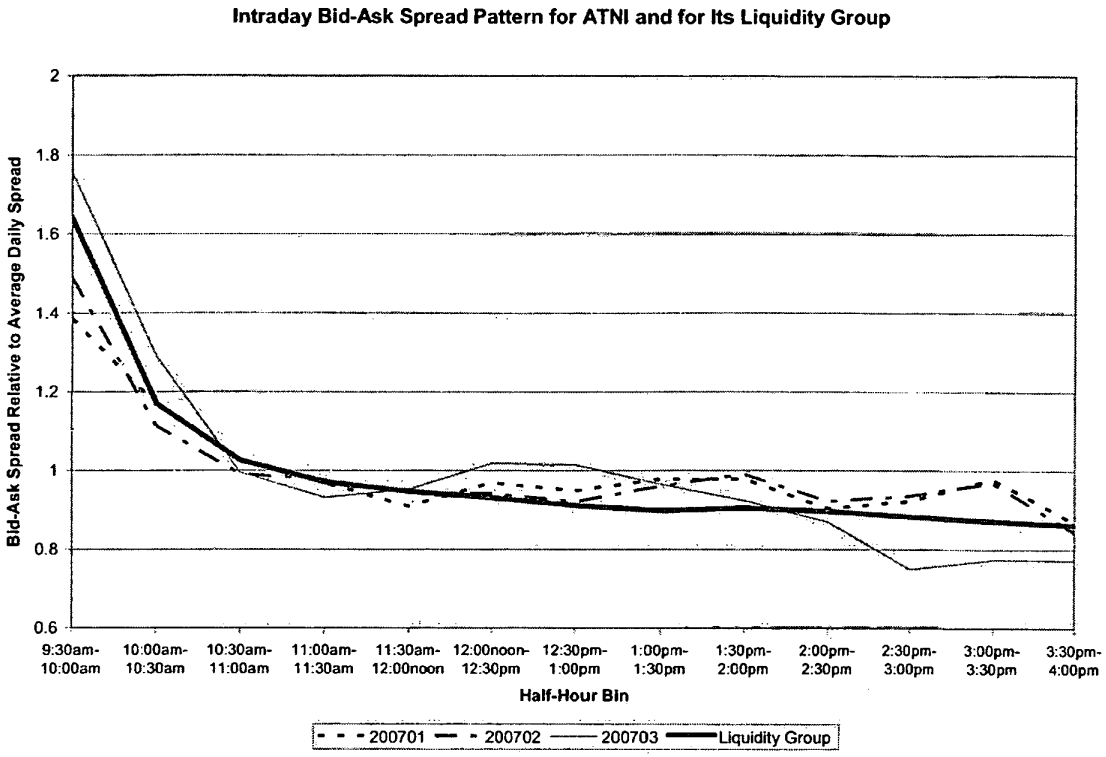

Intraday Bid-Ask Spread Pattern for ATNI and for Its Liquidity Group
Bid-Ask Spread Relative to Average Daily Spread
2
1.8
1.6
1.4
1.2
1
0.8
0.6
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00noon
12:00noon-12:30pm
12:30pm-1:00pm
1:00pm-1:30pm
1:30pm-2:00pm
2:00pm-2:30pm
2:30pm-3:00pm
3:00pm-3:30pm
3:30pm-4:00pm
Half-Hour Bin
200701
200702
200703
Liquidity Group

Figure 5

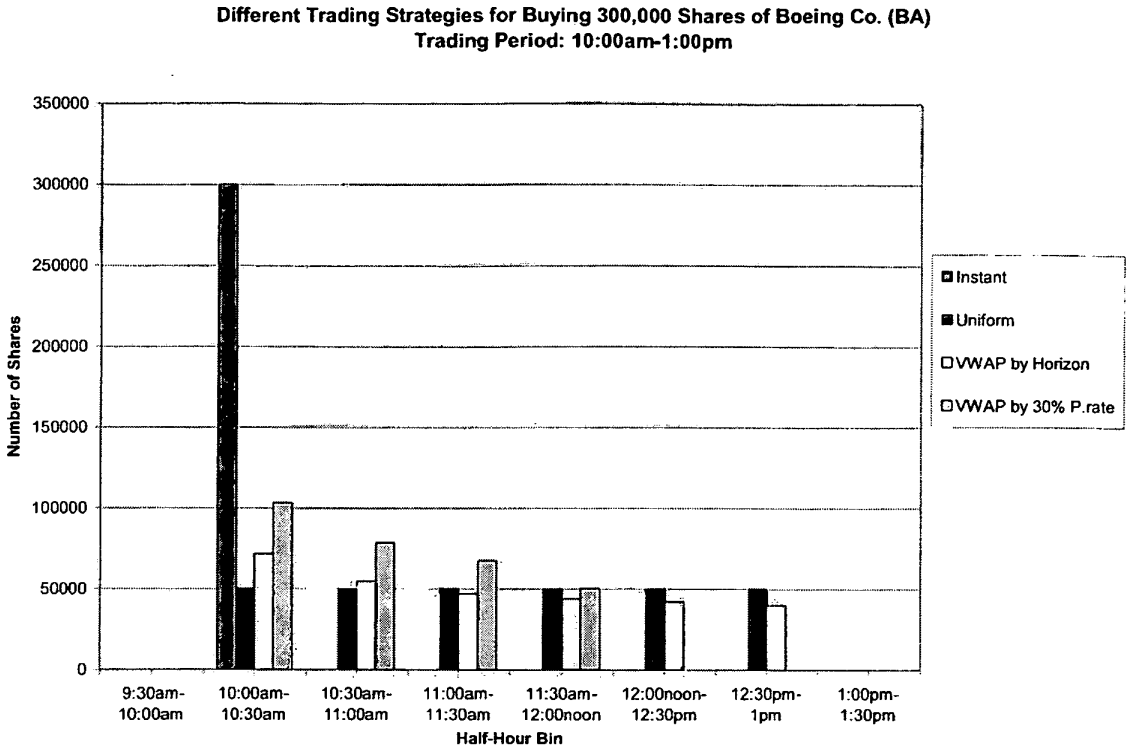

Different Trading Strategies for Buying 300,000 Shares of Boeing Co. (BA)
Trading Period: 10:00am-1:00pm
Number of Shares
350000
300000
250000
200000
150000
100000
50000
0
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00noon
12:00noon-12:30pm
12:30pm-1pm
1:00pm-1:30pm
Half-Hour Bin
Instant
Uniform
VWAP by Horizon
VWAP by 30% P.rate

Figure 6

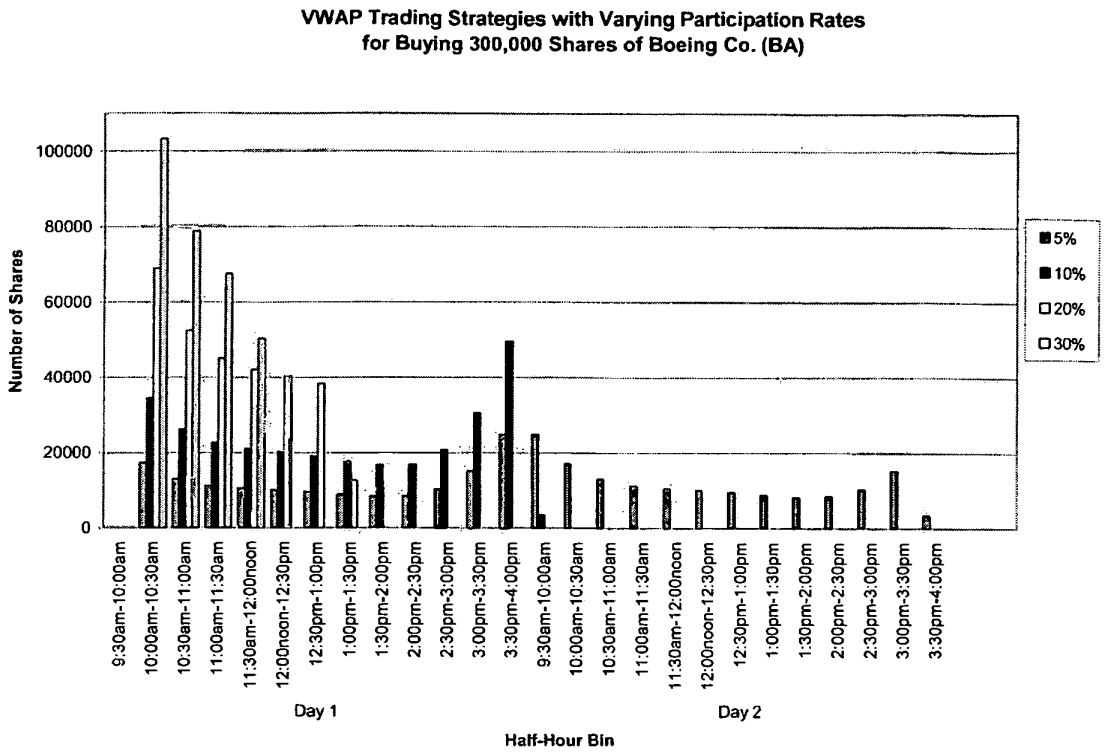

VWAP Trading Strategies with Varying Participation Rates
for Buying 300,000 Shares of Boeing Co. (BA)
Number of Shares
100000
80000
60000
40000
20000
0
5%
10%
20%
30%
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00noon
12:00noon-12:30pm
12:30pm-1:00pm
1:00pm-1:30pm
1:30pm-2:00pm
2:00pm-2:30pm
2:30pm-3:00pm
3:00pm-3:30pm
3:30pm-4:00pm
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00noon
12:00noon-12:30pm
12:30pm-1:00pm
1:00pm-1:30pm
1:30pm-2:00pm
2:00pm-2:30pm
2:30pm-3:00pm
3:00pm-3:30pm
3:30pm-4:00pm
Day 1
Day 2
Half-Hour Bin

Figure 7

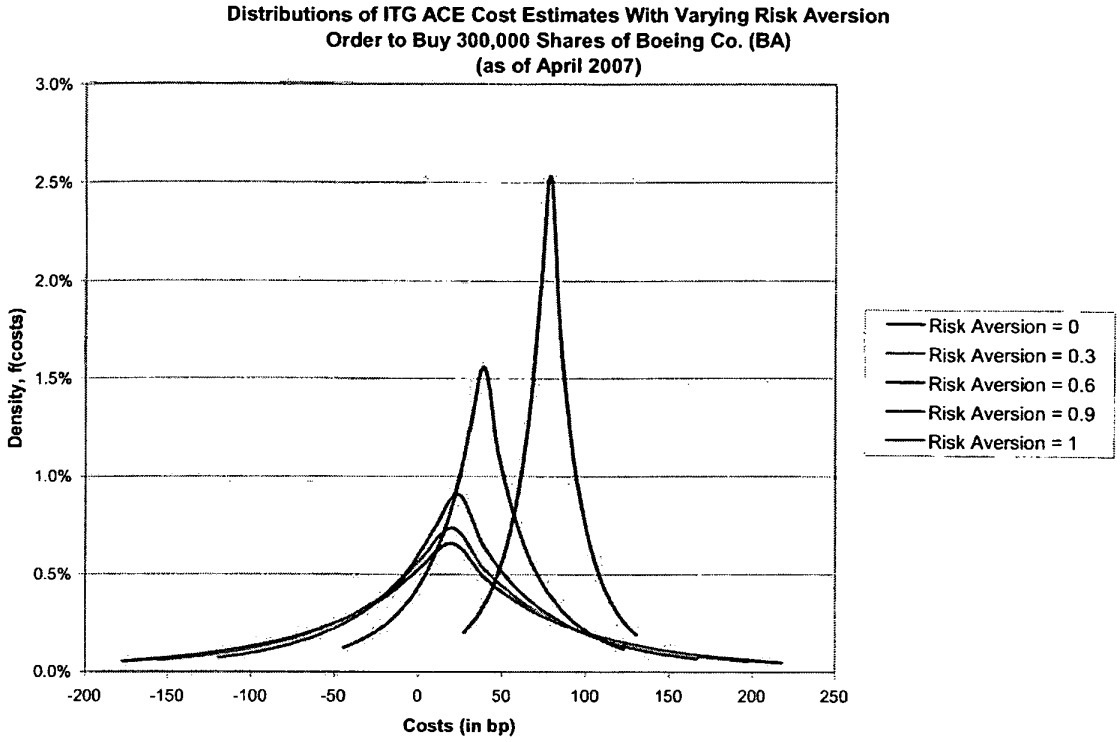

Distributions of ITG ACE Cost Estimates With Varying Risk Aversion
Order to Buy 300,000 Shares of Boeing Co. (BA)
(as of April 2007)
Density, f(costs)
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
-200
-150
-100
-50
0
50
100
150
200
250
Costs (in bp)
Risk Aversion = 0
Risk Aversion = 0.3
Risk Aversion = 0.6
Risk Aversion = 0.9
Risk Aversion = 1

Figure 8

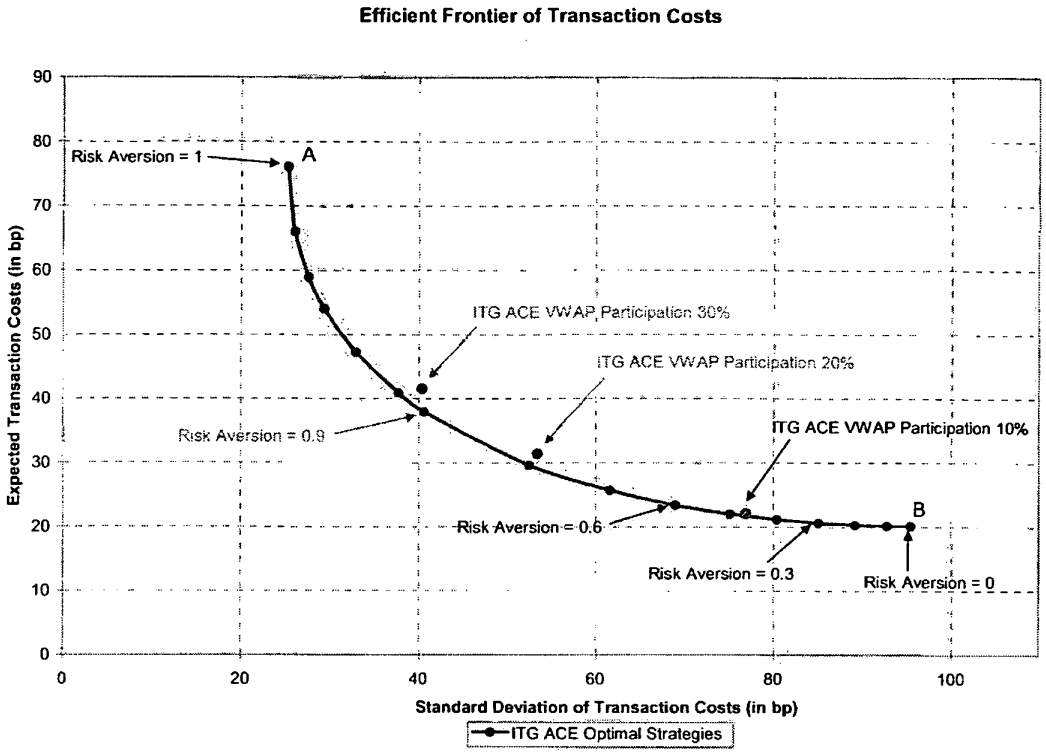

Efficient Frontier of Transaction Costs
Expected Transaction Costs (in bp)
Standard Deviation of Transaction Costs (in bp)
Risk Aversion = 1
A
ITG ACE VWAP Participation 30%
ITG ACE VWAP Participation 20%
ITG ACE VWAP Participation 10%
Risk Aversion = 0.9
Risk Aversion = 0.6
Risk Aversion = 0.3
Risk Aversion = 0
B
ITG ACE Optimal Strategies

Figure 9

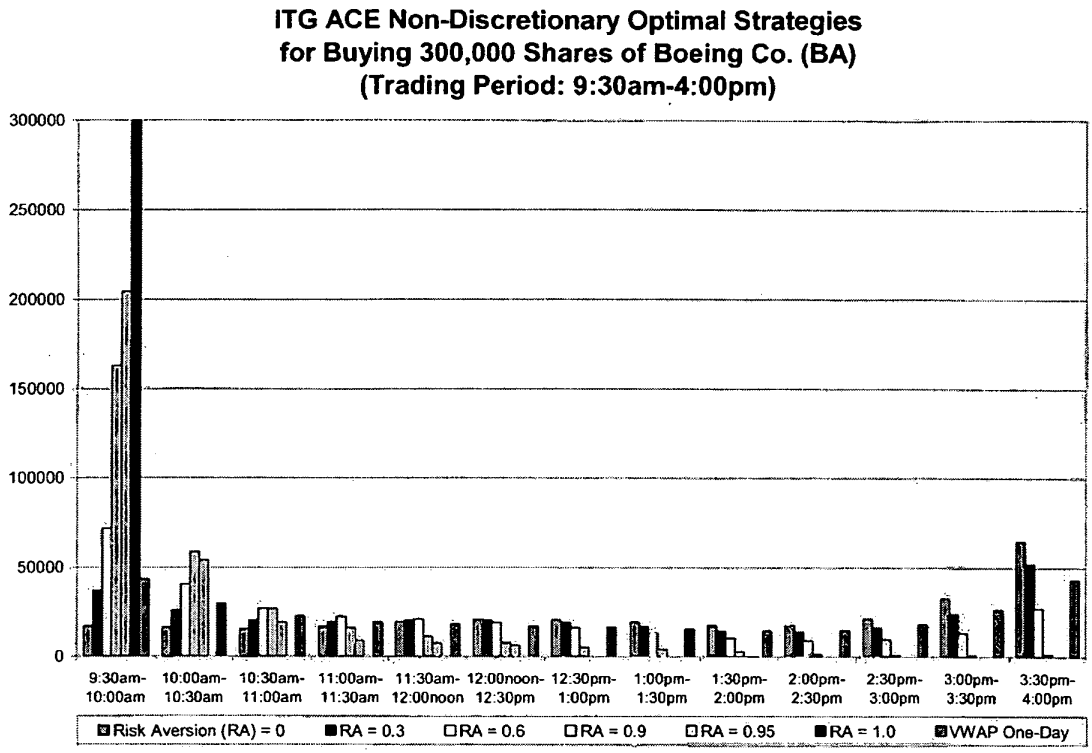

ITG ACE Non-Discretionary Optimal Strategies
for Buying 300,000 Shares of Boeing Co. (BA)
(Trading Period: 9:30am-4:00pm)
300000
250000
200000
150000
100000
50000
0
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00noon
12:00noon-12:30pm
12:30pm-1:00pm
1:00pm-1:30pm
1:30pm-2:00pm
2:00pm-2:30pm
2:30pm-3:00pm
3:00pm-3:30pm
3:30pm-4:00pm
Risk Aversion (RA) = 0
RA = 0.3
RA = 0.6
RA = 0.9
RA = 0.95
RA = 1.0
VWAP One-Day

Figure 10

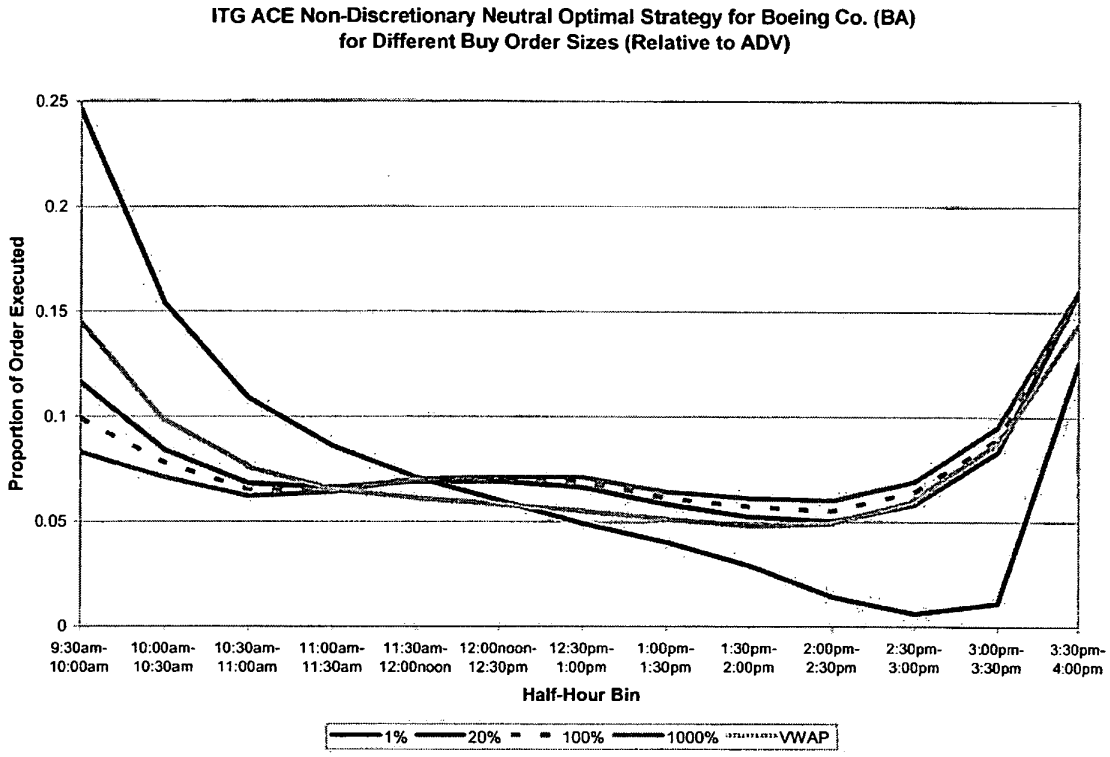

ITG ACE Non-Discretionary Neutral Optimal Strategy for Boeing Co. (BA)
for Different Buy Order Sizes (Relative to ADV)
Proportion of Order Executed
0.25
0.2
0.15
0.1
0.05
0
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00noon
12:00noon-12:30pm
12:30pm-1:00pm
1:00pm-1:30pm
1:30pm-2:00pm
2:00pm-2:30pm
2:30pm-3:00pm
3:00pm-3:30pm
3:30pm-4:00pm
Half-Hour Bin
1%
20%
100%
1000%
VWAP

Figure 11

Order Size (in shares)	Risk Aversion	ITG ACE Discretionary: Optimal Trading Horizon (in days)	ITG ACE Discretionary: Expected Transaction Costs (per share)	ITG ACE Discretionary: Standard Deviation of Transaction Costs (per share)	ITG ACE Non-Discretionary: Optimal Trading Horizon (in days)	ITG ACE Non-Discretionary: Expected Transaction Costs (per share)	ITG ACE Non-Discretionary: Standard Deviation of Transaction Costs (per share)
Panel A. Values are in cents							
300,000	0.00	1	13.2	76.9	1	18.9	75.2
300,000	0.30	1	13.3	69.2	1	19.4	66.4
300,000	0.60	1	14.3	55.9	1	21.9	54.5
300,000	0.90	1	18.7	34.8	1	35.1	34.8
300,000	0.95	1	21.5	29.2	1	44.1	29.3
300,000	1.00	1	30.9	23.5	1	72.5	23.5
1,500,000	0.00	3	25.6	143.9	5	35.8	187.2
1,500,000	0.30	2	28.5	101.1	3	41.7	114.4
1,500,000	0.60	2	31.3	82.4	1	67.3	66.2
1,500,000	0.90	1	57.3	43.8	1	116.1	43.9
1,500,000	0.95	1	72.9	36.2	1	156.1	36.2
1,500,000	1.00	1	123.9	26.5	1	289.1	26.5
Panel B. Values are in basis points							
300,000	0.00	1	14.1	82.5	1	20.3	80.6
300,000	0.30	1	14.3	74.2	1	20.8	71.3
300,000	0.60	1	15.3	60.0	1	23.5	58.4
300,000	0.90	1	20.0	37.3	1	37.7	37.3
300,000	0.95	1	23.0	31.4	1	47.3	31.5
300,000	1.00	1	33.2	25.2	1	77.8	25.2
1,500,000	0.00	3	27.5	154.4	5	38.4	200.8
1,500,000	0.30	2	30.5	108.5	3	44.7	122.7
1,500,000	0.60	2	33.6	88.4	1	72.1	71.0
1,500,000	0.90	1	61.5	47.0	1	124.6	47.0
1,500,000	0.95	1	78.2	38.8	1	167.5	38.9
1,500,000	1.00	1	132.9	28.4	1	310.1	28.4

Figure 12

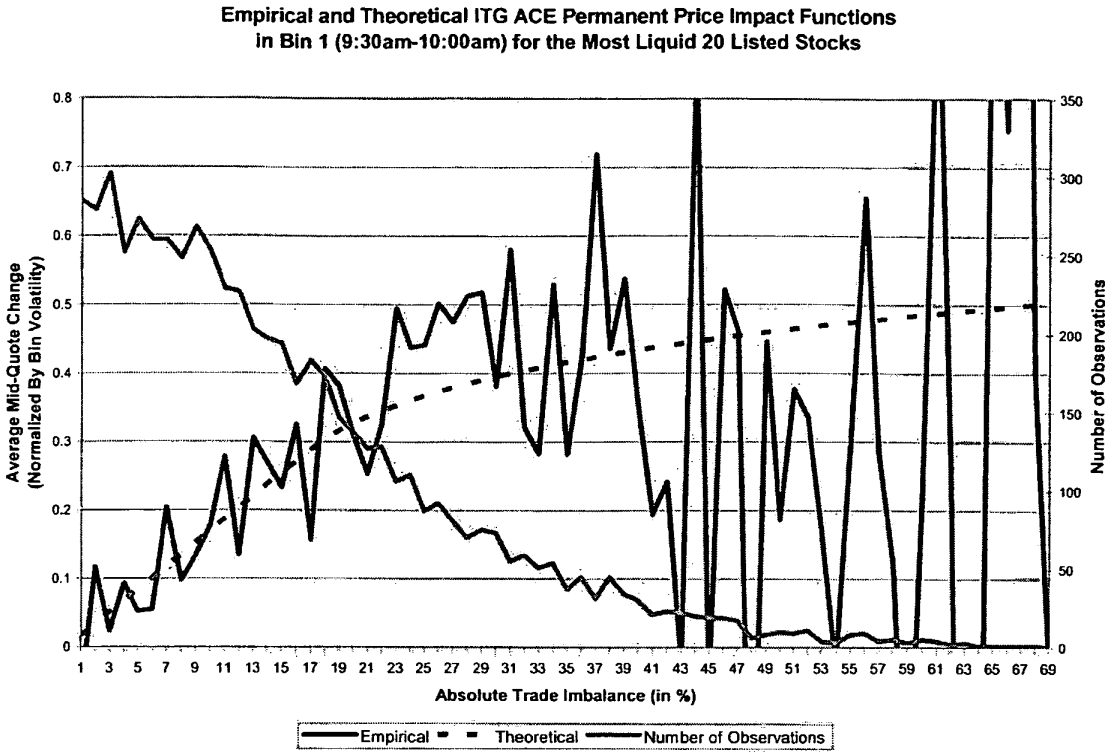

Empirical and Theoretical ITG ACE Permanent Price Impact Functions
in Bin 1 (9:30am-10:00am) for the Most Liquid 20 Listed Stocks
Average Mid-Quote Change
(Normalized By Bin Volatility)
Number of Observations
Absolute Trade Imbalance (in %)
Empirical
Theoretical
Number of Observations

Figure 13

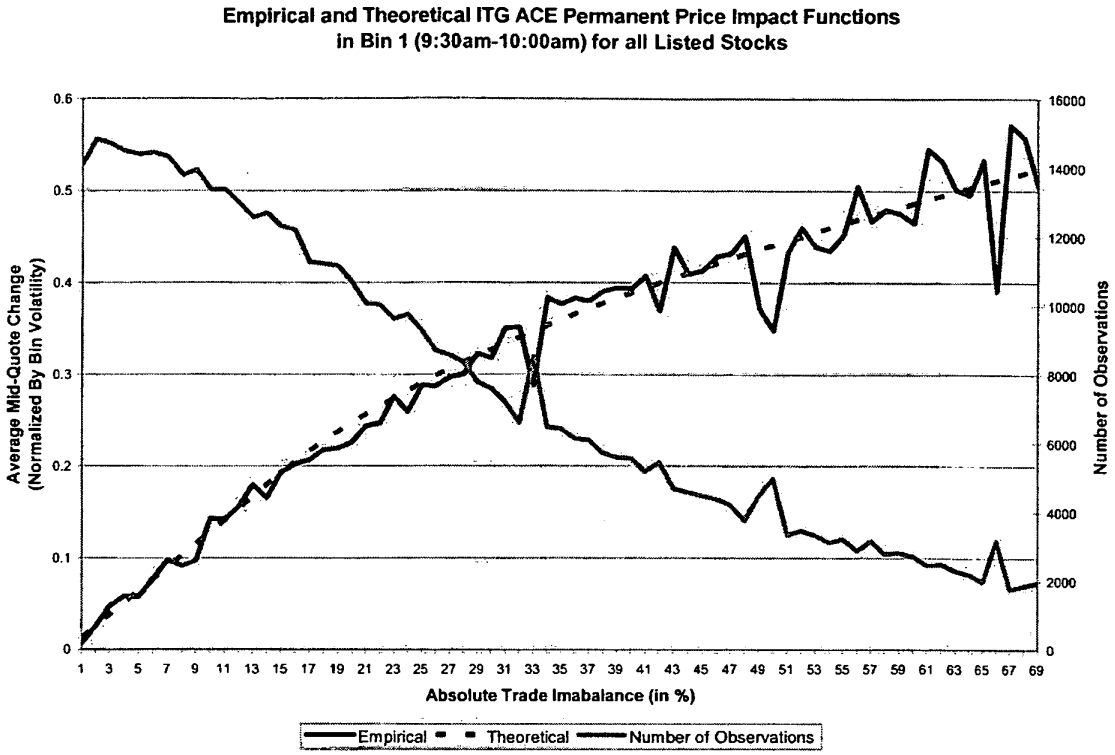

Empirical and Theoretical ITG ACE Permanent Price Impact Functions
in Bin 1 (9:30am-10:00am) for all Listed Stocks
Average Mid-Quote Change
(Normalized By Bin Volatility)
0.6
0.5
0.4
0.3
0.2
0.1
0
Number of Observations
16000
14000
12000
10000
8000
6000
4000
2000
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69
Absolute Trade Imabalance (in %)
Empirical
Theoretical
Number of Observations

Figure 14

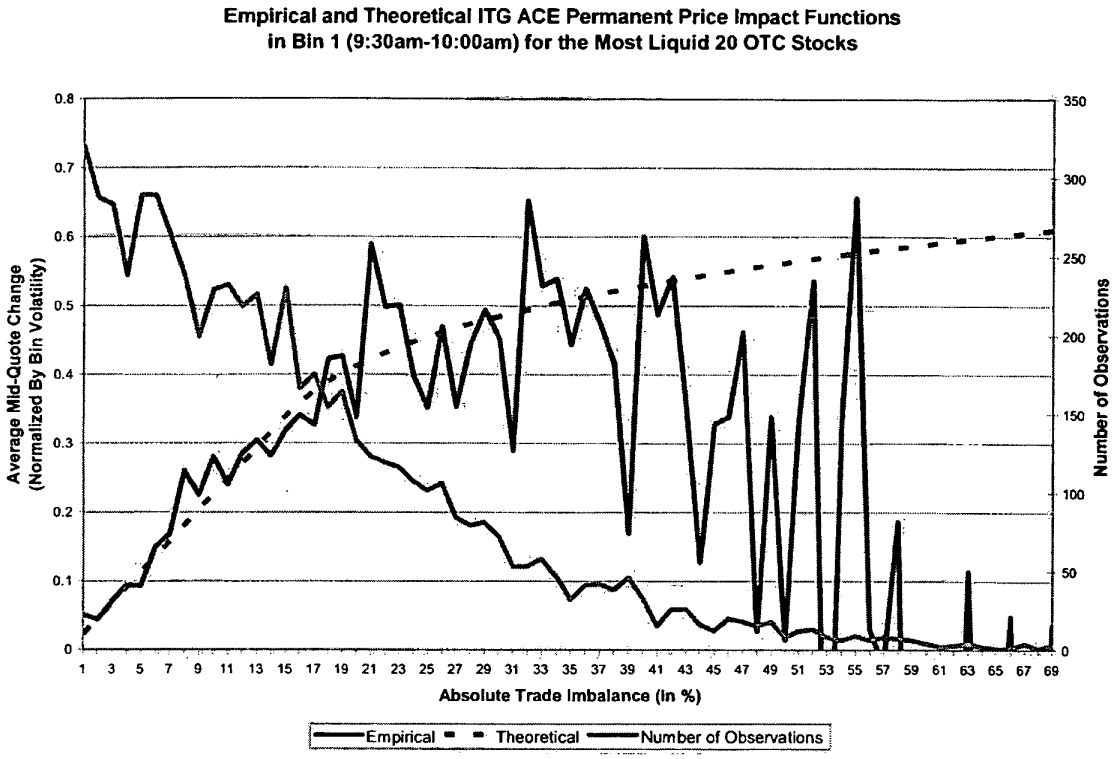

Empirical and Theoretical ITG ACE Permanent Price Impact Functions
in Bin 1 (9:30am-10:00am) for the Most Liquid 20 OTC Stocks
Average Mid-Quote Change
(Normalized By Bin Volatility)
Number of Observations
Absolute Trade Imbalance (in %)
Empirical
Theoretical
Number of Observations

Figure 15

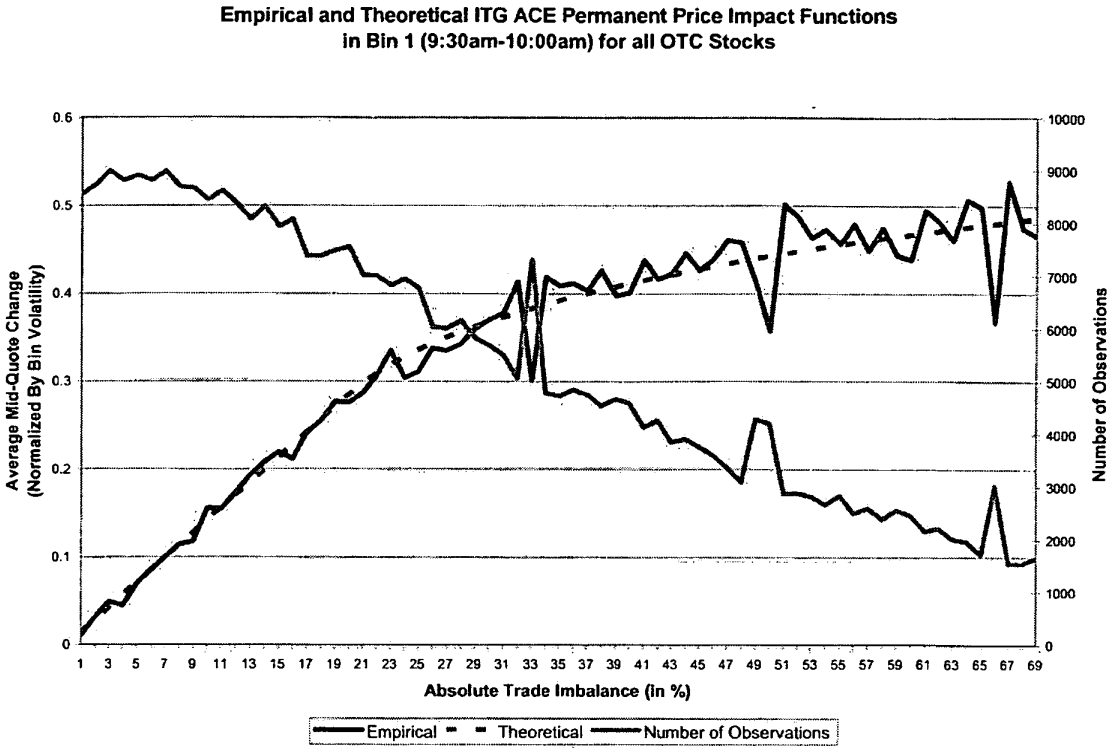

Empirical and Theoretical ITG ACE Permanent Price Impact Functions
in Bin 1 (9:30am-10:00am) for all OTC Stocks
Average Mid-Quote Change
(Normalized By Bin Volatility)
Number of Observations
Absolute Trade Imbalance (in %)
Empirical
Theoretical
Number of Observations

Figure 16

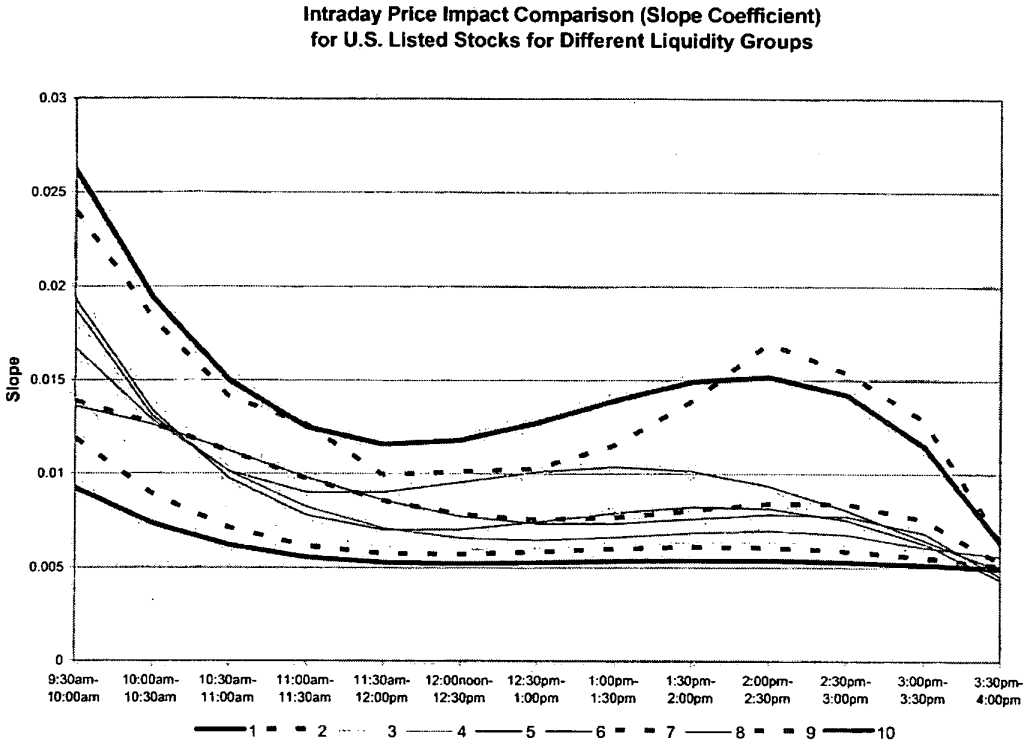

Intraday Price Impact Comparison (Slope Coefficient)
for U.S. Listed Stocks for Different Liquidity Groups
Slope
0.03
0.025
0.02
0.015
0.01
0.005
0
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00pm
12:00noon-12:30pm
12:30pm-1:00pm
1:00pm-1:30pm
1:30pm-2:00pm
2:00pm-2:30pm
2:30pm-3:00pm
3:00pm-3:30pm
3:30pm-4:00pm
1
2
3
4
5
6
7
8
9
10

Figure 17

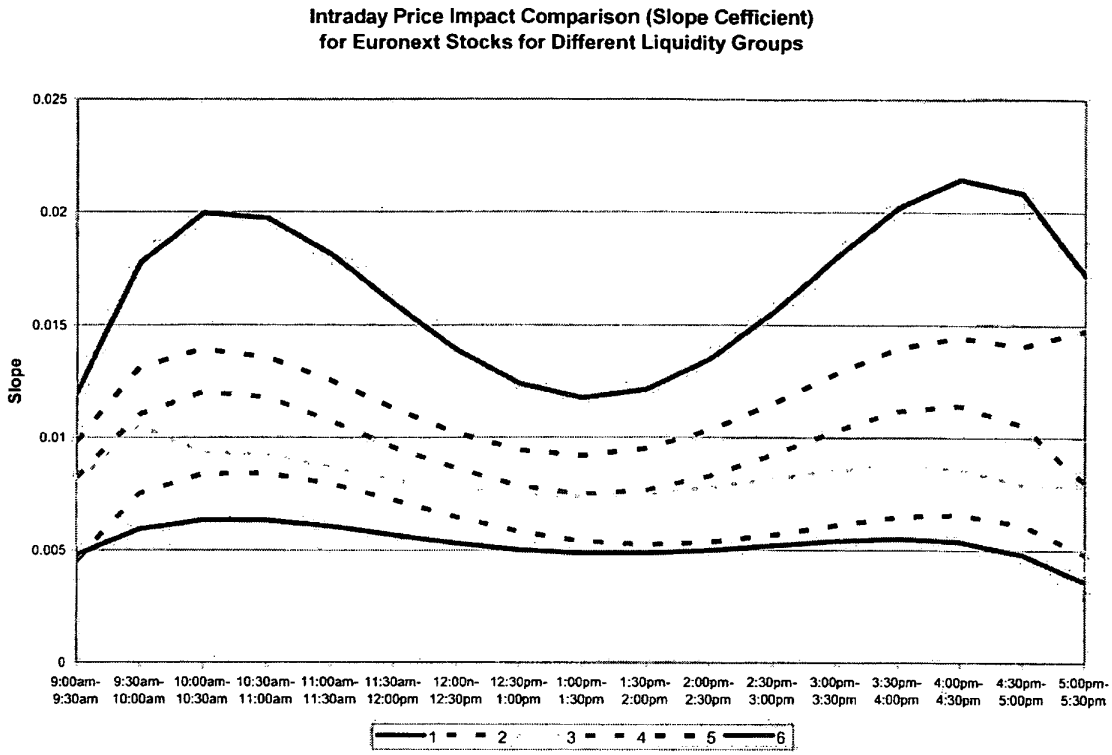

Intraday Price Impact Comparison (Slope Cefficient)
for Euronext Stocks for Different Liquidity Groups
Slope
0.025
0.02
0.015
0.01
0.005
0
9:00am-9:30am
9:30am-10:00am
10:00am-10:30am
10:30am-11:00am
11:00am-11:30am
11:30am-12:00pm
12:00n-12:30pm
12:30pm-1:00pm
1:00pm-1:30pm
1:30pm-2:00pm
2:00pm-2:30pm
2:30pm-3:00pm
3:00pm-3:30pm
3:30pm-4:00pm
4:00pm-4:30pm
4:30pm-5:00pm
5:00pm-5:30pm
1
2
3
4
5
6

Figure 18

Country Name	ISO Country Code	ITG ACE/1 available	ITG ACE/2 available
Australia	AUS	X	X
Austria	AUT	X	-
Belgium	BEL	X	X
Bermuda	BMU	X	-
Brazil	BRA	X	-
Canada	CAN	X	X
China	CHN	X	-
Czech Republic	CZE	X	-
Denmark	DNK	X	X
Finland	FIN	X	X
France	FRA	X	X
Germany	DEU	X	X
Greece	GRC	X	-
Hong Kong	HKG	X	X
Hungary	HUN	X	-
India	IND	X	-
Indonesia	IDN	X	-
Ireland	IRL	X	-
Israel	ISR	X	-
Italy	ITA	X	X
Japan	JPN	X	X
Korea	KOR	X	X
Malaysia	MYS	X	-
Mexico	MEX	X	-
The Netherlands	NLD	X	X
New Zealand	NZL	X	-
Norway	NOR	X	X
Philippines	PHL	X	-
Poland	POL	X	-
Portugal	PRT	X	X
Russia	RUS	X	-
Singapore	SGP	X	X
South Africa	ZAF	X	-
Spain	ESP	X	X
Sweden	SWE	X	X
Switzerland	CHE	X	X
Taiwan	TWN	X	X
Thailand	THA	X	-
Turkey	TUR	X	-
United Kingdom (U.K.)	GBR	X	X
United States (U.S.)	USA	X	X
Total number		**42**	**21**

Figure 19

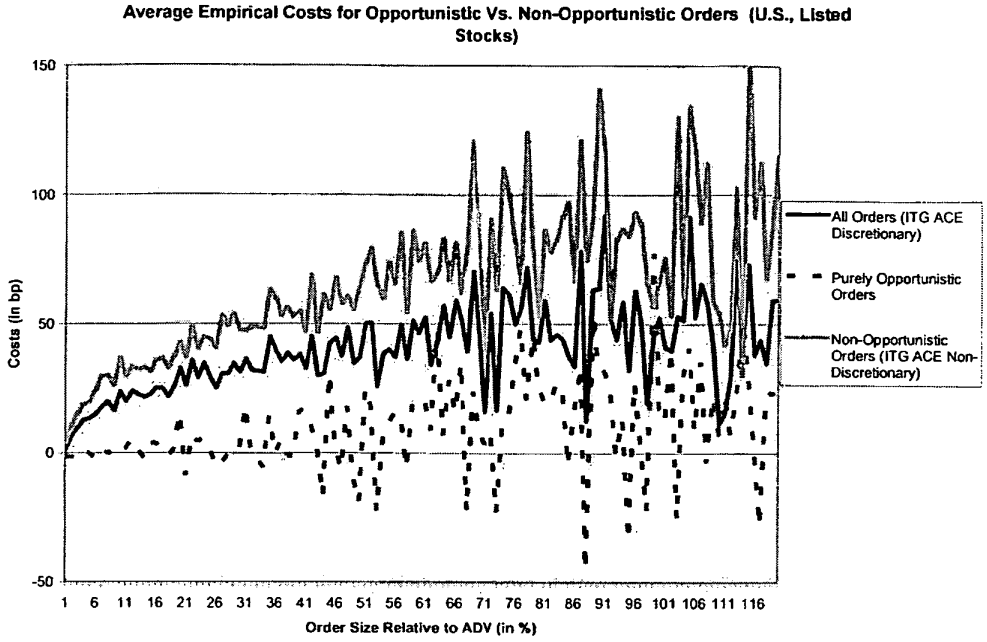

Average Empirical Costs for Opportunistic Vs. Non-Opportunistic Orders (U.S., Listed Stocks)
Costs (in bp)
150
100
50
0
-50
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91 96 101 106 111 116
Order Size Relative to ADV (in %)
All Orders (ITG ACE Discretionary)
Purely Opportunistic Orders
Non-Opportunistic Orders (ITG ACE Non-Discretionary)

Figure 20

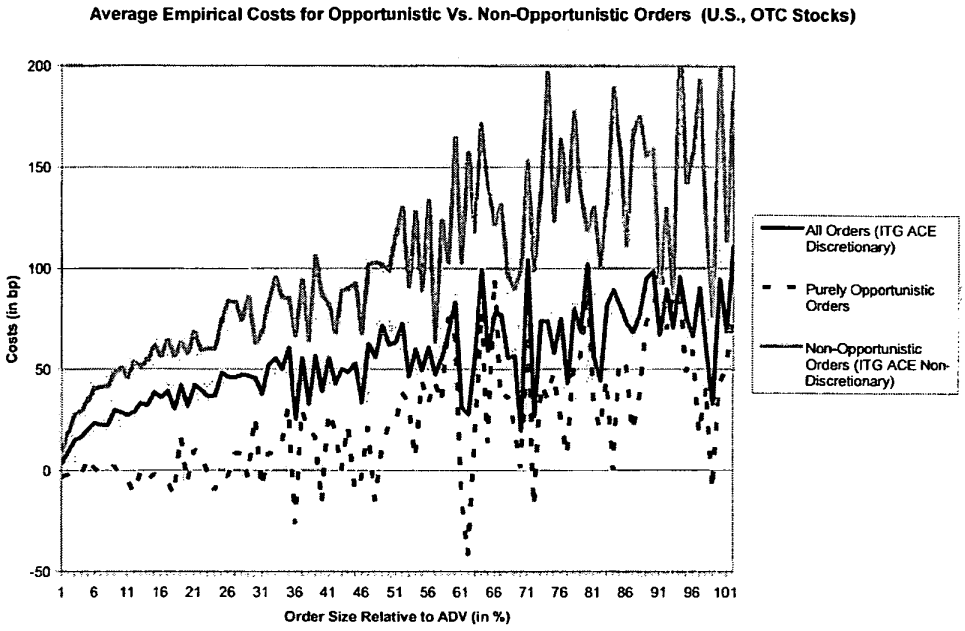

Average Empirical Costs for Opportunistic Vs. Non-Opportunistic Orders (U.S., OTC Stocks)
Costs (in bp)
200
150
100
50
0
-50
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91 96 101
Order Size Relative to ADV (in %)
All Orders (ITG ACE Discretionary)
Purely Opportunistic Orders
Non-Opportunistic Orders (ITG ACE Non-Discretionary)

Figure 21

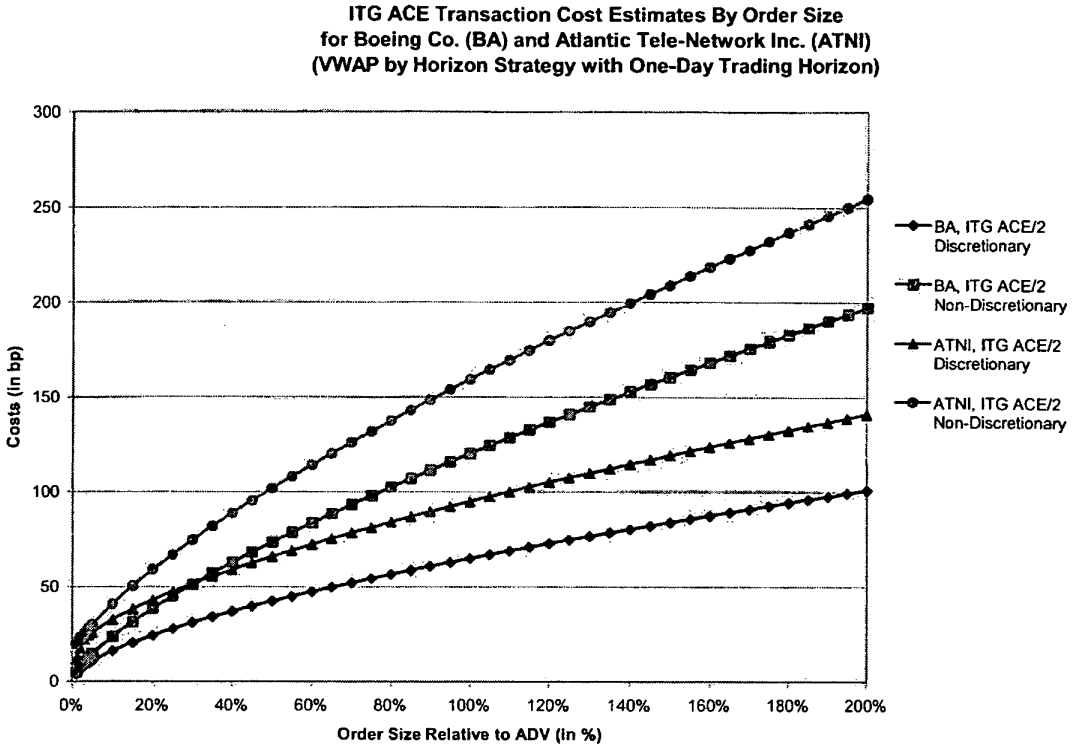

ITG ACE Transaction Cost Estimates By Order Size
for Boeing Co. (BA) and Atlantic Tele-Network Inc. (ATNI)
(VWAP by Horizon Strategy with One-Day Trading Horizon)
Costs (In bp)
300
250
200
150
100
50
0
0%
20%
40%
60%
80%
100%
120%
140%
160%
180%
200%
Order Size Relative to ADV (In %)
BA, ITG ACE/2 Discretionary
BA, ITG ACE/2 Non-Discretionary
ATNI, ITG ACE/2 Discretionary
ATNI, ITG ACE/2 Non-Discretionary

Figure 22

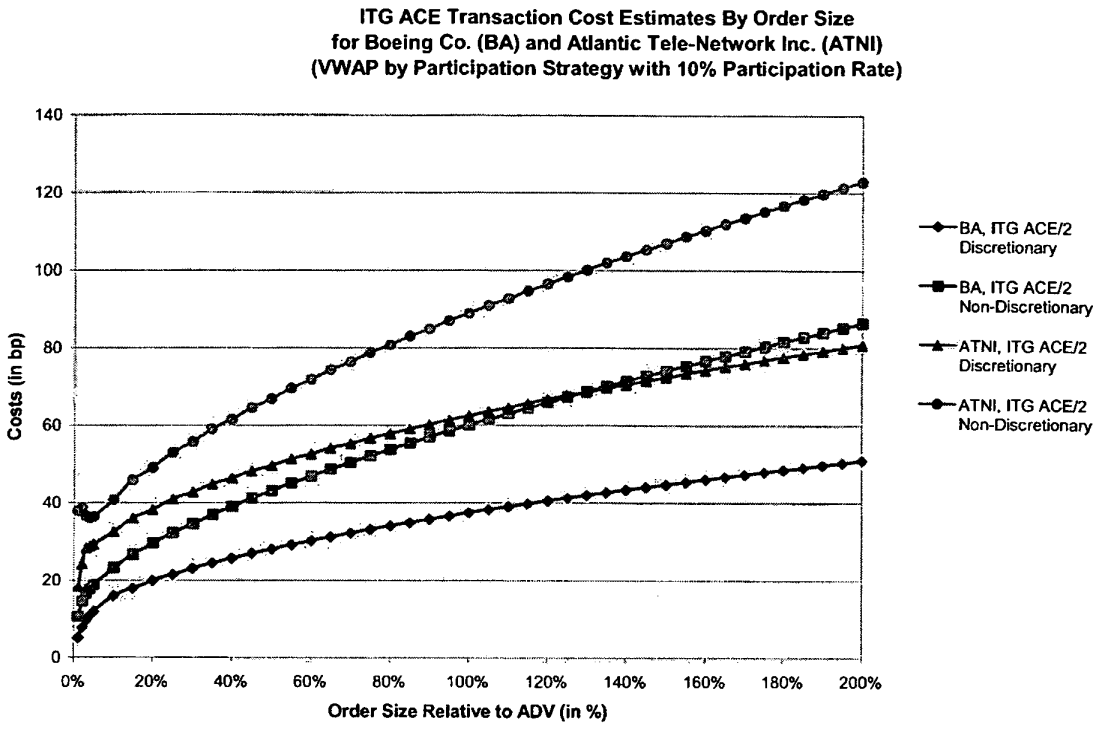

ITG ACE Transaction Cost Estimates By Order Size
for Boeing Co. (BA) and Atlantic Tele-Network Inc. (ATNI)
(VWAP by Participation Strategy with 10% Participation Rate)
Costs (in bp)
140
120
100
80
60
40
20
0
0%
20%
40%
60%
80%
100%
120%
140%
160%
180%
200%
Order Size Relative to ADV (in %)
BA, ITG ACE/2 Discretionary
BA, ITG ACE/2 Non-Discretionary
ATNI, ITG ACE/2 Discretionary
ATNI, ITG ACE/2 Non-Discretionary

Figure 23

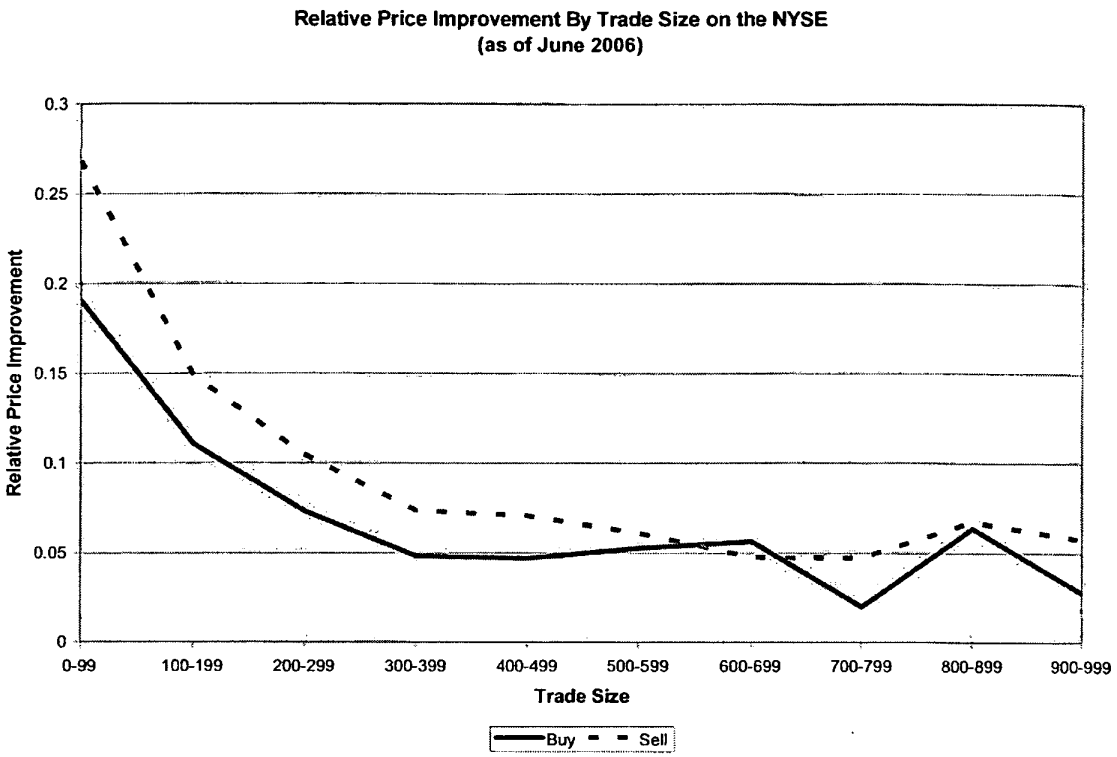

Relative Price Improvement By Trade Size on the NYSE
(as of June 2006)
Relative Price Improvement
0.3
0.25
0.2
0.15
0.1
0.05
0
0-99
100-199
200-299
300-399
400-499
500-599
600-699
700-799
800-899
900-999
Trade Size
Buy
Sell

Figure 24

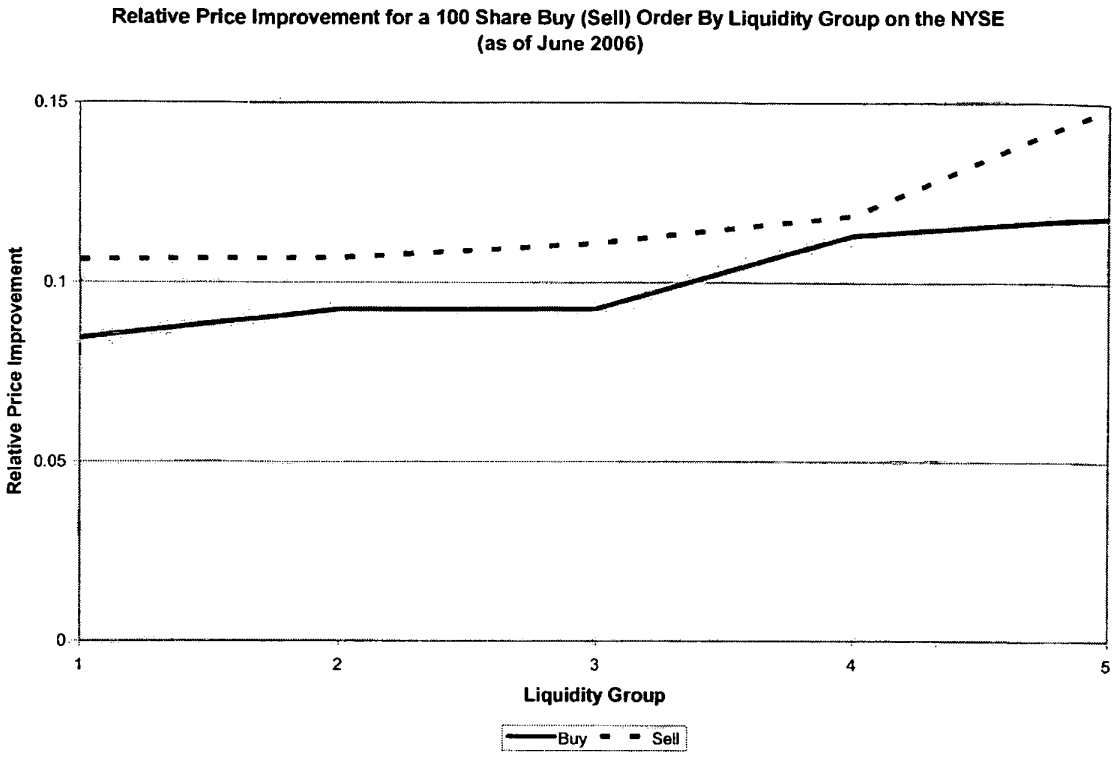

Relative Price Improvement for a 100 Share Buy (Sell) Order By Liquidity Group on the NYSE
(as of June 2006)
0.15
0.1
0.05
0
Relative Price Improvement
1
2
3
4
5
Liquidity Group
Buy
Sell

Figure 25

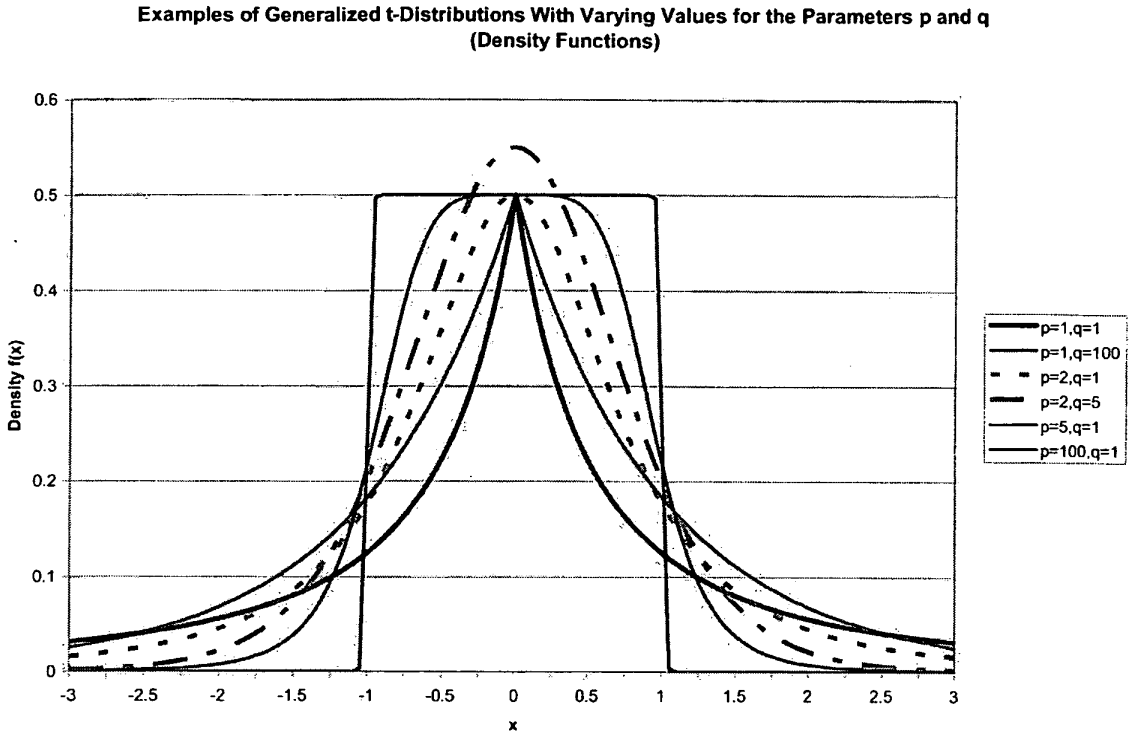

Examples of Generalized t-Distributions With Varying Values for the Parameters p and q
(Density Functions)
Density f(x)
0.6
0.5
0.4
0.3
0.2
0.1
0
-3
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3
x
p=1,q=1
p=1,q=100
p=2,q=1
p=2,q=5
p=5,q=1
p=100,q=1

Figure 26

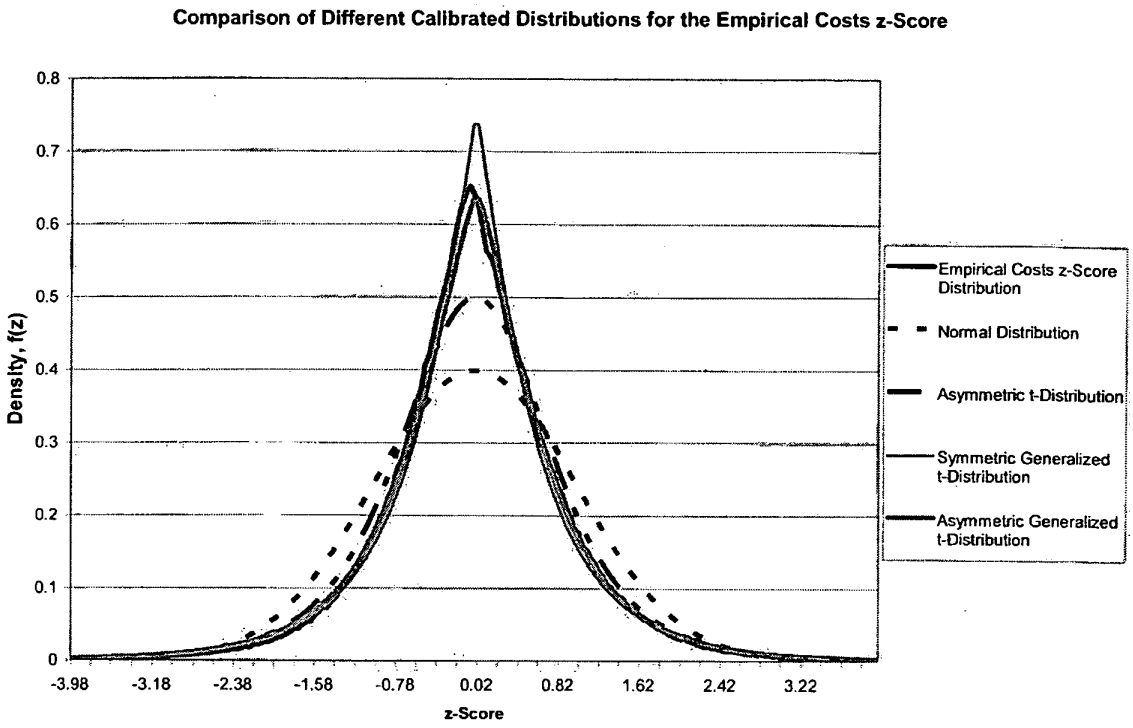

Comparison of Different Calibrated Distributions for the Empirical Costs z-Score
Density, f(z)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-3.98
-3.18
-2.38
-1.58
-0.78
0.02
0.82
1.62
2.42
3.22
z-Score
Empirical Costs z-Score Distribution
Normal Distribution
Asymmetric t-Distribution
Symmetric Generalized t-Distribution
Asymmetric Generalized t-Distribution

Figure 27

Country Name	ISO Country Code	Number of Executions (in million)	Number of Clusters (Order Decisions)	Local Currency Volume (in billion)	Local Currency	Number of Stocks	Number of Clients
United States (U.S.)	USA	42.300	4,592,255	6,402.0	USD	7,405	89
United Kingdom (U.K.)	GBR	2.110	290,093	415.0	GBP	1,871	45
Japan	JPN	1.530	201,130	419.0	JPY	1,794	48
France	FRA	0.800	127,390	233.9	EUR	477	49
Germany	DEU	0.570	98,279	176.9	EUR	377	49
Switzerland	CHE	0.470	69,302	210.3	CHF	223	48
The Netherlands	NLD	0.390	58,530	103.2	EUR	119	48
Italy	ITA	0.270	54,069	76.0	EUR	190	46
Canada	CAN	0.270	46,535	81.3	CAD	739	51
Spain	ESP	0.220	42,264	63.5	EUR	98	47
Australia	AUS	0.190	38,600	62.4	AUD	399	46
Sweden	SWE	0.200	27,415	444.7	SEK	168	46
Finland	FIN	0.110	19,980	30.1	EUR	76	40
Norway	NOR	0.068	13,435	156.1	NOK	124	42
Belgium	BEL	0.063	13,228	14.4	EUR	74	44
Denmark	DNK	0.051	9,007	96.0	DKK	80	45
Portugal	PRT	0.022	4,284	5.3	EUR	22	35

Figure 28

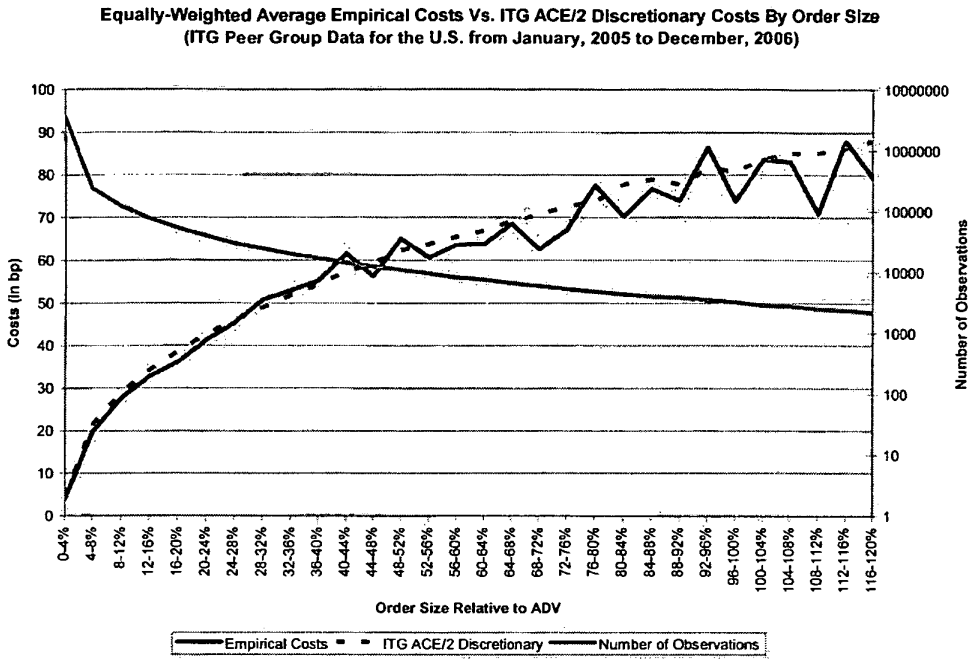

Equally-Weighted Average Empirical Costs Vs. ITG ACE/2 Discretionary Costs By Order Size
(ITG Peer Group Data for the U.S. from January, 2005 to December, 2006)
Costs (in bp)
Number of Observations
Order Size Relative to ADV
Empirical Costs
ITG ACE/2 Discretionary
Number of Observations

Figure 29

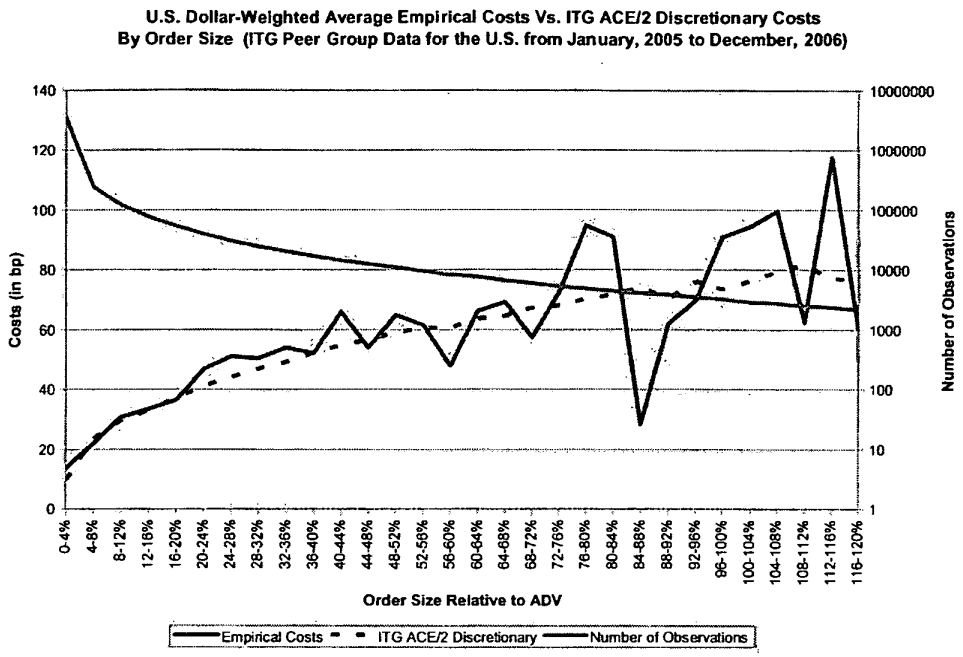

U.S. Dollar-Weighted Average Empirical Costs Vs. ITG ACE/2 Discretionary Costs
By Order Size (ITG Peer Group Data for the U.S. from January, 2005 to December, 2006)
Costs (in bp)
Number of Observations
Order Size Relative to ADV
Empirical Costs
ITG ACE/2 Discretionary
Number of Observations

Figure 30

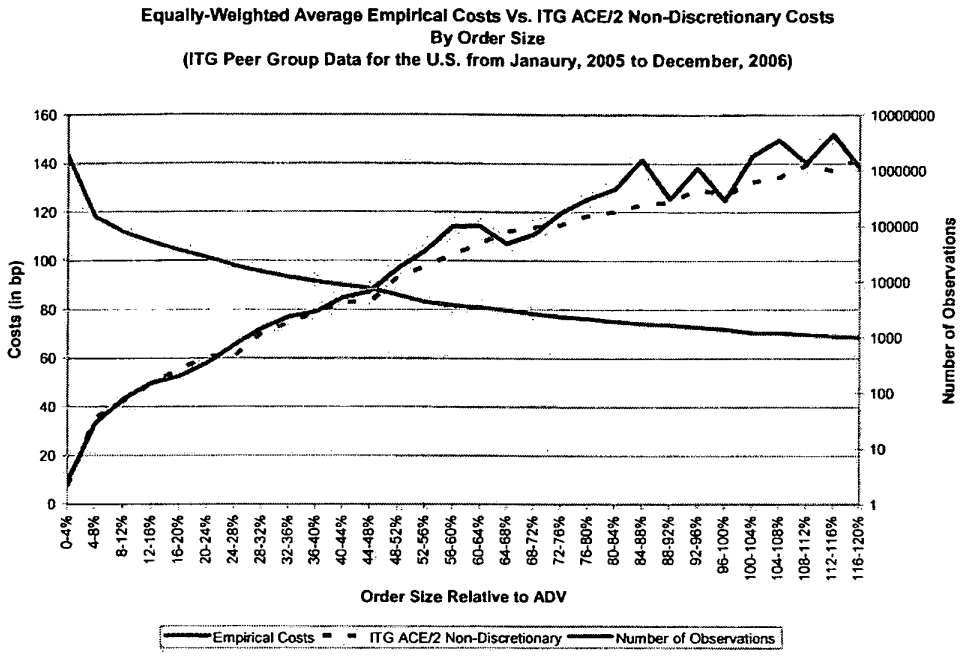

Equally-Weighted Average Empirical Costs Vs. ITG ACE/2 Non-Discretionary Costs
By Order Size
(ITG Peer Group Data for the U.S. from Janaury, 2005 to December, 2006)
Costs (in bp)
Number of Observations
Order Size Relative to ADV
Empirical Costs
ITG ACE/2 Non-Discretionary
Number of Observations

Figure 31

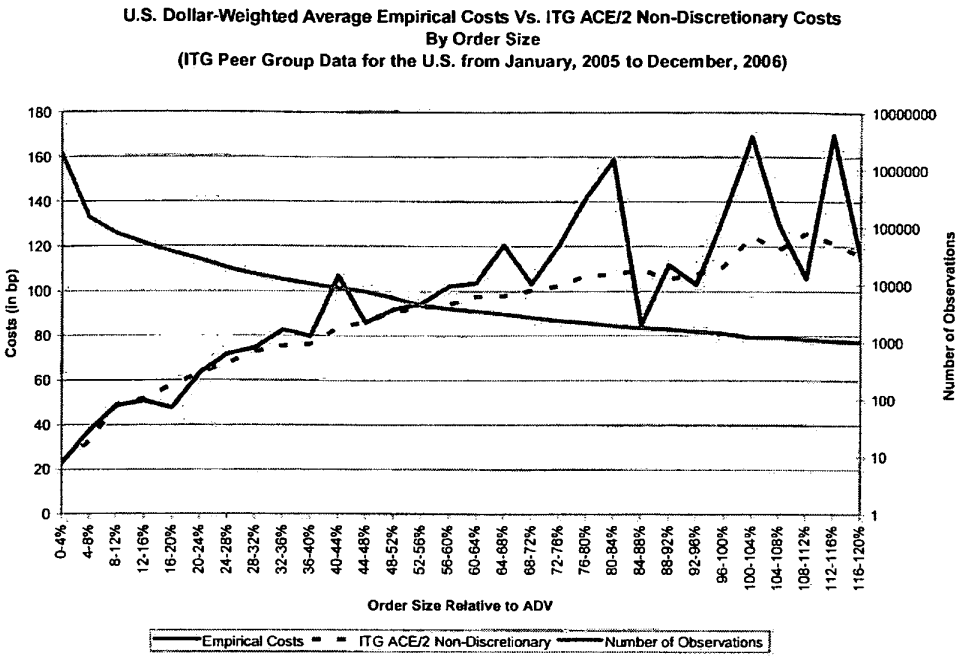

U.S. Dollar-Weighted Average Empirical Costs Vs. ITG ACE/2 Non-Discretionary Costs
By Order Size
(ITG Peer Group Data for the U.S. from January, 2005 to December, 2006)
Costs (in bp)
Number of Observations
Order Size Relative to ADV
Empirical Costs
ITG ACE/2 Non-Discretionary
Number of Observations

Figure 32

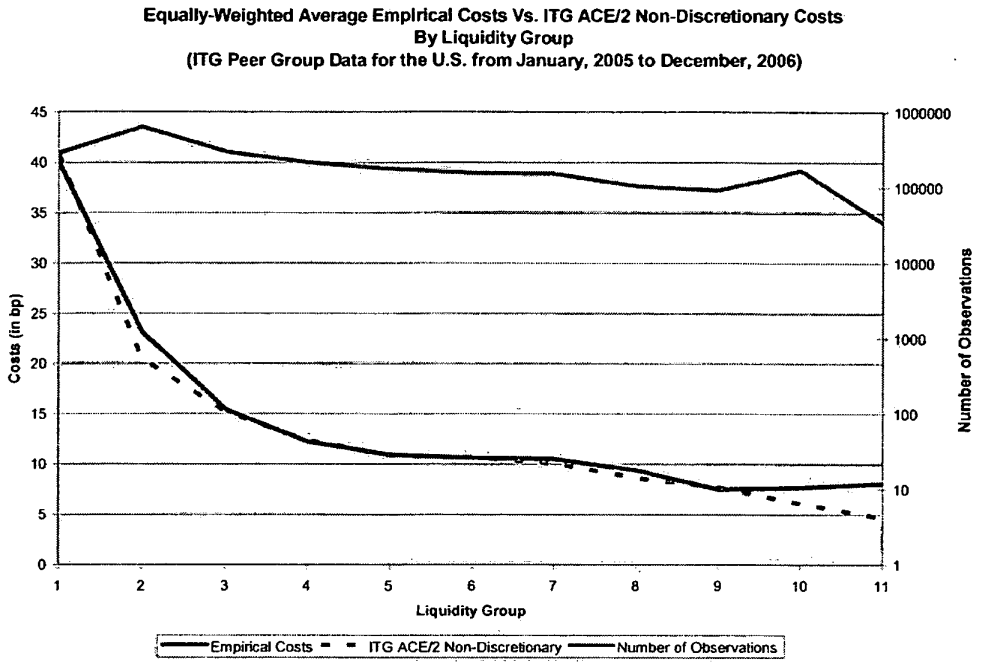

Equally-Weighted Average Empirical Costs Vs. ITG ACE/2 Non-Discretionary Costs
By Liquidity Group
(ITG Peer Group Data for the U.S. from January, 2005 to December, 2006)
Costs (in bp)
Number of Observations
Liquidity Group
Empirical Costs
ITG ACE/2 Non-Discretionary
Number of Observations

Figure 33

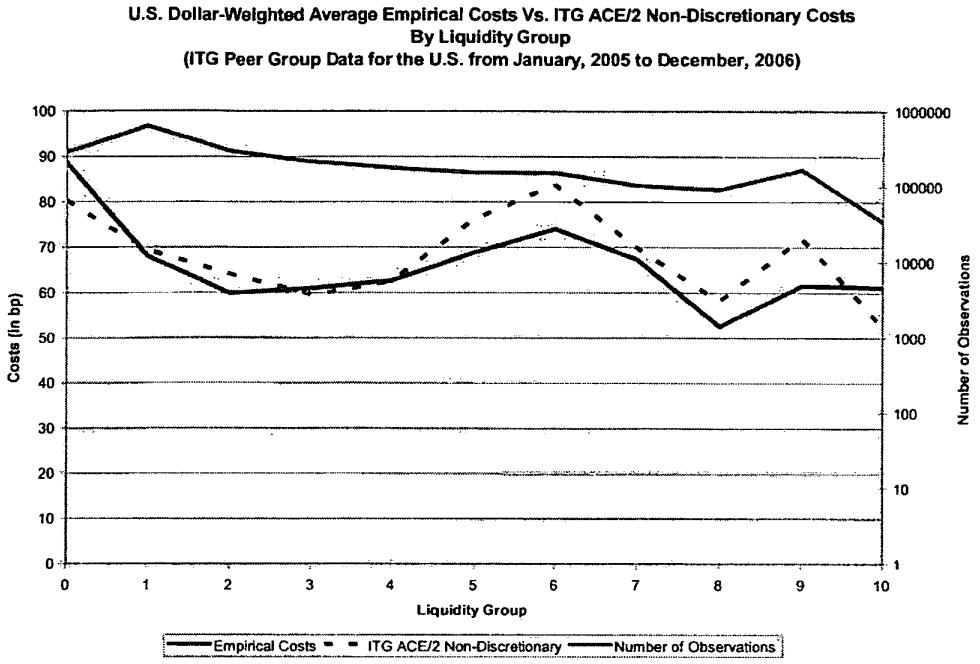

U.S. Dollar-Weighted Average Empirical Costs Vs. ITG ACE/2 Non-Discretionary Costs
By Liquidity Group
(ITG Peer Group Data for the U.S. from January, 2005 to December, 2006)
Costs (in bp)
Number of Observations
Liquidity Group
Empirical Costs
ITG ACE/2 Non-Discretionary
Number of Observations

Figure 34