



# Board of Retirement Regular Meeting

## Sacramento County Employees' Retirement System

### Agenda Item 7

**MEETING DATE:** November 20, 2019

**SUBJECT:** Trading Cost Analysis and Commission Recapture – Third Quarter 2019

**SUBMITTED FOR:**  Consent       Deliberation and Action       Receive and File

#### RECOMMENDATION

Staff recommends the Board receive and file the Quarterly Trading Cost Analysis Reports for the quarter ending September 30, 2019.

#### PURPOSE

This agenda item complies with SCERS' investment policy statement reporting requirements and contributes to the effective management and oversight of investment activities.

#### SUMMARY

SCERS utilizes the services of Elkins/McSherry, a trading cost consultant and wholly owned subsidiary of State Street, to monitor the trading costs of SCERS' public equity and fixed income managers. Elkins/McSherry provides detailed quarterly reports that analyze the various components of trading costs, the amount of principal dollars traded, and the brokers utilized by SCERS' external managers. Key takeaways during the third quarter of 2019 include:

- Commission costs for public equity managers, across both domestic and international markets, continue to be lower than peer group averages.
- Small capitalization equity managers generally have higher commission costs than large capitalization managers, as commission costs are often bundled with research costs through soft-dollar relationships with brokers (versus execution only trading costs).
- International equity trading costs are significantly higher than in U.S. equity markets though SCERS' international equity managers continue to generate consistently lower trading costs compared to peer group averages.
- SCERS fixed income trading costs, which are measured in basis points and based on a markup or discount (spread) to face value, are significantly below the peer universe as measured by Elkins/McSherry.
- SCERS received a rebate of approximately 50% of the commissions generated by the commission recapture program during the third quarter, which is consistent with prior quarters.

**DISCUSSION**

SCERS engages Elkins / McSherry (E/M) to track SCERS’ equity and fixed income trading activity and to monitor manager trade execution. E/M analyzes a manager’s trade activity against like managers across E/M’s universe of approximately 1,400 institutional investors.

E/M’s trade analysis report will highlight potential manager trading issues and, if they occur over two or more quarters, Staff will discuss compliance with the manager. The E/M trading cost reports will analyze and compare the following:

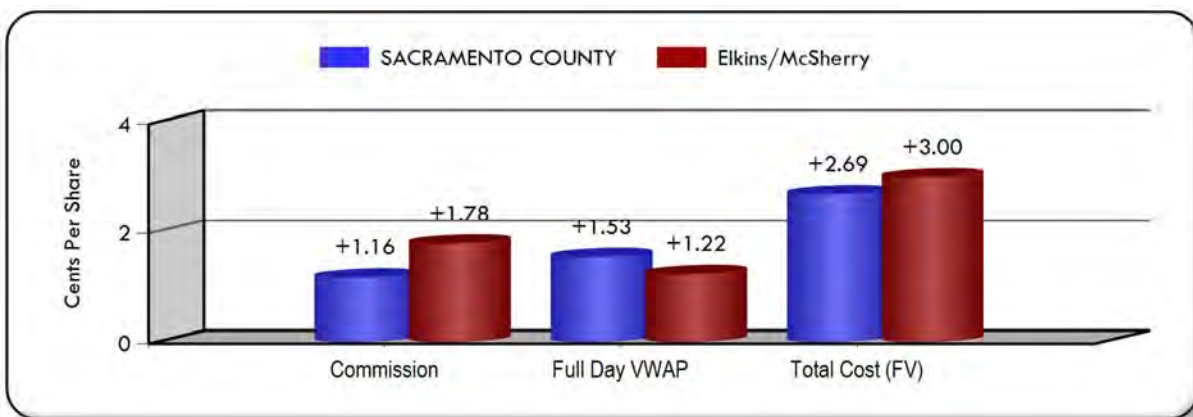
1. Commission costs, trade costs, and any soft dollar amounts.
2. Market Impact Cost, an industry performance metric, which measures the difference between a manager’s trade price and the market’s volume weighted average price (VWAP). VWAP is the average security price weighted by the share volume trade that day.
3. Total trading costs.

Industry metrics used to measure trade performance include “cps” (cents per share) and “bps” (basis points = 1/100th of one percent).

**SCERS TRADE COST SUMMARY**

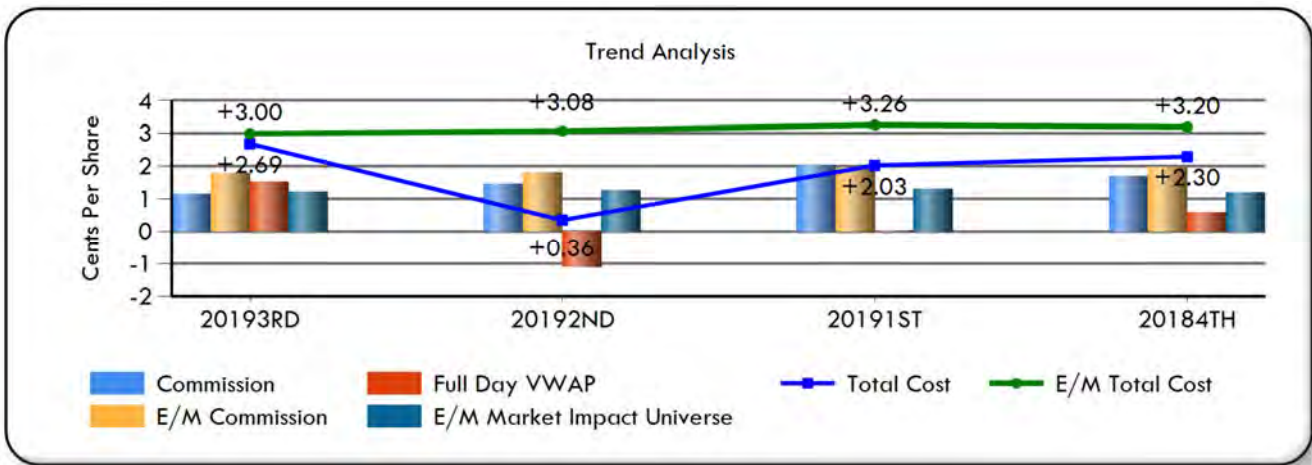
**U.S. EQUITY**

- SCERS’ U.S. equity managers traded 4.5 million shares across the AMEX, NASDAQ, and NYSE exchanges totaling \$228.8 million in principal. SCERS’ equity managers generated an E/M E-Score<sup>1</sup> of 0.06 during the quarter, which signifies that costs were slightly higher than the VWAP when considering the volatility of stocks traded.
- SCERS’ total trading costs equaled +2.69 cps, which is 0.31 cps lower than the peer group at +3.00 cps, as follows:
  - Commission cost of +1.16 cps versus peer group cost of +1.78 cps
  - Market impact costs of +1.53 cps versus peer group cost of +1.22 cps



<sup>1</sup> Elkins/McSherry E-Score Rank evaluates transaction cost analysis, including stock specific trading ranges, to provide an assessment of execution quality compared to other market participants in the Elkins/McSherry universe.

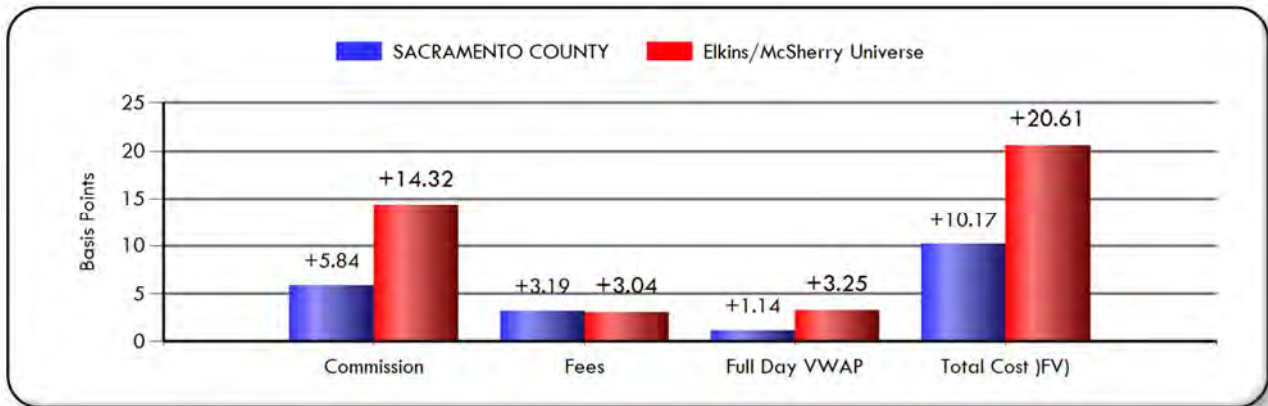
- SCERS' total trading costs were better than 55% of the peer group.
- SCERS' U.S. Equity managers that experienced unfavorable commission costs compared to the U.S. Equity peer group average cost of +1.78 cps include:
  - DGHM at +3.61 cps
  - Weatherbie at +3.51 cps
- As illustrated below, over the past four quarters SCERS' managers have generated slightly lower commission costs than the peer group.
- The U.S. small cap managers (Weatherbie and DGHM) will typically incur additional commission costs in the form of a soft dollar relationship where, in return for conducting trades through a brokerage firm, the manager receives the brokerage firm's research, generally an additional +2.0 cps.
- According to Elkins / McSherry, the average commission for the Bundled (Research Dollars) commission universe is +3.76 cps, which is higher than both of SCERS' U.S. Small Cap managers during the third quarter.



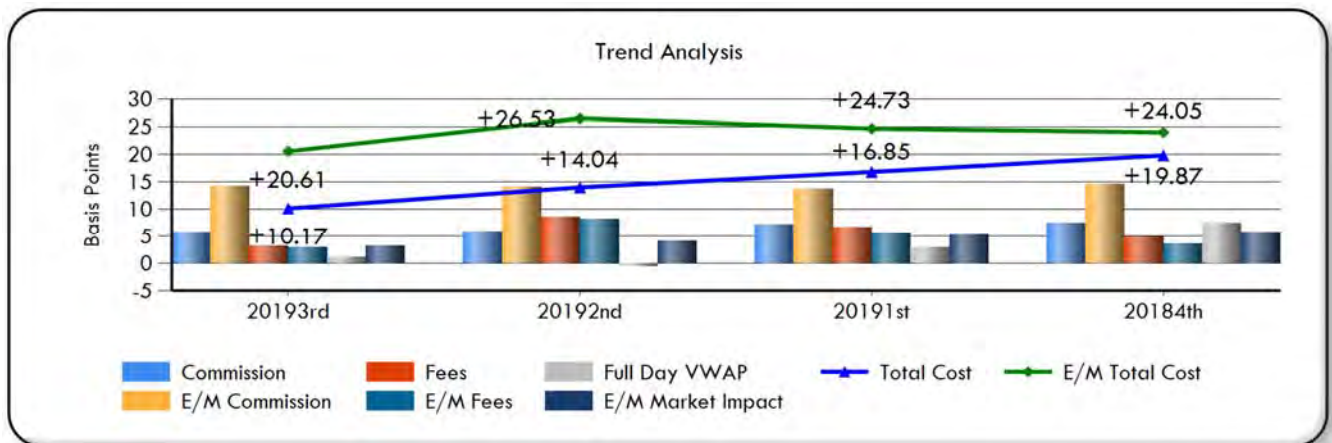
- SCERS' total trading costs have been consistently below the total trading costs of the E/M universe, with the difference averaging 1.29 cps over the past four quarters.
- SCERS' total trading costs during the third quarter were driven higher by market impact costs versus the peer universe. This is a reversal from the prior quarter, when several of SCERS' managers generated market savings compared to the full day volume weighted average price (VWAP).
- SCERS' Passive U.S. Equity Manager Alliance Bernstein generated significant market impact costs above the peer group average during the third quarter, however, this was on a limited number of trades and principal traded, with only \$5 million of principal traded compared to the account market value of approximately \$1.2 billion.

**INTERNATIONAL EQUITY**

- SCERS’ International Equity managers traded 6.6 million shares totaling \$79.5 million in principal across 23 countries.
- Total trading cost equaled +10.17 bps, which is 10.44 bps lower than the peer group at +20.61 bps, as follows:
  - Commission cost of +5.84 bps versus +14.32 bps
  - Fees (country taxes, tariffs) of +3.19 bps versus +3.04 bps
  - Market impact costs of +1.14 bps versus market impact costs of +3.25 bps



- All of SCERS’ International Equity managers analyzed generated commission costs (ranging from +4.73 bps to +7.12 bps), significantly less than the E/M peer group (ranging from +14.05 bps to +14.70 bps). This result is consistent with the previous quarters’ lower trade costs versus the peer group, as illustrated below (commission vs. E/M commission).
- SCERS’ International Equity managers generated lower market impact cost versus the peer group during the quarter (full day VWAP vs. E/M market impact), with the exception of LSV Asset Management, which experienced market impact costs of +11.13 bps compared to +3.45 bps for their benchmark.
- SCERS’ total international trading costs have been consistently below the total trading costs of the E/M universe, with the difference averaging 8.75 bps over the past four quarters.



**U.S. FIXED INCOME**

- SCERS' U.S. Fixed Income managers conducted 408 trades totaling \$686.7 million in principal, as follows:
  - Governments: 315 trades totaling \$498 million
  - Mortgages: 48 trades totaling \$166 million
  - Corporates: 45 trades totaling \$23 million
- Total trading cost equaled +0.54 bps, which is 9.05 bps lower than the E/M peer group cost of +9.59 bps, as follows:
  - Governments at +0.28 bps versus +10.99 bps
  - Mortgages at +0.45 bps versus +4.46 bps
  - Corporates at +6.98 bps versus +16.51 bps
- As illustrated below, the total trade cost (in basis points) is consistent with previous quarters' trade costs versus the peer group. SCERS' overall trading volume (in Principal) is consistent with previous quarters, with the exception of first quarter 2018, which was higher due to rebalancing performed across the fixed income portfolio.



- Comparing SCERS' U.S. Fixed Income Core Plus and Treasury managers trade costs versus their peer group is as follows:
  - TCW / MetWest (Core Plus) at -0.56 bps versus +8.01 bps
  - NeubergerBerman (Treasury) at +7.00 bps versus +18.80 bps

**INTERNATIONAL FIXED INCOME**

- SCERS is invested with Brandywine Global Fixed Income's commingled fund; therefore, trading activity is not tracked.

- Prudential, one of SCERS’ Core Plus Fixed Income managers, is permitted up to a 20% allocation in international bonds or non-U.S. denominated bonds, which is reported as follows:
  - Prudential conducted 144 international trades totaling \$97 million in principal as follows:
    - Governments: 80 trades totaling \$76 million
    - Corporates: 55 trades totaling \$12 million
    - Mortgages: 8 trades totaling \$10 million
    - Municipals: 1 trade for less than \$1 million
  - Total trading cost was -3.26 bps, which was 8.43 bps lower than the E/M peer group cost of +5.17 bps, as follows:
    - Governments at -1.15 bps versus +5.18 bps
    - Corporates at -6.57 bps versus +5.17 bps
    - Mortgages at -16.02 bps versus +5.17 bps
    - Municipals at -1.66 bps versus +5.17 bps
  - Trading costs were lower than the previous quarters’ results, as illustrated below, with principal traded higher driven mostly by corporate issues.



**COMMISSION RECAPTURE**

- SCERS’ commission recapture program, administered by State Street, instructs investment managers to trade with the program’s brokerage partners but only if the trade cost is lower and is the best execution.
- For the third quarter of 2019, SCERS’ brokerage partners provided a rebate back to SCERS for approximately 51% of the commissions paid.
  - For the quarter ending September 30, 2019, the commission rebate totaled \$5,290.

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- For comparison, the commission rebate for the quarter ending September 30, 2018 totaled \$3,688.

**ATTACHMENTS**

- Elkins / McSherry Trading Cost Summary report for the quarter ending September 30, 2019 for U.S. equity, international equity, U.S. fixed income, and global fixed income.

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## SACRAMENTO COUNTY

Trade Cost Summary - U.S. Equity Trading

Period End September 30, 2019







## REPORT CONTENTS

### Tab 1 : Executive Summary

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- **Performance vs. Universe / Trading Components**
- **Short Term Alpha**
- **Market Capitalization Performance**
- **Order Size Performance**
- **Commission Review**

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### Tab 3 : High / Low Cost Trades

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- **Most Active Stocks**
- **10 High / Low Cost Trades**
- **10 High Cost Trade Graphs**
- **10 Low Cost Trade Graphs**



(+) = Cost

**EXECUTIVE SUMMARY**

Elkins/McSherry has been providing trading cost analysis to institutional investors since 1991, serving many of the worlds largest investment managers, pension funds, banks, and broker dealers. Using this vast experience combined with an un-matched collection of global equity market and Universe data, Elkins/McSherry has produced a Trading Cost Analysis on behalf of SACRAMENTO COUNTY. This study evaluates U.S. equity executions from July 1, 2019 to September 30, 2019. The analysis included trading of 4,500,167 shares representing \$228.79 million in principal.

Methodology :

The Elkins/McSherry analysis measures trading efficiency by quantifying the cost of brokerage commission and execution quality versus a Full Day VWAP benchmark for each of the securities traded. These data have been aggregated to summarize results by Buy/Sell, Commissions, Market Impact, Short Term Alpha, Market Cap, Trade Difficulty and Trade Detail. These results are quantified in USD as well as being displayed graphically to highlight the outcomes.

Results :

**BENCHMARK PERFORMANCE**

Commission	Full Day VWAP	E - Score
<ul style="list-style-type: none"> <li>Your commission cost was +1.16 cps (+2.28 bp) or +\$52,110 (0.62 cps (1.22 bp) better than the Elkins/McSherry All Trading Universe)</li> </ul>	<ul style="list-style-type: none"> <li>Your market impact cost was +1.53 cps (+3.01 bp) or +0.31 cps (+0.61 bp) worse than the Elkins/McSherry Universe</li> <li>Your overall trading cost of +2.69 cps (+5.29 bp) was 0.31 cps (0.61 bp) better than the Elkins/McSherry Universe</li> <li>Full Day VWAP Universe Rank: <b>46%</b></li> <li>Total Cost Universe Rank: <b>55%</b></li> </ul>	<ul style="list-style-type: none"> <li>E-Score : 0.06</li> </ul>

**ELKINS/MCSHERRY UNIVERSE VALUES**

Commission (cps)				Market Impact (cps)	
Bundled	All Trading	Execution Only	Program	Median	Full Day VWAP
+3.76	+1.78	+1.29	+1.47	75 %	+1.22
				25 %	0.79
					+3.67



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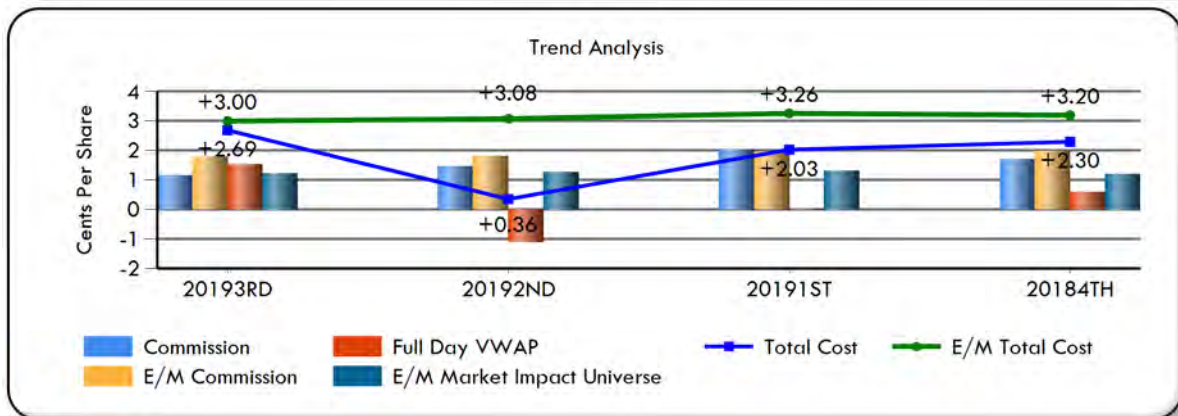
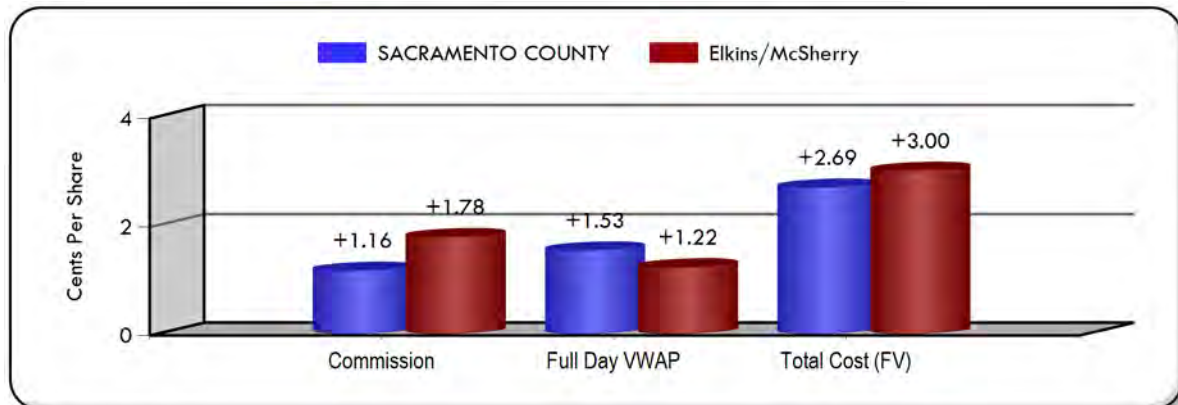
**EXECUTIVE SUMMARY**

**TOTAL PORTFOLIO COST PERFORMANCE**

Side	COMMISSION			MARKET IMPACT		Total Cost	Total Cost/Savings Vs. Universe	E -Score
	Your Avg. Commission (cps)	All Trading Universe (cps)	Bundled Universe (cps)	Full Day VWAP (cps)	Universe Full Day VWAP (cps)	(cps)	Commission+ Full Day VWAP (cps)	
Sells	+1.18	+1.78	+3.76	+0.95	+1.22	+2.13	0.87	0.04
Buys	+1.14	+1.78	+3.76	+1.92	+1.22	+3.06	+0.06	0.08
Total	+1.16	+1.78	+3.76	+1.53	+1.22	+2.69	0.31	0.06

**TRADING COMPONENTS**

	Buys	Sells
Trade Principal	119,126,182	109,667,729
Shares	2,696,718	1,803,449
Unique Names	543	213
Liquidity (% ADV)	0.063	0.105
Avg. Execution Size	2,458	2,947
Avg. Order Completion Time (min)	N/A	N/A
Total Number of Trades	1,097	612



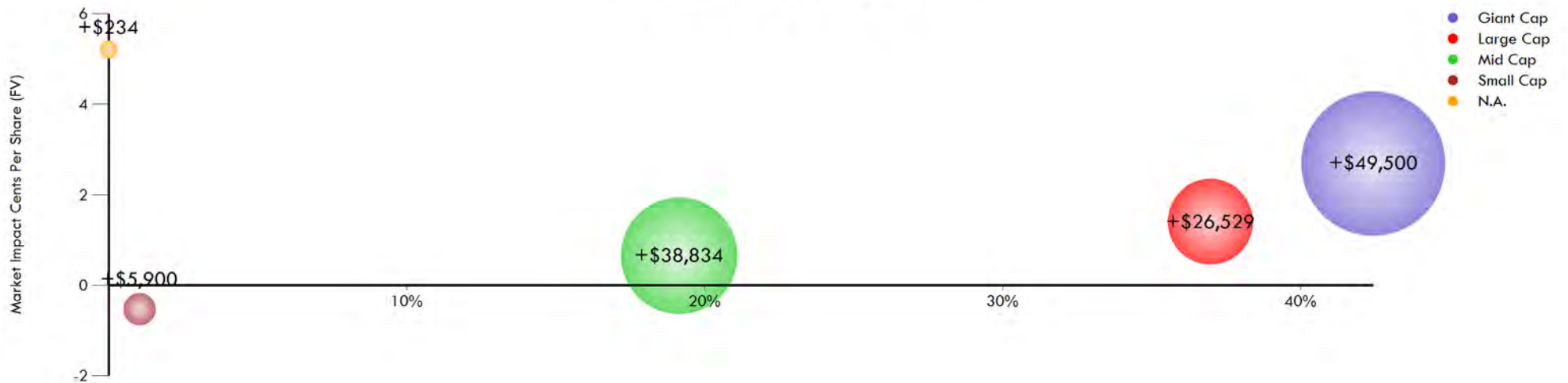
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EXECUTIVE SUMMARY

MARKET CAPITALIZATION

Market Cap	% Traded	Avg. Shares Per Order	COMMISSION		MARKET IMPACT			Total Cost	Total Cost/Savings	E - Score	Market Cap Definition
			Your Commission	All Trading Universe	Full Day VWAP	Universe Full Day VWAP	Rank Full Day VWAP				
	(\$)		(cps)	(cps)	(cps)	(cps)		(cps)			
Giant Cap	42.52 %	3,337	+0.50	+1.78	+2.69	+1.55	39 %	+3.19	0.14	0.08	Over \$25 B
Large Cap	37.05 %	2,041	+0.57	+1.78	+1.41	+1.46	51 %	+1.98	1.26	0.05	\$5 B To \$25 B
Mid Cap	19.23 %	2,681	+2.13	+1.78	+0.66	+1.15	56 %	+2.79	0.14	0.04	\$1 B To \$5 B
Small Cap	1.12 %	3,269	+3.35	+1.78	0.53	+0.89	75 %	+2.82	+0.16	0.00	\$250 M To \$1 B
N.A.	0.08 %	1,466	+0.11	+1.78	+5.21	+1.22	16 %	+5.32	+2.32	0.29	

Total Cost by Market Cap: (USD)

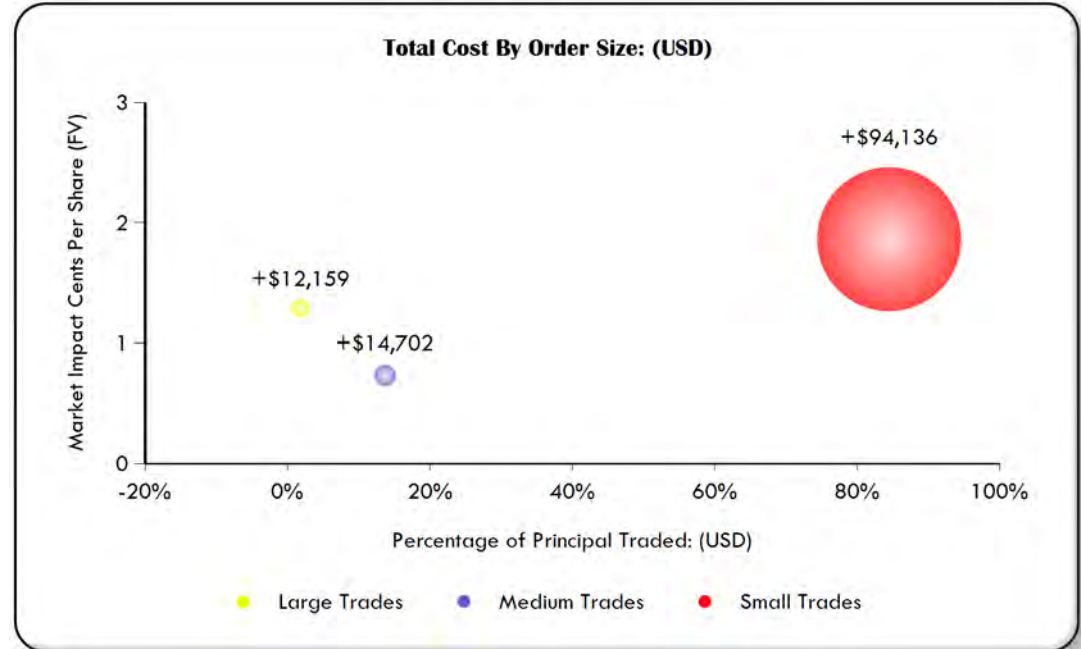
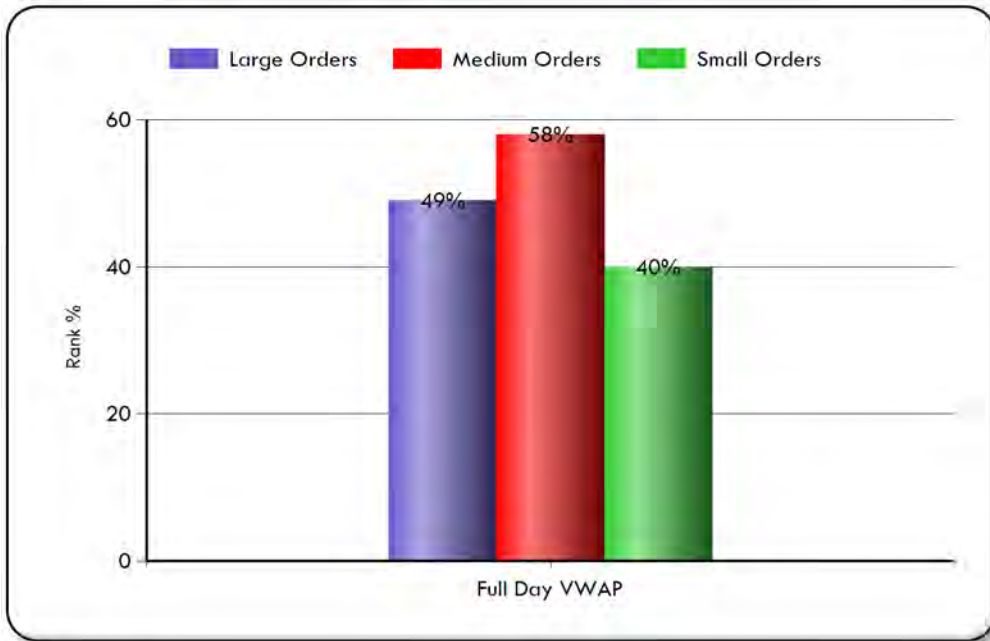


(+) = Cost

EXECUTIVE SUMMARY

ORDER SIZE EVALUATION

Order Size	Total # Of Orders	Avg. Shares Per Order	Avg. Order Completion Time (min)	COMMISSION		MARKET IMPACT			Total Cost	Total Cost/Savings	E - Score	Absolute Size (Shares)
				Your Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Universe Full Day VWAP (cps)	Rank Full Day VWAP	(cps)	Commission+Full Day VWAP Vs. Universe (cps)		
Large Orders	4	118,813	N/A	+1.27	+1.78	+1.29	+1.22	49 %	+2.56	0.44	0.08	50K Or More
Med. Orders	64	16,913	N/A	+0.62	+1.78	+0.73	+1.22	58 %	+1.36	1.64	0.12	10K-50K
Small Orders	1,641	1,793	N/A	+1.34	+1.78	+1.86	+1.22	40 %	+3.20	+0.20	0.05	10K Or Less





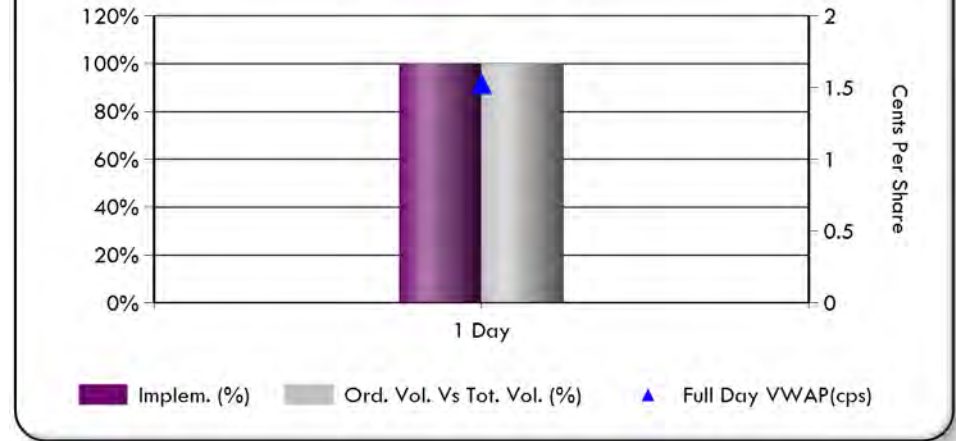
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**EXECUTIVE SUMMARY**

**IMPLEMENTATION DAYS BY TRADE**

Period	Percent Traded (%)	Order Vol. Vs Total Vol. (%)	Full Day VWAP (cps)	E - Score
1 Day	100.00	100%	+1.53	0.06

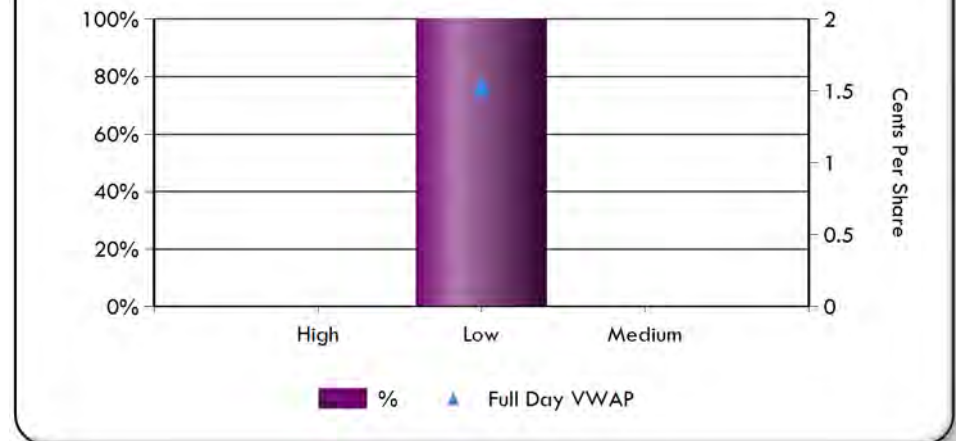
**Implementation Days**



**TRADE DIFFICULTY**

Methodology	Liquid. Cat.	Percent Traded (%)	Full Day VWAP (cps)	E - Score
0%~20% of daily vol.	L	100%	+1.53	0.06

**Avg. % of Daily Volume**





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**EXECUTIVE SUMMARY**

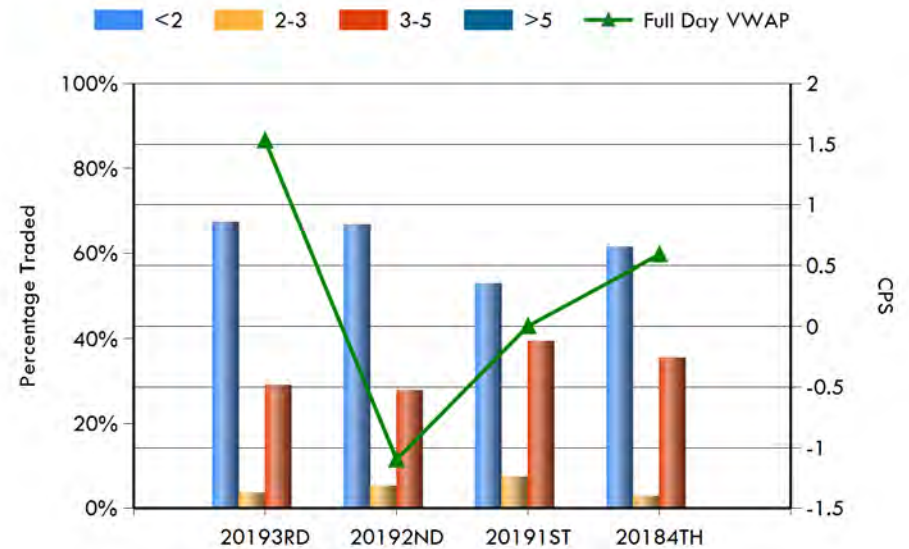
**COMMISSION REVIEW**

Top 10 Broker

Commission Trends

Broker	Total Commission (\$)	Commission 20193rd (cps)	All Trading Universe (cps)	Bundled Universe (cps)	20192ND (cps)	20191ST (cps)	20184TH (cps)
LIQUIDNET	8,994	+2.21	+1.78	+3.76	+3.13	+3.51	+3.51
COWEN & CO	7,418	+3.99	+1.78	+3.76	+4.25	+3.62	+3.65
THEMIS TRA	6,875	+3.56	+1.78	+3.76	+3.41	+3.42	+3.60
ITG	6,426	+3.58	+1.78	+3.76	+3.40	+3.60	+3.46
CAPITAL IN	3,980	+3.82	+1.78	+3.76	+3.28	+3.10	+3.79
MERRILL LY	2,045	+0.33	+1.78	+3.76	+0.01	+0.02	+0.44
NEEDHAM &	1,483	+3.20	+1.78	+3.76	+3.68	+3.54	+3.60
JEFFERIES	1,278	+3.64	+1.78	+3.76	+2.91	+4.31	+3.60
INSTINET	1,159	+3.00	+1.78	+3.76	+3.00	+3.00	+3.00
ISI GROUP	1,073	+2.80	+1.78	+3.76	+3.56	+3.62	+2.80

**Commission Category Trend**



**NOTES**

(+) = Cost

**TRADE CYCLE DETAIL**

**Manager Performance (Full Day VWAP)**



Manager	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION		MARKET IMPACT		TOTAL COST/SAVIN GS	RANK TREND - Full Day VWAP		
					Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	20192ND (%)	20191ST (%)	20184TH (%)
AQR	171	3,626	2,755,946	0.05	+0.06	+1.78	+1.60	44 %	1.34	59	61	50
WEATHERBIE	34	1,600	652,984	0.04	+3.51	+1.78	0.36	70 %	+0.15	57	48	18
DALTON, GREINER, HAR	11	3,766	553,654	-0.08	+3.61	+1.78	1.61	83 %	1.00	96	95	99
EAGLE CAPITAL MANAGE	8	65,535	458,743	0.28	+1.55	+1.78	+2.98	29 %	+1.54	98	68	96
ALLIANCE R 3000 CAPI	5	204	78,840	0.68	+0.58	+1.78	+28.33	1 %	+25.91	86	1	1

**ELKINS/MCSHERRY UNIVERSE VALUES**

Commission (cps)				Market Impact (cps)
Bundled	All Trading	Execution Only	Program	Full Day VWAP
+3.76	+1.78	+1.29	+1.47	+1.22

**NOTES**

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**TRADE CYCLE DETAIL**

**Broker Performance (Full Day VWAP)**



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS Commission + Full Day VWAP Vs. Universe	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP		20192ND (%)	20191ST (%)	20184TH (%)
MORGAN STANLEY	32	3,835	494,673	0.12	396	+0.08	+1.78	+4.33	21 %	+1.42	99	48	93
CREDIT SUISSE	31	2,941	476,465	0.04	429	+0.09	+1.78	+1.96	39 %	0.95	40	87	84
GOLDMAN SACHS	27	3,677	430,180	0.04	843	+0.20	+1.78	+0.94	55 %	1.86	34	50	1
JP MORGAN CHASE	26	3,832	440,682	0.05	219	+0.05	+1.78	+2.11	38 %	0.84	91	34	49
MERRILL LYNCH	26	6,486	616,209	0.05	2,045	+0.33	+1.78	+0.61	59 %	2.06	82	64	99
CITIGROUP	20	3,258	316,040	0.00	234	+0.07	+1.78	0.20	69 %	3.12	35	35	10
ITG	13	1,758	179,318	0.05	6,426	+3.58	+1.78	2.01	86 %	1.42	99	10	14
DEUTSCHE BANK	11	2,280	132,268	-0.02	26	+0.02	+1.78	0.17	69 %	3.15	73	40	54
THEMIS TRADING LLC	10	1,378	192,887	0.02	6,875	+3.56	+1.78	2.86	90 %	2.29	12	15	1
LIQUIDNET	7	4,324	406,417	-0.01	8,994	+2.21	+1.78	+1.83	41 %	+1.05	99	99	93

**ELKINS/MCSHERRY UNIVERSE VALUES**

Commission (cps)				Market Impact (cps)
Bundled	All Trading	Execution Only	Program	Full Day VWAP
+3.76	+1.78	+1.29	+1.47	+1.22

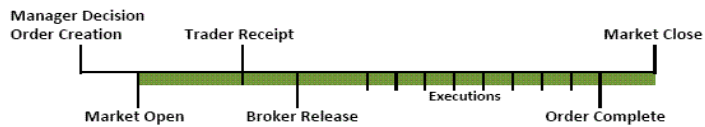
**NOTES**

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(+) = Cost

**TRADE CYCLE DETAIL**

**Broker Performance (Full Day VWAP)**



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	2019 2ND (%)	2019 1ST (%)	2018 4TH (%)
COWEN & CO	4	2,653	185,694	-0.20	7,418	+3.99	+1.78	1.65	83 %	0.65	98	80	87
LOOP CAPITAL MARKETS	4	159	60,400	0.54	362	+0.60	+1.78	+22.44	1 %	+20.05	-	12	-
CONVERGEX	3	48,100	48,100	0.68	722	+1.50	+1.78	+16.91	1 %	+15.41	49	-	1
CAPITAL INSTL SVCS	2	7,436	104,101	0.05	3,980	+3.82	+1.78	+0.04	66 %	+0.87	63	88	99
WILLIAM BLAIR	1	1,767	22,974	0.30	867	+3.77	+1.78	+4.64	19 %	+5.41	1	88	99
STIFEL NICOLAUS & CO	<1	2,060	30,903	-0.22	998	+3.23	+1.78	5.23	97 %	5.00	99	99	99
JEFFERIES & CO	<1	3,188	35,066	-0.23	1,278	+3.64	+1.78	3.43	93 %	2.79	24	99	99
NEEDHAM & CO INC	<1	3,863	46,353	0.10	1,483	+3.20	+1.78	+0.88	56 %	+1.08	99	98	99
PIPER JAFFRAY	<1	1,786	14,289	0.34	560	+3.92	+1.78	+10.58	4 %	+11.50	99	42	10
INSTINET	<1	4,294	38,647	-0.08	1,159	+3.00	+1.78	6.69	98 %	6.68	96	95	99

**ELKINS/MCSHERRY UNIVERSE VALUES**

Commission (cps)				Market Impact (cps)
Bundled	All Trading	Execution Only	Program	Full Day VWAP
+3.76	+1.78	+1.29	+1.47	+1.22

**NOTES**

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(+) = Cost

**TRADE CYCLE DETAIL**

**Broker Performance (Full Day VWAP)**



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	2019 2ND (%)	2019 1ST (%)	2018 4TH (%)
RBC CAPITAL MARKETS	<1	3,068	24,546	-0.12	687	+2.80	+1.78	8.20	99 %	8.39	98	99	-
ISI GROUP INC	<1	2,947	38,305	-0.12	1,073	+2.80	+1.78	1.08	78 %	1.28	45	30	99
UBS	<1	5,691	22,762	0.38	266	+1.17	+1.78	+5.64	14 %	+3.81	-	1	99
STEPHENS & CO INC	<1	920	7,358	0.32	265	+3.60	+1.78	+23.11	1 %	+23.71	18	50	99
CORNERSTONE MACRO LL	<1	2,816	19,714	0.36	629	+3.19	+1.78	+8.91	7 %	+9.10	3	-	-
CANACCORD GENUITY	<1	3,914	19,571	0.17	686	+3.50	+1.78	+3.33	27 %	+3.84	16	1	1
GREEN STREET	<1	4,054	20,271	-0.07	751	+3.70	+1.78	0.84	75 %	0.13	-	-	-
BMO CAPITAL MARKETS	<1	7,628	7,628	0.39	153	+2.00	+1.78	+12.52	2 %	+11.52	-	-	-
RAYMOND JAMES	<1	4,453	13,360	0.31	469	+3.51	+1.78	+1.63	44 %	+2.15	94	47	1
LUMINEX TRADING	<1	13,300	13,300	1.99	346	+2.60	+1.78	+4.26	21 %	+3.86	-	-	-

**ELKINS/MCSHERRY UNIVERSE VALUES**

Commission (cps)				Market Impact (cps)
Bundled	All Trading	Execution Only	Program	Full Day VWAP
+3.76	+1.78	+1.29	+1.47	+1.22

**NOTES**

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(+) = Cost

**TRADE CYCLE DETAIL**

**Broker Performance (Full Day VWAP)**



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	2019 2ND (%)	2019 1ST (%)	2018 4TH (%)
SEAPORT GROUP SECS	<1	6,271	6,271	-0.05	251	+4.00	+1.78	1.66	83 %	0.66	1	-	18
NORTHCOAST RESEARCH	<1	3,700	7,400	0.12	259	+3.50	+1.78	+1.05	54 %	+1.55	-	67	-
CRAIG - HALLUM	<1	2,034	2,034	0.64	73	+3.60	+1.78	+11.50	3 %	+12.10	68	99	99
NORTHLAND SECURITIES	<1	3,300	6,600	0.19	231	+3.50	+1.78	+1.40	48 %	+1.90	96	-	99
BAIRD, ROBERT W	<1	1,890	1,890	-0.67	68	+3.60	+1.78	12.91	99 %	12.31	99	1	39
NATL FINANCIAL SERVS	<1	4,396	8,792	0.53	264	+3.00	+1.78	+11.78	3 %	+11.78	-	-	-
SOUTHWEST SECURITIES	<1	2,840	2,840	-0.40	114	+4.00	+1.78	5.25	97 %	4.25	-	-	99
WELLS FARGO	<1	3,732	3,732	0.38	134	+3.60	+1.78	+3.89	23 %	+4.49	-	99	-
OPPENHEIMER & CO INC	<1	2,127	2,127	0.17	77	+3.60	+1.78	+79.37	1 %	+79.97	-	96	97

**ELKINS/MCSHERRY UNIVERSE VALUES**

Commission (cps)				Market Impact (cps)
Bundled	All Trading	Execution Only	Program	Full Day VWAP
+3.76	+1.78	+1.29	+1.47	+1.22

**NOTES**

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(+) = Cost

**TRADE CYCLE DETAIL**

**ALLIANCE R 3000 CAPITAL MANAGEM Performance (Full Day VWAP)**



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	2019 2ND (%)	2019 1ST (%)	2018 4TH (%)
<b>Grand Total</b>	5	204	78,840	0.68	454	+0.58	+1.78	+28.33	1 %	+25.91	86	1	1
LOOP CAPITAL MARKETS	4	159	60,400	0.54	362	+0.60	+1.78	+22.44	1 %	+20.05	-	-	-
JP MORGAN CHASE	<1	2,775	2,775	1.64	0	+0.00	+1.78	+274.21	1 %	+271.21	-	19	1
UBS	<1	4,502	13,505	0.86	81	+0.60	+1.78	+7.53	11 %	+5.13	-	1	-
CITIGROUP	<1	720	2,160	0.27	11	+0.50	+1.78	+7.09	11 %	+4.59	-	6	-



(+) = Cost

**TRADE CYCLE DETAIL**

**AQR Performance (Full Day VWAP)**



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	2019 2ND (%)	2019 1ST (%)	2018 4TH (%)
<b>Grand Total</b>	171	3,626	2,755,946	0.05	1,640	+0.06	+1.78	+1.60	44 %	1.34	59	61	50
CREDIT SUISSE	31	2,941	476,465	0.04	429	+0.09	+1.78	+1.96	39 %	0.95	40	87	85
MORGAN STANLEY	31	3,897	487,109	0.13	97	+0.02	+1.78	+4.76	18 %	+1.78	83	59	75
GOLDMAN SACHS	27	3,734	421,990	0.04	549	+0.13	+1.78	+1.04	54 %	1.83	31	56	18
JP MORGAN CHASE	26	3,841	437,907	0.01	219	+0.05	+1.78	+0.38	61 %	2.57	82	45	61
MERRILL LYNCH	25	5,174	486,327	0.07	97	+0.02	+1.78	+1.35	49 %	1.63	62	64	41
CITIGROUP	20	3,339	313,880	0.00	223	+0.07	+1.78	0.25	69 %	3.17	43	57	16
DEUTSCHE BANK	11	2,280	132,268	-0.02	26	+0.02	+1.78	0.17	69 %	3.15	73	61	61



(+) = Cost

TRADE CYCLE DETAIL

DALTON, GREINER, HARTMAN, MAHER Performance (Full Day VWAP)



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	2019 2ND (%)	2019 1ST (%)	2018 4TH (%)
COWEN & CO	4	2,700	178,209	-0.22	7,174	+4.03	+1.78	1.81	85 %	0.78	98	83	87
CAPITAL INSTL SVCS	2	7,436	104,101	0.05	3,980	+3.82	+1.78	+0.04	66 %	+0.87	74	99	99
INSTINET	<1	4,294	38,647	-0.08	1,159	+3.00	+1.78	6.69	98 %	6.68	96	95	99
RBC CAPITAL MARKETS	<1	3,068	24,546	-0.12	687	+2.80	+1.78	8.20	99 %	8.39	98	99	-
ISI GROUP INC	<1	2,947	38,305	-0.12	1,073	+2.80	+1.78	1.08	78 %	1.28	45	30	99
LIQUIDNET	<1	3,057	36,682	-0.27	1,284	+3.50	+1.78	5.31	97 %	4.81	94	88	97
GREEN STREET	<1	4,054	20,271	-0.07	751	+3.70	+1.78	0.84	75 %	0.13	-	-	-
JEFFERIES & CO	<1	3,467	10,400	-0.54	390	+3.75	+1.78	4.46	95 %	3.71	45	99	-
NEEDHAM & CO INC	<1	19,448	19,448	0.53	583	+3.00	+1.78	+5.39	15 %	+5.39	99	-	-
WILLIAM BLAIR	<1	4,977	9,954	0.66	398	+4.00	+1.78	+5.32	15 %	+6.32	20	87	-
PIPER JAFFRAY	<1	2,515	5,030	-0.25	226	+4.50	+1.78	1.93	85 %	0.43	99	95	-
RAYMOND JAMES	<1	11,790	11,790	0.24	413	+3.50	+1.78	+1.22	50 %	+1.72	91	90	1
STIFEL NICOLAUS & CO	<1	4,700	14,100	-0.21	423	+3.00	+1.78	0.97	77 %	0.96	97	-	99
LUMINEX TRADING	<1	13,300	13,300	1.99	346	+2.60	+1.78	+4.26	21 %	+3.86	-	-	-
MORGAN STANLEY	<1	5,760	5,760	-0.23	230	+4.00	+1.78	1.99	86 %	0.99	-	49	-
SEAPORT GROUP SECS	<1	6,271	6,271	-0.05	251	+4.00	+1.78	1.66	83 %	0.66	1	-	18
NORTHCOAST RESEARCH	<1	3,700	7,400	0.12	259	+3.50	+1.78	+1.05	54 %	+1.55	-	67	-
NORTHLAND SECURITIES	<1	3,300	6,600	0.19	231	+3.50	+1.78	+1.40	48 %	+1.90	96	-	99
SOUTHWEST SECURITIES	<1	2,840	2,840	-0.40	114	+4.00	+1.78	5.25	97 %	4.25	-	-	-
Grand Total	11	3,766	553,654	-0.08	19,972	+3.61	+1.78	1.61	83 %	1.00	96	95	99



(+) = Cost

**TRADE CYCLE DETAIL**

**EAGLE CAPITAL MANAGEMENT Performance (Full Day VWAP)**



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	2019 2ND (%)	2019 1ST (%)	2018 4TH (%)
CONVERGEX	3	48,100	48,100	0.68	722	+1.50	+1.78	+16.91	1 %	+15.41	49	-	1
LIQUIDNET	2	131,476	262,951	0.23	4,076	+1.55	+1.78	+3.25	27 %	+1.80	99	-	1
MERRILL LYNCH	1	129,882	129,882	-0.27	1,948	+1.50	+1.78	2.17	87 %	3.66	1	-	99
MORGAN STANLEY	1	925	925	-0.03	37	+4.00	+1.78	152.31	99 %	151.31	99	-	99
UBS	<1	9,257	9,257	0.17	185	+2.00	+1.78	+2.87	30 %	+1.87	-	-	99
BMO CAPITAL MARKETS	<1	7,628	7,628	0.39	153	+2.00	+1.78	+12.52	2 %	+11.52	-	-	-
<b>Grand Total</b>	<b>8</b>	<b>65,535</b>	<b>458,743</b>	<b>0.28</b>	<b>7,120</b>	<b>+1.55</b>	<b>+1.78</b>	<b>+2.98</b>	<b>29 %</b>	<b>+1.54</b>	<b>98</b>	<b>68</b>	<b>96</b>





(+) = Cost

TRADE CYCLE DETAIL

WEATHERBIE Performance (Full Day VWAP)



Broker	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP		
					Commission (USD)	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	2019 2ND (%)	2019 1ST (%)	2018 4TH (%)
Grand Total	34	1,600	652,984	0.04	22,923	+3.51	+1.78	0.36	70 %	+0.15	57	48	18
ITG	13	1,758	179,318	0.05	6,426	+3.58	+1.78	2.01	86 %	1.42	99	10	8
THEMIS TRADING LLC	10	1,378	192,887	0.02	6,875	+3.56	+1.78	2.86	90 %	2.29	12	15	1
LIQUIDNET	5	1,335	106,784	-0.09	3,635	+3.40	+1.78	+0.79	57 %	+1.20	69	99	96
WILLIAM BLAIR	<1	1,184	13,020	0.23	469	+3.60	+1.78	+4.12	22 %	+4.72	1	88	99
STIFEL NICOLAUS & CO	<1	1,400	16,803	-0.23	575	+3.42	+1.78	8.81	99 %	8.39	99	99	99
NEEDHAM & CO INC	<1	2,446	26,905	0.00	900	+3.34	+1.78	2.38	89 %	2.03	99	98	99
JEFFERIES & CO	<1	3,083	24,666	-0.14	888	+3.60	+1.78	3.00	91 %	2.40	1	87	99
PIPER JAFFRAY	<1	1,543	9,259	0.49	333	+3.60	+1.78	+17.38	1 %	+17.98	78	8	10
STEPHENS & CO INC	<1	920	7,358	0.32	265	+3.60	+1.78	+23.11	1 %	+23.71	1	2	99
CORNERSTONE MACRO LL	<1	2,816	19,714	0.36	629	+3.19	+1.78	+8.91	7 %	+9.10	3	-	-
CANACCORD GENUITY	<1	3,914	19,571	0.17	686	+3.50	+1.78	+3.33	27 %	+3.84	16	1	1
GOLDMAN SACHS	<1	2,048	8,190	-0.09	295	+3.60	+1.78	4.32	95 %	3.71	41	24	1
CRAIG - HALLUM	<1	2,034	2,034	0.64	73	+3.60	+1.78	+11.50	3 %	+12.10	68	99	99
COWEN & CO	<1	1,871	7,485	0.37	244	+3.26	+1.78	+2.24	35 %	+2.50	82	23	-
BAIRD, ROBERT W	<1	1,890	1,890	-0.67	68	+3.60	+1.78	12.91	99 %	12.31	-	1	-
NATL FINANCIAL SERVS	<1	4,396	8,792	0.53	264	+3.00	+1.78	+11.78	3 %	+11.78	-	-	-
RAYMOND JAMES	<1	785	1,570	0.49	57	+3.60	+1.78	+4.73	18 %	+5.33	99	45	1
WELLS FARGO	<1	3,732	3,732	0.38	134	+3.60	+1.78	+3.89	23 %	+4.49	-	99	-
MORGAN STANLEY	<1	440	879	-0.73	32	+3.60	+1.78	24.71	99 %	24.11	-	-	99
OPPENHEIMER & CO INC	<1	2,127	2,127	0.17	77	+3.60	+1.78	+79.37	1 %	+79.97	-	96	97



(+) = Cost

**TRADE DETAIL ANALYSIS**

**Largest Shares Volume Traded**

							Market Impact
Security	# Orders	Shares	US Dollars	Commission (cps)	% of Volume	E - Score	Full Day VWAP (cps)
GE	6	441,089	3,919,986	+1.37	0.09%	0.04	+1.32
MTG	8	147,704	1,972,683	+0.06	0.53%	0.12	+0.85
OEC	30	83,348	1,146,757	+3.22	0.46%	-0.19	1.48
F	2	83,018	769,503	+0.02	0.14%	0.26	+0.51
TTMI	14	80,149	774,848	+3.09	0.77%	0.42	+1.89
TWTR	8	69,850	2,876,087	+0.04	0.08%	-0.05	0.80
ACAD	18	62,467	2,104,072	+3.60	0.04%	-0.08	14.30
WFC	5	59,415	2,840,289	+0.03	0.07%	0.15	+1.66
WPX	4	56,106	576,199	+3.34	0.10%	0.94	+10.65
GKOS	24	55,419	3,692,760	+3.60	0.36%	0.12	+2.31

**Names Most Traded - Total Orders**

							Market Impact
Security	# Orders	Shares	US Dollars	Commission (cps)	% of Volume	E - Score	Full Day VWAP (cps)
HEI	43	43,057	5,721,655	+3.60	0.11%	0.21	+17.59
GKOS	24	55,419	3,692,760	+3.60	0.36%	0.12	+2.31
TWTR	8	69,850	2,876,087	+0.04	0.08%	-0.05	0.80
GE	6	441,089	3,919,986	+1.37	0.09%	0.04	+1.32
ROKU	6	23,052	3,111,349	+0.08	0.03%	0.13	+19.25
AMZN	6	2,377	4,407,528	+0.03	0.01%	0.33	+300.75
WFC	5	59,415	2,840,289	+0.03	0.07%	0.15	+1.66
MSFT	5	21,208	2,918,830	+0.09	0.02%	0.04	+1.68
CMI	5	14,817	2,451,887	+0.06	0.29%	-0.01	0.08
ORCL	3	54,704	3,130,167	+1.33	0.12%	0.61	+15.05



(+) = Cost

**TRADE CONTRIBUTIONS**

Cost\Savings Performance				
Category	Principal USD	# of Trades	Avg. Market Impact (cps)	Percentage of all Cost\Savings
10 High Cost Trades	8,081,969	10	+259.56	24.46%
Cost Trades	129,839,490	992	+29.77	100.00%
Saving Trades	98,954,420	717	20.11	100.00%
10 Low Cost Trades	4,231,197	10	94.00	25.16%





(+) = Cost

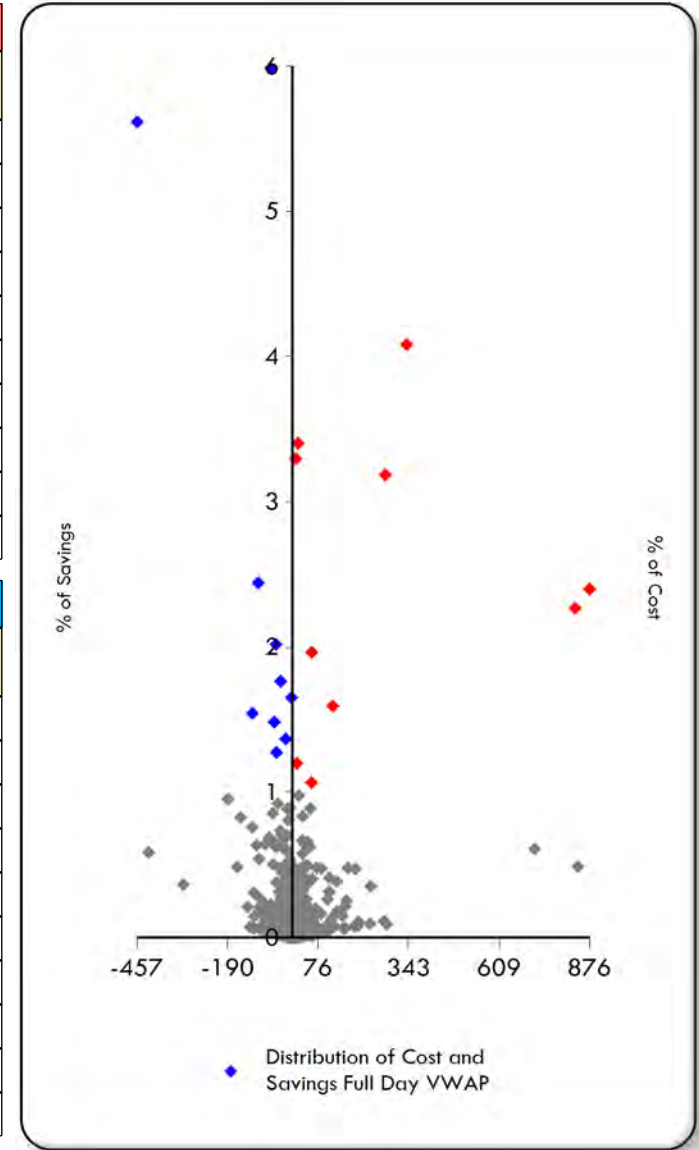
**TRADE LEVEL DETAILS**

**10 High Cost Trades (Full Day VWAP)**

Side	Security	Trade Date	Shares	Cost (%)	E - Score	Full Day VWAP (cps)	Manager	Broker
Buy	EHTH	2019/07/26	2,890	4.08	0.83	+337.63	WEATHERBIE	LIQUIDNET
Sell	ORCL	2019/07/01	48,100	3.40	0.68	+16.91	EAGLE CAPI	CONVERGEX
Buy	GE	2019/08/16	75,178	3.30	0.49	+10.48	EAGLE CAPI	LIQUIDNET
Sell	AAPL	2019/09/20	2,775	3.18	1.64	+274.21	ALLIANCE R	JP MORGAN
Buy	FICO	2019/09/27	654	2.40	1.70	+875.93	AQR	MORGAN STA
Buy	AMZN	2019/07/22	651	2.27	0.94	+833.29	AQR	MORGAN STA
Sell	HEI	2019/09/11	8,213	1.97	0.46	+57.22	WEATHERBIE	ITG
Buy	NVRO	2019/08/12	3,188	1.60	0.00	+119.69	WEATHERBIE	ITG
Sell	WPX	2019/07/16	21,635	1.20	1.13	+13.27	DALTON, GR	CAPITAL IN
Buy	ROKU	2019/09/04	4,481	1.07	0.14	+56.95	AQR	CREDIT SUI

**10 Low Cost Trades (Full Day VWAP)**

Side	Security	Trade Date	Shares	Savings (%)	E - Score	Full Day VWAP (cps)	Manager	Broker
Buy	ACAD	2019/09/09	16,180	5.99	-0.28	62.93	WEATHERBIE	ITG
Sell	EVBG	2019/08/06	2,092	5.62	-2.12	456.71	WEATHERBIE	ITG
Sell	TER	2019/07/24	4,139	2.44	-0.75	100.30	DALTON, GR	CAPITAL IN
Buy	RPD	2019/09/09	7,147	2.02	-0.47	48.11	WEATHERBIE	THEMIS TRA
Buy	OII	2019/07/25	8,841	1.77	-0.56	33.99	DALTON, GR	INSTINET
Buy	GE	2019/08/05	129,882	1.65	-0.27	2.17	EAGLE CAPI	MERRILL LY
Buy	W	2019/07/01	2,237	1.55	-0.66	117.57	WEATHERBIE	THEMIS TRA
Buy	URBN	2019/08/01	4,778	1.49	-0.69	52.91	DALTON, GR	CAPITAL IN
Sell	GKOS	2019/08/29	12,237	1.37	-0.26	19.03	WEATHERBIE	ITG
Buy	ACAD	2019/09/18	4,691	1.28	-0.96	46.27	WEATHERBIE	LIQUIDNET



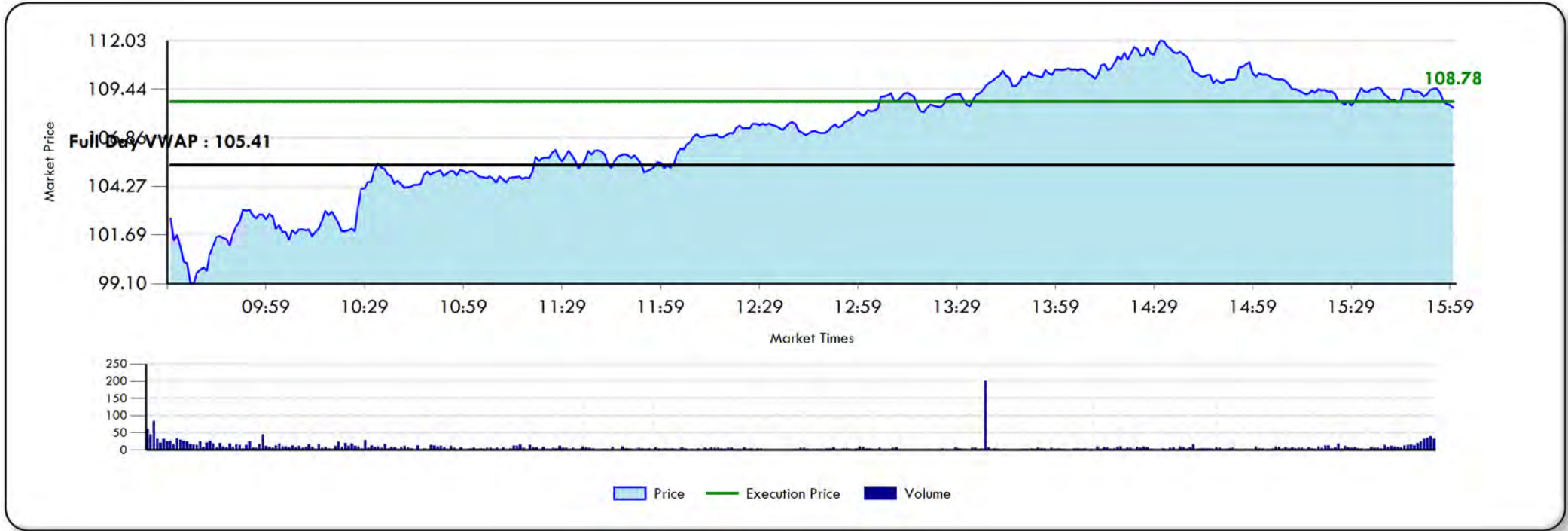


(+) = Cost

**TRADE LEVEL DETAIL - HIGH COST**

**EHTH - 2019/07/26**

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	WEATHERBIE	LIQUIDNET	07/26/2019 09:30:00	07/26/2019 16:00:00	2,890	108.7814	105.4051	+9,757	+337.63	0.83	0.08



**NOTES**

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 4.08% of your market impact cost.

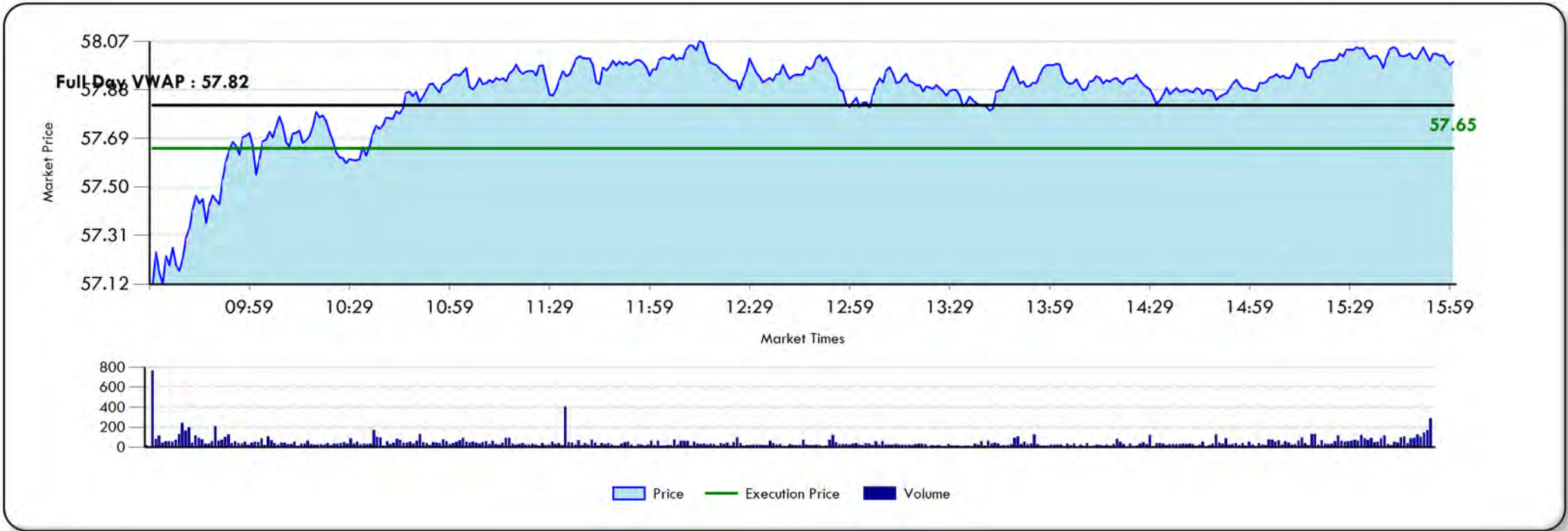


(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

ORCL - 2019/07/01

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Sell	EAGLE CAPITAL MANAGEMENT	CONVERGEX	07/01/2019 09:30:00	07/01/2019 16:00:00	48,100	57.6505	57.8196	+8,132	+16.91	0.68	0.24



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 3.40% of your market impact cost.



(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

GE - 2019/08/16

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	EAGLE CAPITAL MANAGEMENT	LIQUIDNET	08/16/2019 09:30:00	08/16/2019 16:00:00	75,178	8.7144	8.6096	+7,876	+10.48	0.49	0.03



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 3.30% of your market impact cost.

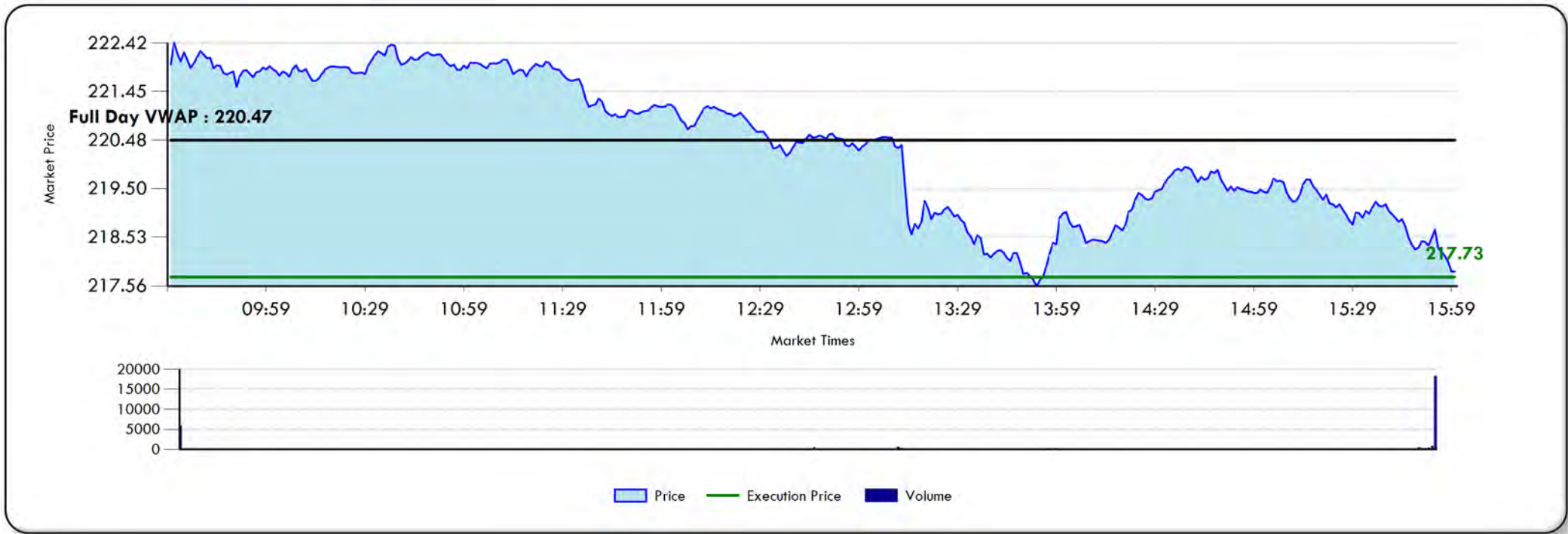


(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

AAPL - 2019/09/20

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Sell	ALLIANCE R 3000 CAPITAL MANAGEM	JP MORGAN CHASE	09/20/2019 09:30:00	09/20/2019 16:00:00	2,775	217.7300	220.4721	+7,609	+274.21	1.64	0.00



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 3.18% of your market impact cost.





(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

FICO - 2019/09/27

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	AQR	MORGAN STANLEY	09/27/2019 09:30:00	09/27/2019 16:00:00	654	310.6792	301.9199	+5,729	+875.93	1.70	0.18



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 2.40% of your market impact cost.



(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

AMZN - 2019/07/22

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	AQR	MORGAN STANLEY	07/22/2019 09:30:00	07/22/2019 16:00:00	651	1980.7440	1972.4111	+5,425	+833.29	0.94	0.02



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 2.27% of your market impact cost.

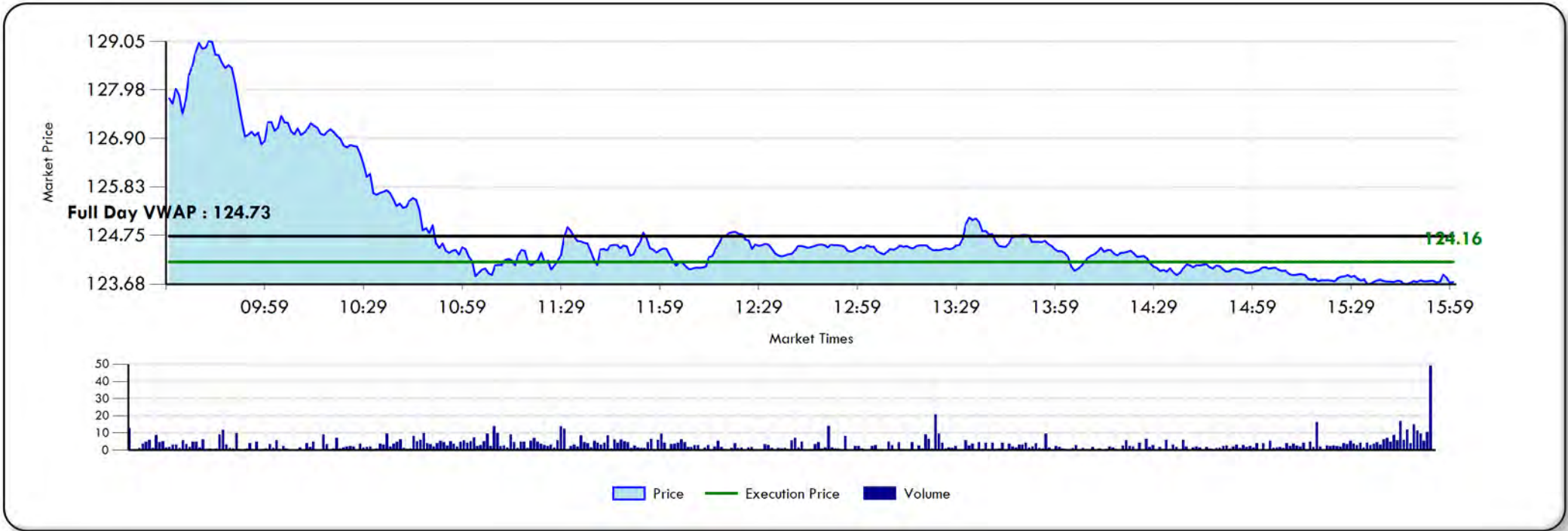


(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

HEI - 2019/09/11

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Sell	WEATHERBIE	ITG	09/11/2019 09:30:00	09/11/2019 16:00:00	8,213	124.1598	124.7320	+4,699	+57.22	0.46	0.54



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.97% of your market impact cost.

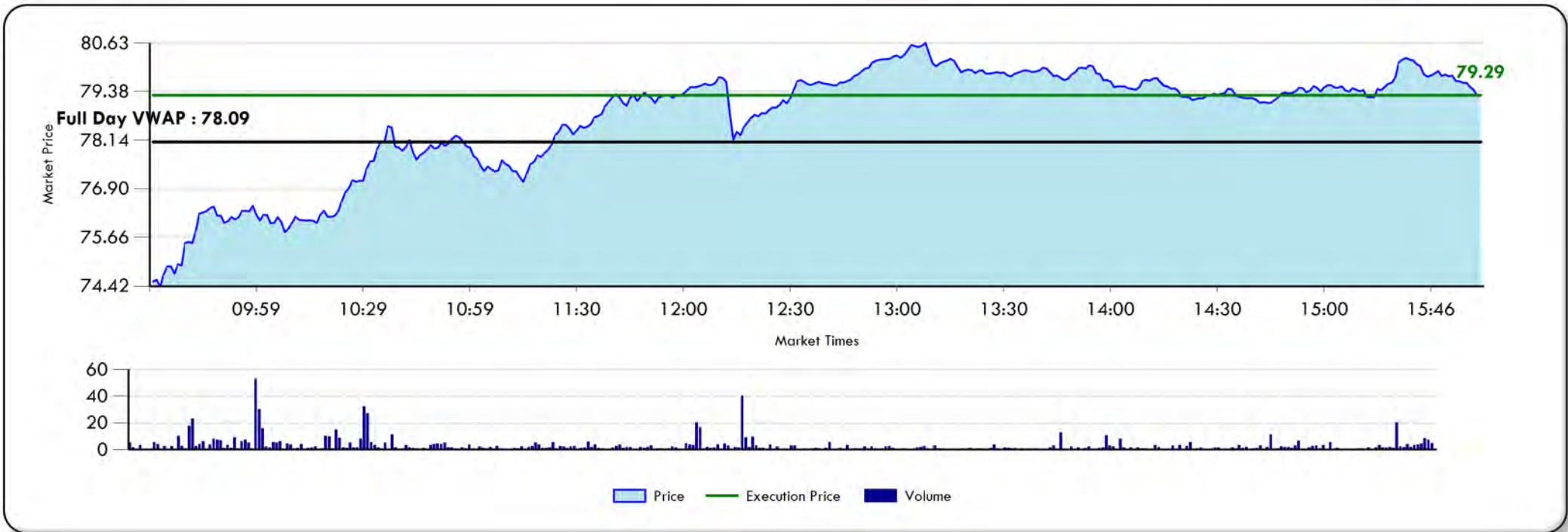


(+) = Cost

**TRADE LEVEL DETAIL - HIGH COST**

**NVRO - 2019/08/12**

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	WEATHERBIE	ITG	08/12/2019 09:30:00	08/12/2019 16:00:00	3,188	79.2887	78.0919	+3,816	+119.69	0.00	0.30



**NOTES**

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.60% of your market impact cost.



(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

WPX - 2019/07/16

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Sell	DALTON, GREINER, HARTMAN, MAHER	CAPITAL INSTL SVCS	07/16/2019 09:30:00	07/16/2019 16:00:00	21,635	10.4520	10.5847	+2,871	+13.27	1.13	0.20



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.20% of your market impact cost.

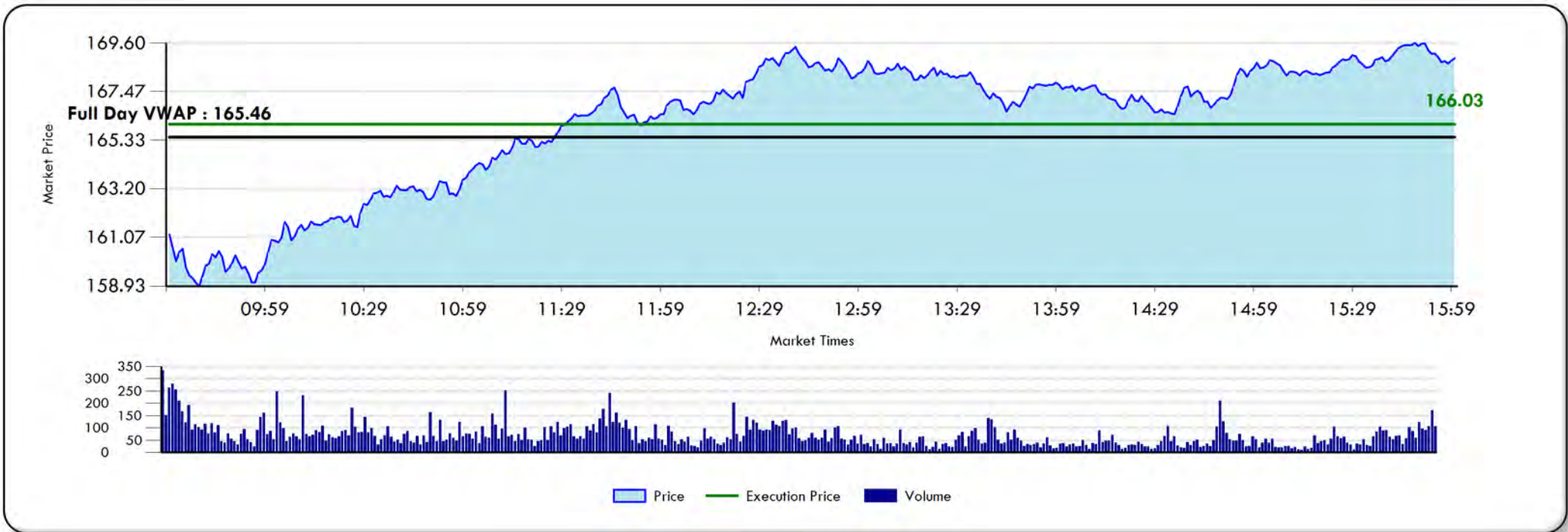


(+) = Cost

**TRADE LEVEL DETAIL - HIGH COST**

**ROKU - 2019/09/04**

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	AQR	CREDIT SUISSE	09/04/2019 09:30:00	09/04/2019 16:00:00	4,481	166.0333	165.4638	+2,552	+56.95	0.14	0.02



**NOTES**

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.07% of your market impact cost.



(+) = Cost

TRADE LEVEL DETAIL - LOW COST

ACAD - 2019/09/09

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	WEATHERBIE	ITG	09/09/2019 09:30:00	09/09/2019 16:00:00	16,180	38.7208	39.3501	10,182	62.93	-0.28	0.07



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 5.99% of your market impact savings.



(+) = Cost

TRADE LEVEL DETAIL - LOW COST

EVBG - 2019/08/06

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Sell	WEATHERBIE	ITG	08/06/2019 09:30:00	08/06/2019 16:00:00	2,092	88.3331	83.7660	9,554	456.71	-2.12	0.08



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 5.62% of your market impact savings.





(+) = Cost

TRADE LEVEL DETAIL - LOW COST

TER - 2019/07/24

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Sell	DALTON, GREINER, HARTMAN, MAHER	CAPITAL INSTL SVCS	07/24/2019 09:30:00	07/24/2019 16:00:00	4,139	57.0882	56.0852	4,152	100.30	-0.75	0.03



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 2.44% of your market impact savings.

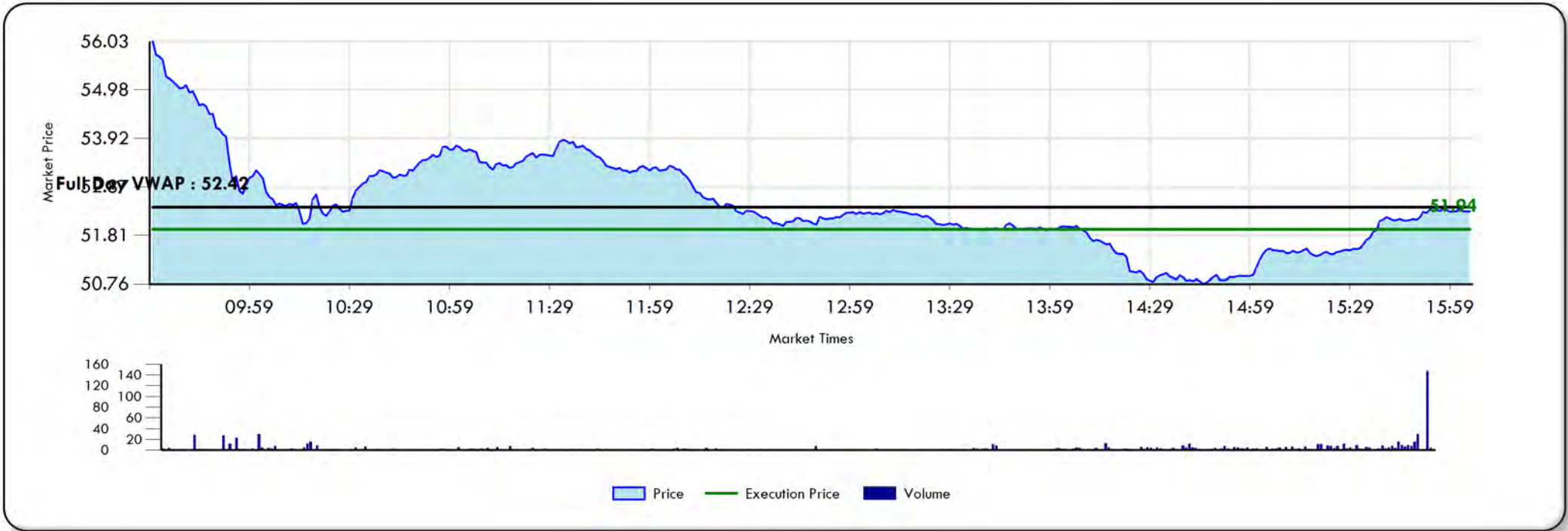


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

RPD - 2019/09/09

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	WEATHERBIE	THEMIS TRADING LLC	09/09/2019 09:30:00	09/09/2019 16:00:00	7,147	51.9394	52.4205	3,438	48.11	-0.47	0.65



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 2.02% of your market impact savings.

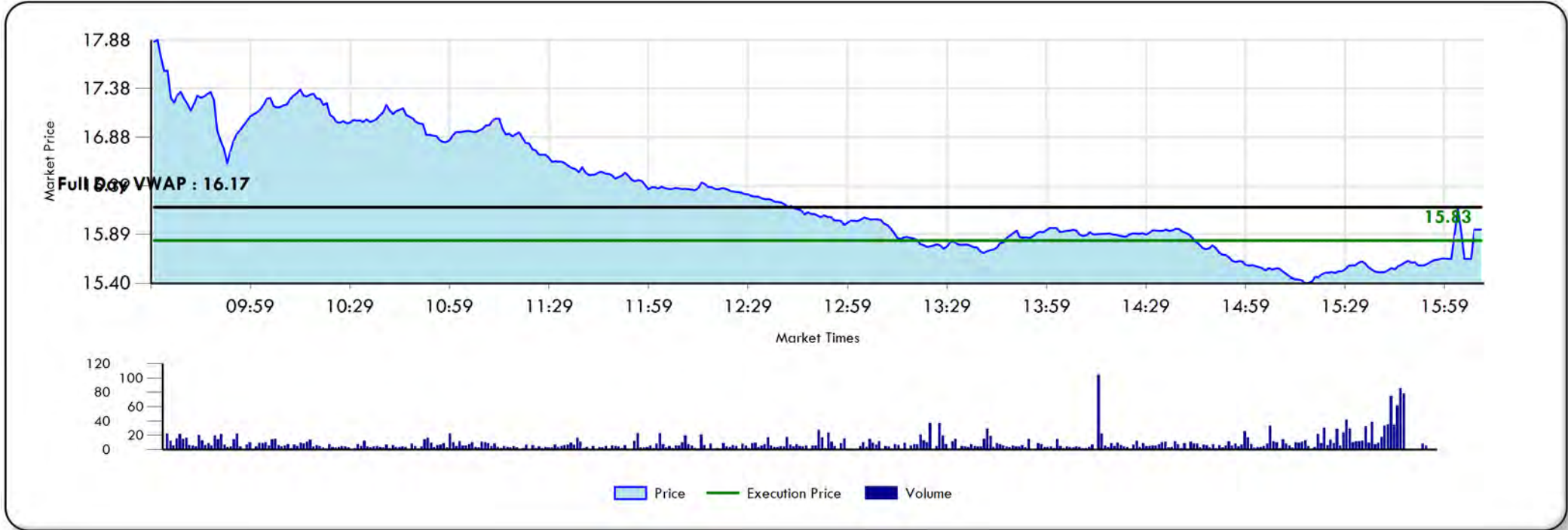


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

OII - 2019/07/25

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	DALTON, GREINER, HARTMAN, MAHER	INSTINET	07/25/2019 09:30:00	07/25/2019 16:00:00	8,841	15.8287	16.1686	3,005	33.99	-0.56	0.26



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.77% of your market impact savings.

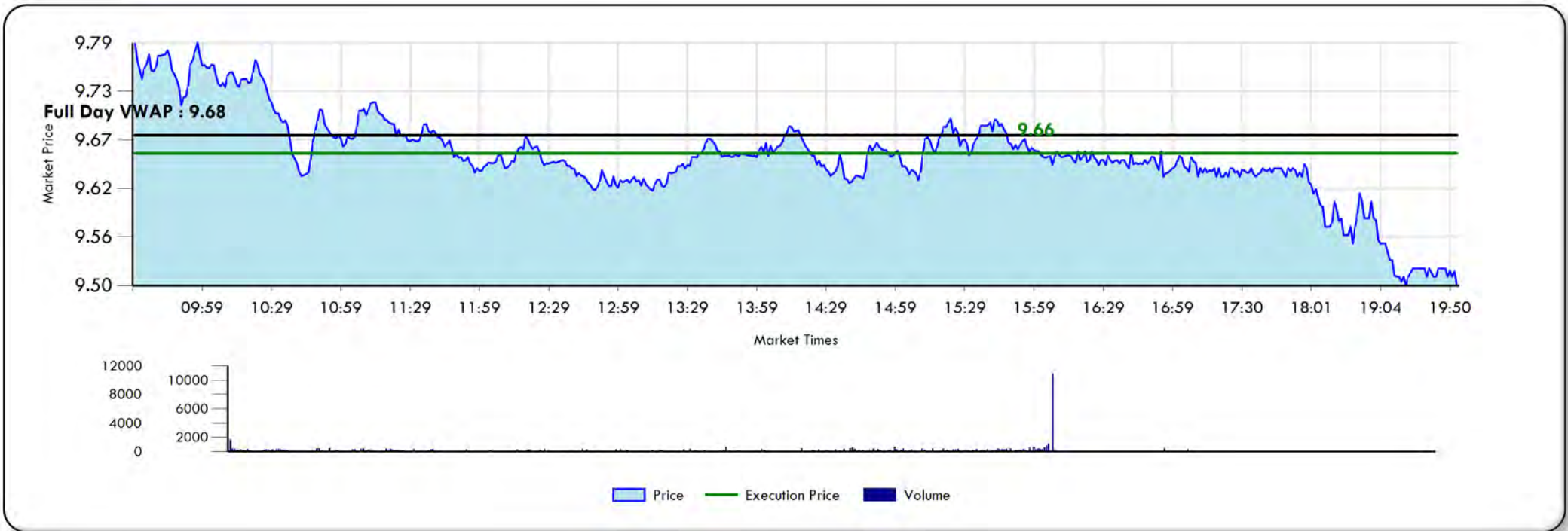


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

GE - 2019/08/05

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	EAGLE CAPITAL MANAGEMENT	MERRILL LYNCH	08/05/2019 09:30:00	08/05/2019 16:00:00	129,882	9.6582	9.6799	2,813	2.17	-0.27	0.18



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.65% of your market impact savings.

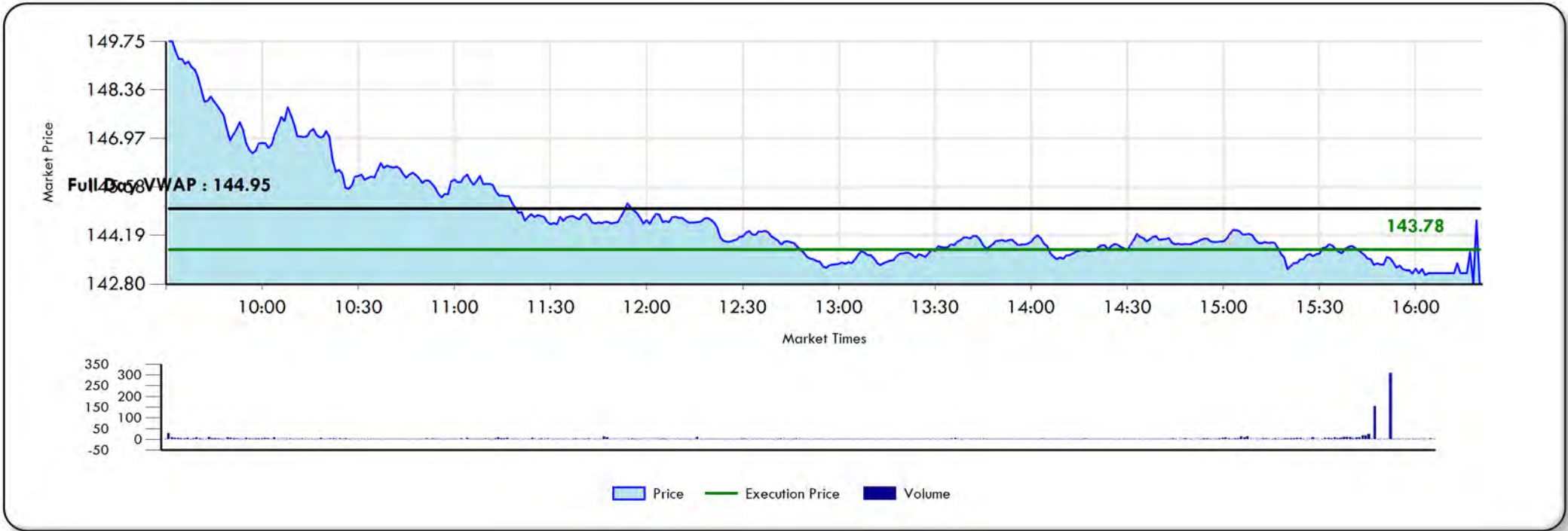


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

W - 2019/07/01

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	WEATHERBIE	THEMIS TRADING LLC	07/01/2019 09:30:00	07/01/2019 16:00:00	2,237	143.7786	144.9543	2,630	117.57	-0.66	0.16



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.55% of your market impact savings.



(+) = Cost

TRADE LEVEL DETAIL - LOW COST

URBN - 2019/08/01

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	DALTON, GREINER, HARTMAN, MAHER	CAPITAL INSTL SVCS	08/01/2019 09:30:00	08/01/2019 16:00:00	4,778	22.0279	22.5570	2,528	52.91	-0.69	0.18



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.49% of your market impact savings.

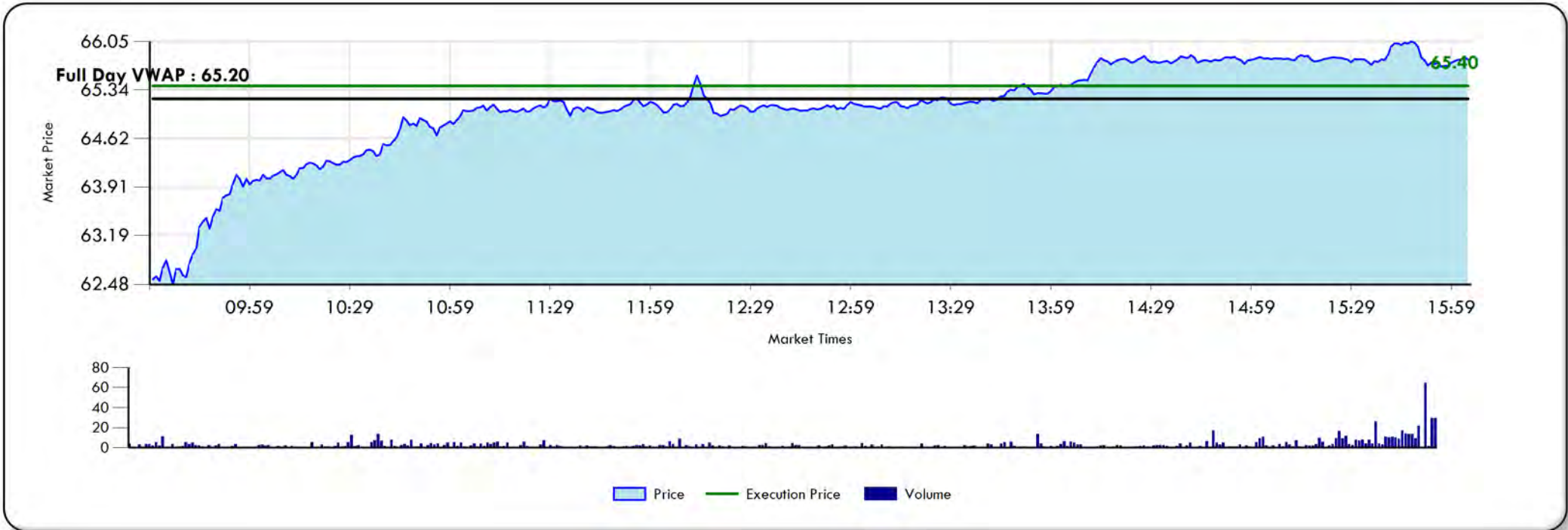


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

GKOS - 2019/08/29

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Sell	WEATHERBIE	ITG	08/29/2019 09:30:00	08/29/2019 16:00:00	12,237	65.3951	65.2048	2,329	19.03	-0.26	1.11



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.37% of your market impact savings.

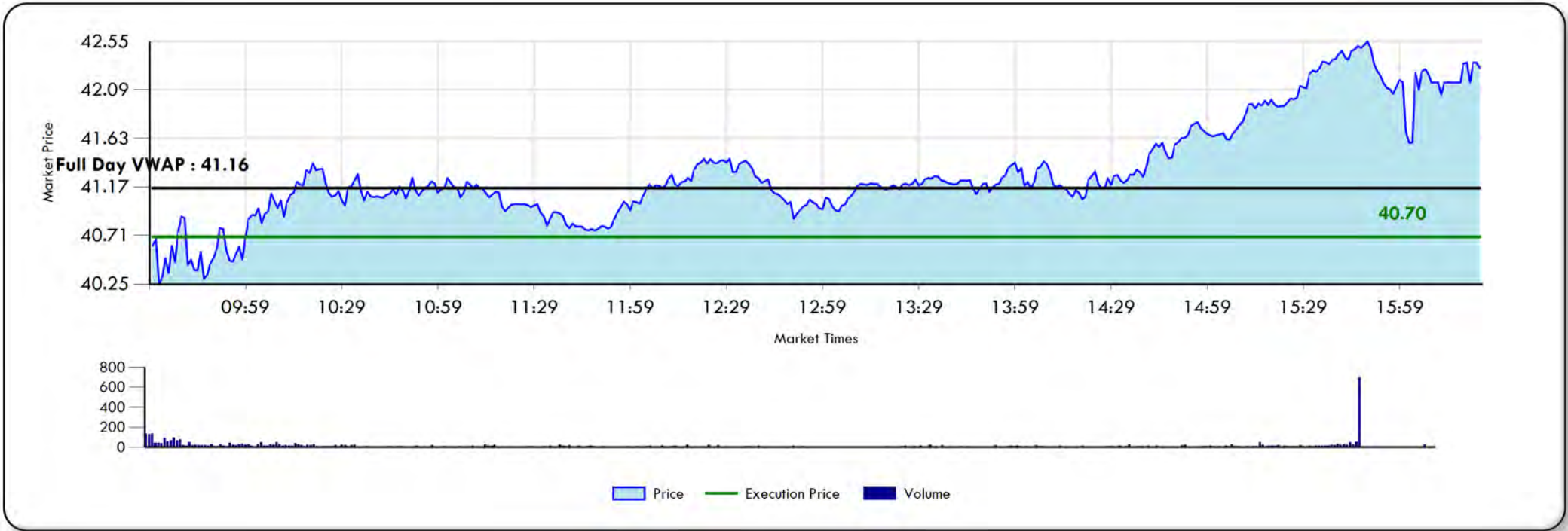


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

ACAD - 2019/09/18

Side	Manager	Broker	Time In (EST)	Time Out (EST)	Shares	Client Price (USD)	Full Day VWAP (USD)	Cost Full Day VWAP (USD)	Cost Full Day VWAP (cps)	E - Score	Volume (%)
Buy	WEATHERBIE	LIQUIDNET	09/18/2019 09:30:00	09/18/2019 16:00:00	4,691	40.6977	41.1604	2,171	46.27	-0.96	0.08



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.28% of your market impact savings.



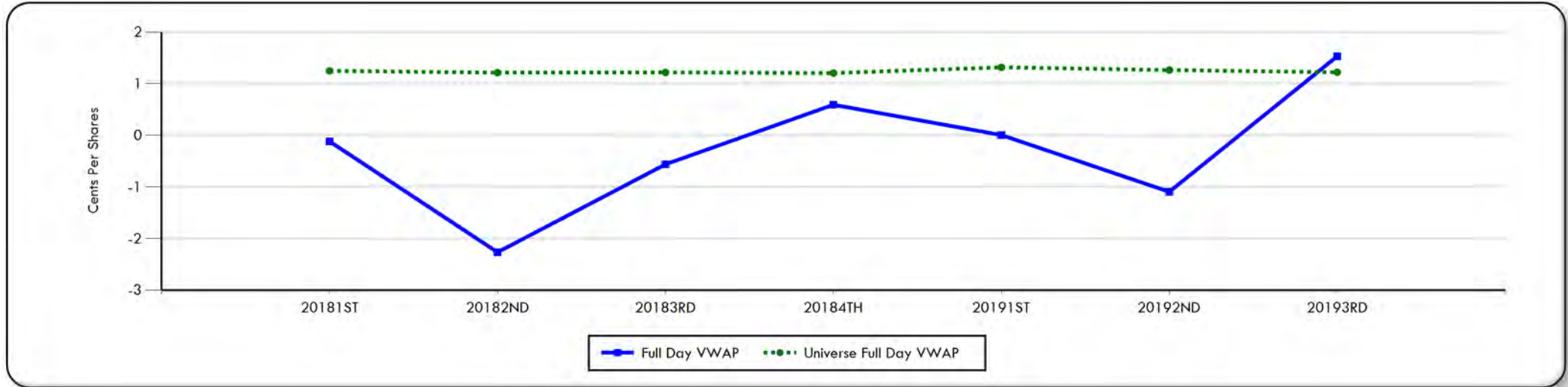


(+) = Cost

**TRADE HISTORY**

**Trade History**

Period	Total Shares	Total Dollars Traded	Commission		Full Day VWAP (cps)	Full Day VWAP Universe Rank (%)
			(cps)	(\$)		
20181ST	3,617,136	158,343,996	+2.72	98,459	0.12	81
20182ND	4,581,935	191,343,600	+2.09	95,937	2.27	93
20183RD	1,200,559	52,564,669	+3.35	40,162	0.56	80
20184TH	3,436,466	183,217,997	+1.71	58,637	+0.59	61
20191ST	4,459,275	188,723,176	+2.03	90,386	+0.00	69
20192ND	3,647,786	171,841,719	+1.45	52,944	1.10	81
20193RD	4,500,167	228,793,910	+1.16	52,110	+1.53	46



**Note on Universes:**

Universes constructed of preferred securities are exclusive of fixed income transactions such as convertible bonds

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## SACRAMENTO COUNTY

Trade Cost Summary - Global Equity Trading

Period End September 30, 2019





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(+) = Cost

## EXECUTIVE SUMMARY

Elkins/McSherry has been providing trading cost analysis to institutional investors since 1991, serving many of the world's largest investment managers, pension funds, banks, and broker dealers. Using this vast experience combined with an unmatched collection of global equity market and Universe data, Elkins/McSherry has produced a Trading Cost Analysis on behalf of SACRAMENTO COUNTY. This study evaluates global equity executions from July 1, 2019 to September 30, 2019. The analysis included trading of 6,595,563 shares representing \$79.52 million in principal across 23 countries.

### Methodology :

The Elkins/McSherry analysis measures trading efficiency by quantifying the cost of brokerage commission, fees, and execution quality versus an Full Day VWAP benchmark for each of the securities traded. These data have been separated to summarize results, by Buy/Sell, Commissions, Market Impact, Short Term Alpha, Market Cap, Country, Trade Difficulty, and Highest and Lowest Cost Trades. These results are quantified in \$ and Basis Points (BP) as well as being displayed graphically to highlight the outcomes.

### Results :

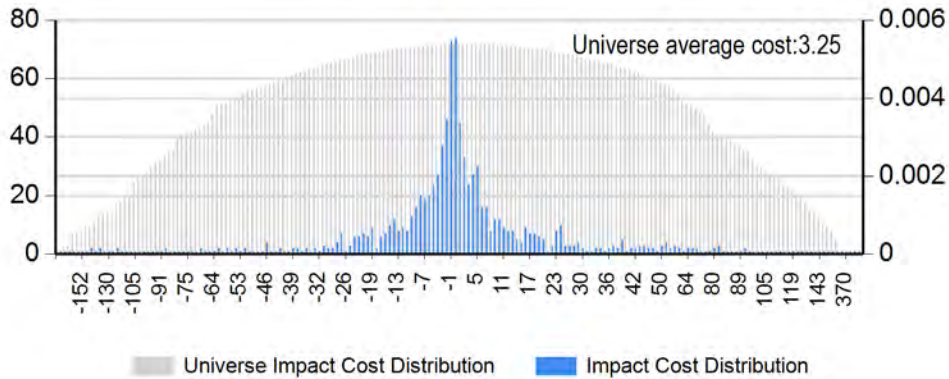
BENCHMARK PERFORMANCE			
Commission	Fees	Full Day VWAP	E - Score
<ul style="list-style-type: none"> <li>Your commission cost was +5.84 bp or \$ +\$46,464 (8.48 bp better than the Elkins/McSherry Universe)</li> </ul>	<ul style="list-style-type: none"> <li>Your fee cost was +3.19 bp or \$ +25,328 (+0.14 bp worse than the Elkins/McSherry Universe)</li> </ul>	<ul style="list-style-type: none"> <li>Your market impact cost was +1.14 bp or \$+9,081 (2.11 bp better than the Elkins/McSherry Universe)</li> <li>Your overall trading cost of +10.17 bp was 10.44 bp better than the Elkins/McSherry Universe.</li> <li>Sacramento County trading was higher than the Elkins/McSherry Universe in 7 countries and lower than the Elkins/McSherry Universe in 19 countries.</li> <li>10 of your brokers had trading cost higher than summary universe of countries (principal weighted) in which they traded. 32 of your brokers had lower trading cost.</li> </ul>	<ul style="list-style-type: none"> <li>E - Score : 0.02</li> </ul>



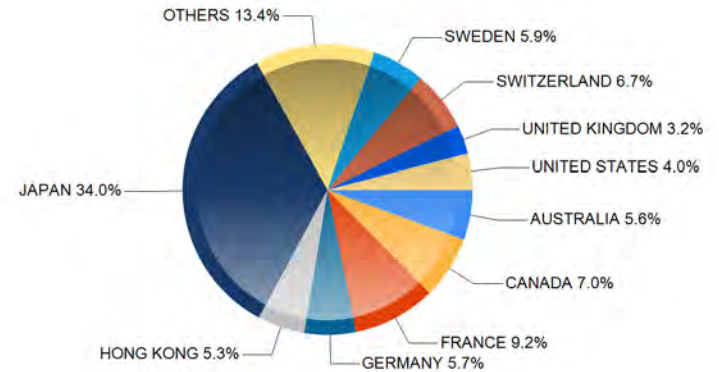
(+) = Cost

**EXECUTIVE SUMMARY**

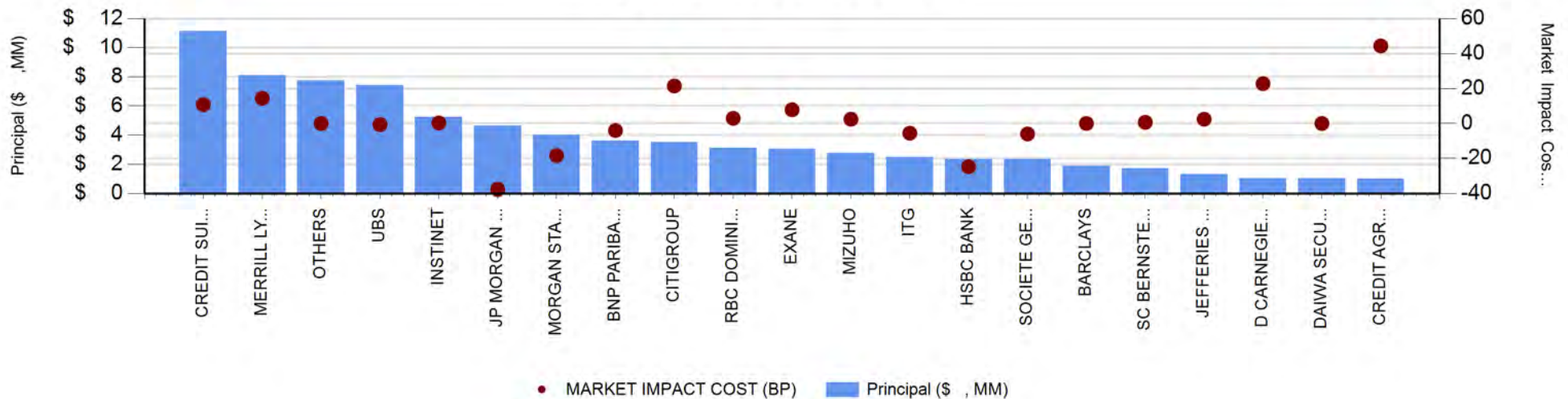
**Cost Distribution**



**Principal Across Country**



**Top 20 Brokers in Principal Traded**





(+) = Cost

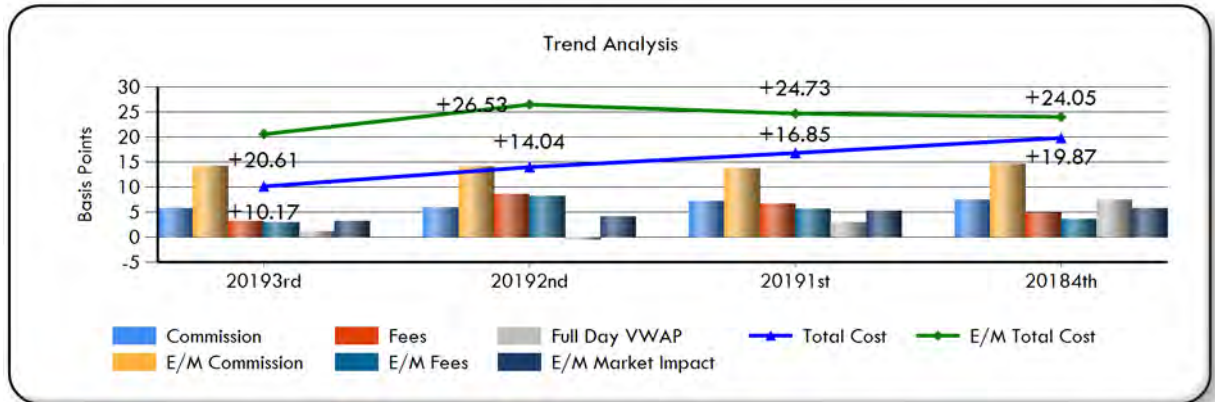
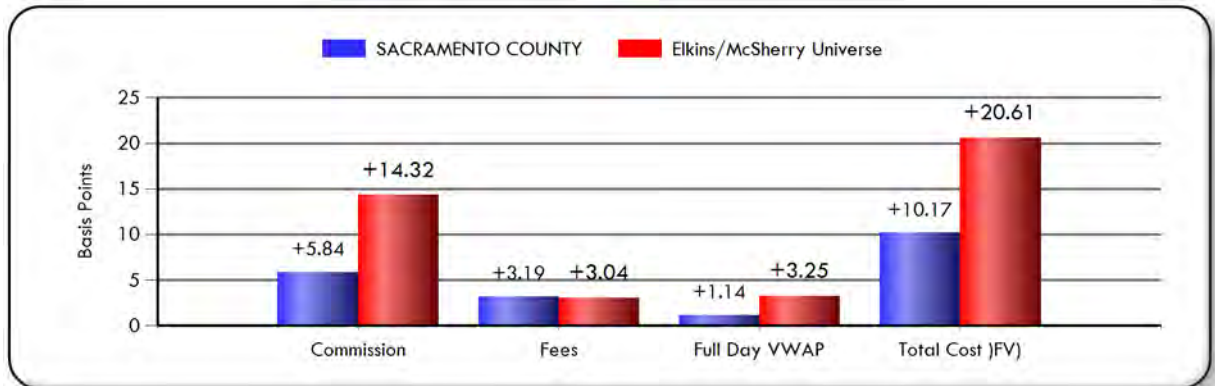
**EXECUTIVE SUMMARY**

**TOTAL PORTFOLIO COST PERFORMANCE**

Side	COMMISSION			Fees		MARKET IMPACT		Total Cost	Total Cost/Savings Vs. Universe	E - Score
	Your Avg. Commission	Bundled Universe	All Trading Universe	Fees	Universe	Full Day VWAP	Universe Full Day VWAP		Commission+Fees Full Day VWAP	
	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)	
Sell	+5.86	+14.45	+3.03	+1.13	+1.15	+3.75	+3.33	+10.74	8.19	0.07
Buy	+5.82	+14.19	+2.97	+5.24	+4.93	1.47	+3.17	+9.60	12.69	-0.03
<b>Total</b>	+5.84	+14.32	+3.00	+3.19	+3.04	+1.14	+3.25	+10.17	10.44	0.02

**TRADING COMPONENTS**

	Buys	Sells
Trade Principal	39,741,571	39,773,483
Shares	2,572,994	4,022,569
Unique Names	92	58
Liquidity (% POV)	0.198	0.377
Avg. Order Size	5,294	7,950
Avg. Order Completion Time (min)	N/A	N/A
Total Number of Trades	486	506





(+) = Cost

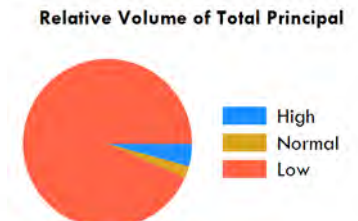
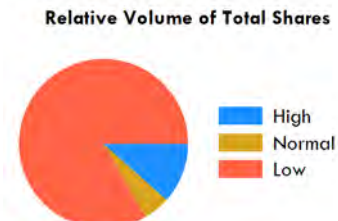
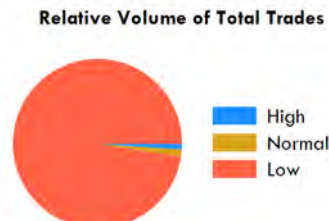
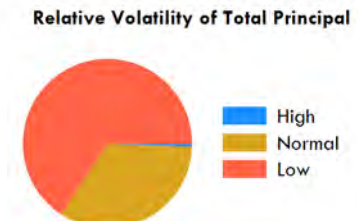
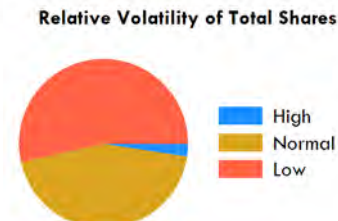
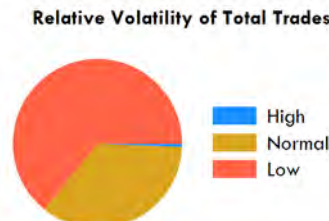
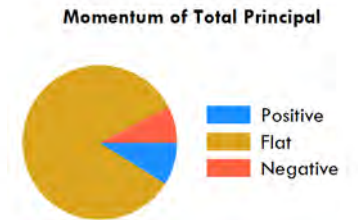
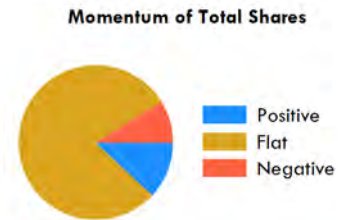
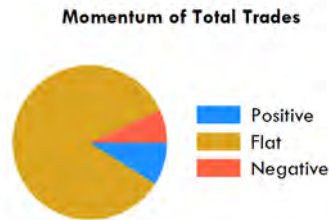
**EXECUTIVE SUMMARY**

**Market Metrics Summary**

Momentum	Positive			Flat			Negative		
	Trades	Shares	Principal	Trades	Shares	Principal	Trades	Shares	Principal
% Of Total									
Buys	5%	4%	6%	41%	32%	40%	3%	3%	3%
Sells	4%	8%	3%	43%	47%	43%	4%	6%	4%
Total	9%	12%	9%	84%	79%	84%	7%	9%	8%

Relative Volatility	High			Normal			Low		
	Trades	Shares	Principal	Trades	Shares	Principal	Trades	Shares	Principal
% Of Total									
Buys				17%	17%	19%	32%	22%	31%
Sells	1%	2%	1%	18%	27%	14%	32%	31%	35%
Total	1%	2%	1%	35%	44%	34%	64%	53%	66%

Relative Volume	High			Normal			Low		
	Trades	Shares	Principal	Trades	Shares	Principal	Trades	Shares	Principal
% Of Total									
Buys	1%	1%	2%	1%	1%	1%	48%	37%	47%
Sells	0%	11%	2%	1%	4%	2%	50%	46%	46%
Total	1%	12%	4%	1%	5%	2%	98%	83%	93%



**NOTES**

**MOMENTUM:** One-day open to close pricing trend of a security

Positive - Greater than +2%

Flat - Within a +2% and -2% range

Negative - Price decrease is more negative than -2%

**RELATIVE VOLATILITY:** The standard deviation of price relative to the one-day average price

High - Greater than 20%

Normal - Between 5% and 20%

Low - Less than 5%

**RELATIVE VOLUME:** Executed shares relative to the one-day total market volume

High - Greater than 10%

Normal - Between 5% and 10%

Low - Less than 5%





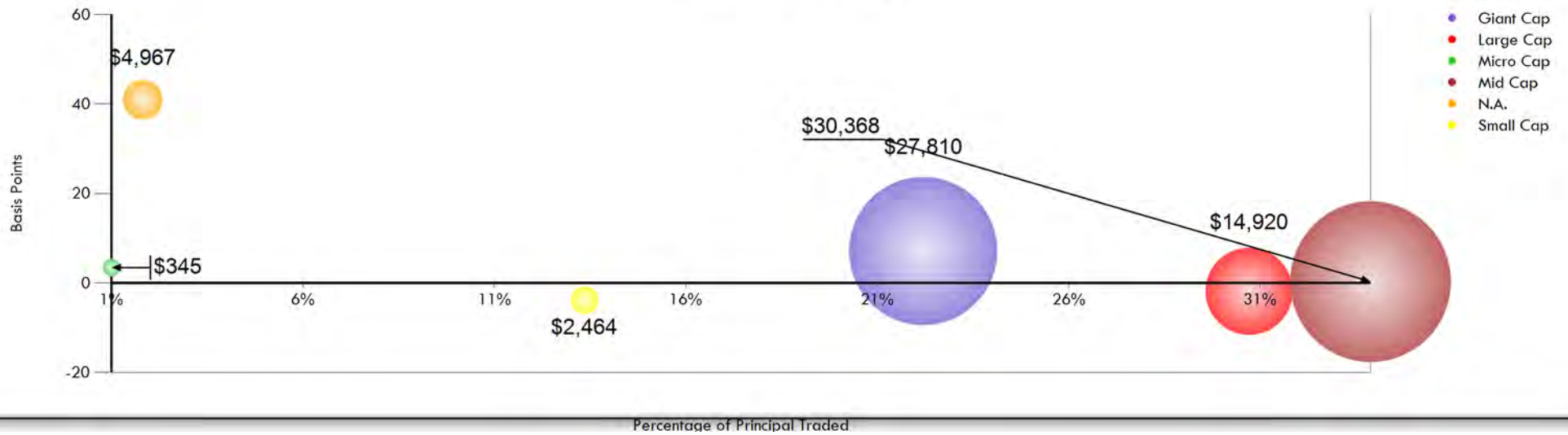
(+) = Cost

**EXECUTIVE SUMMARY**

**MARKET CAPITALIZATION**

Market Cap	% Traded	Avg. Principal Per Order	COMMISSION		MARKET IMPACT		Total Cost	Total Cost/Savings	E - Score	Market Cap Definition
			Your Commission	Bundled Universe	Full Day VWAP	Universe Full Day VWAP				
	(%)	(\$)	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)		
Mid Cap	33.39 %	74,158	+6.29	+14.17	+0.28	+3.57	+11.44	11.05	0.04	\$1 Billion To \$5 Billion
Large Cap	30.22 %	98,069	+5.93	+14.16	1.87	+3.21	+6.21	13.24	-0.05	\$5 Billion To \$25 Billion
Giant Cap	21.71 %	103,971	+5.11	+14.95	+7.13	+2.53	+16.11	4.72	0.11	Over \$25 Billion
Small Cap	12.86 %	49,407	+5.71	+14.01	3.85	+3.71	+2.41	16.09	-0.11	\$250 Million To \$1 Billion
N.A.	1.32 %	116,760	+6.16	+14.87	+40.95	+2.86	+47.10	+29.36	0.72	
Micro Cap	0.51 %	57,448	+5.15	+13.24	+3.43	+4.77	+8.58	9.45	0.22	Under \$250 Million

**Total Cost by Market Cap**





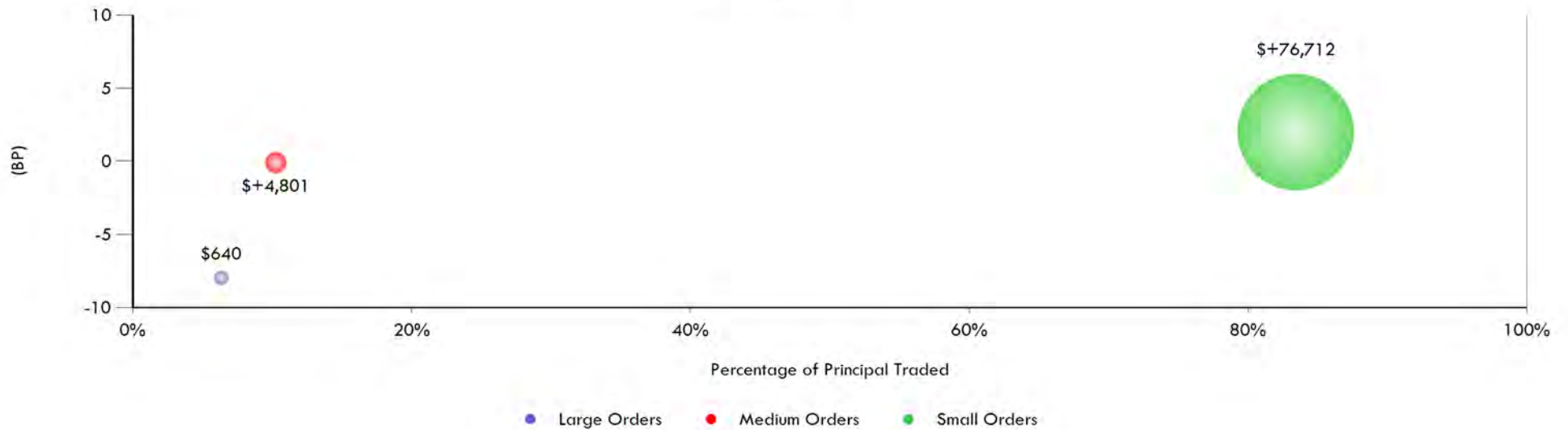
(+) = Cost

**EXECUTIVE SUMMARY**

**ORDER SIZE EVALUATION**

Order Size	Total # Of Orders	Avg. Principal Per Order (\$)	Avg. Order Completion Time (min)	COMMISSION		MARKET IMPACT		Total Cost	Total Cost/Savings	E - Score	Absolute Size (Principal)
				Your Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	(bp)	Commission+Fees +Full Day VWAP Vs. Universe (bp)		
Large Orders	3	1,679,498	N/A	+5.41	+15.32	7.97	+3.31	1.26	21.01	-0.21	1M or Greater
Medium Orders	12	679,606	N/A	+5.98	+14.28	0.11	+2.92	+5.88	11.34	0.07	Between 500k - 1M
Small Orders	977	67,883	N/A	+5.86	+14.25	+1.99	+3.29	+11.54	9.55	0.03	500K or Less

**Total Cost By Order Size**





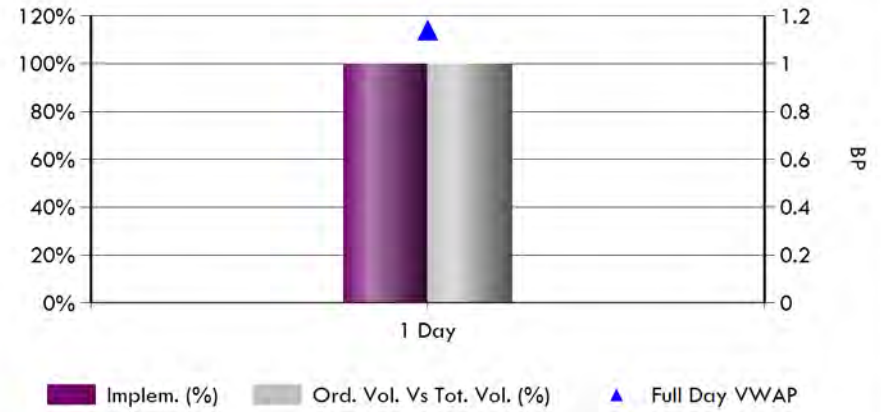
(+) = Cost

**EXECUTIVE SUMMARY**

**IMPLEMENTATION DAYS BY TRADE**

Period	Percent Traded (%)	Order Vol. Vs Total Vol. (%)	Full Day VWAP (bp)	E - Score
1 Day	100.00	100%	+1.14	0.02

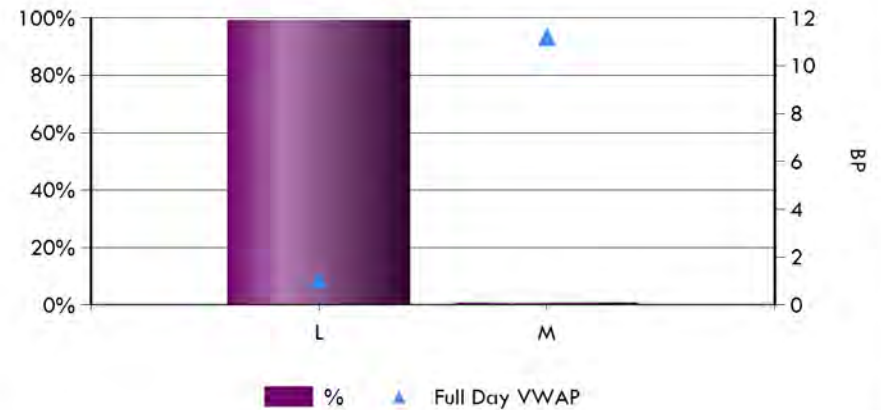
**Implementation Days**



**TRADE DIFFICULTY**

Methodology	Liquid. Cat.	Percent Traded (%)	Full Day VWAP (bp)	E - Score
0%~20% of daily vol.	L	99%	+1.07	0.01
20%~50% of daily vol.	M	1%	+11.22	0.38

**Avg. % of Daily Volume**



**EXECUTIVE SUMMARY**

**COUNTRY PERFORMANCE**

Country	Principal (\$ Millions)	Total Principal Traded (%)	COMMISSION		FEES		MARKET IMPACT		Total Cost Diff. From Universe (bp)	E - Score
			Commission (bp)	Bundled Universe Commission (bp)	Fees (bp)	Universe Fees (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)		
<b>HIGHEST COST COUNTRIES - Total Cost Universe Difference</b>										
ISRAEL	<1	0.39%	+14.38	+14.14	+0.00	+0.02	+29.90	+2.99	+27.14	0.50
SOUTH AFRICA - SELLS	<1	0.36%	+7.57	+15.37	+0.05	+0.04	+25.99	+2.81	+15.39	0.56
IRELAND - SELLS	<1	0.59%	+9.91	+14.45	+0.15	+0.00	+30.56	+12.95	+13.21	0.84
PHILIPPINES - SELLS	<1	0.31%	+15.00	+21.91	+64.00	+63.05	+18.25	+0.90	+11.39	0.38
BRAZIL	1	1.75%	+11.55	+14.18	+3.18	+2.31	+16.98	+5.38	+9.85	0.22
AUSTRALIA	4	5.58%	+5.76	+13.17	+0.00	+2.01	+18.84	+2.78	+6.64	0.26
ITALY - SELLS	<1	1.14%	+10.52	+13.07	+0.00	+0.00	+14.77	+5.72	+6.50	0.46

## EXECUTIVE SUMMARY

### COUNTRY PERFORMANCE

Country	Principal (\$ Millions)	Total Principal Traded (%)	COMMISSION		FEES		MARKET IMPACT		Total Cost Diff. From Universe (bp)	E - Score
			Commission (bp)	Bundled Universe Commission (bp)	Fees (bp)	Universe Fees (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)		
<b>LOWEST COST COUNTRIES - Total Cost Universe Difference</b>										
IRELAND - BUYS	<1	0.08%	+3.00	+19.43	+100.21	+100.00	110.94	+2.15	129.31	-2.14
PORTUGAL	<1	0.52%	+10.78	+14.00	+0.00	+0.01	68.60	+5.18	77.01	-1.38
U.K. - SELLS	<1	1.05%	+3.04	+14.46	+0.19	+0.00	10.47	+10.21	31.91	-0.23
U.K. - BUYS	2	2.14%	+6.32	+15.58	+41.11	+35.58	26.18	+1.59	31.51	-0.14
FINLAND	<1	0.26%	+8.00	+13.79	+0.00	+0.01	19.15	+4.94	29.89	-0.89
SWEDEN	5	5.85%	+7.46	+13.82	+0.00	+0.01	17.43	+1.04	24.84	-0.11
FRANCE - BUYS	3	4.08%	+4.52	+13.61	+30.00	+30.00	9.59	+2.39	21.07	-0.19
SINGAPORE	2	2.29%	+5.12	+18.87	+4.00	+3.43	+0.87	+1.58	13.88	0.02
GERMANY	5	5.73%	+4.87	+13.58	+0.00	+0.02	1.90	+3.01	13.64	-0.05
DENMARK	2	2.52%	+7.13	+13.85	+0.00	+0.01	2.14	+4.45	13.32	-0.13
JAPAN	27	34.04%	+5.63	+13.62	+0.00	+0.02	0.71	+4.13	12.86	-0.06
NORWAY	1	1.43%	+6.04	+13.24	+0.00	+0.02	+0.83	+4.77	11.16	-0.02
U.S.	3	3.99%	+1.98	+14.42	+0.14	+0.07	+4.94	+1.77	9.21	-0.04
INDIA	<1	0.66%	+10.81	+18.05	+11.95	+11.08	+0.70	+1.98	7.65	-0.04
CANADA	6	7.03%	+4.22	+15.34	+0.00	+0.01	+8.10	+3.05	6.09	0.24
NETHERLANDS	<1	1.05%	+5.25	+14.18	+0.00	+0.08	+6.60	+2.88	5.29	0.12
SWITZERLAND	5	6.72%	+8.01	+13.69	+0.00	+0.01	+3.31	+2.74	5.12	0.09
FRANCE - SELLS	4	5.16%	+4.62	+14.54	+0.00	+0.00	+9.66	+2.46	2.72	0.17
HONG KONG	4	5.29%	+5.49	+18.48	+10.78	+8.76	+10.84	+1.11	1.24	0.22



(+) = Cost

**TRADE CYCLE DETAIL**

**3 LOWEST COST MANAGER (Full Day VWAP)**



Manager	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION		MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission +Fees+Full Day VWAP Vs. Universe (bp)	20192nd (bp)	20191st (bp)	20184th (bp)
LSV ASSET MANAGEMENT	32	504	40.42%	63,772	0.17	+4.73	+14.40	+11.13	+3.45	2.04	16.69	7.85	5.96
WILLIAM BLAIR & COMP	16	260	20.51%	62,729	0.03	+7.12	+14.70	+0.95	+2.89	9.17	11.86	+4.82	5.07
LAZARD ASSET MANAGEM	31	228	39.07%	136,248	-0.14	+6.32	+14.05	9.09	+3.23	19.80	10.97	12.73	3.45

**NOTES**

- Manager above made up 100.00 % of principal traded.



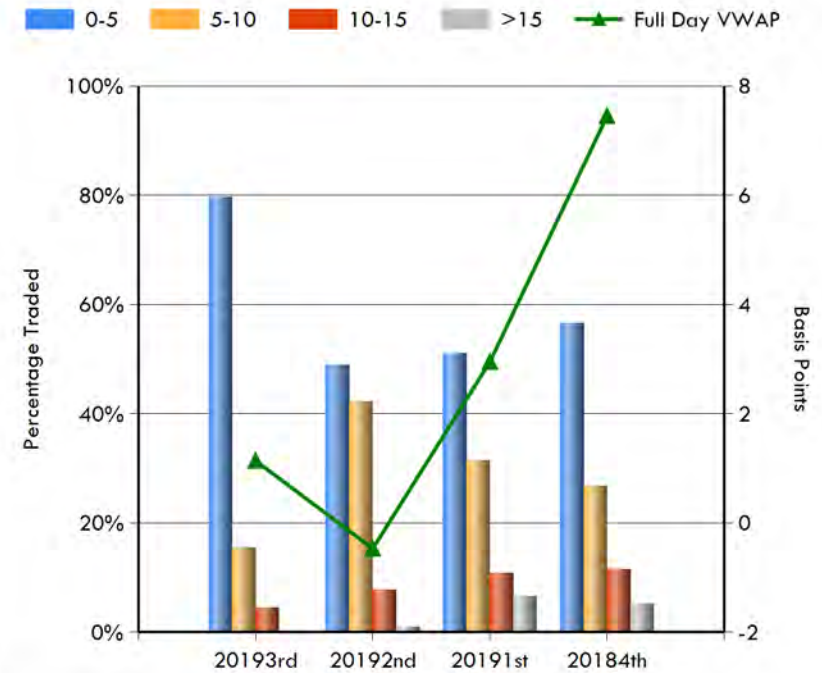
(+) = Cost

**COMMISSION REVIEW**

**COMMISSION REVIEW - Top 20 Brokers (Commission \$)**

Broker	Total Commission	Commission (bp)	Bundled Universe (bp)	All Trading Universe (bp)	Commission Trends		
					2019 2nd	2019 1st	2018 4th
CREDIT SUI	7,208	+6.47	+14.18	+2.96	+6.17	+8.13	+7.06
UBS	5,644	+7.60	+14.43	+3.01	+6.73	+5.10	+8.70
MERRILL LY	4,107	+5.06	+13.83	+2.88	+6.81	+6.43	+7.86
JP MORGAN	3,580	+7.70	+13.73	+2.89	+3.09	+11.77	+7.28
BNP PARIBA	2,704	+7.52	+14.14	+2.97	+7.99	+5.68	+8.23
MORGAN STA	2,557	+6.40	+16.55	+3.19	+7.77	+10.73	+5.52
INSTINET	2,086	+3.98	+13.65	+3.01	+3.77	+3.48	+3.63
BARCLAYS	1,575	+8.42	+14.09	+2.74	+3.58	+7.01	+5.21
CITIGROUP	1,523	+4.34	+14.99	+2.81	+4.52	+5.04	+10.47
EXANE	1,434	+4.69	+14.01	+2.78	+3.00	+7.00	+6.67
RBC DOMINI	1,407	+4.52	+15.34	+4.02	+4.65	+47.03	+24.39
MIZUHO	1,394	+5.03	+13.62	+2.99	+4.99	+7.45	+11.29
ITG	1,167	+4.69	+13.97	+3.07	+5.04	+5.06	+4.67
SOCIETE GE	1,118	+4.78	+13.88	+2.84	+4.98	+5.08	+4.59
HSBC BANK	834	+3.56	+14.90	+2.70	+3.00	+3.00	+4.14
JEFFERIES	807	+6.08	+14.37	+2.84	+5.94	+5.02	+5.07
D CARNEGIE	730	+7.00	+13.82	+3.00	+7.00	+7.00	+7.00
CREDIT AGR	662	+6.63	+14.52	+2.96	+15.00	+11.30	+10.37
BANCO PACT	555	+11.55	+14.18	+4.29	-	-	-
BANCO ITAU	523	+11.55	+14.18	+4.29	-	-	-

**Commission Category Trend**





(+) = Cost

**TRADE CYCLE DETAIL**

**MANAGER PERFORMANCE (FULL DAY VWAP)**



Manager	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION		MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission +Fees+Full Day VWAP Vs. Universe (bp)	2019 2nd (bp)	2019 1st (bp)	2018 4th (bp)
LSV ASSET MANAGEMENT	32	504	40.42%	63,772	0.17	+4.73	+14.40	+11.13	+3.45	2.04	16.69	7.85	5.96
LAZARD ASSET MANAGEM	31	228	39.07%	136,248	-0.14	+6.32	+14.05	9.09	+3.23	19.80	10.97	12.73	3.45
WILLIAM BLAIR & COMP	16	260	20.51%	62,729	0.03	+7.12	+14.70	+0.95	+2.89	9.17	11.86	+4.82	5.07

**NOTES**

- Manager above made up 100.00 % of principal traded.





(+) = Cost

**TRADE CYCLE DETAIL**

**BROKER PERFORMANCE (FULL DAY VWAP)**



Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission +Fees+Full Day VWAP Vs. Universe (bp)	2019 2nd (bp)	2019 1st (bp)	2018 4th (bp)
CREDIT SUISSE	11	129	14.01%	86,360	0.16	7,208	+6.47	+14.18	+10.80	+3.20	0.01	14.25	5.40	11.98
MERRILL LYNCH	8	80	10.21%	101,439	0.23	4,107	+5.06	+13.83	+14.46	+3.47	+2.30	4.72	2.71	11.57
UBS	7	107	9.34%	69,397	-0.02	5,644	+7.60	+14.43	0.70	+3.12	10.93	12.04	8.26	1.42
INSTINET	5	70	6.59%	74,884	0.05	2,086	+3.98	+13.65	+0.27	+4.11	13.53	12.45	23.01	+2.32
JP MORGAN CHASE	5	22	5.85%	211,331	-0.78	3,580	+7.70	+13.73	37.45	+3.80	46.68	19.56	20.82	+4.20
MORGAN STANLEY	4	20	5.02%	199,626	-0.18	2,557	+6.40	+16.55	18.45	+2.38	30.41	10.02	+6.62	13.79
BNP PARIBAS	4	37	4.52%	97,220	0.02	2,704	+7.52	+14.14	4.05	+3.48	14.18	95.73	2.41	31.96
CITIGROUP	4	79	4.41%	44,399	0.38	1,523	+4.34	+14.99	+21.48	+2.20	+8.79	+1.50	10.72	12.99
RBC DOMINION SECS	3	18	3.91%	172,888	0.25	1,407	+4.52	+15.34	+2.93	+3.05	10.95	17.59	+35.86	+75.90
EXANE	3	33	3.85%	92,758	0.14	1,434	+4.69	+14.01	+7.82	+2.54	4.04	14.08	4.03	56.62

**NOTES**

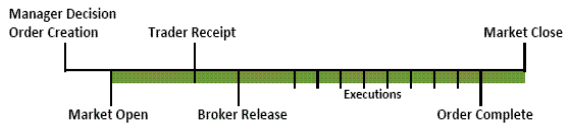
- Brokers above made up 67.71 % of principal traded.



(+) = Cost

**TRADE CYCLE DETAIL**

**BROKER PERFORMANCE (FULL DAY VWAP)**



Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission +Fees+Full Day VWAP Vs. Universe (bp)	2019 2nd (bp)	2019 1st (bp)	2018 4th (bp)
MIZUHO	3	58	3.48%	47,769	-0.05	1,394	+5.03	+13.62	+2.45	+4.13	10.29	8.69	14.79	+4.39
ITG	2	32	3.13%	77,759	-0.09	1,167	+4.69	+13.97	5.57	+3.24	17.58	8.91	21.98	7.24
HSBC BANK	2	58	2.94%	40,356	-0.50	834	+3.56	+14.90	24.73	+3.51	36.27	25.76	14.89	21.64
SOCIETE GENERALE	2	49	2.94%	47,736	-0.09	1,118	+4.78	+13.88	6.02	+2.79	17.93	20.98	30.94	16.55
BARCLAYS	2	30	2.35%	62,394	-0.11	1,575	+8.42	+14.09	0.01	+3.83	9.16	+7.46	0.51	+17.05
SC BERNSTEIN	2	8	2.14%	212,865	-0.12	226	+1.33	+14.67	+0.64	+2.01	14.59	15.00	43.17	+19.54
JEFFERIES & CO	1	19	1.67%	69,851	0.01	807	+6.08	+14.37	+2.41	+3.28	7.70	15.15	17.38	27.79
D CARNEGIE AG	1	13	1.31%	80,251	0.55	730	+7.00	+13.82	+22.81	+1.04	+14.94	+92.18	12.24	31.14
DAIWA SECURITIES	1	9	1.31%	115,665	0.00	520	+5.00	+13.62	0.03	+4.13	12.80	-	+0.35	23.28
CREDIT AGRICOLE	<1	17	1.26%	58,708	0.83	662	+6.63	+14.52	+44.60	+3.62	+33.32	21.38	9.51	16.45

**NOTES**

- Brokers above made up 22.54 % of principal traded.



(+) = Cost

**TRADE CYCLE DETAIL**

**BROKER PERFORMANCE (FULL DAY VWAP)**



Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission +Fees+Full Day VWAP Vs. Universe (bp)	2019 2nd (bp)	2019 1st (bp)	2018 4th (bp)
LIQUIDNET	<1	14	1.14%	64,672	0.00	380	+4.19	+14.78	+4.12	+2.43	8.84	+37.87	+41.28	20.01
KEPLER EQUITIES	<1	8	0.83%	82,951	-0.52	332	+5.00	+14.54	19.28	+2.46	31.28	-	-	+72.82
SVENSKA HANDELSBANKE	<1	10	0.79%	62,804	-0.20	440	+7.00	+13.70	20.39	+1.82	28.93	-	+149.28	26.45
SMBC SECURITIES INC	<1	7	0.73%	83,062	-0.18	316	+5.43	+13.62	8.08	+4.13	20.42	13.02	6.30	11.50
BANCO PACTUAL	<1	2	0.60%	240,079	0.44	555	+11.55	+14.18	+27.62	+5.38	+20.53	-	-	-
GOODBODY STOCKBROKER	<1	6	0.58%	76,535	0.85	459	+10.00	+14.45	+30.63	+12.95	+13.38	-	-	+31.79
ODDO SECS	<1	2	0.57%	228,326	0.46	228	+5.00	+13.61	+17.23	+2.39	+6.23	-	64.84	+13.10
BANCO ITAU SA	<1	3	0.57%	150,900	0.15	523	+11.55	+14.18	+23.19	+5.38	+16.00	-	-	-
CANTOR FITZGERALD	<1	2	0.56%	223,717	0.37	216	+4.83	+14.42	+12.33	+1.77	+0.89	-	0.88	23.10
GOLDMAN SACHS	<1	7	0.56%	63,761	0.31	227	+5.09	+14.92	+13.41	+1.86	+8.61	24.61	+25.51	+14.04

**NOTES**

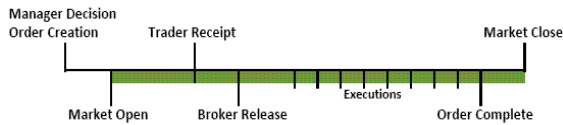
- Brokers above made up 6.94 % of principal traded.



(+) = Cost

**TRADE CYCLE DETAIL**

**BROKER PERFORMANCE (FULL DAY VWAP)**



Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission +Fees+Full Day VWAP Vs. Universe (bp)	2019 2nd (bp)	2019 1st (bp)	2018 4th (bp)
INDIA INFOLINE LTD	<1	4	0.46%	92,392	-0.03	443	+12.00	+18.05	1.76	+1.98	8.71	-	-	-
MACQUARIE	<1	7	0.42%	47,941	0.15	260	+7.76	+14.95	+8.58	+3.13	1.72	-	+35.72	10.94
SCOTIA CAPITAL	<1	11	0.41%	29,989	-0.68	116	+3.53	+15.34	9.23	+3.05	24.10	24.28	15.87	124.03
INVESTEC BANK	<1	5	0.35%	55,891	-0.01	196	+7.00	+15.58	39.50	+1.59	85.02	20.32	+16.64	62.54
NOMURA	<1	1	0.30%	240,139	N/A	120	+5.00	+13.62	0.11	+4.13	12.88	-	-	+15.84
MITSUBISHI UFJ SECS	<1	3	0.21%	55,596	0.13	100	+6.00	+13.62	+7.21	+4.13	4.56	21.29	-	-
PAREL	<1	1	0.17%	132,273	-0.52	66	+5.00	+13.82	6.21	+1.04	16.08	-	58.82	-
ENSKILDA SECURITIES	<1	2	0.16%	62,461	0.02	87	+7.00	+13.82	1.62	+1.04	9.49	22.72	39.23	-
JOH BERENBERG GOSSLE	<1	3	0.12%	32,877	-0.08	69	+7.00	+13.58	6.20	+3.01	15.81	18.41	+15.50	82.52
KNIGHT CAPITAL	<1	1	0.07%	58,560	0.09	5	+0.77	+14.42	+1.95	+1.77	13.55	-	-	-

**NOTES**

- Brokers above made up 2.69 % of principal traded.



(+) = Cost

**TRADE CYCLE DETAIL**

**BROKER PERFORMANCE (FULL DAY VWAP)**



Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission +Fees+Full Day VWAP Vs. Universe (bp)	20192nd	20191st	20184th
TOKYO MITSUBISHI	<1	1	0.06%	49,238	0.04	25	+5.00	+13.62	+1.32	+4.13	11.45	-	-	+14.53
BANK OF AMERICA	<1	4	0.06%	10,984	-0.14	18	+4.00	+15.34	1.17	+3.05	15.57	-	-	-

**NOTES**

- Brokers above made up 0.12 % of principal traded.



(+) = Cost

**TRADE CYCLE DETAIL**

**LAZARD ASSET MANAGEMENT PERFORMANCE (FULL DAY VWAP)**



Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission + Fees + Full Day VWAP Vs. Universe (bp)	2019 2nd (bp)	2019 1st (bp)	2018 4th (bp)
<b>GRAND TOTAL</b>	31	228	39.07%	136,248	-0.14	19,636	+6.32	+14.05	9.09	+3.23	19.80	10.97	12.73	3.45
JP MORGAN CHASE	4	11	5.05%	365,212	-0.86	2,980	+7.42	+13.64	42.60	+3.86	52.69	28.46	20.60	0.43
UBS	4	31	4.71%	120,865	-0.15	2,930	+7.82	+13.82	6.78	+4.14	16.91	11.81	29.50	8.89
RBC DOMINION SECS	3	11	3.34%	241,358	0.24	1,179	+4.44	+15.34	+1.57	+3.05	12.39	17.59	+35.86	+89.79
MERRILL LYNCH	3	22	3.27%	118,191	-0.06	1,820	+7.00	+13.65	7.32	+3.47	17.46	4.52	17.42	12.73
CREDIT SUISSE	2	13	2.78%	170,317	0.23	2,615	+11.81	+13.71	+6.22	+2.98	+1.33	3.38	+6.10	+5.81
HSBC BANK	2	28	2.19%	62,075	-0.64	521	+3.00	+14.45	25.70	+2.57	35.61	-	-	-
MORGAN STANLEY	2	10	2.12%	168,413	-0.62	1,059	+6.29	+14.27	47.32	+2.91	58.04	11.46	+38.64	16.89
ITG	2	13	2.02%	123,355	0.17	801	+5.00	+13.76	+1.01	+3.31	11.08	9.19	38.99	10.68
BARCLAYS	1	9	1.72%	151,556	-0.05	1,406	+10.31	+13.92	+5.00	+1.73	0.35	+10.52	+39.91	+20.23
SC BERNSTEIN	1	3	1.55%	410,896	-0.23	95	+0.77	+14.42	2.91	+1.77	18.21	+31.92	-	+27.11



(+) = Cost

**TRADE CYCLE DETAIL**

**LSV ASSET MANAGEMENT PERFORMANCE (FULL DAY VWAP)**



Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission + Fees + Full Day VWAP Vs. Universe (bp)	2019 2nd	2019 1st	2018 4th
<b>GRAND TOTAL</b>	32	504	40.42%	63,772	0.17	15,217	+4.73	+14.40	+11.13	+3.45	2.04	16.69	7.85	5.96
CREDIT SUISSE	8	109	10.11%	73,769	0.19	3,978	+4.95	+14.35	+14.62	+3.13	+2.21	27.40	18.00	28.23
MERRILL LYNCH	5	57	6.60%	92,031	0.36	2,098	+4.00	+13.95	+24.49	+3.35	+11.31	8.15	+23.41	16.03
INSTINET	4	42	5.03%	95,219	0.06	1,589	+3.97	+13.66	+0.16	+4.10	13.65	11.27	39.15	+24.35
CITIGROUP	3	77	4.19%	43,315	0.40	1,334	+4.00	+14.96	+23.91	+2.23	+10.13	+5.80	9.52	+3.27
MIZUHO	3	56	3.37%	47,915	-0.06	1,341	+5.00	+13.62	+2.36	+4.13	10.41	8.69	2.52	-
UBS	2	47	2.86%	48,338	0.12	1,136	+5.00	+14.82	+4.09	+2.27	8.72	32.75	4.17	2.99
MORGAN STANLEY	2	2	2.06%	818,505	0.18	818	+5.00	+18.85	+4.07	+1.63	10.84	-	24.00	17.36
BNP PARIBAS	2	17	2.04%	95,465	0.42	1,386	+8.54	+13.61	+26.08	+3.73	+16.81	44.65	+234.82	+14.22
EXANE	<1	23	1.24%	42,792	-0.37	394	+4.00	+13.61	15.81	+2.39	27.81	-	-	-
SOCIETE GENERALE	<1	13	0.77%	47,307	-0.55	308	+5.00	+13.61	25.48	+2.42	36.50	4.66	2.11	13.60



(+) = Cost

**TRADE CYCLE DETAIL**

**WILLIAM BLAIR & COMPANY PERFORMANCE (FULL DAY VWAP)**



Broker	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	COMMISSION			MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
						Commission (\$)	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission+Fees+Full Day VWAP Vs. Universe (bp)	2019 2nd (bp)	2019 1st (bp)	2018 4th (bp)
<b>GRAND TOTAL</b>	16	260	20.51%	62,729	0.03	11,611	+7.12	+14.70	+0.95	+2.89	9.17	11.86	+4.82	5.07
UBS	1	29	1.77%	48,507	0.11	1,578	+11.22	+15.42	+7.76	+1.80	+1.42	+0.70	6.66	+17.90
INSTINET	1	28	1.56%	44,382	0.03	497	+4.00	+13.62	+0.65	+4.13	13.12	14.21	5.61	24.59
BNP PARIBAS	1	15	1.46%	77,411	-0.34	806	+6.94	+15.25	24.72	+2.69	35.12	30.74	+34.19	12.05
EXANE	1	8	1.31%	130,532	-0.01	731	+7.00	+13.86	+2.85	+2.76	6.78	-	4.03	60.66
D CARNEGIE AG	1	13	1.31%	80,251	0.55	730	+7.00	+13.82	+22.81	+1.04	+14.94	+92.18	12.24	31.14
CREDIT SUISSE	<1	7	1.11%	126,496	-0.26	614	+6.93	+13.84	12.41	+4.32	23.46	46.10	+2.92	2.25
SOCIETE GENERALE	<1	21	0.93%	35,395	0.02	297	+4.00	+14.06	0.76	+2.78	13.65	16.83	51.57	1.54
MORGAN STANLEY	<1	8	0.84%	83,923	0.03	681	+10.14	+16.67	1.18	+2.91	9.09	3.20	+7.27	+16.60
ITG	<1	15	0.80%	42,440	-0.71	267	+4.19	+14.58	20.92	+2.99	32.33	7.87	3.15	1.75
JP MORGAN CHASE	<1	11	0.79%	57,451	-0.27	600	+9.49	+14.34	4.61	+3.48	8.33	+7.39	74.66	+60.26





(+) = Cost

**TRADE DETAIL ANALYSIS**

**Largest Principal Volume Traded**

							Market Impact
Name	# Orders	Shares	Net Principal (\$)	Principal (\$)	% of Volume	E - Score	Full Day VWAP (bp)
MATSUMOTOKIYOSHI HOLDINGS CO C	29	79,000	-2,731,436	2,731,436	0.51%	0.11	+3.95
ROGERS COMMUNICATIONS INC B CO	11	52,290	2,631,216	2,631,216	0.54%	0.12	0.03
IDEMITSU KOSAN CO LTD COMMON S	12	94,300	-2,423,700	2,423,700	0.39%	0.05	+5.73
BASF SE COMMON STOCK	25	35,600	2,317,653	2,317,653	0.04%	0.19	+5.96
ABB LTD REG COMMON STOCK CHF.1	16	119,215	-2,271,435	2,271,435	0.12%	0.05	+2.77
ZOZO INC COMMON STOCK	6	103,900	-726,619	2,118,912	0.16%	-0.38	20.66
CK HUTCHISON HOLDINGS LTD COMM	39	221,900	-1,976,936	1,976,936	0.12%	0.58	+20.69
HITACHI HIGH TECHNOLOGIES CO C	28	37,200	1,955,464	1,955,464	0.35%	0.32	+16.55
TOKYO ELECTRON LTD COMMON STOC	2	12,481	-1,866,374	1,866,374	0.25%	-1.46	80.85
CARLSBERG AS B COMMON STOCK DK	20	13,679	1,736,811	1,851,837	0.33%	-0.05	+0.16

**Names Most Traded - Total Orders (\$)**

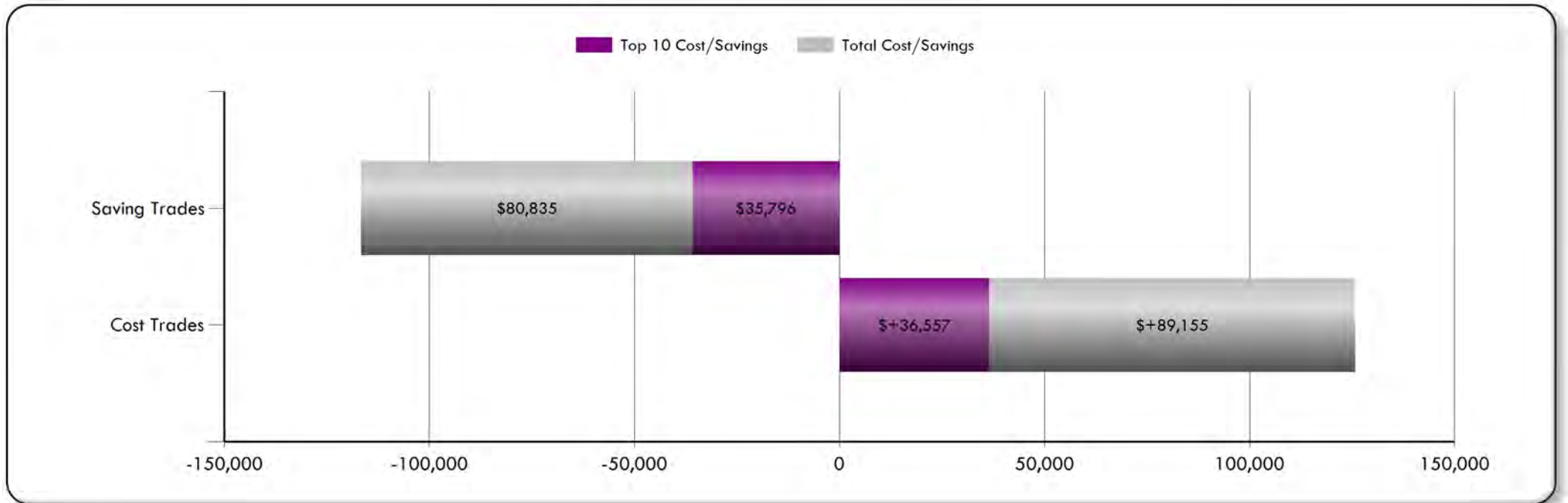
							Market Impact
Name	# Orders	Shares	Net Principal (\$)	Commission (bp)	% of Volume	E - Score	Full Day VWAP (bp)
CK HUTCHISON HOLDINGS LTD COMM	39	221,900	-1,976,936	+4.51	0.12%	0.58	+20.69
SUMITOMO CORP COMMON STOCK	32	94,400	-1,423,691	+4.53	0.06%	-0.06	1.31
RESTAURANT GROUP PLC COMMON ST	30	373,695	663,739	+3.00	1.50%	-0.29	13.50
MATSUMOTOKIYOSHI HOLDINGS CO C	29	79,000	-2,731,436	+5.74	0.51%	0.11	+3.95
HITACHI HIGH TECHNOLOGIES CO C	28	37,200	1,955,464	+4.49	0.35%	0.32	+16.55
WHEELLOCK + CO LTD COMMON STOCK	26	140,000	826,211	+4.59	0.48%	-0.19	5.80
BASF SE COMMON STOCK	25	35,600	2,317,653	+4.01	0.04%	0.19	+5.96
ASTELLAS PHARMA INC COMMON STO	25	58,200	-799,588	+5.09	0.04%	-0.12	+1.01
CARREFOUR SA COMMON STOCK EUR2	24	74,300	1,311,826	+4.98	0.26%	-0.25	7.67
NEXITY COMMON STOCK EUR5.0	24	23,100	-1,090,707	+4.52	2.40%	-0.51	21.62



(+) = Cost

**TRADE CONTRIBUTIONS**

Cost/Savings Performance				
Category	Principal (\$)	# of Trades	Avg. Market Impact (bp)	Percentage of all Cost/Savings
10 High Cost Trades	5,024,809	10	+101.96	29.08%
Cost Trades	41,561,811	499	+33.47	100.00%
Saving Trades	37,936,423	492	33.33	100.00%
10 Low Cost Trades	4,363,275	10	96.36	30.69%





(+) = Cost

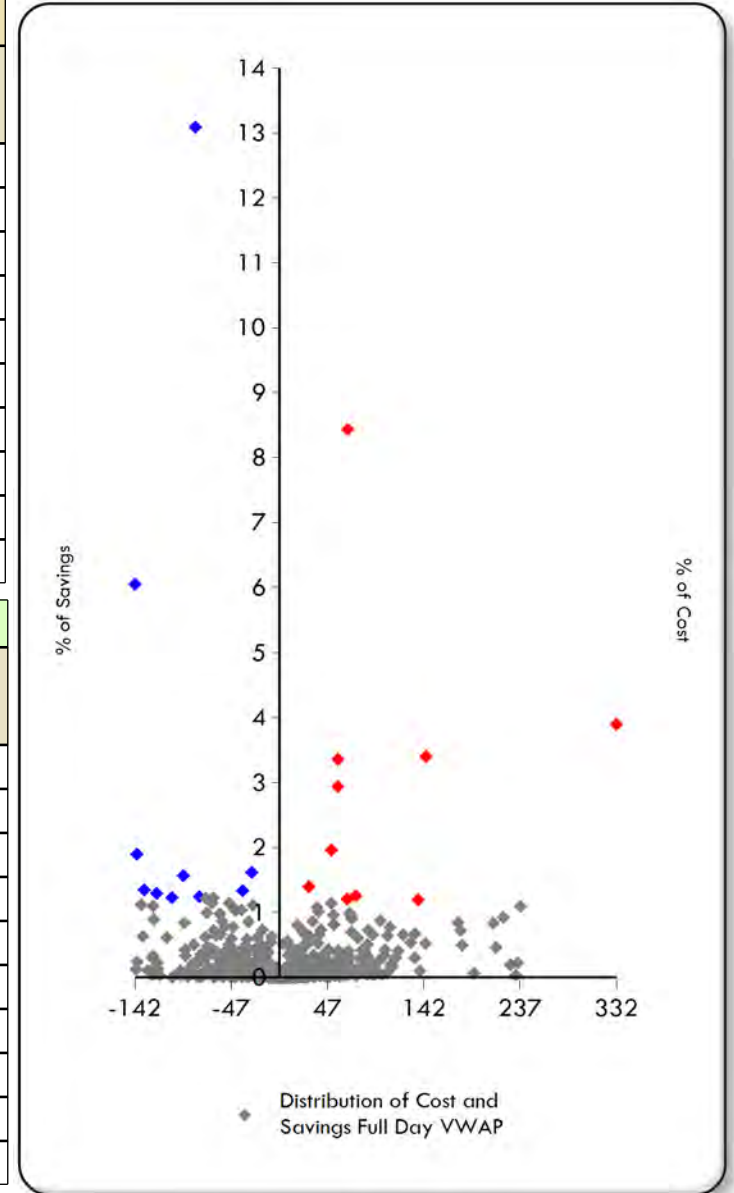
**TRADE LEVEL DETAILS**

**10 High Cost Trades (Full Day VWAP)**

Side	Country	Security	Trade Date	Principal (\$)	Cost (%)	E - Score	Full Day VWAP (bp)	Manager	Exbroker
Buy	JAP	KONICA MIN	20190805	1,581,458	8.43%	0.89	+67.50	LSV A	MERRI
Sell	JAP	NISSAN MOT	20190806	142,648	3.90%	1.46	+332.42	LSV A	CREDI
Buy	JAP	IDEMITSU K	20190808	300,216	3.40%	1.70	+144.62	LSV A	CREDI
Sell	CAN	TFI INTERN	20190712	729,366	3.36%	1.01	+57.66	LSV A	CREDI
Sell	FRA	SANOFI COM	20190712	637,590	2.94%	1.28	+57.70	LAZAR	EXANE
Buy	JAP	MATSUMOTOK	20190802	483,168	1.96%	1.10	+51.38	LSV A	BNP P
Buy	SWI	ABB LTD RE	20190815	604,730	1.40%	0.82	+29.19	LAZAR	CREDI
Sell	US	GLOBANT SA	20190808	208,483	1.26%	0.63	+75.42	WILLI	JEFFE
Sell	FRA	SANOFI COM	20190712	225,695	1.21%	1.49	+66.95	LAZAR	SOCIE
Buy	JAP	MATSUMOTOK	20190805	111,455	1.20%	1.32	+136.78	LSV A	INSTI

**10 Low Cost Trades (Full Day VWAP)**

Side	Country	Security	Trade Date	Principal (\$)	Savings (%)	E - Score	Full Day VWAP (bp)	Manager	Exbroker
Buy	JAP	TOKYO ELEC	20190702	1,827,019	13.09%	-1.51	82.89	LAZAR	JP MO
Sell	SWE	HEXAGON AB	20190917	502,305	6.05%	-1.53	142.45	LAZAR	MORGA
Buy	JAP	IDEMITSU K	20190819	155,531	1.90%	-1.46	140.58	LSV A	INSTI
Sell	JAP	ZOZO INC C	20190913	696,146	1.62%	-0.68	27.21	LAZAR	UBS
Buy	JAP	IDEMITSU K	20190806	191,501	1.57%	-0.82	94.70	LSV A	CREDI
Buy	UK	AVAST PLC	20190904	116,510	1.35%	-0.03	133.35	WILLI	JEFFE
Buy	JAP	MATSUMOTOK	20190819	428,815	1.34%	-1.05	36.22	LSV A	BNP P
Sell	NTH	POSTNL NV	20190808	126,355	1.30%	-0.83	121.20	LSV A	CREDI
Buy	SWE	ADDTECH AB	20190820	182,331	1.24%	-1.28	78.98	WILLI	BNP P
Sell	JAP	STANLEY EL	20190726	136,761	1.23%	-2.66	106.06	WILLI	ITG



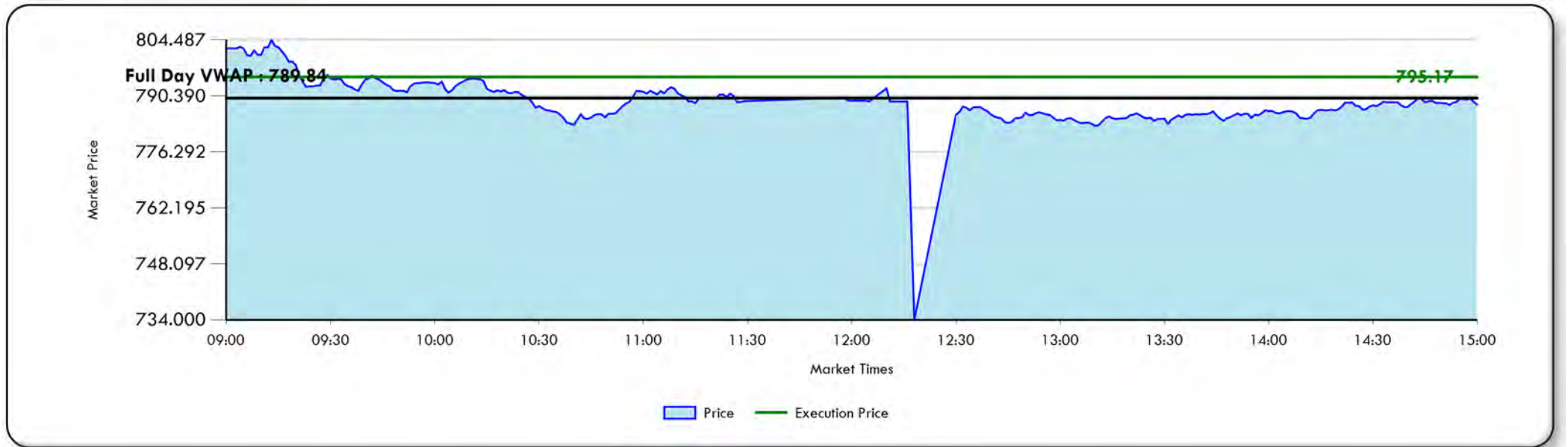


(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

KONICA MINOLTA INC COMMON STOC - 20190805

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LSV ASSET MANAGEMENT	MERRILL LYNCH	JAP	JPY	6496700	08/05/2019 09:00:00	08/05/2019 15:00:00	1,581,458	795.17	789.84	+10,603	+67.49	0.89	3.33



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 8.43% of your market impact cost.

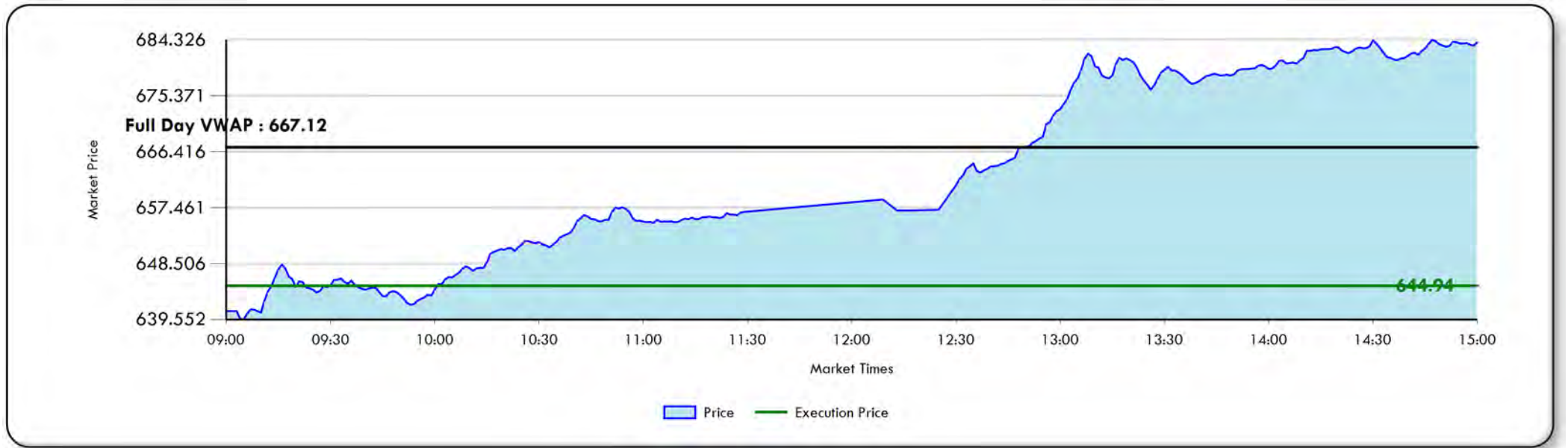


(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

NISSAN MOTOR CO LTD COMMON STO - 20190806

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	LSV ASSET MANAGEMENT	CREDIT SUISSE	JAP	JPY	6642860	08/06/2019 09:00:00	08/06/2019 15:00:00	142,648	644.94	667.12	+4,905	+332.41	1.46	0.10



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 3.90% of your market impact cost.

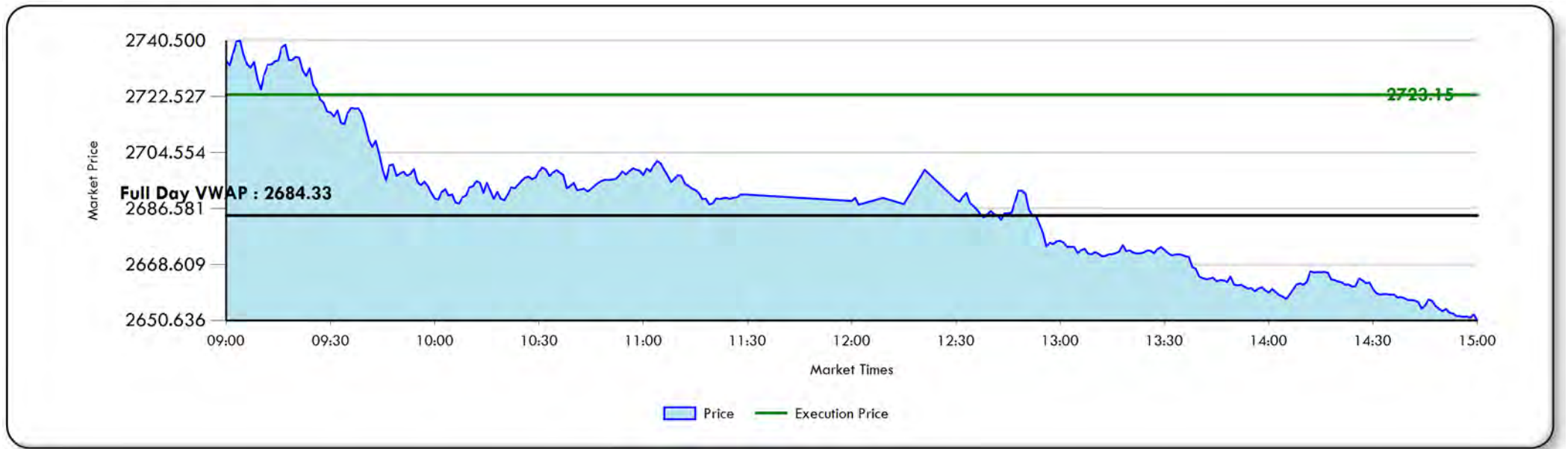


(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

IDEMITSU KOSAN CO LTD COMMON S - 20190808

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LSV ASSET MANAGEMENT	CREDIT SUISSE	JAP	JPY	B1FF8P7	08/08/2019 09:00:00	08/08/2019 15:00:00	300,216	2723.15	2684.33	+4,280	+144.62	1.70	0.46



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 3.40% of your market impact cost.



(+) = Cost

**TRADE LEVEL DETAIL - HIGH COST**

**TFI INTERNATIONAL INC COMMON S - 20190712**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	LSV ASSET MANAGEMENT	CREDIT SUISSE	CAN	CAD	BDRXBF4	07/12/2019 09:30:00	07/12/2019 16:00:00	729,366	38.37	38.60	+4,230	+57.65	1.01	7.66



**NOTES**

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 3.36% of your market impact cost.

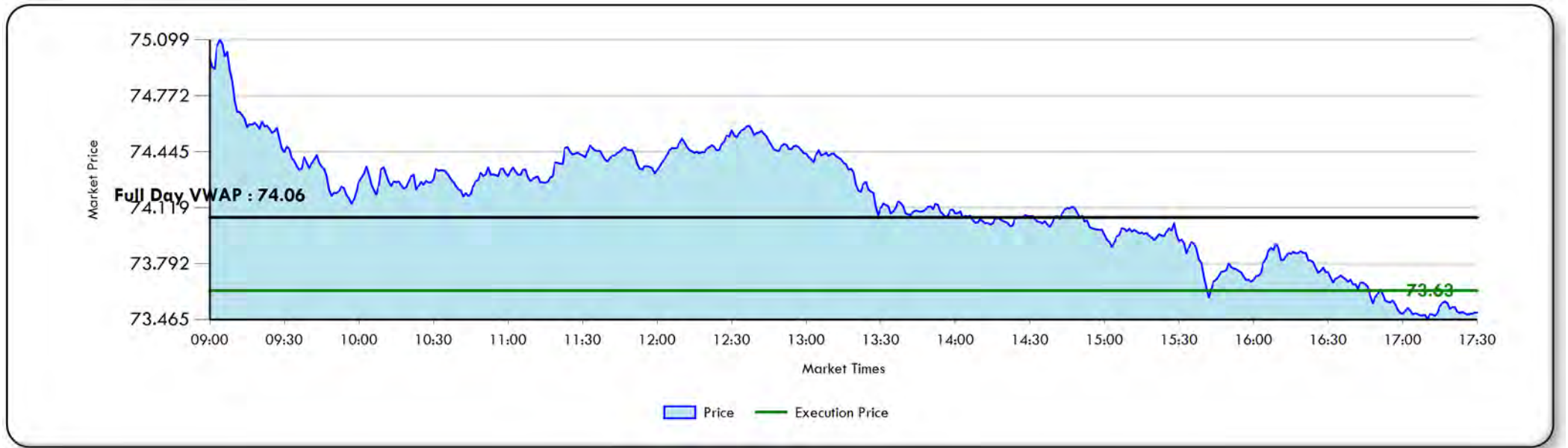


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TRADE LEVEL DETAIL - HIGH COST

SANOFI COMMON STOCK EUR2.0 - 20190712

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	LAZARD ASSET MANAGEMENT	EXANE	FRA	EUR	5671735	07/12/2019 09:00:00	07/12/2019 17:30:00	637,590	73.63	74.06	+3,700	+57.69	1.28	0.40



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 2.94% of your market impact cost.



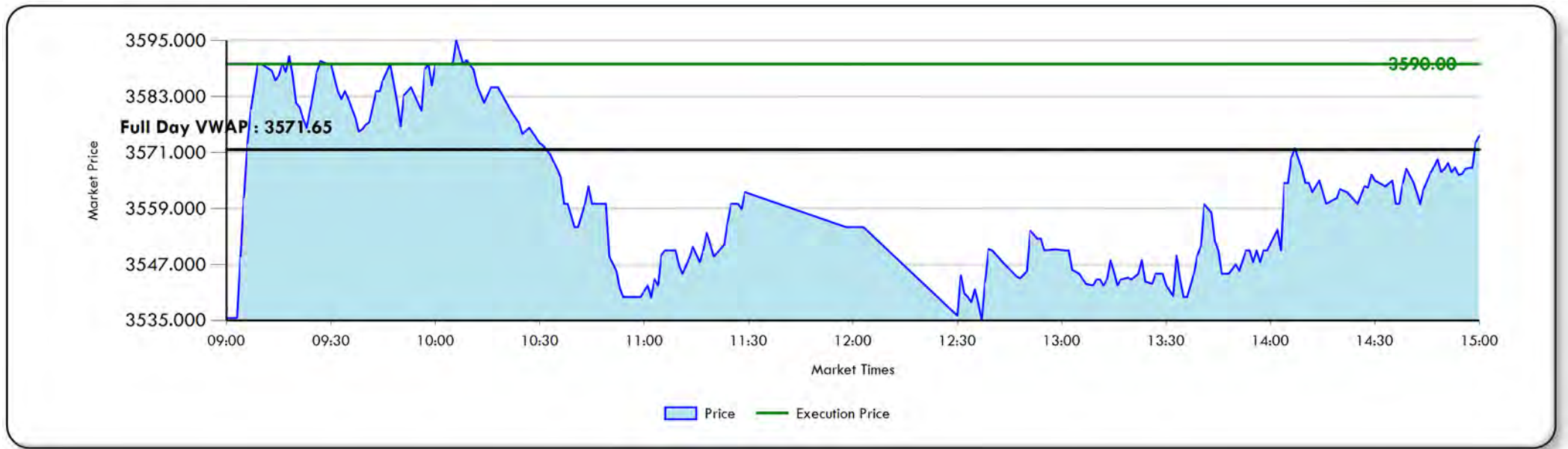


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TRADE LEVEL DETAIL - HIGH COST

MATSUMOTOKIYOSHI HOLDINGS CO C - 20190802

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LSV ASSET MANAGEMENT	BNP PARIBAS	JAP	JPY	B249GCO	08/02/2019 09:00:00	08/02/2019 15:00:00	483,168	3590.00	3571.65	+2,470	+51.37	1.10	1.61



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.96% of your market impact cost.

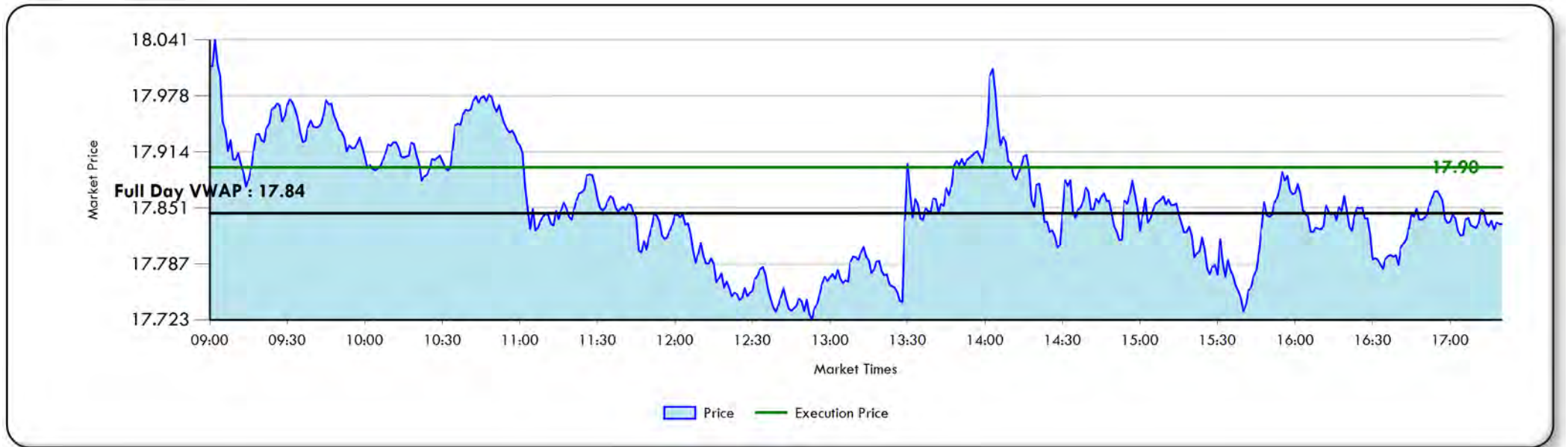


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**TRADE LEVEL DETAIL - HIGH COST**

**ABB LTD REG COMMON STOCK CHF.1 - 20190815**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LAZARD ASSET MANAGEMENT	CREDIT SUISSE	SWI	CHF	7108899	08/15/2019 09:00:00	08/15/2019 17:20:00	604,730	17.90	17.84	+1,760	+29.19	0.82	0.44



**NOTES**

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.40% of your market impact cost.

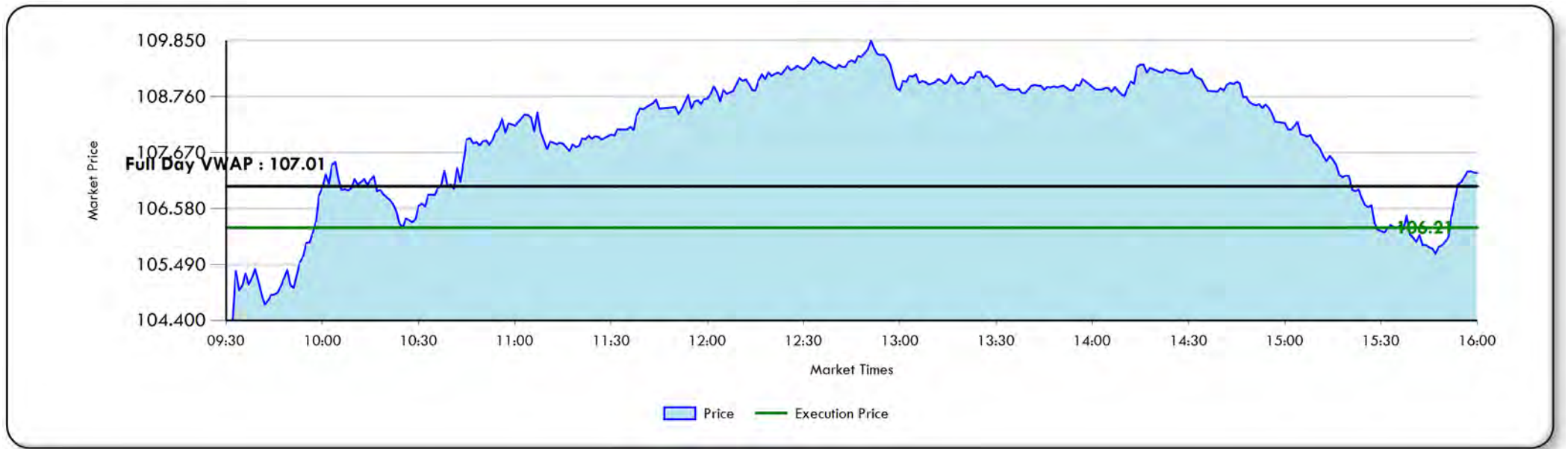


(+) = Cost

**TRADE LEVEL DETAIL - HIGH COST**

**GLOBANT SA COMMON STOCK USD1.2 - 20190808**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	WILLIAM BLAIR & COMPANY	JEFFERIES & CO	US	USD	BP40HF4	08/08/2019 09:30:00	08/08/2019 16:00:00	208,483	106.21	107.01	+1,584	+75.42	0.63	0.34



**NOTES**

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.26% of your market impact cost.

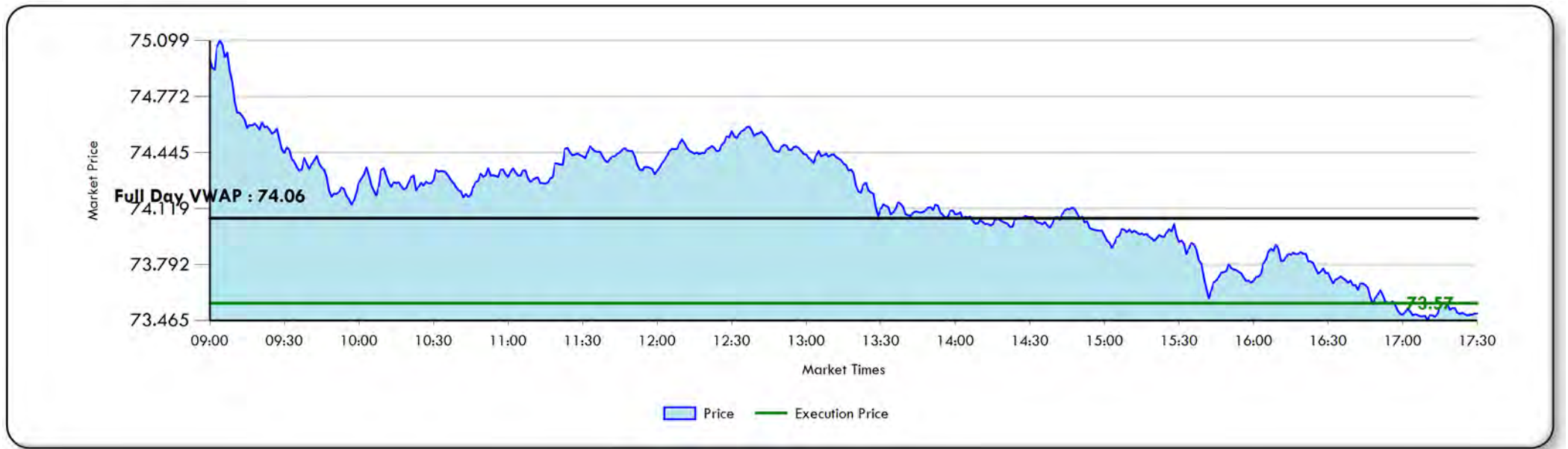


(+) = Cost

**TRADE LEVEL DETAIL - HIGH COST**

**SANOFI COMMON STOCK EUR2.0 - 20190712**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	LAZARD ASSET MANAGEMENT	SOCIETE GENERALE	FRA	EUR	5671735	07/12/2019 09:00:00	07/12/2019 17:30:00	225,695	73.57	74.06	+1,521	+66.94	1.49	0.14



**NOTES**

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.21% of your market impact cost.

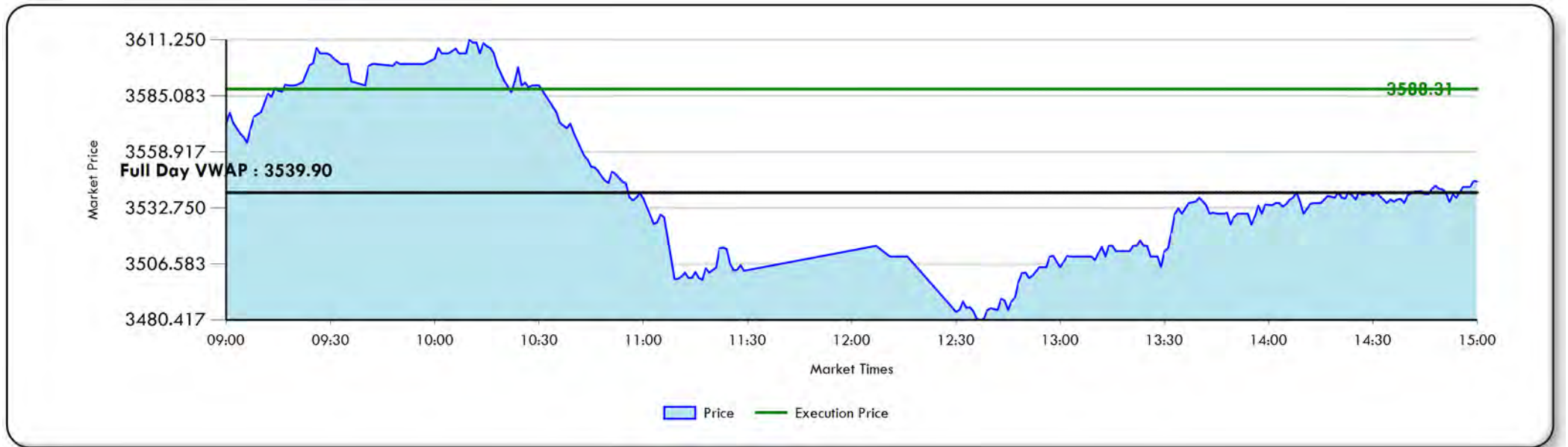


(+) = Cost

TRADE LEVEL DETAIL - HIGH COST

MATSUMOTOKIYOSHI HOLDINGS CO C - 20190805

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LSV ASSET MANAGEMENT	INSTINET	JAP	JPY	B249GCO	08/05/2019 09:00:00	08/05/2019 15:00:00	111,455	3588.31	3539.90	+1,504	+136.78	1.32	0.50



NOTES

- Out of all your high cost trades that lost to Full Day VWAP, this order made up 1.20% of your market impact cost.

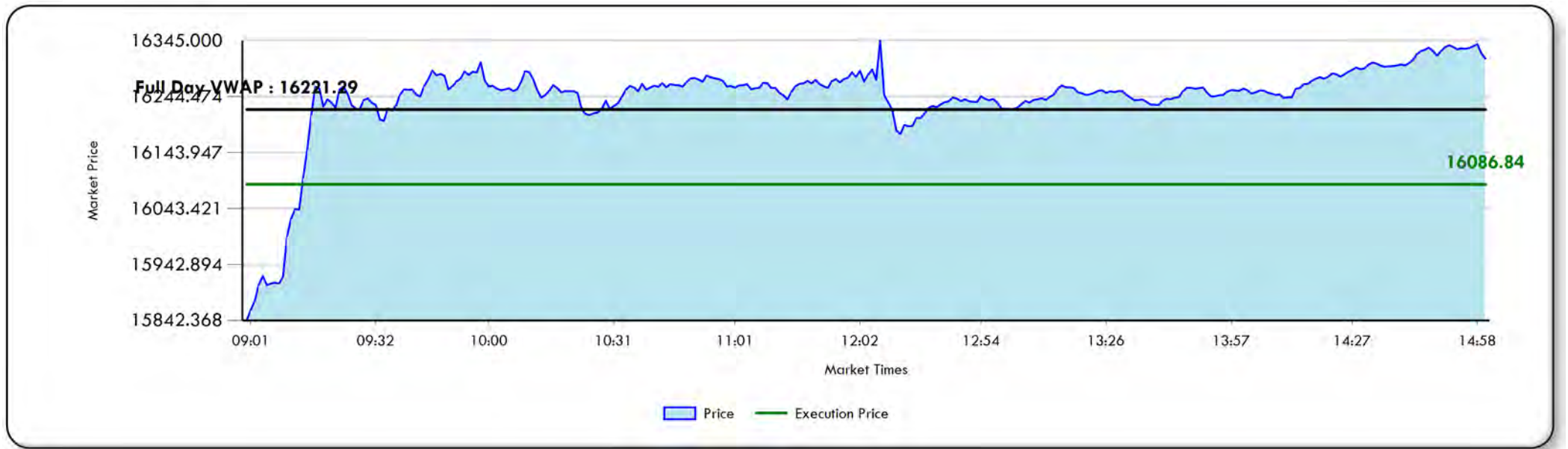


(+) = Cost

**TRADE LEVEL DETAIL - LOW COST**

**TOKYO ELECTRON LTD COMMON STOC - 20190702**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LAZARD ASSET MANAGEMENT	JP MORGAN CHASE	JAP	JPY	6895675	07/02/2019 09:00:00	07/02/2019 15:00:00	1,827,019	16086.84	16221.29	15,270	82.88	-1.51	0.48



**NOTES**

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 13.09% of your market impact cost.

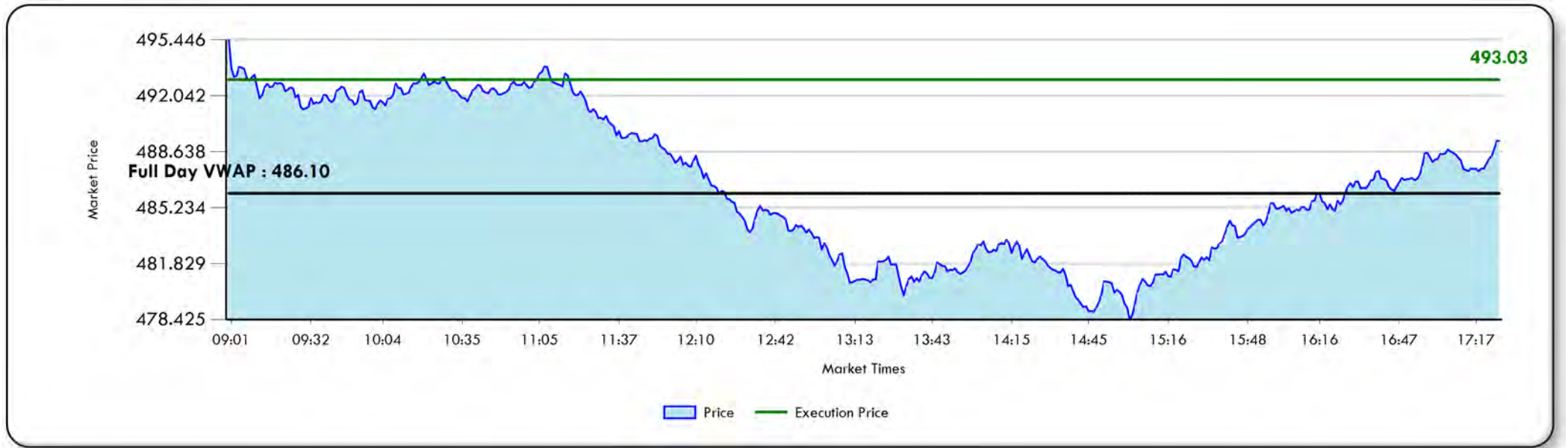


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

HEXAGON AB B SHS COMMON STOCK - 20190917

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	LAZARD ASSET MANAGEMENT	MORGAN STANLEY	SWE	SEK	B1XF2L2	09/17/2019 09:00:00	09/17/2019 17:30:00	502,305	493.03	486.10	7,055	142.44	-1.53	1.01



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 6.05% of your market impact cost.



(+) = Cost

TRADE LEVEL DETAIL - LOW COST

IDEMITSU KOSAN CO LTD COMMON S - 20190819

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LSV ASSET MANAGEMENT	INSTINET	JAP	JPY	B1FF8P7	08/19/2019 09:00:00	08/19/2019 15:00:00	155,531	2670.90	2708.99	2,218	140.58	-1.46	0.35



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.90% of your market impact cost.



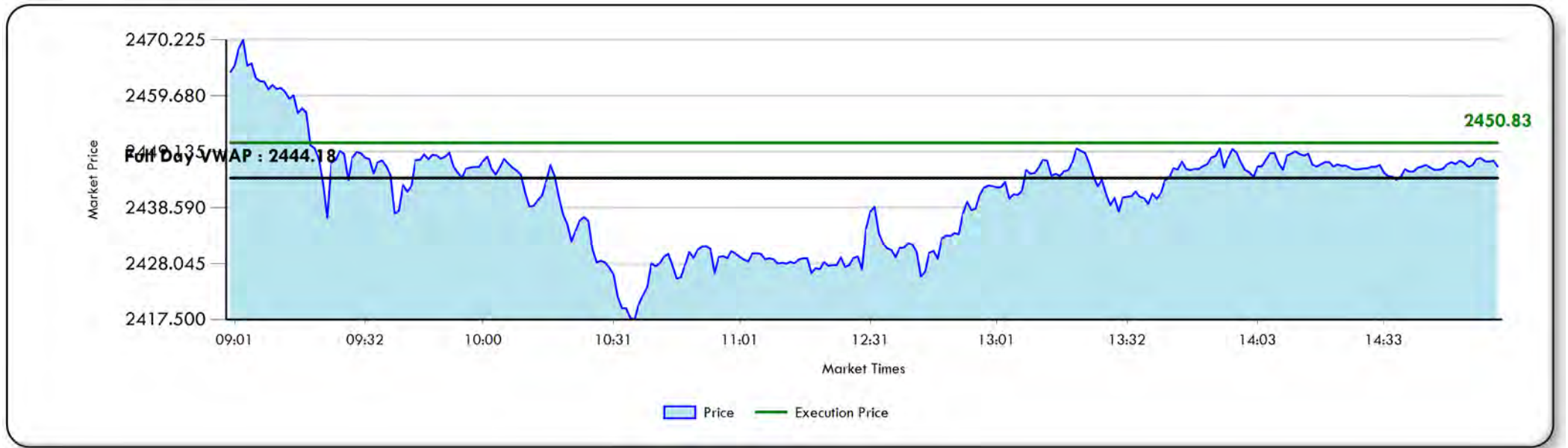


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

ZOZO INC COMMON STOCK - 20190913

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	LAZARD ASSET MANAGEMENT	UBS	JAP	JPY	B292RC1	09/13/2019 09:00:00	09/13/2019 15:00:00	696,146	2450.83	2444.18	1,889	27.20	-0.68	0.14



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.62% of your market impact cost.

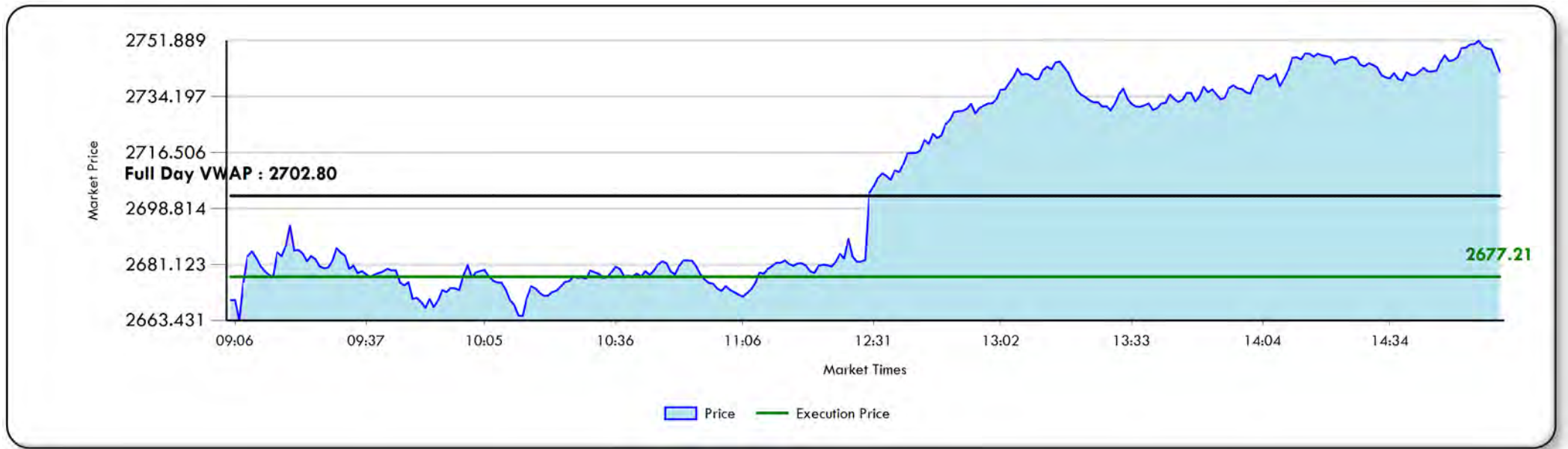


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

IDEMITSU KOSAN CO LTD COMMON S - 20190806

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LSV ASSET MANAGEMENT	CREDIT SUISSE	JAP	JPY	B1FF8P7	08/06/2019 09:00:00	08/06/2019 15:00:00	191,501	2677.21	2702.80	1,831	94.70	-0.82	0.28



NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.57% of your market impact cost.

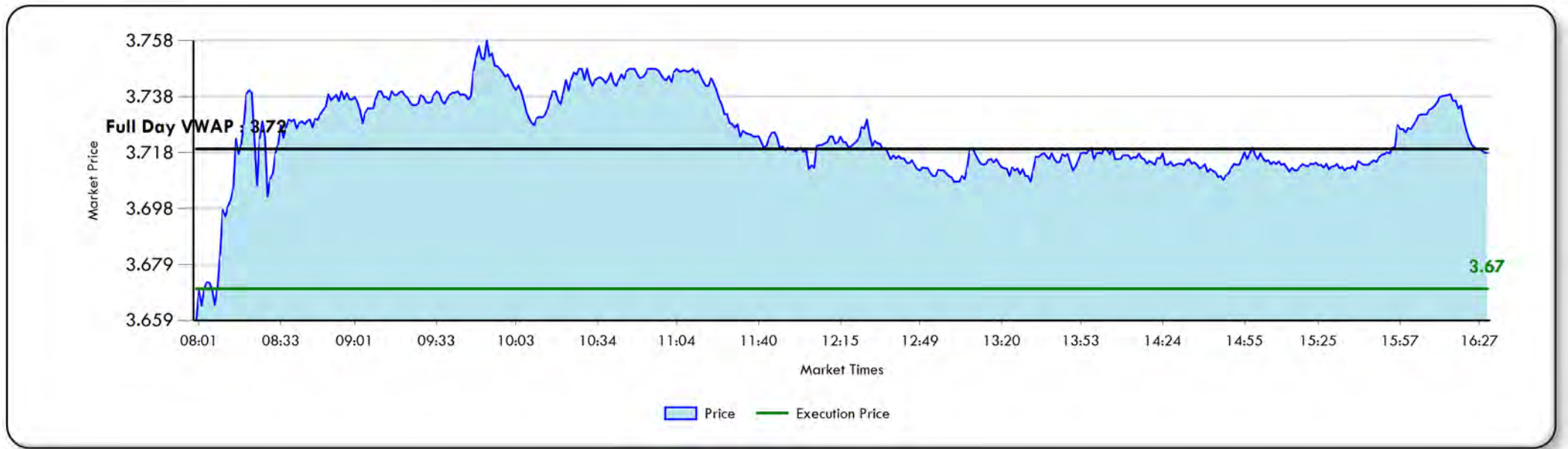


(+) = Cost

**TRADE LEVEL DETAIL - LOW COST**

**AVAST PLC COMMON STOCK GBP.1 - 20190904**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	WILLIAM BLAIR & COMPANY	JEFFERIES & CO	UK	GBP	BDD85M8	09/04/2019 08:00:00	09/04/2019 16:30:00	116,510	3.67	3.72	1,575	133.35	-0.03	0.32



**NOTES**

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.35% of your market impact cost.

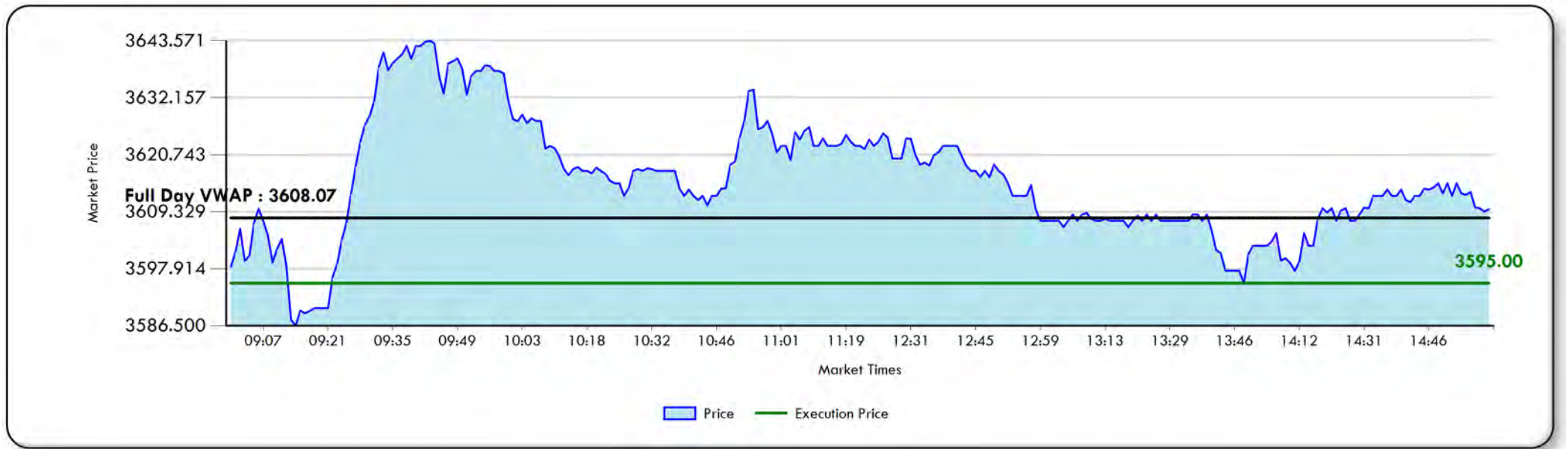


(+) = Cost

**TRADE LEVEL DETAIL - LOW COST**

**MATSUMOTOKIYOSHI HOLDINGS CO C - 20190819**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	LSV ASSET MANAGEMENT	BNP PARIBAS	JAP	JPY	B249GCO	08/19/2019 09:00:00	08/19/2019 15:00:00	428,815	3595.00	3608.07	1,559	36.22	-1.05	2.22



**NOTES**

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.34% of your market impact cost.

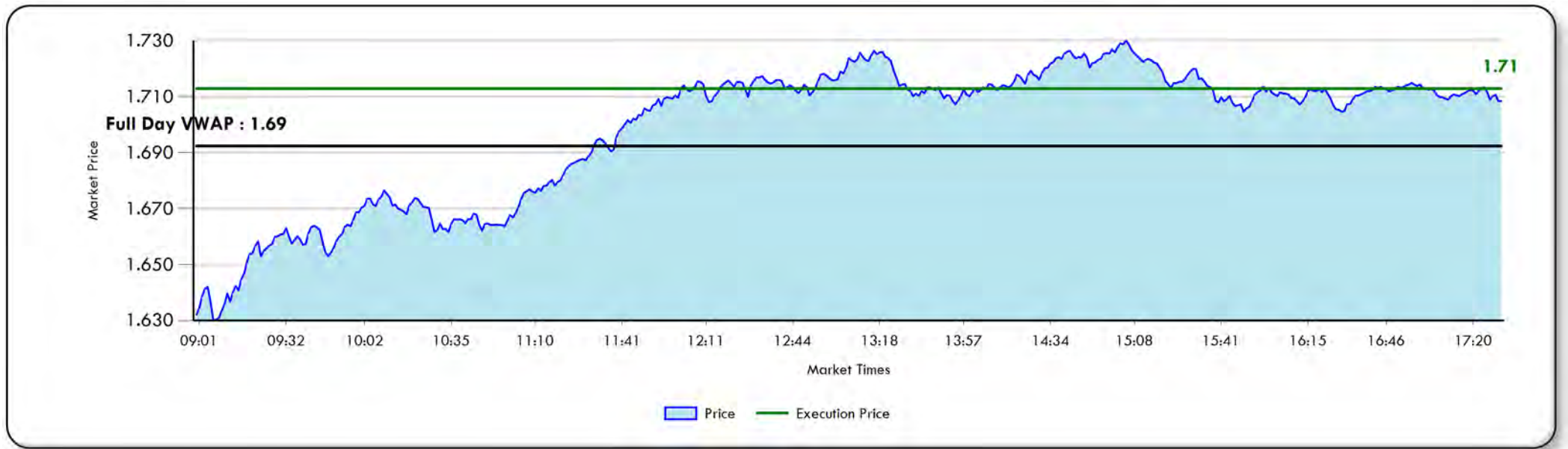


(+) = Cost

**TRADE LEVEL DETAIL - LOW COST**

**POSTNL NV COMMON STOCK EUR.08 - 20190808**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	LSV ASSET MANAGEMENT	CREDIT SUISSE	NTH	EUR	5481558	08/08/2019 09:00:00	08/08/2019 17:30:00	126,355	1.71	1.69	1,513	121.19	-0.83	0.63



**NOTES**

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.30% of your market impact cost.

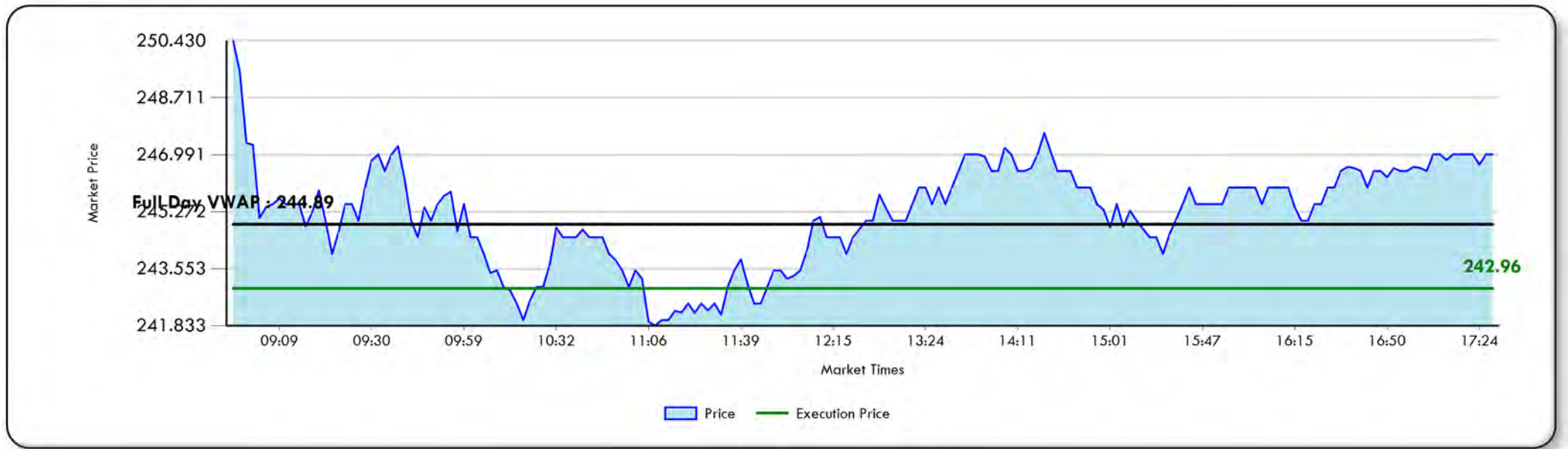


(+) = Cost

**TRADE LEVEL DETAIL - LOW COST**

**ADDTECH AB B SHARES COMMON STO - 20190820**

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
B	WILLIAM BLAIR & COMPANY	BNP PARIBAS	SWE	SEK	BH57BM3	08/20/2019 09:00:00	08/20/2019 17:30:00	182,331	242.96	244.89	1,452	78.98	-1.28	4.32



**NOTES**

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.24% of your market impact cost.

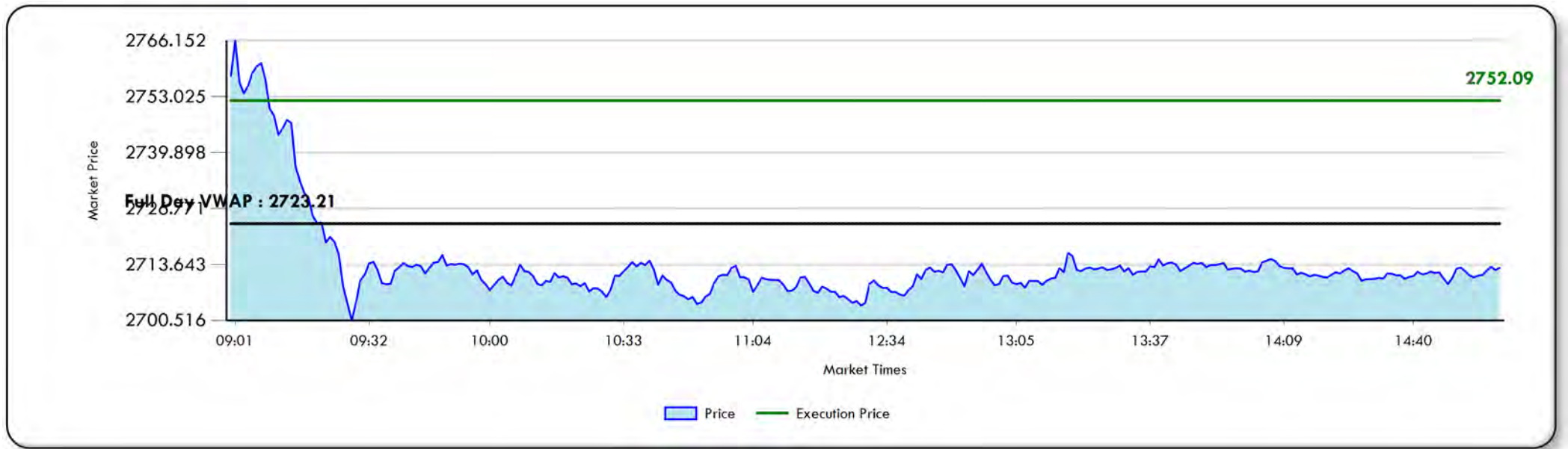


(+) = Cost

TRADE LEVEL DETAIL - LOW COST

STANLEY ELECTRIC CO LTD COMMON - 20190726

Side	Manager	Broker	Country	Currency	CUSIP	Time In	Time Out	Principal	Client Price	Full Day VWAP	Cost Full Day VWAP	Cost Full Day VWAP	E - Score	Volume
								(\$)			(\$)	(bp)		(%)
S	WILLIAM BLAIR & COMPANY	ITG	JAP	JPY	6841106	07/26/2019 09:00:00	07/26/2019 15:00:00	136,761	2752.09	2723.21	1,435	106.05	-2.66	0.48

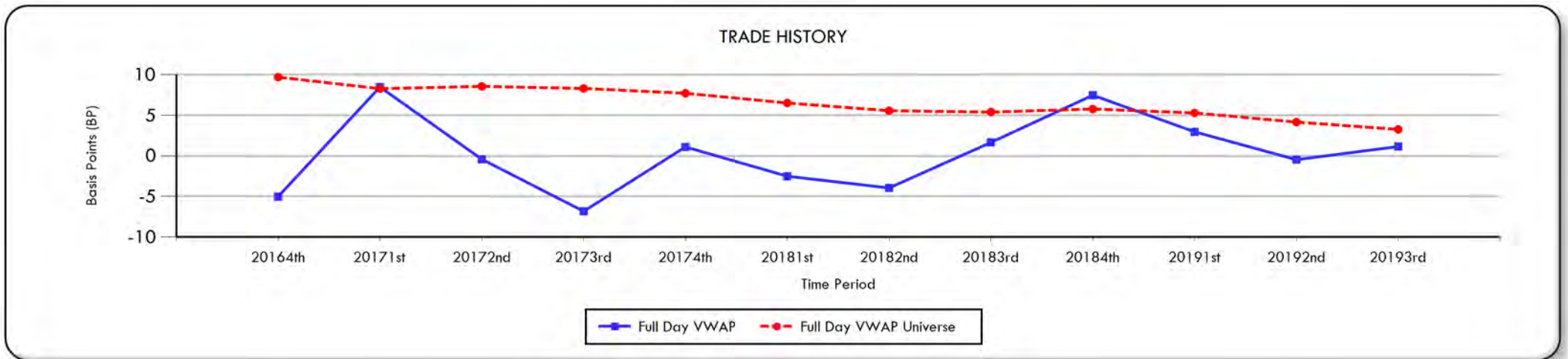


NOTES

- Out of all your low cost trades that beat to Full Day VWAP, this order made up 1.23% of your market impact cost.

### TRADE HISTORY

Period	Total Principal (\$)	Commission (bp)	Commission Universe (bp)	Fees (bp)	Fees Universe (bp)	Full Day VWAP (bp)	Full Day VWAP Universe (bp)	Total Cost/Savings Vs. Universe (bp)
20164th	200,915,200	+7.12	+16.08	+5.97	+6.25	5.02	+9.68	23.94
20171st	193,287,065	+8.16	+15.81	+6.67	+6.60	+8.47	+8.26	7.37
20172nd	199,438,944	+6.90	+14.86	+4.37	+4.99	0.43	+8.55	17.56
20173rd	186,109,779	+7.65	+14.45	+5.00	+5.31	6.83	+8.29	22.23
20174th	198,018,280	+7.13	+14.19	+3.98	+4.19	+1.09	+7.70	13.88
20181st	207,232,838	+8.30	+14.33	+5.34	+5.43	2.52	+6.50	15.12
20182nd	152,374,616	+7.46	+14.16	+10.17	+6.65	3.96	+5.55	12.69
20183rd	84,663,286	+6.92	+13.97	+5.95	+3.81	+1.64	+5.39	8.65
20184th	132,282,303	+7.47	+14.63	+4.94	+3.67	+7.46	+5.76	4.18
20191st	75,137,208	+7.16	+13.73	+6.74	+5.73	+2.95	+5.28	7.88
20192nd	70,813,093	+5.93	+14.19	+8.58	+8.20	0.48	+4.15	12.50
20193rd	79,515,054	+5.84	+14.32	+3.19	+3.04	+1.14	+3.25	10.44





**Elkins/McSherry Global Universe**

Country	Price	Commission	Fees	Market Impact	Total
ARGENTINA	2.97 BP	42.15 BP	0.00 BP	24.97 BP	67.12 BP
AUSTRALIA	5.89 BP	13.17 BP	2.01 BP	2.78 BP	17.96 BP
AUSTRIA	29.22 BP	13.54 BP	0.02 BP	5.13 BP	18.69 BP
BELGIUM	50.83 BP	13.37 BP	0.00 BP	3.02 BP	16.39 BP
BRAZIL	7.15 BP	14.18 BP	2.31 BP	5.38 BP	21.87 BP
CANADA	16.70 BP	15.34 BP	0.01 BP	3.05 BP	18.40 BP
CHILE	0.21 BP	16.77 BP	0.72 BP	3.03 BP	20.52 BP
CHINA	3.44 BP	17.59 BP	5.43 BP	1.46 BP	24.48 BP
COLOMBIA	2.06 BP	20.25 BP	1.07 BP	8.26 BP	29.58 BP
CZECH REPUBLIC	9.25 BP	14.06 BP	0.01 BP	2.50 BP	16.57 BP
DENMARK	54.32 BP	13.85 BP	0.01 BP	4.45 BP	18.31 BP
EGYPT	2.05 BP	18.35 BP	16.90 BP	5.99 BP	41.24 BP
FINLAND	20.37 BP	13.79 BP	0.01 BP	4.94 BP	18.74 BP
FRANCE - BUYS	50.46 BP	13.61 BP	30.00 BP	2.39 BP	46.00 BP
FRANCE - SELLS	54.10 BP	14.54 BP	0.00 BP	2.46 BP	17.00 BP
GERMANY	52.53 BP	13.58 BP	0.02 BP	3.01 BP	16.61 BP
GREECE	1.89 BP	18.83 BP	3.07 BP	10.49 BP	32.39 BP
HONG KONG	2.04 BP	18.48 BP	8.76 BP	1.11 BP	28.35 BP
HUNGARY	14.42 BP	13.47 BP	0.00 BP	2.11 BP	15.58 BP
INDONESIA	0.27 BP	16.70 BP	8.23 BP	2.70 BP	27.63 BP

**Elkins/McSherry Global Universe**

Country	Price	Commission	Fees	Market Impact	Total
INDIA	7.11 BP	18.05 BP	11.08 BP	1.98 BP	31.11 BP
IRELAND - BUYS	13.59 BP	19.43 BP	100.00 BP	2.15 BP	121.58 BP
IRELAND - SELLS	14.14 BP	14.45 BP	0.00 BP	12.95 BP	27.40 BP
ISRAEL	2.77 BP	14.14 BP	0.02 BP	2.99 BP	17.15 BP
ITALY - BUYS	6.82 BP	13.58 BP	12.00 BP	1.98 BP	27.56 BP
ITALY - SELLS	10.41 BP	13.07 BP	0.00 BP	5.72 BP	18.79 BP
JAPAN	21.25 BP	13.62 BP	0.02 BP	4.13 BP	17.77 BP
KOREA - BUYS	55.02 BP	19.06 BP	0.00 BP	4.15 BP	23.21 BP
KOREA - SELLS	56.83 BP	17.38 BP	24.70 BP	2.34 BP	44.42 BP
LUXEMBOURG	139.68 BP	14.49 BP	0.08 BP	24.85 BP	39.42 BP
MALAYSIA	1.28 BP	17.22 BP	3.33 BP	1.21 BP	21.76 BP
MEXICO	2.19 BP	14.15 BP	0.00 BP	1.09 BP	15.24 BP
NORWAY	9.02 BP	13.24 BP	0.02 BP	4.77 BP	18.03 BP
NETHERLANDS	34.97 BP	14.18 BP	0.08 BP	2.88 BP	17.14 BP
NEW ZEALAND	3.36 BP	19.14 BP	0.00 BP	4.71 BP	23.85 BP
PERU	1.04 BP	27.27 BP	4.05 BP	4.36 BP	35.68 BP
PHILIPPINES - BUYS	1.05 BP	24.35 BP	4.44 BP	1.64 BP	30.43 BP
PHILIPPINES - SELLS	0.76 BP	21.91 BP	63.05 BP	0.90 BP	85.86 BP
POLAND	8.38 BP	15.06 BP	0.00 BP	3.39 BP	18.45 BP
PORTUGAL	5.66 BP	14.00 BP	0.01 BP	5.18 BP	19.19 BP

**Elkins/McSherry Global Universe**

Country	Price	Commission	Fees	Market Impact	Total
RUSSIA	0.05 BP	14.42 BP	0.00 BP	12.80 BP	27.22 BP
SOUTH AFRICA - BUYS	20.87 BP	15.09 BP	20.10 BP	3.75 BP	38.94 BP
SOUTH AFRICA - SELLS	13.05 BP	15.37 BP	0.04 BP	2.81 BP	18.22 BP
SINGAPORE	2.32 BP	18.87 BP	3.43 BP	1.58 BP	23.88 BP
SPAIN	6.81 BP	13.86 BP	0.00 BP	2.80 BP	16.66 BP
SWEDEN	12.59 BP	13.82 BP	0.01 BP	1.04 BP	14.87 BP
SWITZERLAND	64.52 BP	13.69 BP	0.01 BP	2.74 BP	16.44 BP
TAIWAN - BUYS	2.56 BP	18.18 BP	0.04 BP	1.33 BP	19.55 BP
TAIWAN - SELLS	2.05 BP	18.08 BP	27.16 BP	2.54 BP	47.78 BP
THAILAND	1.90 BP	16.81 BP	0.62 BP	2.18 BP	19.61 BP
TURKEY	1.42 BP	15.22 BP	0.00 BP	3.26 BP	18.48 BP
U.K. - BUYS	6.74 BP	15.58 BP	35.58 BP	1.59 BP	52.75 BP
U.K. - SELLS	6.50 BP	14.46 BP	0.00 BP	10.21 BP	24.67 BP
U.S.	52.05 BP	14.42 BP	0.07 BP	1.77 BP	16.26 BP
VENEZUELA	10.50 BP	43.22 BP	9.10 BP	31.03 BP	83.35 BP
TOTAL: 55	17.81 BP	16.99 BP	7.23 BP	4.98 BP	29.20 BP



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## SACRAMENTO COUNTY

US Fixed Income Analysis

Period End September 30, 2019



## EXECUTIVE SUMMARY

Elkins/McSherry has been providing trading cost analyses to institutional investors since 1991. During that time we have produced Post-Trade Cost Analyses for many of the worlds largest investment managers, pension funds, banks, and broker dealers. Using this vast experience combined with an un-matched collection of global fixed income market and Universe data, Elkins/McSherry has recently produced a Trading Cost Analysis on behalf of Sacramento County. This study evaluates U.S. fixed income executions from July 01,2019 to September 30,2019. The analysis included trading of 408 trades in 111 different issues representing \$686,682,765 in principal across mortgages, governments And corporates.

### Methodology:

The Elkins/McSherry analysis measures trading efficiency by quantifying the cost of each trade by comparing your executed price to the average price or benchmark price on the day of the trade and to the Elkins/McSherry U.S. Fixed Income Trading Cost Universe. Daily prices are calculated from Market Axess, Tullett Prebon, Bloomberg and Reuters. For comparison purposes, Elkins/McSherry establishes average institutional trading costs quarterly for the most actively traded U.S.treasury, corporates, agencies, mortgages and municipal issues. The "Universe" is the average trading cost incurred by pension funds, investment managers, banks and brokers for Treasuries, Corporates, Agencies, Mortgages and Municipals. Benchmark prices are calculated by using the following methodologies: Government Bonds – Average of six indicative prices received from Tullett Prebon. Municipal Bonds – Average of institutional sized execution prices from MSRB. If actual trade prices are not available the Elkins/McSherry analysis defaults to a fair value price from Reuters or Bloomberg. Corporate Bonds – Average of execution prices where available, from TRACE and Market Axess. If actual trade prices are not available the Elkins/McSherry analysis defaults to a fair value price from Reuters or Bloomberg. Mortgage Bonds – Reuters or Bloomberg fair value prices.

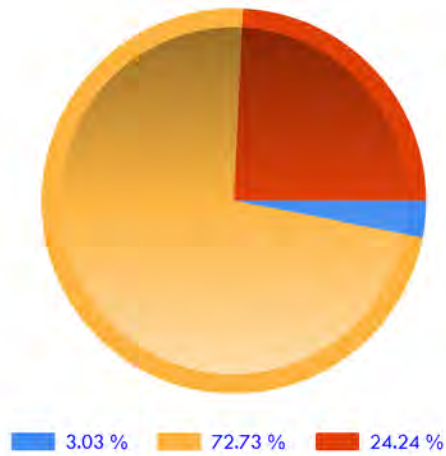
### Results:

Buy/Sell	GRAND TOTAL PERFORMANCE							TRADE COST HISTORICAL PERFORMANCE				
	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe		Q2	Q1	Q4	Q3
							(Thous. \$)	BP	2019	2019	2018	2018
BUYS	358	211	87	+375.90	+10.49	+11.57	38.64	1.08	+1.20	+2.14	+8.56	+10.48
SELLS	328	197	55	338.71	10.32	+7.43	582.55	17.75	+0.28	2.58	7.18	10.05
GRAND TOTAL	687	408	111	+37.19	+0.54	+9.59	621.19	9.05	+0.74	0.25	+0.33	+0.04

EXECUTIVE SUMMARY

BOND TYPES PERFORMANCE								TRADE COST HISTORICAL PERFORMANCE			
Bond Type	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$) BP	Q2 2019	Q1 2019	Q4 2018	Q3 2018
Governments	498	315	47	+13.78	+0.28	+10.99	532.76 10.71	+0.87	0.12	0.29	0.10
Mortgages	166	48	22	+7.52	+0.45	+4.46	66.71 4.01	1.02	0.64	+2.32	+0.15
Corporates	23	45	42	+15.89	+6.98	+16.51	21.72 9.53	1.30	0.97	+1.54	+0.71

Bonds by Principal Traded



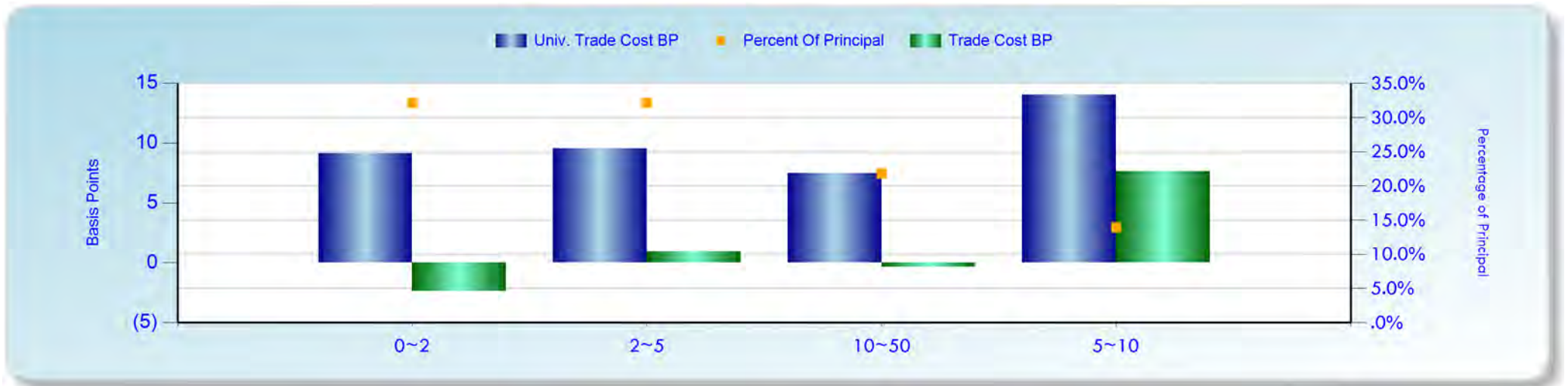
Historical Trade Cost Trend



EXECUTIVE SUMMARY

EXECUTION PERFORMANCE SUMMARY

Trade Size (Millions)	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP
0~2	221	311	90	51.98	2.36	+9.14	253.68	11.50
2~5	221	73	33	+21.10	+0.96	+9.53	189.19	8.57
10~50	150	10	8	5.30	0.35	+7.50	117.57	7.85
5~10	96	14	13	+73.38	+7.67	+14.02	60.75	6.35

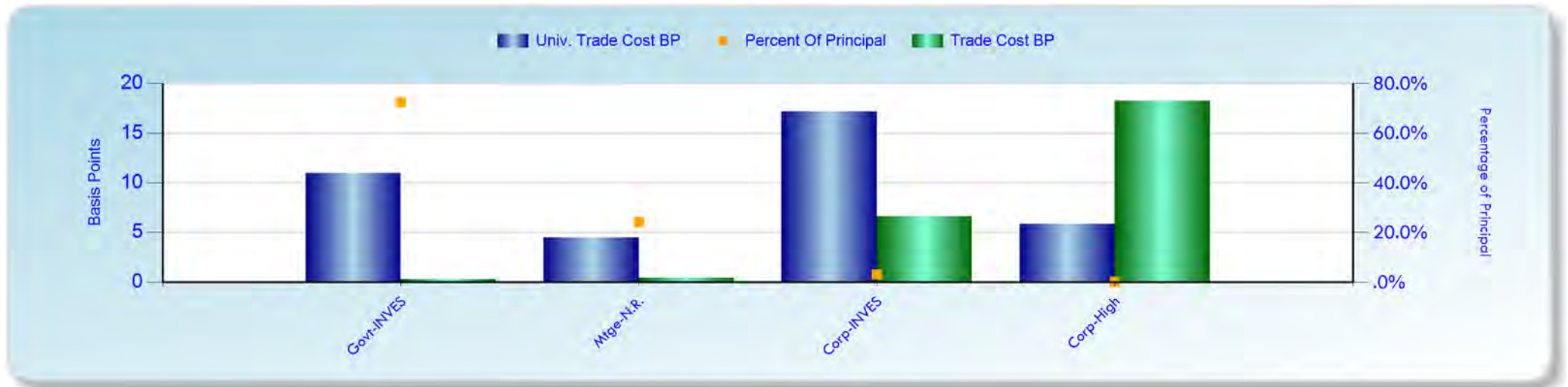




EXECUTIVE SUMMARY

GRADING SUMMARY

Grading	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP
Govt-INVESTMENT GRADE	498	315	47	+13.78	+0.28	+10.99	532.76	10.71
Mtge-N.R.	166	48	22	+7.52	+0.45	+4.46	66.71	4.01
Corp-INVESTMENT GRADE	22	42	39	+14.22	+6.61	+17.18	22.73	10.57
Corp-High Yield	<1	2	2	+1.25	+18.25	+5.84	+0.85	+12.41



EXECUTIVE SUMMARY

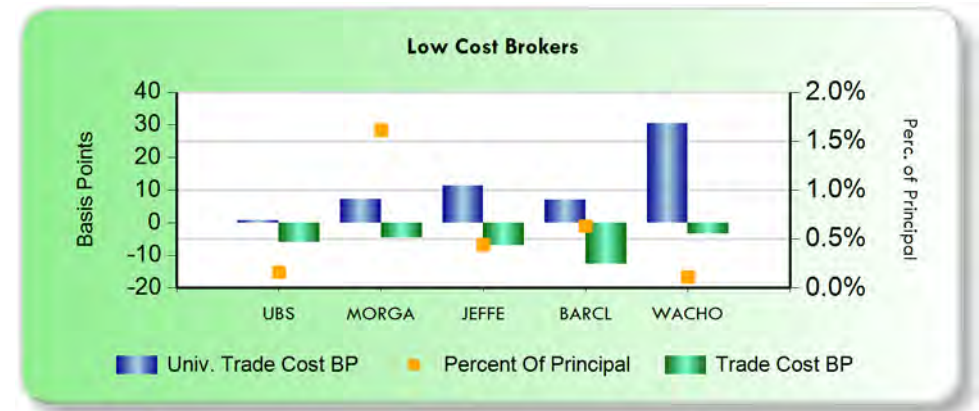
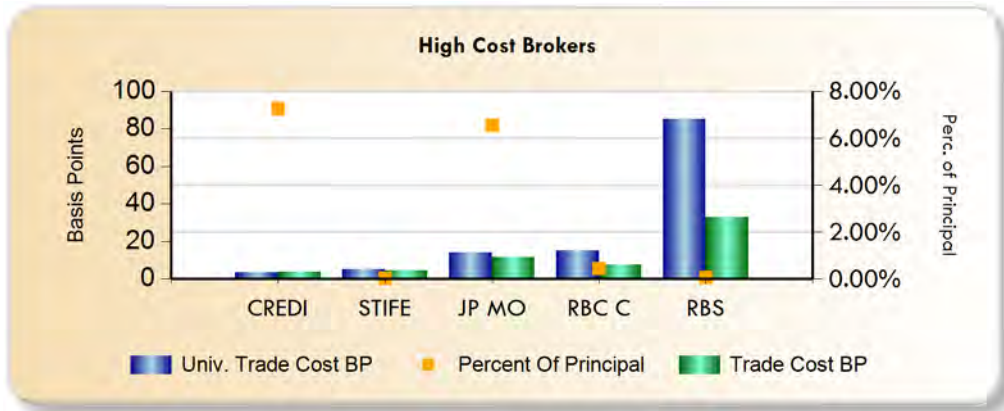
RATING SUMMARY

Rating	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous.\$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP
AAA	497.53	315	47	+13.78	+0.28	+10.99	532.76	10.71
NR	166.37	48	22	+7.52	+0.45	+4.46	66.71	4.01
BBB+	6.57	13	13	+3.45	+5.25	+18.24	8.54	12.99
BBB-	4.05	11	9	+0.01	+0.02	+9.47	3.82	9.45
BBB	2.94	8	8	+4.21	+14.31	+30.14	4.66	15.83
A	2.93	2	2	+1.96	+6.69	+11.41	1.39	4.72
A+	2.21	1	1	0.64	2.91	+12.53	3.41	15.44
A-	1.66	4	4	+2.96	+17.79	+26.98	1.53	9.19
BB+	<1	2	2	+1.25	+18.25	+5.84	+0.85	+12.41
AA	<1	1	1	+1.91	+29.81	+14.43	+0.99	+15.38



EXECUTIVE SUMMARY

BROKER	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous.\$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP
<b>5 HIGHEST COST BROKERS (Sorted By Trade Cost BP)</b>								
CREDIT SUISSE	50	16	10	+19.06	+3.82	+3.42	+2.02	+0.40
STIFEL NICOLAUS & CO	<1	1	1	+0.14	+4.56	+5.23	0.02	0.67
JP MORGAN CHASE	45	51	23	+52.75	+11.72	+14.10	10.71	2.38
RBC CAPITAL MARKETS	3	7	7	+2.39	+7.56	+15.28	2.44	7.72
RBS	<1	1	1	+1.72	+32.90	+85.12	2.73	52.22
<b>5 LOWEST COST BROKERS (Sorted By Trade Cost BP)</b>								
UBS	1	3	3	0.65	5.87	+0.71	0.73	6.58
MORGAN STANLEY	11	9	9	5.09	4.60	+7.21	13.08	11.81
JEFFERIES & CO	3	9	5	2.13	6.99	+11.32	5.58	18.31
BARCLAYS	4	13	5	5.45	12.55	+7.06	8.52	19.61
WACHOVIA BANK	<1	2	2	0.26	3.34	+30.51	2.65	33.85





**COUNTRY PERFORMANCE BASED ON BUYS AND SELLS**

Country									
		Principal	No. of	No. of	Trade Cost	Trade Cost	Univ. Trade	Cost Diff. from Universe	
	Side	(Mil. \$ )	Trades	Issues	(Thous. \$)	BP	Cost BP	(Thous. \$)	BP
UNITED STATES	SELLS	328	197	55	338.71	10.32	+7.43	582.55	17.75
	BUYS	358	211	87	+375.90	+10.49	+11.57	38.64	1.08

**Manager PERFORMANCE**

Manager PERFORMANCE									TRADE COST HISTORICAL PERFORMANCE			
Manager	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$) BP		Q2 2019	Q1 2019	Q4 2018	Q3 2018
METROPOLITAN WEST MG	574	367	87	31.95	0.56	+8.01	491.46	8.57	+0.61	0.75	+0.28	+0.03
NEUBERGER BERMAN	103	17	10	+71.98	+7.00	+18.80	121.26	11.80	+1.42	+0.54	+1.09	+0.92
BARCLAYS 1-10 YR TIP	10	24	20	2.83	2.84	+5.66	8.48	8.50	+1.36	0.09	0.35	1.52

### BROKER PERFORMANCE

BROKER PERFORMANCE									TRADE COST HISTORICAL PERFORMANCE			
BROKER	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$) BP		Q2 2019	Q1 2019	Q4 2018	Q3 2018
CITIGROUP	169	64	30	8.27	0.49	+6.00	109.50	6.49	+0.54	+2.05	0.11	+1.08
GOLDMAN SACHS	89	42	25	+0.03	+0.00	+12.42	110.47	12.42	0.50	+2.30	+0.53	+0.08
HOWARD TAYLOR & COMP	75	27	15	10.89	1.44	+10.65	91.10	12.09	+8.22	+2.20	8.02	+3.81
NOMURA	71	40	19	13.90	1.96	+9.80	83.34	11.76	1.59	+2.68	+3.57	+1.03
CREDIT SUISSE	50	16	10	+19.06	+3.82	+3.42	+2.02	+0.40	+1.45	2.28	+4.26	+0.47
JP MORGAN CHASE	45	51	23	+52.75	+11.72	+14.10	10.71	2.38	+2.60	+2.00	+1.99	1.01
CITADEL SECURITIES	31	23	9	0.22	0.07	+8.85	27.94	8.92	0.18	+0.03	1.63	0.17
HSBC BANK	28	22	11	+2.13	+0.77	+8.71	21.89	7.94	+0.77	4.00	1.31	+0.43
BANK OF AMERICA	24	27	18	+5.23	+2.21	+15.63	31.66	13.42	0.08	5.66	3.04	1.19
WELLS FARGO	19	17	15	2.00	1.05	+9.57	20.18	10.62	+1.80	4.58	0.34	+1.76
DEUTSCHE BANK	17	12	8	4.16	2.41	+8.35	18.60	10.76	1.81	2.53	1.34	+0.20
BMO CAPITAL MARKETS	17	11	9	+6.22	+3.73	+12.43	14.51	8.70	+0.30	1.28	5.31	0.27
PERSHING	16	4	3	+0.77	+0.48	+23.65	36.89	23.17	-	19.39	-	+2.79
MORGAN STANLEY	11	9	9	5.09	4.60	+7.21	13.08	11.81	0.57	5.45	+1.64	2.98
BNY MELLON	8	5	4	0.22	0.28	+9.22	7.65	9.50	+2.27	7.98	1.73	+1.12
BARCLAYS	4	13	5	5.45	12.55	+7.06	8.52	19.61	+2.02	+1.48	1.02	+0.35
JJ KENNY DRAKE INC	4	2	2	+0.02	+0.04	+7.23	3.02	7.19	7.67	0.24	-	-
RBC CAPITAL MARKETS	3	7	7	+2.39	+7.56	+15.28	2.44	7.72	0.68	2.81	2.44	2.76
JEFFERIES & CO	3	9	5	2.13	6.99	+11.32	5.58	18.31	1.87	+13.62	+28.32	-
UBS	1	3	3	0.65	5.87	+0.71	0.73	6.58	+0.32	+2.20	0.45	+2.88

TRADE DETAILS

Buy/Sell	Security	Bond Type	Trade Date/ Maturity	Manager/ Broker	Cty	Local Curr.	Principal (\$)	Price	Benchmark Price	Trade Cost BP	Trading Cost
<b>15 Highest Cost Trades</b>											
B	912810SJ US TREASURY N/B 08/49 2.25	Govt	08/14/2019 08/15/2049	NEUBERGER BERMA NOMURA	US	USD	18,301,505	104.490	103.923	+54.27	+99,315
B	9128283F US TREASURY N/B 11/27 2.25	Govt	09/12/2019 11/15/2027	NEUBERGER BERMA JP MORGAN CHASE	US	USD	9,277,079	104.532	103.900	+60.45	+56,081
B	912810RZ US TREASURY N/B 11/47 2.75	Govt	08/09/2019 11/15/2047	NEUBERGER BERMA GOLDMAN SACHS	US	USD	4,961,709	111.499	110.430	+95.91	+47,589
B	912810SJ US TREASURY N/B 08/49 2.25	Govt	08/09/2019 08/15/2049	METROPOLITAN WE GOLDMAN SACHS	US	USD	5,215,785	100.594	99.773	+81.55	+42,533
B	912828Y9 US TREASURY N/B 07/26 1.875	Govt	08/01/2019 07/31/2026	METROPOLITAN WE GOLDMAN SACHS	US	USD	5,455,992	100.664	99.942	+71.71	+39,125
B	01F0306A FNCL 3 10/12	Mtge	09/05/2019 12/31/2099	METROPOLITAN WE CITIGROUP	US	USD	17,923,754	101.984	101.890	+9.25	+16,587
S	912810SD US TREASURY N/B 08/48 3	Govt	09/23/2019 08/15/2048	NEUBERGER BERMA PERSHING	US	USD	2,838,528	117.781	118.424	+54.56	+15,486
B	912828YG US TREASURY N/B 09/26 1.625	Govt	09/27/2019 09/30/2026	METROPOLITAN WE HOWARD TAYLOR &	US	USD	14,335,000	100.000	99.895	+10.55	+15,119
S	912810RZ US TREASURY N/B 11/47 2.75	Govt	08/22/2019 11/15/2047	NEUBERGER BERMA PERSHING	US	USD	5,079,953	114.156	114.461	+26.69	+13,559
B	912810SJ US TREASURY N/B 08/49 2.25	Govt	08/13/2019 08/15/2049	METROPOLITAN WE DEUTSCHE BANK	US	USD	3,507,150	103.000	102.655	+33.53	+11,758
B	912810SJ US TREASURY N/B 08/49 2.25	Govt	08/28/2019 08/15/2049	NEUBERGER BERMA GOLDMAN SACHS	US	USD	2,289,355	107.734	107.216	+48.15	+11,023
B	01F0306B FNCL 3 11/12	Mtge	09/18/2019 12/31/2099	METROPOLITAN WE CREDIT SUISSE	US	USD	6,119,244	101.145	100.980	+16.27	+9,954
B	912810SJ US TREASURY N/B 08/49 2.25	Govt	09/13/2019 08/15/2049	METROPOLITAN WE CITIGROUP	US	USD	3,216,346	98.813	98.527	+28.94	+9,307
S	9128285W TSY INFL IX N/B 01/29 0.875	Govt	07/18/2019 01/15/2029	METROPOLITAN WE HSBC BANK	US	USD	3,431,969	105.347	105.611	+25.12	+8,620



B	01F0306B FNCL 3 11/12	Mtge	09/19/2019 12/31/2099	METROPOLITAN WE CITIGROUP	US	USD	11,620,391	101.047	100.980	+6.62	+7,691
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TRADE DETAILS

Buy/Sell	Security	Bond Type	Trade Date/ Maturity	Manager/ Broker	Cty	Local Curr.	Principal (\$)	Price	Benchmark Price	Trade Cost BP	Trading Cost
<b>15 Lowest Cost Trades</b>											
S	912810RT US TREASURY N/B 08/46 2.25	Govt	08/14/2019 08/15/2046	NEUBERGER BERMA NOMURA	US	USD	19,896,112	104.250	103.752	47.81	95,127
S	912810RT US TREASURY N/B 08/46 2.25	Govt	08/09/2019 08/15/2046	NEUBERGER BERMA GOLDMAN SACHS	US	USD	4,942,420	100.969	100.023	93.62	46,273
S	912810SH US TREASURY N/B 05/49 2.875	Govt	08/09/2019 05/15/2049	METROPOLITAN WE GOLDMAN SACHS	US	USD	5,493,048	114.439	113.570	75.87	41,674
S	9128286X US TREASURY N/B 05/26 2.125	Govt	08/01/2019 05/31/2026	METROPOLITAN WE GOLDMAN SACHS	US	USD	5,644,626	102.258	101.538	70.43	39,757
S	01F03069 FNCL 3 9/12	Mtge	09/05/2019 12/31/2099	METROPOLITAN WE CITIGROUP	US	USD	17,929,932	102.020	101.920	9.76	17,492
B	912810RQ US TREASURY N/B 02/46 2.5	Govt	09/23/2019 02/15/2046	NEUBERGER BERMA PERSHING	US	USD	2,931,302	106.593	107.141	51.39	15,065
S	912828Y9 US TREASURY N/B 07/26 1.875	Govt	09/27/2019 07/31/2026	METROPOLITAN WE HOWARD TAYLOR &	US	USD	14,763,301	101.641	101.537	10.18	15,036
B	912810SD US TREASURY N/B 08/48 3	Govt	08/22/2019 08/15/2048	NEUBERGER BERMA PERSHING	US	USD	5,071,710	119.899	120.211	26.05	13,212
S	912810SH US TREASURY N/B 05/49 2.875	Govt	08/13/2019 05/15/2049	METROPOLITAN WE DEUTSCHE BANK	US	USD	3,691,103	116.992	116.622	31.65	11,683
S	912810SH US TREASURY N/B 05/49 2.875	Govt	09/13/2019 05/15/2049	METROPOLITAN WE CITIGROUP	US	USD	3,386,709	112.329	112.028	26.76	9,062
S	01F0306A FNCL 3 10/12	Mtge	09/19/2019 12/31/2099	METROPOLITAN WE CITIGROUP	US	USD	11,628,476	101.117	101.040	7.63	8,877
S	912810SH US TREASURY N/B 05/49 2.875	Govt	08/14/2019 05/15/2049	METROPOLITAN WE NOMURA	US	USD	898,568	119.016	117.934	90.85	8,163
S	21H03069 G2SF 3 9/12	Mtge	09/13/2019 12/31/2099	METROPOLITAN WE CREDIT SUISSE	US	USD	3,623,773	102.078	101.850	22.35	8,099
S	9128286X US TREASURY N/B 05/26 2.125	Govt	08/20/2019 05/31/2026	METROPOLITAN WE HOWARD TAYLOR &	US	USD	10,077,600	104.000	103.920	7.66	7,722
S	912810SH US TREASURY N/B 05/49 2.875	Govt	08/14/2019 05/15/2049	METROPOLITAN WE HOWARD TAYLOR &	US	USD	2,424,765	118.281	117.934	29.33	7,111



AGENCIES



**BOND TYPE PERFORMANCE**

Bond Type	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous.\$)	BP
CORPORATES	23	45	42	+15.89	+6.98	+16.51	21.72	9.53

**CORPORATES**



**BOND TYPE PERFORMANCE**

Bond Type	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous.\$)	BP
GOVERNMENTS	498	315	47	+13.78	+0.28	+10.99	532.76	10.71

**GOVERNMENTS**



**BOND TYPE PERFORMANCE**

Bond Type	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous.\$)	BP
MORTGAGES	166	48	22	+7.52	+0.45	+4.46	66.71	4.01

**MORTGAGES**





**MUNICIPALS**





**RATING BY EACH BOND TYPE**

**GOVERNMENTS - RATING DETAILS**

Rating	Principal	No. of	No. of Issues	Trade Cost	Trade Cost	Univ. Trade	Cost Diff. from Universe	
	(Mil. \$ )	Trades		(Thous. \$)	BP	Cost BP	(Thous. \$)	BP
AAA	498	315	47	+13.78	+0.28	+10.99	532.76	10.71



**RATING BY EACH BOND TYPE**

**MORTGAGES - RATING DETAILS**

Rating	Principal	No. of	No. of Issues	Trade Cost	Trade Cost	Univ. Trade	Cost Diff. from Universe	
	(Mil. \$ )	Trades		(Thous. \$)	BP	Cost BP	(Thous. \$)	BP
NR	166	48	22	+7.52	+0.45	+4.46	66.71	4.01

**RATING BY EACH BOND TYPE**

**CORPORATES - RATING DETAILS**

Rating	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost		Univ. Trade Cost BP	Cost Diff. from Universe	
				(Thous. \$)	BP		(Thous. \$)	BP
BBB+	7	13	13	+3.45	+5.25	+18.24	8.54	12.99
BBB-	4	11	9	+0.01	+0.02	+9.47	3.82	9.45
BBB	3	8	8	+4.21	+14.31	+30.14	4.66	15.83
A	3	2	2	+1.96	+6.69	+11.41	1.39	4.72
A+	2	1	1	0.64	2.91	+12.53	3.41	15.45
A-	2	4	4	+2.96	+17.79	+26.98	1.53	9.19
BB+	<1	2	2	+1.25	+18.25	+5.84	+0.85	+12.41
AA	<1	1	1	+1.91	+29.81	+14.43	+0.99	+15.38
A+ *-	<1	1	1	+0.42	+7.11	+4.37	+0.16	+2.74
AA-	<1	2	1	+0.36	+7.14	+14.61	0.38	7.47

HISTORICAL DATA

Quarter	Principal (Thous. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP
07/01/2019-09/30/2019	686,683	408	111	+37.19	+0.54	+9.59	621.19	9.05
04/01/2019-06/30/2019	446,471	355	107	+32.98	+0.74	+9.54	392.87	8.80
01/01/2019-03/31/2019	777,794	441	181	19.31	0.25	+11.49	913.04	11.74
Year-Ending 2019	1,910,948	1204		+50.86	+0.27	+10.35	1,927.10	10.08
10/01/2018-12/31/2018	713,870	364	137	+23.27	+0.33	+8.75	601.62	8.42
07/01/2018-09/30/2018	578,565	315	150	+2.45	+0.04	+7.31	420.64	7.27
04/01/2018-06/30/2018	779,482	378	169	+203.86	+2.62	+9.58	542.73	6.96
01/01/2018-03/31/2018	1,666,649	1608	992	+113.13	+0.68	+8.88	1,367.40	8.20
Year-Ending 2018	3,738,566	2665		+342.70	+0.92	+8.76	2,932.39	7.84
10/01/2017-12/31/2017	624,736	649	254	37.30	0.60	+6.59	448.75	7.19
07/01/2017-09/30/2017	733,365	712	245	70.43	0.96	+7.13	593.40	8.09
04/01/2017-06/30/2017	789,018	849	277	11.21	0.14	+6.26	504.99	6.40
01/01/2017-03/31/2017	710,311	779	281	+88.61	+1.25	+7.07	413.59	5.82
Year-Ending 2017	2,857,429	2989		30.32	0.11	+6.76	1,960.73	6.86
10/01/2016-12/31/2016	711,667	646	221	68.72	0.97	+6.26	514.24	7.23
07/01/2016-09/30/2016	589,731	684	203	14.71	0.25	+6.35	389.30	6.60
04/01/2016-06/30/2016	619,130	801	269	67.81	1.10	+8.74	608.75	9.84
01/02/2016-03/31/2016	710,978	1117	262	193.39	2.72	+6.08	625.45	8.80
Year-Ending 2016	2,631,505	3248		344.62	1.31	+6.81	2,137.74	8.12
10/01/2015-12/31/2015	820,526	980	212	138.86	1.69	+8.52	837.57	10.21
07/01/2015-09/30/2015	992,841	1625	204	225.86	2.27	+3.74	596.77	6.01
04/01/2015-06/30/2015	1,141,971	1504	246	310.14	2.72	+7.36	1,150.64	10.08
01/01/2015-03/31/2015	944,141	1100	191	8.38	0.09	+6.57	628.26	6.66
Year-Ending 2015	3,899,478	5209		683.23	1.75	+6.49	3,213.25	8.24

### HISTORICAL DATA

Quarter	Principal (Thous. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous. \$)	BP
10/01/2014-12/31/2014	676,216	885	213	+41.55	+0.61	+5.86	354.40	5.25
07/01/2014-09/30/2014	905,295	785	133	+534.89	+5.91	+6.85	85.46	0.94
04/01/2014-06/30/2014	727,152	957	240	48.64	0.67	+7.04	560.46	7.71
01/02/2014-03/31/2014	920,513	1033	210	131.04	1.42	+6.54	733.34	7.96
Year-Ending 2014	3,229,176	3660		+396.76	+1.23	+6.60	1,733.66	5.37
10/01/2013-12/31/2013	804,252	799	216	45.80	0.57	+5.50	487.92	6.07
07/01/2013-09/30/2013	778,379	825	214	+21.56	+0.28	+6.25	465.02	5.97
04/01/2013-06/30/2013	937,180	803	217	51.74	0.55	+7.82	784.80	8.37
01/02/2013-03/31/2013	635,964	613	190	+89.06	+1.40	+8.12	427.14	6.72
Year-Ending 2013	3,155,775	3040		+13.07	+0.04	+6.90	2,164.88	6.86
10/01/2012-12/31/2012	528,034	613	192	215.02	4.07	+7.49	610.46	11.56
07/01/2012-09/30/2012	567,084	722	230	+18.83	+0.33	+8.56	466.39	8.23
04/01/2012-06/30/2012	520,106	739	204	+102.98	+1.98	+8.39	333.44	6.41
01/02/2012-03/31/2012	136,055	131	54	+29.91	+2.20	+7.08	66.46	4.88
Year-Ending 2012	1,751,279	2205		63.30	0.36	+8.07	1,476.76	8.43
10/01/2011-12/31/2011	91,474	88	43	18.39	2.01	+6.04	73.67	8.05
07/01/2011-09/30/2011	101,872	106	49	47.22	4.64	+4.74	95.51	9.38
04/01/2011-06/30/2011	100,523	97	54	4.28	0.43	+4.90	53.56	5.33
01/02/2011-03/31/2011	205,267	171	56	143.81	7.01	+7.08	289.08	14.09
Year-Ending 2011	499,136	462		213.70	4.28	+5.97	511.82	10.25
10/01/2010-12/31/2010	184,240	138	57	8.71	0.47	+5.73	114.34	6.20
07/01/2010-09/30/2010	219,586	151	60	20.80	0.95	+4.97	129.88	5.92
04/01/2010-06/30/2010	161,213	123	50	+101.24	+6.28	+7.34	17.15	1.06
01/02/2010-03/31/2010	221,701	181	70	+60.21	+2.72	+11.49	194.49	8.77
Year-Ending 2010	786,740	593		+131.95	+1.68	+7.47	455.85	5.79

**BENCHMARK VENDOR REPORT**

Bonds	Number of Trades	Number of Issues	Vendor Benchmark	Percent Of Principal
CORPORATES	36	34	MARKETAXESS-TRADES	83.29 %
	7	7	BVAL	12.88 %
	2	2	ISSUE PRICE	3.83 %
GOVERNMENTS	305	47	TULLET PREBON	95.55 %
	5	4	BVAL	2.82 %
	5	3	BLOOMBERGTERMINAL	1.63 %
MORTGAGES	44	20	BLOOMBERGTERMINAL	98.85 %
	4	3	TULLET PREBON	1.15 %

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## SACRAMENTO COUNTY

Global Fixed Income Analysis

Period End September 30, 2019



## EXECUTIVE SUMMARY

Elkins/McSherry has been providing trading cost analyses to institutional investors since 1991. During that time we have produced Post-Trade Cost Analyses for many of the worlds largest investment managers, pension funds, banks, and broker dealers. Using this vast experience combined with an un-matched collection of global fixed income market and Universe data, Elkins/McSherry has recently produced a Trading Cost Analysis on behalf of Sacramento County. This study evaluates global fixed income executions from July 01,2019 to September 30,2019. The analysis included trading of 144 trades in 79 different issues representing \$97,170,305 in principal across municipals, mortgages, governments And corporates.

### Methodology:

The cost of each trade will be determined by comparing your executed price to the average or benchmark price of the issue on the day of the trade and to the Elkins/McSherry Fixed Income Trading Cost Universe. For comparison purposes, Elkins/McSherry establishes average institutional trading costs quarterly for governments, corporates and agency issues. The Universe is the average trading cost incurred by pension funds, investment managers, banks and brokers.

### Results:

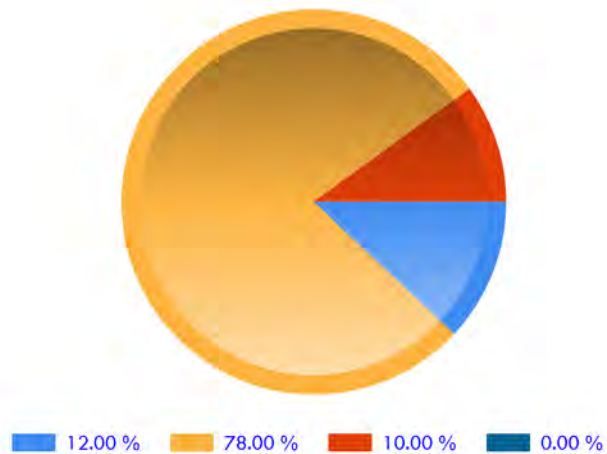
GRAND TOTAL PERFORMANCE								TRADE COST HISTORICAL PERFORMANCE				
Buy/Sell	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP	Q2 2019	Q1 2019	Q4 2018	Q3 2018
BUYS	67	80	56	28.67	4.26	+5.19	63.57	9.45	3.89	1.20	3.06	1.18
SELLS	30	64	40	2.97	0.99	+5.15	18.35	6.14	+2.14	+4.01	+7.57	+1.14
GRAND TOTAL	97	144	79	31.64	3.26	+5.17	81.92	8.43	1.18	+1.53	+1.45	+0.05



EXECUTIVE SUMMARY

BOND TYPES PERFORMANCE								TRADE COST HISTORICAL PERFORMANCE			
Bond Type	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$) BP	Q2 2019	Q1 2019	Q4 2018	Q3 2018
Governments	76	80	30	8.70	1.15	+5.18	47.88 6.33	+1.06	+5.06	+2.78	0.61
Corporates	12	55	41	7.60	6.57	+5.17	13.59 11.74	1.00	1.10	1.30	+5.88
Mortgages	10	8	7	15.27	16.02	+5.17	20.20 21.19	14.45	40.89	20.02	24.86
Municipals	<1	1	1	.06	1.66	+5.17	0.25 6.83	-	+85.70	-	-

Bonds by Principal Traded



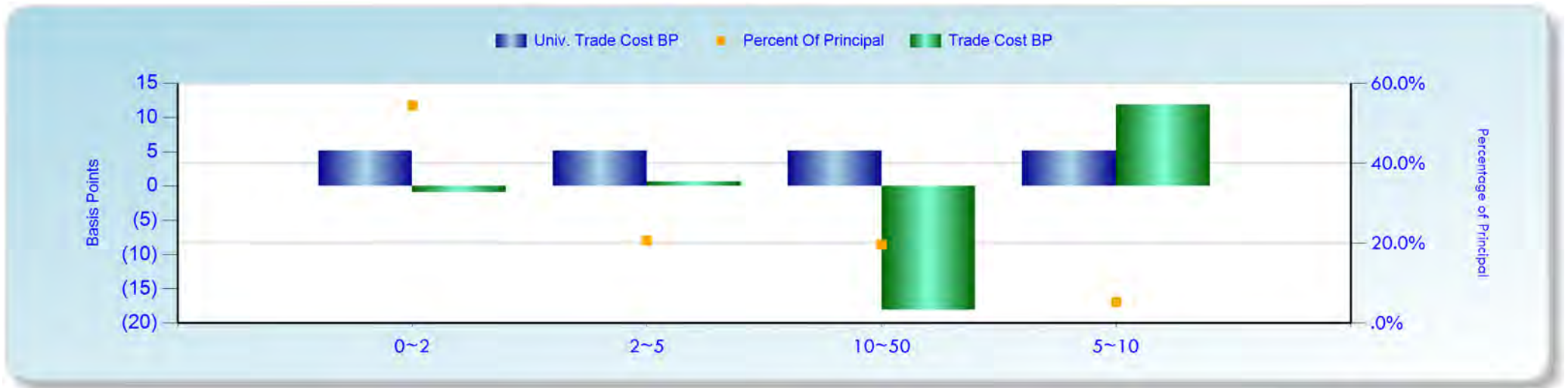
Historical Trade Cost Trend



EXECUTIVE SUMMARY

EXECUTION PERFORMANCE SUMMARY

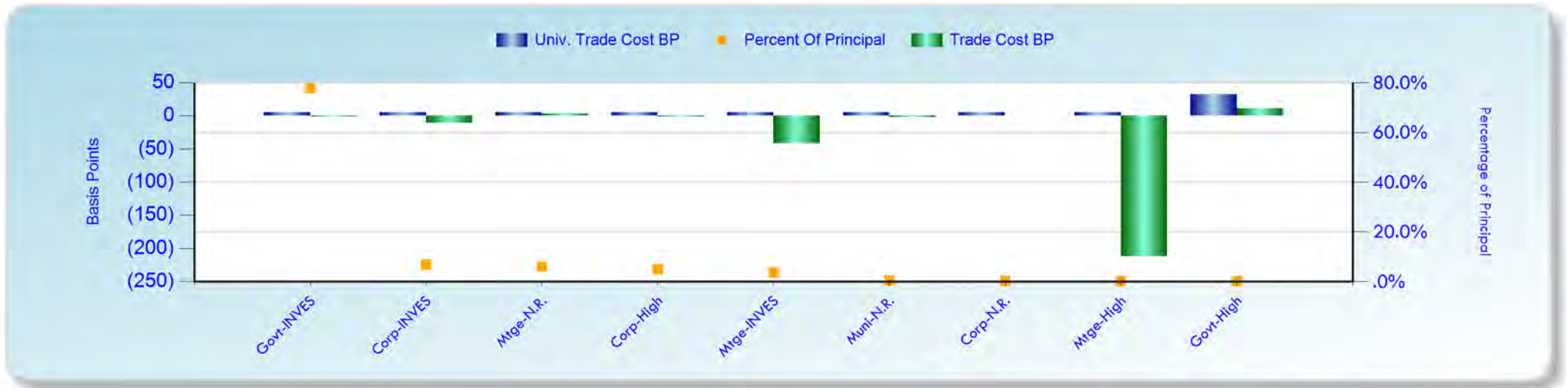
Trade Size (Millions)	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP
0~2	53	136	75	4.76	0.90	+5.18	32.17	6.08
2~5	20	6	5	+1.36	+0.68	+5.17	9.01	4.49
10~50	19	1	1	34.37	18.05	+5.17	44.22	23.22
5~10	5	1	1	+6.13	+11.91	+5.17	+3.47	+6.74



EXECUTIVE SUMMARY

GRADING SUMMARY

Grading	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP
Govt-INVESTMENT GRADE	76	79	29	8.84	1.17	+5.13	47.63	6.30
Corp-INVESTMENT GRADE	7	22	20	7.11	10.77	+5.17	10.52	15.94
Mtge-N.R.	6	5	4	+1.91	+3.25	+5.17	1.13	1.92
Corp-High Yield	5	32	20	0.50	1.04	+5.17	2.97	6.21
Mtge-INVESTMENT GRADE	4	2	2	14.54	41.19	+5.17	16.36	46.36
Muni-N.R.	<1	1	1	0.06	1.66	+5.17	0.25	6.83
Corp-N.R.	<1	1	1	+0.00	+0.00	+5.17	0.10	5.17
Mtge-High Yield	<1	1	1	2.64	211.83	+5.17	2.70	217.00
Govt-High Yield	<1	1	1	+0.14	+11.33	+32.24	0.26	20.91



EXECUTIVE SUMMARY

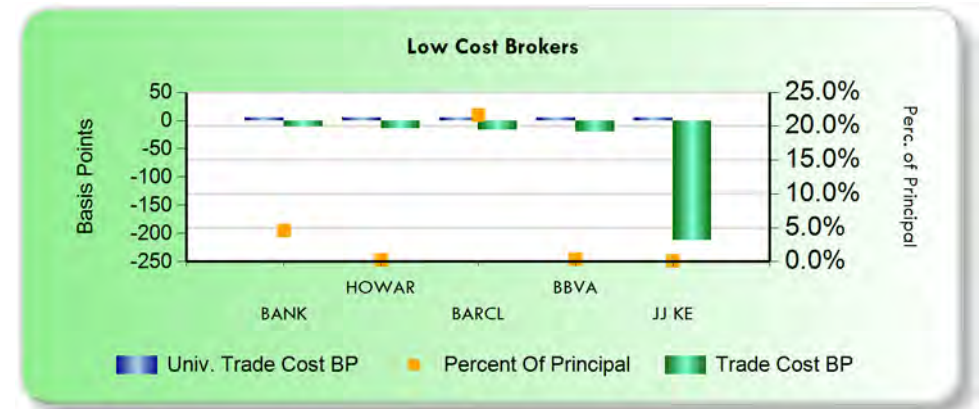
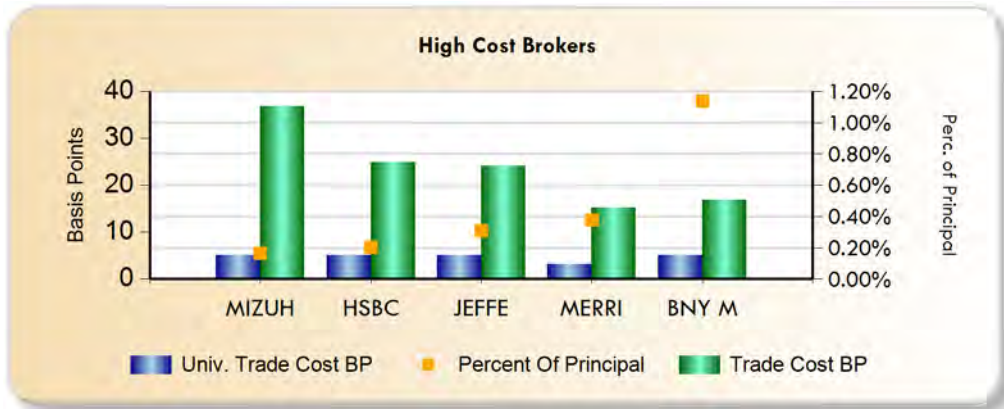
RATING SUMMARY

Rating	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous.\$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	Cost Diff. from Universe BP
AAA	79.10	81	31	23.38	2.96	+5.13	63.99	8.09
NR	6.44	7	6	+1.85	+2.87	+5.17	1.48	2.30
BBB	1.76	3	3	2.19	12.45	+5.17	3.09	17.62
BBB-	1.70	7	7	+0.92	+5.38	+5.17	+0.04	+0.21
BB-	1.49	11	7	+0.62	+4.15	+5.17	0.15	1.02
BBB+	1.16	6	5	0.26	2.20	+5.17	0.86	7.37
B+	1.02	9	5	0.61	5.96	+5.17	1.14	11.13
BB+	<1	2	2	+0.22	+2.31	+5.17	0.27	2.86
BB	<1	4	3	+0.01	+0.09	+5.17	0.39	5.08
A	<1	1	1	2.93	43.85	+5.17	3.28	49.02



**EXECUTIVE SUMMARY**

BROKER	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous.\$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)	BP
<b>5 HIGHEST COST BROKERS (Sorted By Trade Cost BP)</b>								
MIZUHO	<1	1	1	+0.59	+36.78	+5.17	+0.51	+31.61
HSBC BANK	<1	2	2	+0.50	+24.98	+5.17	+0.39	+19.81
JEFFERIES & CO	<1	4	2	+0.72	+24.10	+5.17	+0.57	+18.93
MERRILL LYNCH	<1	2	2	+0.56	+15.29	+3.25	+0.44	+12.04
BNY MELLON	1	2	2	+1.86	+16.83	+5.17	+1.29	+11.66
<b>5 LOWEST COST BROKERS (Sorted By Trade Cost BP)</b>								
BANK OF AMERICA	4	21	15	4.80	10.71	+5.17	7.11	15.88
HOWARD TAYLOR & COMP	<1	1	1	0.36	14.03	+5.17	0.49	19.20
BARCLAYS	21	9	9	34.58	16.43	+5.17	45.46	21.60
BBVA SECURITIES	<1	1	1	0.71	19.81	+5.17	0.89	24.98
JJ KENNY DRAKE INC	<1	1	1	2.64	211.83	+5.17	2.70	217.00



**COUNTRY PERFORMANCE**

COUNTRY SUMMARY									TRADE COST HISTORICAL PERFORMANCE			
Country	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$) BP		Q2 2019	Q1 2019	Q4 2018	Q3 2018
UNITED STATES	96	141	77	32.34	3.36	+5.17	82.14	8.53	1.23	+1.51	0.27	+0.05
UNITED KINGDOM	<1	2	1	+0.56	+7.85	+1.20	+0.48	+6.65	-	+12.06	-	-
GREECE	<1	1	1	+0.14	+11.33	+32.24	0.26	20.91	-	-	+27.56	-

**COUNTRY PERFORMANCE BASED ON BUYS AND SELLS**

Country	Side	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
								(Thous. \$)	BP
UNITED STATES	SELLS	30	63	39	3.53	1.19	+5.17	18.89	6.36
	BUYS	67	78	54	28.81	4.33	+5.17	63.25	9.50
UNITED KINGDOM	SELLS	<1	1	1	+0.56	+31.55	+1.20	+0.54	+30.35
	BUYS	<1	1	1	+0.00	+0.00	+1.20	0.06	1.20
GREECE	BUYS	<1	1	1	+0.14	+11.33	+32.24	0.26	20.91

**Manager PERFORMANCE**

Manager PERFORMANCE								TRADE COST HISTORICAL PERFORMANCE			
Manager	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$) BP	Q2 2019	Q1 2019	Q4 2018	Q3 2018
PRUDENTIAL INVESTMEN	97	144	79	31.64	3.26	+5.17	81.92 8.43	1.18	+1.53	+1.45	+0.05



### BROKER PERFORMANCE

BROKER PERFORMANCE									TRADE COST HISTORICAL PERFORMANCE			
BROKER	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$)		Q2 2019	Q1 2019	Q4 2018	Q3 2018
BARCLAYS	21	9	9	34.58	16.43	+5.17	45.46	21.60	+2.61	+6.57	7.88	+6.03
JP MORGAN CHASE	16	21	15	0.85	0.53	+5.38	9.44	5.91	5.28	+22.64	2.43	+1.70
NOMURA	12	7	6	+2.40	+2.03	+5.17	3.72	3.14	+1.21	+0.91	9.12	+0.68
MORGAN STANLEY	8	14	12	+2.18	+2.77	+5.17	1.89	2.40	17.96	+1.39	+4.23	+2.80
RBC CAPITAL MARKETS	8	7	6	0.03	0.04	+5.17	4.00	5.21	47.90	+0.31	0.92	1.25
GOLDMAN SACHS	7	8	8	+7.81	+10.71	+4.88	+4.25	+5.83	+11.54	+0.89	+0.56	4.71
CITIGROUP	7	10	10	4.63	6.46	+5.17	8.33	11.63	3.25	+10.15	+3.54	+4.60
BANK OF AMERICA	4	21	15	4.80	10.71	+5.17	7.11	15.88	4.57	13.76	+0.83	67.01
TD SECURITIES	4	7	7	+0.76	+1.79	+5.17	1.43	3.38	0.04	0.04	+0.30	+0.02
CITADEL SECURITIES	2	4	4	+0.04	+0.17	+5.17	1.16	5.00	+0.06	0.21	0.33	+0.16
CREDIT SUISSE	2	5	4	0.12	0.75	+5.17	0.99	5.92	+5.67	+6.19	+8.78	0.28
BNY MELLON	1	2	2	+1.86	+16.83	+5.17	+1.29	+11.66	20.19	+0.00	+0.00	-
WELLS FARGO	<1	3	3	+0.13	+1.88	+5.17	0.22	3.29	-	14.37	9.45	8.57
SCOTIA CAPITAL	<1	2	2	0.50	8.15	+5.17	0.81	13.32	3.62	-	+0.47	-
BNP PARIBAS	<1	1	1	0.08	1.55	+5.17	0.35	6.72	+0.08	19.38	+0.40	-
MERRILL LYNCH	<1	2	2	+0.56	+15.29	+3.25	+0.44	+12.04	-	1.35	+25.76	4.02
BBVA SECURITIES	<1	1	1	0.71	19.81	+5.17	0.89	24.98	-	8.20	-	-
JEFFERIES & CO	<1	4	2	+0.72	+24.10	+5.17	+0.57	+18.93	+1.42	+3.98	+3.19	+14.52
BMO CAPITAL MARKETS	<1	2	2	0.16	5.55	+5.17	0.30	10.72	+9.66	+1.41	+0.04	-
HOWARD TAYLOR & COMP	<1	1	1	0.36	14.03	+5.17	0.49	19.20	-	-	-	-
UBS	<1	1	1	+0.00	+0.00	+5.17	0.11	5.17	+11.36	+10.00	0.92	-
CANTOR FITZGERALD	<1	3	2	+0.04	+1.80	+5.17	0.07	3.37	12.61	-	-	8.17

Sacramento County  
Period End September 30, 2019  
(Global Fixed Income Analysis)

### BROKER PERFORMANCE

BROKER PERFORMANCE									TRADE COST HISTORICAL PERFORMANCE			
BROKER	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$) BP		Q2 2019	Q1 2019	Q4 2018	Q3 2018
HSBC BANK	<1	2	2	+0.50	+24.98	+5.17	+0.39	+19.81	+40.75	+4.35	+12.01	6.15
MIZUHO	<1	1	1	+0.59	+36.78	+5.17	+0.51	+31.61	+3.36	-	-	-
SEAPORT GROUP SECS	<1	1	1	+0.19	+12.47	+5.17	+0.11	+7.30	-	+0.83	-	-
JJ KENNY DRAKE INC	<1	1	1	2.64	211.83	+5.17	2.70	217.00	-	-	-	-
SUMRIDGE PARTNERS LL	<1	2	1	+0.06	+10.95	+5.17	+0.03	+5.78	-	-	-	-
STIFEL NICOLAUS & CO	<1	1	1	0.04	10.52	+5.17	0.06	15.69	-	-	+5.85	-
DEUTSCHE BANK	<1	1	1	+0.03	+12.42	+5.17	+0.02	+7.25	3.78	23.87	1.46	1.93

TRADE DETAILS

Buy/Sell	Security	Bond Type	Trade Date/ Maturity	Manager/ Broker	Cty	Local Curr.	Principal (\$)	Price	Benchmark Price	Trade Cost BP	Trading Cost
<b>15 Highest Cost Trades</b>											
B	912810SJ US TREASURY N/B 08/49 2.25	Govt	09/25/2019 08/15/2049	PRUDENTIAL INVE JP MORGAN CHASE	US	USD	3,100,020	103.334	102.873	+44.57	+13,817
B	9128286T US TREASURY N/B 05/29 2.375	Govt	07/31/2019 05/15/2029	PRUDENTIAL INVE GOLDMAN SACHS	US	USD	5,150,976	103.020	102.897	+11.91	+6,133
B	912810RC US TREASURY N/B 08/43 3.625	Govt	09/26/2019 08/15/2043	PRUDENTIAL INVE NOMURA	US	USD	3,929,913	128.639	128.508	+10.18	+4,000
S	74727PBB STATE OF QATAR SR UNSECURED	Govt	07/02/2019 03/14/2049	PRUDENTIAL INVE GOLDMAN SACHS	US	USD	388,600	116.000	116.510	+43.97	+1,709
S	912810SF US TREASURY N/B 02/49 3	Govt	07/29/2019 02/15/2049	PRUDENTIAL INVE JP MORGAN CHASE	US	USD	606,375	108.281	108.567	+26.41	+1,601
S	912810SF US TREASURY N/B 02/49 3	Govt	08/12/2019 02/15/2049	PRUDENTIAL INVE JP MORGAN CHASE	US	USD	605,446	117.563	117.871	+26.25	+1,589
B	3132XSHJ FED HM LN PC POOL Q50232 FG	Mtge	09/06/2019 08/01/2047	PRUDENTIAL INVE BNY MELLON	US	USD	858,316	104.227	104.040	+17.90	+1,536
S	912810SF US TREASURY N/B 02/49 3	Govt	08/12/2019 02/15/2049	PRUDENTIAL INVE CITADEL SECURIT	US	USD	564,281	117.559	117.871	+26.58	+1,500
S	80413TAL SAUDI INTERNATIONAL BOND SR	Govt	07/16/2019 01/16/2050	PRUDENTIAL INVE BANK OF AMERICA	US	USD	320,988	116.300	116.740	+37.83	+1,214
S	912828XT US TREASURY N/B 05/24 2	Govt	07/01/2019 05/31/2024	PRUDENTIAL INVE TD SECURITIES	US	USD	1,534,725	100.969	101.045	+7.58	+1,164
B	054937AL BB+T CORPORATION JR SUBORDIN	Corp	07/22/2019 12/30/1899	PRUDENTIAL INVE MORGAN STANLEY	US	USD	580,000	100.000	99.804	+19.58	+1,136
B	5512878 REPUBLIC OF ITALY	Govt	09/17/2019 08/04/2028	PRUDENTIAL INVE MORGAN STANLEY	US	GBP	160,162	128.510	127.763	+58.13	+931
S	9128286T US TREASURY N/B 05/29 2.375	Govt	07/31/2019 05/15/2029	PRUDENTIAL INVE CITIGROUP	US	USD	3,003,721	102.867	102.897	+2.89	+867
B	912828YE US TREASURY N/B 08/24 1.25	Govt	09/03/2019 08/31/2024	PRUDENTIAL INVE JP MORGAN CHASE	US	USD	2,417,850	99.500	99.466	+3.45	+835



B	912828YB US TREASURY N/B 08/29 1.625	Govt	08/12/2019 08/15/2029	PRUDENTIAL INVE CREDIT SUISSE	US	USD	722,106	99.601	99.486	+11.51	+831
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**TRADE DETAILS**

Buy/Sell	Security	Bond Type	Trade Date/ Maturity	Manager/ Broker	Cty	Local Curr.	Principal (\$)	Price	Benchmark Price	Trade Cost BP	Trading Cost
<b>15 Lowest Cost Trades</b>											
B	91281ORM US TREASURY N/B 05/45 3	Govt	09/19/2019 05/15/2045	PRUDENTIAL INVE BARCLAYS	US	USD	19,044,438	115.701	115.910	18.05	34,373
B	08162UAW BENCHMARK MORTGAGE TRUST BMA	Mtge	07/31/2019 01/15/2052	PRUDENTIAL INVE JP MORGAN CHASE	US	USD	3,416,066	111.855	112.330	42.42	14,492
S	80413TAL SAUDI INTERNATIONAL BOND SR	Govt	09/17/2019 01/16/2050	PRUDENTIAL INVE BANK OF AMERICA	US	USD	311,150	122.500	120.891	131.39	4,088
B	097023CQ BOEING CO SR UNSECURED 02/50	Corp	07/29/2019 02/01/2050	PRUDENTIAL INVE JP MORGAN CHASE	US	USD	669,296	99.155	99.590	43.85	2,935
S	45660GBB INDYMAC INDX MORTGAGE LOAN T	Mtge	07/17/2019 08/25/2036	PRUDENTIAL INVE JJ KENNY DRAKE	US	USD	124,645	93.000	91.030	211.83	2,640
S	912810SJ US TREASURY N/B 08/49 2.25	Govt	09/26/2019 08/15/2049	PRUDENTIAL INVE NOMURA	US	USD	3,073,359	102.445	102.364	7.93	2,438
B	345397ZU FORD MOTOR CREDIT CO LLC SR	Corp	07/29/2019 11/01/2022	PRUDENTIAL INVE CITIGROUP	US	USD	1,534,201	99.948	100.100	15.16	2,326
B	912810SF US TREASURY N/B 02/49 3	Govt	07/29/2019 02/15/2049	PRUDENTIAL INVE CITIGROUP	US	USD	1,084,101	108.410	108.567	14.48	1,570
B	06051GHV BANK OF AMERICA CORP SR UNSE	Corp	07/18/2019 07/23/2030	PRUDENTIAL INVE BANK OF AMERICA	US	USD	400,000	100.000	100.389	38.94	1,557
B	912810SH US TREASURY N/B 05/49 2.875	Govt	08/12/2019 05/15/2049	PRUDENTIAL INVE JP MORGAN CHASE	US	USD	597,892	114.979	115.277	25.92	1,550
B	912810SH US TREASURY N/B 05/49 2.875	Govt	08/12/2019 05/15/2049	PRUDENTIAL INVE CITADEL SECURIT	US	USD	557,630	114.975	115.277	26.26	1,464
B	9128286Z US TREASURY N/B 06/24 1.75	Govt	07/01/2019 06/30/2024	PRUDENTIAL INVE TD SECURITIES	US	USD	1,501,237	99.750	99.825	7.52	1,129
S	912828Y8 US TREASURY N/B 07/24 1.75	Govt	09/03/2019 07/31/2024	PRUDENTIAL INVE JP MORGAN CHASE	US	USD	2,485,273	101.855	101.814	4.07	1,010
B	29261AAB ENCOMPASS HEALTH CORP COMPAN	Corp	09/09/2019 02/01/2030	PRUDENTIAL INVE CITIGROUP	US	USD	150,000	100.000	100.625	62.50	938
S	9128286T US TREASURY N/B 05/29 2.375	Govt	08/12/2019 05/15/2029	PRUDENTIAL INVE CREDIT SUISSE	US	USD	760,581	106.375	106.254	11.38	866



AGENCIES



**BOND TYPE PERFORMANCE**

Bond Type	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous.\$)	BP
CORPORATES	12	55	41	7.60	6.57	+5.17	13.59	11.74

**CORPORATES**





**BOND TYPE PERFORMANCE**

Bond Type	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous.\$)	BP
GOVERNMENTS	76	80	30	8.70	1.15	+5.18	47.88	6.33

**GOVERNMENTS**



**BOND TYPE PERFORMANCE**

Bond Type	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous.\$)	BP
MORTGAGES	10	8	7	15.27	16.02	+5.17	20.20	21.19

**MORTGAGES**



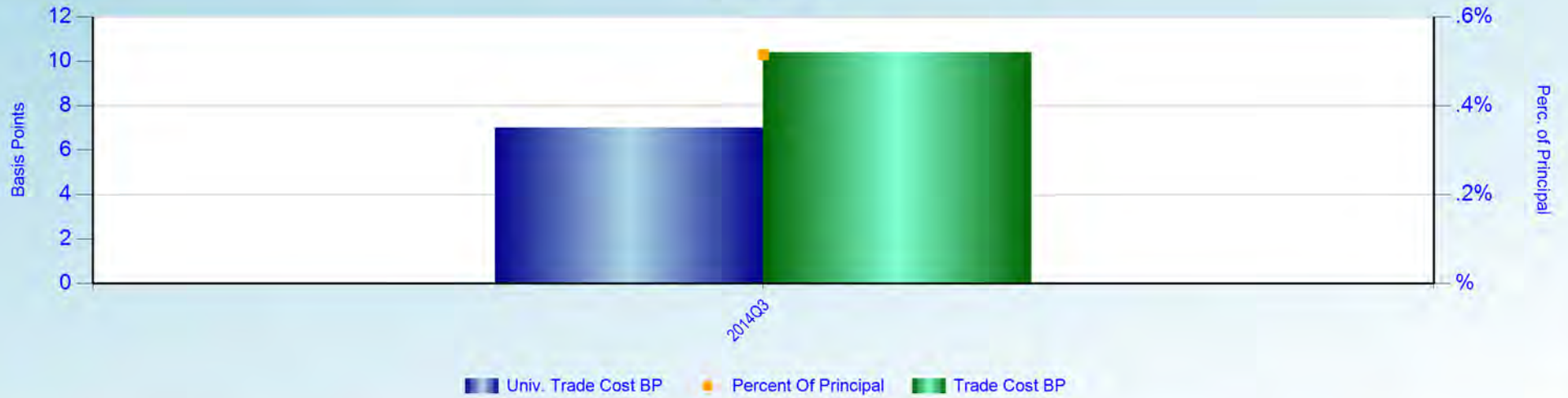
**BOND TYPE PERFORMANCE**

Bond Type	Principal (Mil. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous.\$)	BP
MUNICIPALS	<1	1	1	0.06	1.66	+5.17	0.25	6.83





UNCLASSIFIED



**RATING BY EACH BOND TYPE**

**GOVERNMENTS - RATING DETAILS**

Rating	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost	Trade Cost	Univ. Trade	Cost Diff. from Universe	
				(Thous. \$)	BP	Cost BP	(Thous. \$)	BP
AAA	76	79	29	8.84	1.17	+5.13	47.63	6.30
B-	<1	1	1	+0.14	+11.33	+32.24	0.26	20.91

**RATING BY EACH BOND TYPE**

**MORTGAGES - RATING DETAILS**

Rating	Principal	No. of	No. of Issues	Trade Cost	Trade Cost	Univ. Trade	Cost Diff. from Universe	
	(Mil. \$ )	Trades		(Thous. \$)	BP	Cost BP	(Thous. \$)	BP
NR	6	5	4	+1.91	+3.25	+5.17	1.13	1.92
AAA	4	2	2	14.54	41.19	+5.17	16.36	46.36
CCC	<1	1	1	2.64	211.83	+5.17	2.70	217.00

**RATING BY EACH BOND TYPE**

**CORPORATES - RATING DETAILS**

Rating	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost		Univ. Trade		Cost Diff. from Universe	
				(Thous. \$)	BP	Cost BP	(Thous. \$)	BP	
BBB	2	3	3	2.19	12.45	+5.17	3.09	17.62	
BBB-	2	7	7	+0.92	+5.38	+5.17	+0.04	+0.21	
BB-	1	11	7	+0.62	+4.15	+5.17	0.15	1.02	
BBB+	1	6	5	0.26	2.20	+5.17	0.86	7.37	
B+	1	9	5	0.61	5.96	+5.17	1.14	11.13	
BB+	<1	2	2	+0.22	+2.31	+5.17	0.27	2.86	
BB	<1	4	3	+0.01	+0.09	+5.17	0.39	5.08	
A	<1	1	1	2.93	43.85	+5.17	3.28	49.02	
AA-	<1	3	2	0.73	11.07	+5.17	1.07	16.24	
A-	<1	1	1	1.56	38.94	+5.17	1.76	44.11	
AA	<1	1	1	0.36	14.03	+5.17	0.49	19.20	
CCC+	<1	2	1	0.14	5.73	+5.17	0.27	10.90	
B-	<1	3	1	0.54	21.72	+5.17	0.67	26.89	
NR	<1	1	1	+0.00	+0.00	+5.17	0.10	5.17	
B	<1	1	1	0.04	7.45	+5.17	0.08	12.62	

**RATING BY EACH BOND TYPE**

**MUNICIPALS - RATING DETAILS**

Rating	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost		Univ. Trade Cost BP	Cost Diff. from Universe	
				(Thous. \$)	BP		(Thous. \$)	BP
NR	<1	1	1	0.06	1.66	+5.17	0.25	6.83



**COUNTRIES BY EACH BOND TYPE**

<b>GOVERNMENTS</b>								
Country	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe (Thous. \$) BP	
UNITED STATES	75	77	28	9.41	1.26	+5.17	48.10	6.43
UNITED KINGDOM	<1	2	1	+0.56	+7.85	+1.20	+0.48	+6.65
GREECE	<1	1	1	+0.14	+11.33	+32.24	0.26	20.91



**COUNTRIES BY EACH BOND TYPE**

CORPORATES								
Country	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous. \$)	BP
UNITED STATES	12	55	41	7.60	6.57	+5.17	13.59	11.74



**COUNTRIES BY EACH BOND TYPE**

MORTGAGES								
Country	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous. \$)	BP
UNITED STATES	10	8	7	15.27	16.02	+5.17	20.20	21.19



**COUNTRIES BY EACH BOND TYPE**

MUNICIPALS								
Country	Principal (Mil. \$ )	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous. \$)	BP
UNITED STATES	<1	1	1	0.06	1.66	+5.17	0.25	6.83

### HISTORICAL DATA

Quarter	Principal (Thous. \$)	No. of Trades	No. of Issues	Trade Cost		Univ. Trade Cost BP	Cost Diff. from Universe	
				(Thous. \$)	BP		(Thous. \$)	BP
07/01/2019-09/30/2019	97,170	144	79	31.64	3.26	+5.17	81.92	8.43
04/01/2019-06/30/2019	58,138	153	87	6.84	1.18	+5.19	37.02	6.37
01/01/2019-03/31/2019	93,964	228	119	+14.36	+1.53	+6.02	42.17	4.49
Year-Ending 2019	249,272	525		24.11	0.97	+5.50	161.11	6.46
10/01/2018-12/31/2018	66,814	146	75	+9.69	+1.45	+7.24	38.71	5.79
07/01/2018-09/30/2018	37,664	102	50	+0.18	+0.05	+5.24	19.56	5.19
04/01/2018-06/30/2018	77,479	217	112	+12.54	+1.62	+5.51	30.15	3.89
01/01/2018-03/31/2018	51,291	127	70	1.01	0.20	+10.09	52.77	10.29
Year-Ending 2018	233,248	592		+21.40	+0.92	+6.97	141.19	6.05
10/01/2017-12/31/2017	47,359	119	46	21.97	4.64	+4.00	40.93	8.64
07/01/2017-09/30/2017	74,271	178	73	+11.09	+1.49	+2.75	9.35	1.26
04/01/2017-06/30/2017	65,905	139	61	+10.87	+1.65	+3.17	10.02	1.52
01/01/2017-03/31/2017	88,323	207	89	+24.27	+2.75	+3.32	5.07	0.57
Year-Ending 2017	275,858	643		+24.27	+0.88	+3.25	65.38	2.37
10/01/2016-12/31/2016	59,762	110	50	5.73	0.96	+3.49	26.57	4.45
07/01/2016-09/30/2016	44,927	135	53	+9.79	+2.18	+3.58	6.28	1.40
04/01/2016-06/30/2016	76,455	102	58	+22.49	+2.94	+5.97	23.17	3.03
01/02/2016-03/31/2016	91,594	125	57	42.69	4.66	+4.69	85.61	9.35
Year-Ending 2016	272,738	472		16.14	0.59	+4.60	141.63	5.19
10/01/2015-12/31/2015	43,193	60	34	29.83	6.91	+7.18	60.85	14.09
07/01/2015-09/30/2015	20,663	41	24	68.34	33.07	+4.30	77.22	37.37
04/01/2015-06/30/2015	143,060	122	71	98.11	6.86	+5.55	177.48	12.41
01/01/2015-03/31/2015	116,093	109	56	60.79	5.24	+5.51	124.75	10.75
Year-Ending 2015	323,008	332		257.06	7.96	+5.67	440.30	13.63

### HISTORICAL DATA

Quarter	Principal (Thous. \$)	No. of Trades	No. of Issues	Trade Cost (Thous. \$)	Trade Cost BP	Univ. Trade Cost BP	Cost Diff. from Universe	
							(Thous. \$)	BP
10/01/2014-12/31/2014	48,315	72	50	+9.25	+1.91	+5.72	18.39	3.81
07/01/2014-09/30/2014	266,740	204	99	216.37	8.11	+7.08	405.13	15.19
04/01/2014-06/30/2014	244,265	204	138	+42.48	+1.74	+8.55	166.48	6.81
01/02/2014-03/31/2014	187,634	187	128	+186.20	+9.92	+8.13	+33.59	+1.79
Year-Ending 2014	746,953	667		+21.55	+0.29	+7.74	556.41	7.45
10/01/2013-12/31/2013	143,798	142	84	+56.51	+3.93	+8.36	63.70	4.43
07/01/2013-09/30/2013	187,166	136	90	+47.79	+2.55	+6.68	77.19	4.13
04/01/2013-06/30/2013	157,154	129	98	+104.81	+6.67	+1.44	+82.21	+5.23
01/02/2013-03/31/2013	281,064	206	156	+366.87	+13.05	+1.56	+323.04	+11.49
Year-Ending 2013	769,183	613		+575.98	+7.49	+4.05	+264.35	+3.44
10/01/2012-12/31/2012	132,722	116	90	+470.95	+35.48	+2.11	+442.94	+33.37
07/01/2012-09/30/2012	120,859	101	77	+125.20	+10.36	+2.09	+99.92	+8.27
04/01/2012-06/30/2012	85,150	85	60	+71.84	+8.44	+2.27	+52.54	+6.17
01/02/2012-03/31/2012	31,666	13	9	0.75	0.24	+7.38	24.12	7.62
Year-Ending 2012	370,398	315		+667.24	+18.01	+2.59	+571.28	+15.42
10/01/2011-12/31/2011	54,456	22	11	+249.88	+45.89	+3.18	+232.57	+42.71
07/01/2011-09/30/2011	45,561	26	10	+31.66	+6.95	+4.14	+12.80	+2.81
04/01/2011-06/30/2011	40,214	15	6	+83.99	+20.88	+4.01	+67.86	+16.87
01/02/2011-03/31/2011	45,680	23	3	+2.18	+0.48	+5.21	21.63	4.73
Year-Ending 2011	185,912	86		+367.70	+19.78	+4.09	+291.59	+15.68
10/01/2010-12/31/2010	57,022	27	11	152.30	26.71	+8.46	200.51	35.17
Year-Ending 2010	57,022	27		152.30	26.71	+8.46	200.51	35.16

**BENCHMARK VENDOR REPORT**

Bonds	Number of Trades	Number of Issues	Vendor Benchmark	Percent Of Principal
CORPORATES	36	24	MARKETAXESS-TRADES	65.54 %
	8	8	ISSUE PRICE	16.44 %
	10	8	BVAL	15.49 %
	1	1	BLOOMBERGTERMINAL	2.53 %
GOVERNMENTS	63	21	TULLET PREBON	95.72 %
	8	4	BVAL	1.53 %
	5	5	BLOOMBERGTERMINAL	1.47 %
	1	1	ISSUE PRICE	0.71 %
	3	2	MARKETAXESS-EMQUOTES	0.57 %
MORTGAGES	8	7	BLOOMBERGTERMINAL	100.00 %
MUNICIPALS	1	1	MSRB-TRADES	100.00 %

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