



Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 10

MEETING DATE: February 15, 2023

SUBJECT: Trading Cost Analysis Report—Fourth Quarter 2022

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

RECOMMENDATION

Receive and file the Quarterly Trading Cost Analysis Reports for the quarter ending December 31, 2022.

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 (E/M), a trading cost consultant and wholly owned subsidiary of State Street, to monitor the trading costs of SCERS' public equity and fixed income managers, whose assets are held at the custodian, State Street (commingled fund trading costs are not covered by E/M). This report will summarize the key details of the Transaction Cost Analysis reports from E/M. The E/M reports analyze costs across both explicit and implicit costs, including commission trading costs, fees, and market impact costs¹. As detailed below, across all asset classes, SCERS' trading costs generated a net savings versus E/M benchmark costs of approximately \$1.2 million for the fourth quarter 2022. Summary versions of the reports are included as attachments, with expanded reports available upon request. The summary notes below are categorized by asset class for the quarter. Comments below are summarized at a high level by asset class, and specific manager issues, if any, will be noted in compliance with SCERS' Transaction Cost Analysis policy.

¹ Market Impact Costs measure the difference between a manager's trade price and a market benchmark, such as the volume weighted average price (VWAP).

Fourth Quarter 2022

- U.S. Equity ([E/M Summary Report](#))
 - SCERS' total trading savings was 2.1 cents per share (cps)², which was 5.75 cps lower than the E/M benchmark costs of +3.65 cps³.
 - SCERS' U.S. equity managers outperformed on both commissions and market impact costs during the quarter. For commissions, SCERS' equity manager costs were better than the universe by 1.22 cps (+0.61 cps versus +1.83 cps). Market impact costs were lower by 4.53 cps (-2.71 cps versus +1.82 cps) compared to the benchmark.
 - As measured in basis points (bp), SCERS' total trading savings was 3.78 bp, which was 10.35 bp lower than the E/M benchmark costs of +6.57 bp.
 - Based on 4.2 million shares traded during the quarter (\$234.9 million principal), SCERS' U.S. equity managers produced savings of approximately \$243,000 compared to E/M benchmark costs.
 - All of SCERS' U.S. equity managers outperformed the benchmark, measured by total cost/savings, with Alliance Bernstein as the top performing manager.

- Global Equity ([E/M Summary Report](#))
 - SCERS' total global equity trading costs were +7.29 basis points (bp), 12.51 basis points lower than the E/M benchmark costs of +19.8 bp.
 - SCERS' equity managers generated market impact savings of 3.68 bp, which was better than market impact costs of +0.83 bp for the benchmark (4.51 bp better than the benchmark), as measured by the full day VWAP.
 - SCERS' commission costs (+7.50 bp) were significantly lower than benchmark costs (+15.24 bp). Costs for fees (+3.48 bp) were also slightly lower than the benchmark (+3.75 bp).
 - Total principal traded was \$97 million across 20 countries, resulting in a savings of approximately \$122,000 compared to E/M benchmark costs.
 - No manager specific issues were noted, with all managers delivering cost savings versus E/M benchmarks in every quarter over the past year.

- U.S. Fixed Income ([E/M Summary Report](#))
 - SCERS' U.S. Fixed Income managers generated trade savings of 0.15 basis points during the quarter, significantly lower than the E/M benchmark costs of +9.25 bp (difference of 9.40 bp).
 - Total trade volume was approximately \$809 million in principal, with 551 trades executed across 169 different securities.
 - The trade costs versus the benchmark represented a savings of approximately \$760,000 versus average benchmark costs.
 - Trade savings for the quarter were primarily driven by Government Bonds while Corporate Bonds generated trade costs. However, relative to the E/M benchmark, both bond types delivered better costs.

² Transaction Cost Analysis (TCA) is presented in either cents per share (cps) or basis points (bp). Cents per share is typically used for U.S. Equity analysis, while basis points is used across other asset classes. Cents per share is the cost for executing transactions on a per share basis, while basis points represent costs based on principal amount traded, with 1 basis point equal to 1/100th of one percent.

³ Difference between SCERS' trading costs and benchmark costs may not equal due to rounding.

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- Brandywine's trade cost was higher this quarter at +10.85 bp and was slightly lower (0.10 bp) than the E/M benchmark (+10.95 bp).
 - Global Fixed Income ([E/M Summary Report](#))
 - SCERS' Global Fixed Income trade savings were 0.14 bp, which was 5.20 bp lower than the benchmark costs of +5.06 bp.
 - Trade volume during the quarter was approximately \$192.9 million, with 251 trades executed across 50 different securities.
 - Trade costs versus the benchmark resulted in cost savings of approximately \$100 thousand compared to average benchmark costs.
 - No manager specific issues were noted. Prudential is the lone manager in the global fixed income report. Prudential is a core plus manager, but it has the flexibility to add non-U.S. exposure, and has delivered significant cost savings versus the E/M benchmark.
 - Commission Recapture
 - For the fourth quarter 2022, SCERS received a rebate of \$2,888, which represents approximately 53% of the commissions generated through the program during the quarter.
 - The rebate received in the fourth quarter of 2022 was lower than the rebate received in the fourth quarter of the prior year, which was \$3,228.
 - For the calendar year ending December 2022, SCERS has received a rebate of \$15,942, which is 15% lower than the rebate received for 2021.

Staff has received and reviewed the full reports from Elkins/McSherry. The summary reports attached include key pages from these reports. The full reports are available upon request.

ATTACHMENTS

- Board Order
- Elkins / McSherry Trading Cost Summary reports for the quarter ending December 31, 2022, for U.S. equity, international equity, U.S. fixed income, and global fixed income.

Prepared by:

/S/

Michael Vang
Investment Analyst

Reviewed by:

/S/

Steve Davis
Chief Investment Officer

/S/

Eric Stern
Chief Executive Officer



Retirement Board Order

Sacramento County Employees' Retirement System

**Before the Board of Retirement
February 15, 2023**

AGENDA ITEM:

Trading Cost Analysis Report – Fourth Quarter 2022

THE BOARD OF RETIREMENT hereby approves Staff's recommendation to receive and file the Trading Cost Analysis Report – Fourth Quarter 2022.

I HEREBY CERTIFY that the above order was passed and adopted on February 15, 2023 by the following vote of the Board of Retirement, to wit:

AYES:

NOES:

ABSENT:

ABSTAIN:

ALTERNATES:

(Present but not voting)

Keith DeVore
Board President

Eric Stern
Chief Executive Officer and
Board Secretary



SACRAMENTO COUNTY

Trade Cost Summary - U.S. Equity Trading

Period End December 31, 2022





(+) = 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 October 1 , 2022 to December 31, 2022. The analysis included trading of 4,228,867 shares representing \$234.88 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"> Your commission cost was +0.61 cps (+1.09 bp) or +\$25,657 (1.22 cps (2.19 bp) better than the Elkins/McSherry All Trading Universe) 	<ul style="list-style-type: none"> Your market impact savings was 2.71 cps (4.88 bp) or 4.53 cps (8.15 bp) better than the Elkins/McSherry Universe Your overall trading savings of 2.10 cps (3.78 bp) was 5.75 cps (10.35 bp) better than the Elkins/McSherry Universe Full Day VWAP Universe Rank: 85% Total Cost Universe Rank: 88% 	<ul style="list-style-type: none"> E-Score : -0.03

ELKINS/MCSHERRY UNIVERSE VALUES					
Commission (cps)				Market Impact (cps)	
Bundled	All Trading	Execution Only	Program		Full Day VWAP
+3.59	+1.82	+1.57	+1.60	Median	+1.82
				75 %	0.45
				25 %	+4.39



(+) = Cost

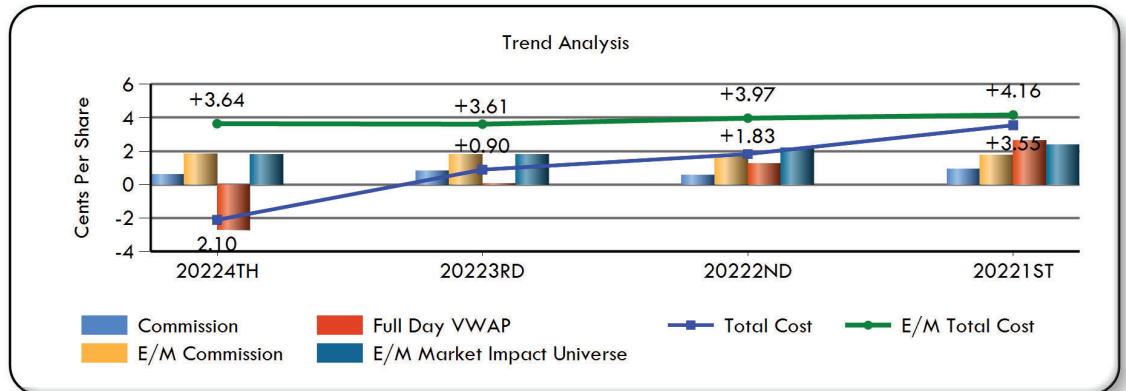
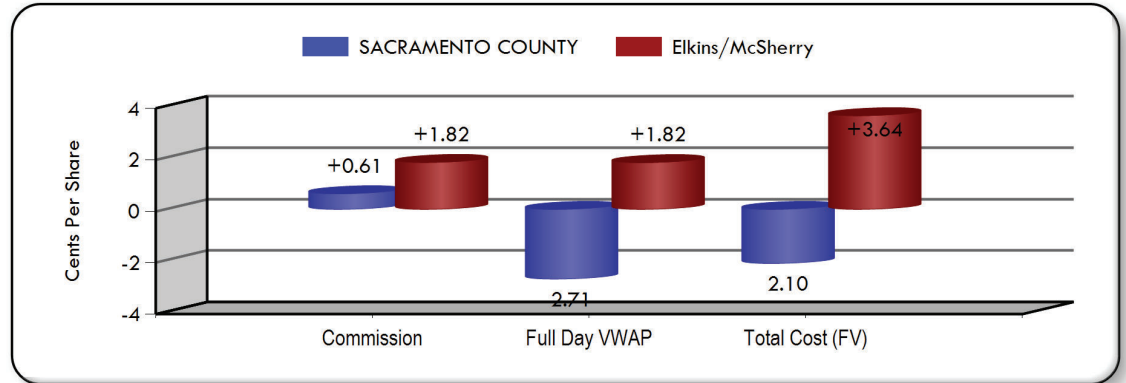
EXECUTIVE SUMMARY

TOTAL PORTFOLIO COST PERFORMANCE

Side	COMMISSION			MARKET IMPACT		Total Cost (cps)	Total Cost/Savings Vs. Universe Commission+ Full Day VWAP (cps)	E -Score
	Your Avg. Commission (cps)	All Trading Universe (cps)	Bundled Universe (cps)	Full Day VWAP (cps)	Universe Full Day VWAP (cps)			
Sells	+0.57	+1.82	+3.59	+2.72	+1.82	+3.29	0.36	0.01
Buys	+0.63	+1.82	+3.59	6.68	+1.82	6.05	9.69	-0.08
Total	+0.61	+1.82	+3.59	2.71	+1.82	2.10	5.75	-0.03

TRADING COMPONENTS

	Buy	Sell
Trade Principal	121,559,187	113,319,087
Shares	2,442,865	1,786,002
Unique Names	1,022	455
Liquidity (% ADV)	0.02	0.043
Avg. Execution Size	974	1,768
Avg. Order Completion Time (min)	N/A	N/A
Total Number of Trades	2,508	1,010





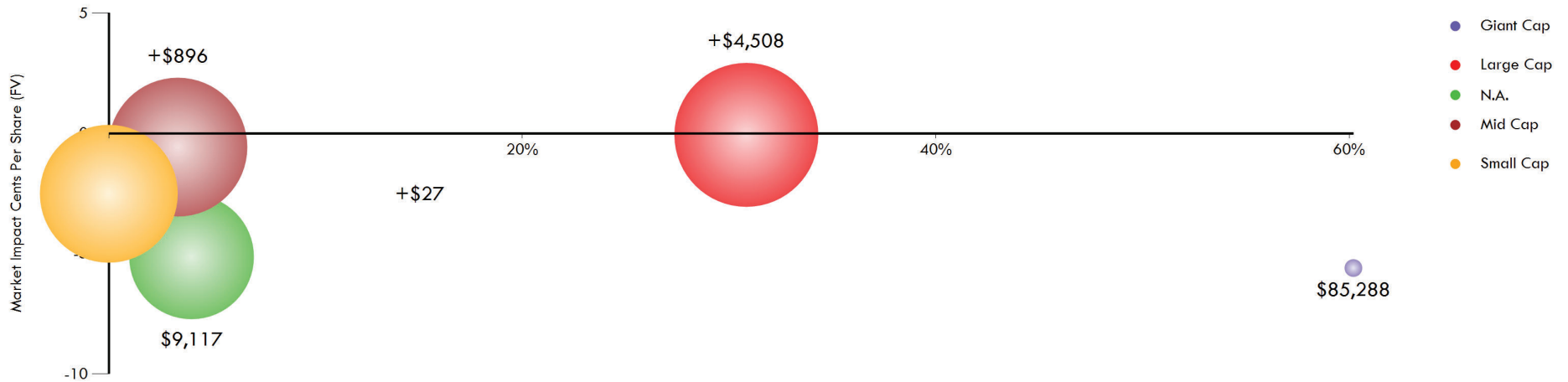
(+) = Cost

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)	Commission+ Full Day VWAP Vs. Universe		
	(\$)		(cps)	(cps)	(cps)	(cps)	%	(cps)	(cps)		
Giant Cap	60.52 %	1,309	+0.78	+1.82	5.60	+0.43	85 %	4.82	7.07	-0.05	Over \$25 B
Large Cap	31.16 %	1,140	+0.30	+1.82	0.06	+0.41	56 %	+0.24	1.99	-0.01	\$5 B To \$25 B
N.A.	4.33 %	1,169	+1.20	+1.82	5.14	+1.82	90 %	3.94	7.58	-0.07	
Mid Cap	3.67 %	1,073	+0.87	+1.82	0.57	+0.21	72 %	+0.30	1.74	0.00	\$1 B To \$5 B
Small Cap	0.33 %	1,390	+2.62	+1.82	2.51	+0.02	81 %	+0.11	1.74	-0.07	\$250 M To \$1 B

Total Cost by Market Cap: (USD)





(+) = Cost

TRADE CYCLE DETAIL

Manager Performance (Full Day VWAP)

					COMMISSION	MARKET IMPACT	TOTAL COST/SAVINGS	RANK TREND - Full Day VWAP				
Manager	Principal Traded (USD/Mil)	Shares Per Order	Total Shares	E - Score	Your Avg. Commission (cps)	All Trading Universe (cps)	Full Day VWAP (cps)	Rank Full Day VWAP	Commission + Full Day VWAP Vs. Universe	20223RD (%)	20222ND (%)	20221ST (%)
AQR	173	2,825	3,174,740	0.03	+0.06	+1.82	+0.73	60 %	2.86	51	63	63
EAGLE CAPITAL MANAGE	35	3,866	448,465	-0.15	+3.02	+1.82	2.76	85 %	3.38	91	99	20
ALLIANCE R 3000 CAPI	14	92	183,699	-0.60	+0.49	+1.82	67.92	99 %	71.08	79	34	1
WEATHERBIE	9	1,185	264,286	0.04	+2.72	+1.82	0.50	75 %	1.42	83	29	75
SNYDER CAPITAL	4	3,285	157,677	0.01	+1.43	+1.82	+0.38	64 %	1.83	77	1	17

ELKINS/MCSHERRY UNIVERSE VALUES

Commission (cps)				Market Impact (cps)
Bundled	All Trading	Execution Only	Program	Full Day VWAP
+3.59	+1.82	+1.57	+1.60	+1.82

NOTES

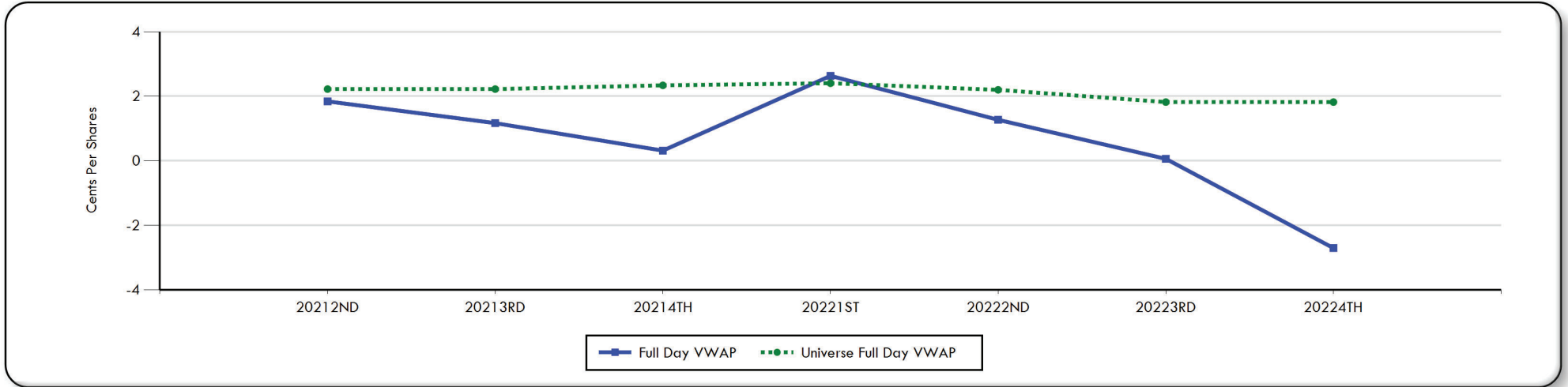
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(+) = Cost

TRADE HISTORY

Trade History						
Period	Total Shares	Total Dollars Traded	Commission		Full Day VWAP	Full Day VWAP Universe Rank
			(cps)	(\$)		
20212ND	4,562,592	321,911,989	+0.97	44,270	+1.84	53
20213RD	3,421,487	239,340,867	+1.19	40,598	+1.17	63
20214TH	3,409,560	249,657,729	+1.02	34,929	+0.31	73
20221ST	3,487,247	233,423,890	+0.92	32,053	+2.63	49
20222ND	5,613,701	304,350,198	+0.56	31,536	+1.27	58
20223RD	3,605,342	199,601,336	+0.84	30,249	+0.06	67
20224TH	4,228,867	234,878,273	+0.61	25,657	2.71	85



Note on Universes:

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



SACRAMENTO COUNTY

Trade Cost Summary - Global Equity Trading

Period End December 31, 2022





(+) = Cost

EXECUTIVE SUMMARY

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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.

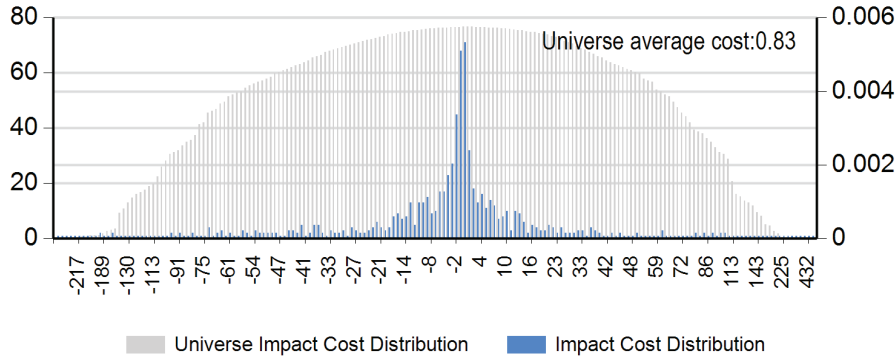
Results :

BENCHMARK PERFORMANCE			
Commission	Fees	Full Day VWAP	E - Score
<ul style="list-style-type: none"> Your commission cost was +7.50 bp or \$ +\$72,842 (7.74 bp better than the Elkins/McSherry Universe) 	<ul style="list-style-type: none"> Your fee cost was +3.48 bp or \$ +33,795 (0.27 bp better than the Elkins/McSherry Universe) 	<ul style="list-style-type: none"> Your market impact savings was 3.68 bp or \$35,767 (4.51 bp better than the Elkins/McSherry Universe) Your overall trading cost of +7.29 bp was 12.51 bp better than the Elkins/McSherry Universe. Sacramento County trading was higher than the Elkins/McSherry Universe in 4 countries and lower than the Elkins/McSherry Universe in 19 countries. 2 of your brokers had trading cost higher than summary universe of countries (principal weighted) in which they traded. 29 of your brokers had lower trading cost. 	<ul style="list-style-type: none"> E - Score : -0.05

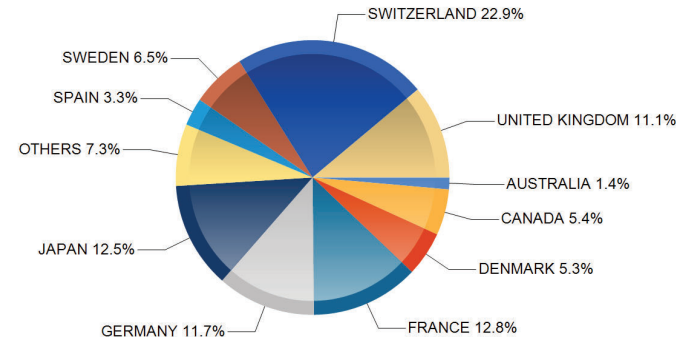
(+) = Cost

EXECUTIVE SUMMARY

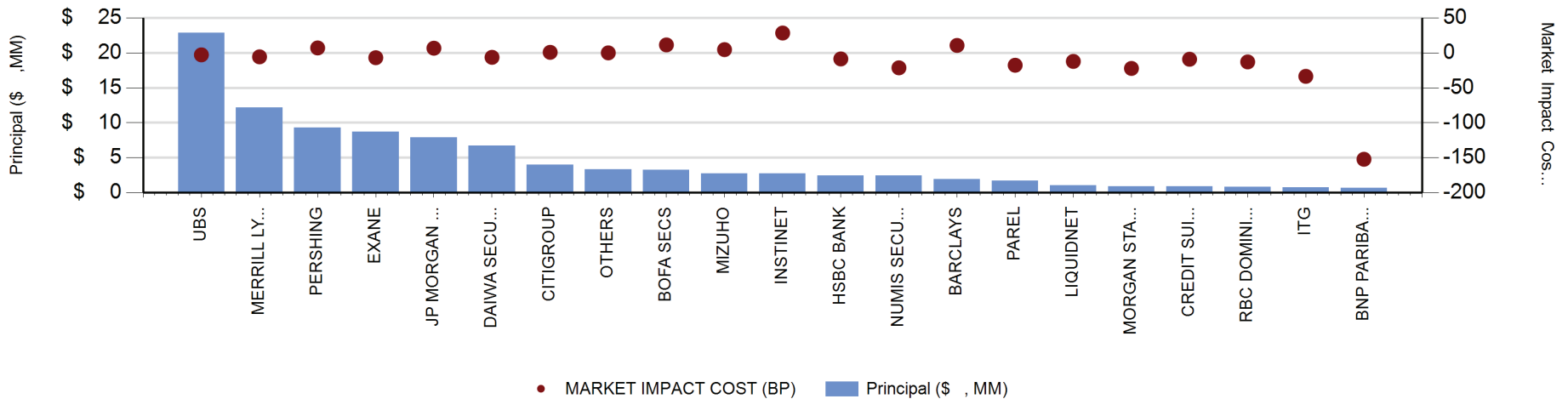
Cost Distribution



Principal Across Country



Top 20 Brokers in Principal Traded





(+) = Cost

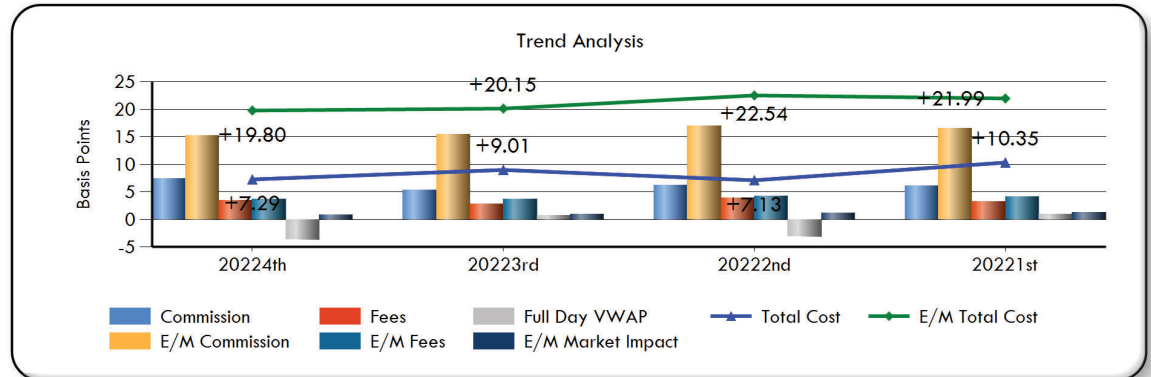
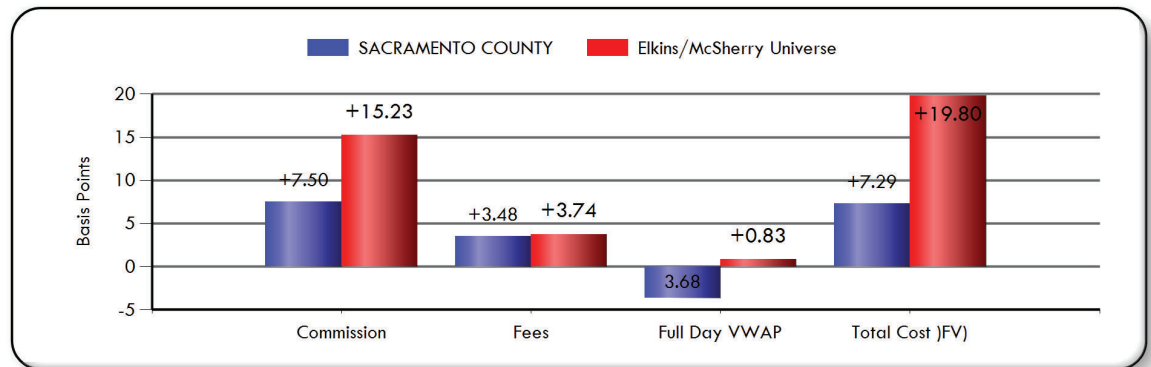
EXECUTIVE SUMMARY

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	+7.93	+14.48	+4.16	+0.01	+0.46	5.00	+0.96	+2.95	12.96	-0.07
Buy	+7.04	+16.02	+4.52	+7.09	+7.17	2.31	+0.68	+11.82	12.04	-0.03
Total	+7.50	+15.23	+4.34	+3.48	+3.74	3.68	+0.83	+7.29	12.51	-0.05

TRADING COMPONENTS

	Buy	Sells
Trade Principal	47,599,155	49,568,245
Shares	2,378,691	2,165,463
Unique Names	80	29
Liquidity (% POV)	0.156	0.211
Avg. Order Size	5,251	5,949
Avg. Order Completion Time (min)	N/A	N/A
Total Number of Trades	453	364





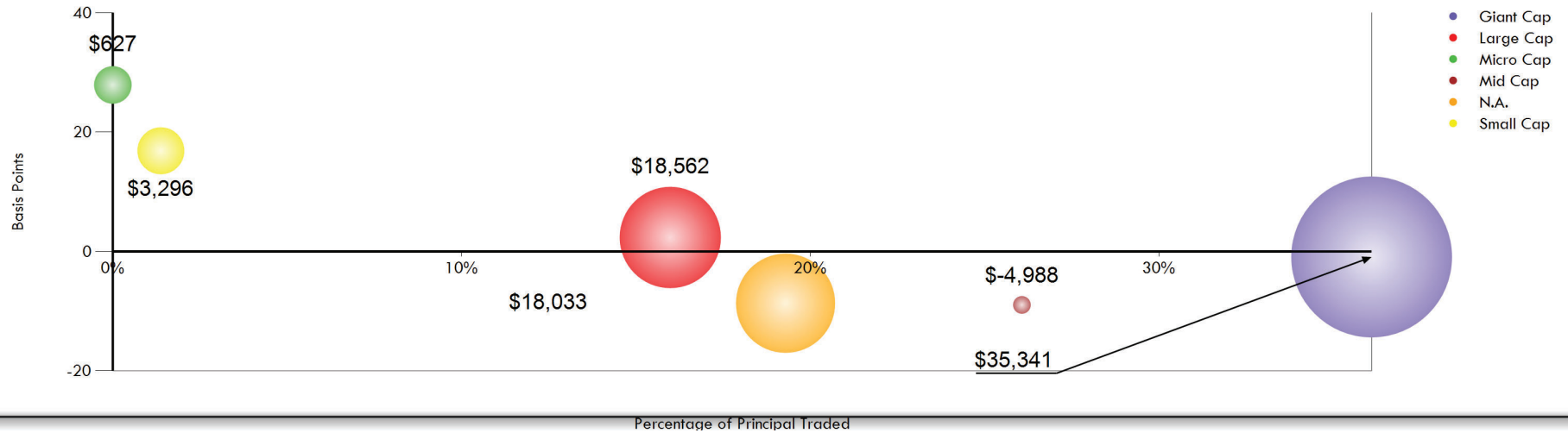
(+) = Cost

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		Commission+Fees+ Full Day VWAP Vs. Universe		
	(%)	(\$)	(bp)	(bp)	(bp)	(bp)	(bp)	(bp)		
Giant Cap	36.29 %	339,101	+8.20	+14.31	0.93	+0.73	+10.02	7.67	-0.02	Over \$25 Billion
Mid Cap	26.27 %	82,593	+6.88	+14.20	8.96	+0.84	1.96	18.03	-0.12	\$1 Billion To \$5 Billion
N.A.	19.49 %	122,167	+6.86	+16.71	8.68	+0.62	+9.53	18.21	-0.17	
Large Cap	16.18 %	78,229	+7.99	+17.33	+2.35	+1.23	+11.81	9.73	0.08	\$5 Billion To \$25 Billion
Small Cap	1.57 %	40,236	+4.70	+13.99	+16.88	+1.07	+21.57	+6.51	0.32	\$250 Million To \$1 Billion
Micro Cap	0.20 %	19,069	+5.01	+14.47	+27.91	+1.05	+32.92	+17.40	0.61	Under \$250 Million

Total Cost by Market Cap





(+) = Cost

TRADE CYCLE DETAIL

MANAGER PERFORMANCE (FULL DAY VWAP)

						COMMISSION		MARKET IMPACT		TOTAL COST/SAVINGS	Commission+Fees+Full Day VWAP Vs. Universe TREND		
Manager	Principal Traded (\$ Millions)	Total Orders Traded	% Principal	Avg. Principal (\$)	E - Score	Commission (bp)	Bundled Universe (bp)	Full Day VWAP (bp)	Universe Full Day VWAP (bp)	Commission+Fees+Full Day VWAP Vs. Universe (bp)	20223rd (bp)	20222nd (bp)	20221st (bp)
LAZARD ASSET MANAGEM	57	288	58.46%	197,230	-0.13	+9.39	+15.75	6.71	+0.85	14.05	9.79	17.02	14.34
LSV ASSET MANAGEMENT	26	490	26.44%	52,440	0.02	+4.39	+15.40	0.63	+0.85	13.20	14.81	12.53	6.11
WALTER SCOTT INTL EA	15	39	15.10%	376,138	0.10	+5.62	+12.94	+2.68	+0.71	5.35	8.75	16.64	29.20

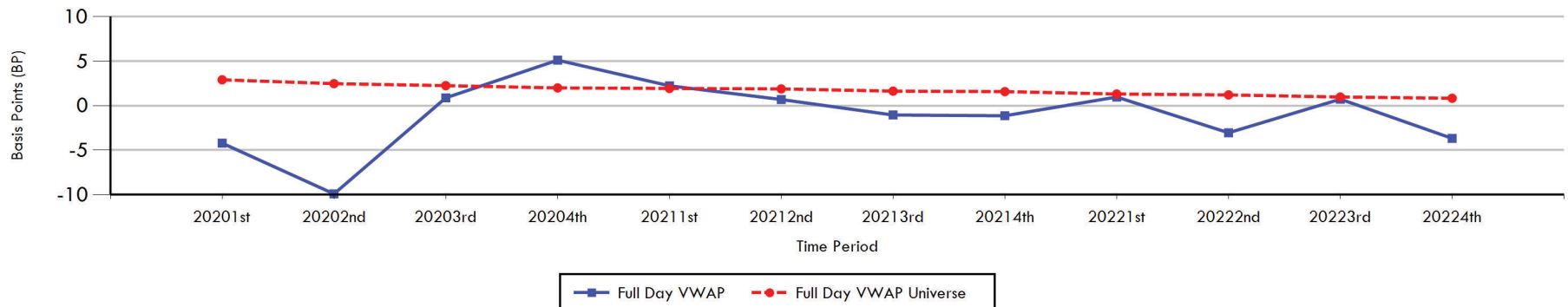
NOTES

- Manager above made up 100.00 % of principal traded.

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)
20201st	150,544,093	+6.57	+13.82	+6.85	+5.12	4.22	+2.90	12.63
20202nd	87,805,344	+5.99	+13.63	+5.49	+3.89	9.91	+2.47	18.40
20203rd	111,885,782	+5.88	+13.92	+5.08	+3.34	+0.87	+2.24	7.68
20204th	123,198,008	+8.22	+13.38	+5.56	+4.53	+5.10	+1.99	1.01
20211st	136,997,071	+6.55	+14.68	+4.53	+3.63	+2.22	+1.93	6.94
20212nd	108,155,071	+6.85	+14.69	+2.35	+2.18	+0.68	+1.88	8.86
20213rd	128,819,762	+6.84	+15.28	+2.96	+3.03	1.05	+1.62	11.19
20214th	92,011,716	+6.46	+16.33	+4.11	+3.75	1.14	+1.57	12.22
20221st	142,399,956	+6.14	+16.57	+3.25	+4.13	+0.96	+1.30	11.64
20222nd	108,848,003	+6.24	+17.04	+3.93	+4.30	3.05	+1.20	15.41
20223rd	90,075,776	+5.40	+15.50	+2.88	+3.69	+0.72	+0.96	11.14
20224th	97,167,399	+7.50	+15.23	+3.48	+3.74	3.68	+0.83	12.51

TRADE HISTORY





SACRAMENTO COUNTY

US Fixed Income Analysis

Period End December 31, 2022



Sacramento County
Period End December 31, 2022
(US Fixed Income Analysis)

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 October 01,2022 to December 31,2022. The analysis included trading of 551 trades in 169 different issues representing \$808,752,139 in principal across municipals, governments And corporates.

Methodology:

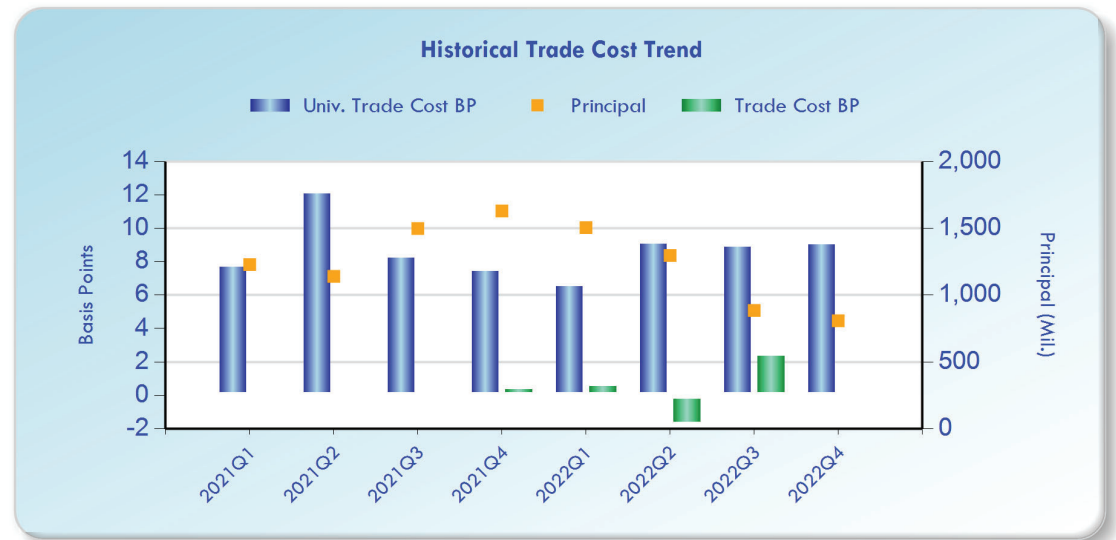
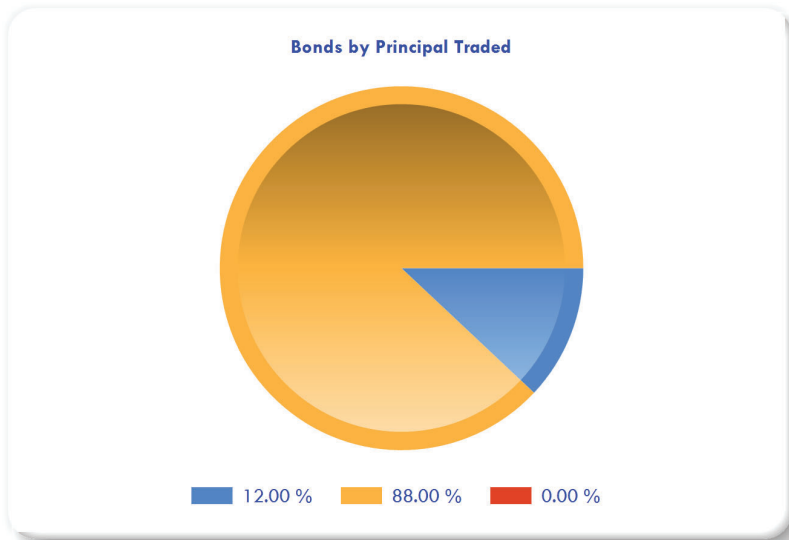
The Elkins/McSherry analysis measures trading efficiency by quantifying the cost of each trade by comparing your executed price to the average price or benchmark price on the day of the trade and to the Elkins/McSherry U.S. Fixed Income Trading Cost Universe. Daily prices are calculated from Market Axess, 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:

	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 (Thous. \$)	BP	Q3 2022	Q2 2022	Q1 2022	Q4 2021
Buy/Sell												
BUYS	420	283	97	15.87	0.38	+9.90	431.41	10.28	4.83	1.73	+3.16	+3.95
SELLS	389	268	101	+3.56	+0.09	+8.55	328.91	8.46	+9.00	1.87	1.61	2.65
GRAND TOTAL	809	551	169	12.31	0.15	+9.25	760.32	9.40	+2.55	1.79	+0.75	+0.56

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	Q3 2022	Q2 2022	Q1 2022	Q4 2021
Governments	712	392	73	62.28	0.87	+8.80	688.75 9.67	+3.06	2.80	+1.04	+0.80
Corporates	97	158	95	+49.56	+5.12	+12.55	71.88 7.43	5.40	+5.34	2.65	3.22
Municipals	<1	1	1	+0.42	+32.56	+8.25	+0.31 +24.31	-	+31.87	+11.65	-



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. \$)		Q3 2022	Q2 2022	Q1 2022	Q4 2021
REAMS CORE PLUS	357	85	42	69.57	1.95	+7.71	344.68	9.66	+3.55	3.81	-	-
METROPOLITAN WEST MG	221	312	71	68.35	3.09	+10.76	306.49	13.85	+4.75	1.72	+0.23	+0.82
NEUBERGER BERMAN	143	62	33	+30.68	+2.14	+9.74	108.86	7.60	0.07	+1.39	+3.63	0.38
BRANDYWINE	86	72	25	+93.52	+10.85	+10.95	0.84	0.10	2.06	-	-	-
BARCLAYS 1-10 YR TIP	1	20	10	+1.41	+13.47	+8.24	+0.55	+5.23	+4.03	+0.26	+12.78	+3.04

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	
10/01/2022-12/31/2022	808,752	551	169	12.31	0.15	+9.25	760.32	9.40
07/01/2022-09/30/2022	885,304	531	152	+225.35	+2.55	+9.08	578.21	6.53
04/01/2022-06/30/2022	1,296,595	808	295	232.16	1.79	+9.27	1,433.79	11.06
01/01/2022-03/31/2022	1,505,098	1025	186	+112.54	+0.75	+6.73	901.06	5.98
Year-Ending 2022	4,495,749	2915		+93.42	+0.21	+8.38	3,673.39	8.17
10/01/2021-12/31/2021	1,629,686	898	162	+91.67	+0.56	+7.64	1,153.23	7.08
07/01/2021-09/30/2021	1,498,166	784	166	+37.36	+0.25	+8.43	1,226.02	8.18
04/01/2021-06/30/2021	1,140,626	714	146	+8.51	+0.07	+12.30	1,394.68	12.23
01/01/2021-03/31/2021	1,228,670	773	156	+49.54	+0.40	+7.91	922.83	7.51
Year-Ending 2021	5,497,148	3169		+187.08	+0.34	+8.88	4,696.76	8.54
10/01/2020-12/31/2020	712,135	425	128	143.93	2.02	+10.68	904.17	12.70
07/01/2020-09/30/2020	914,835	532	159	+97.11	+1.06	+11.35	940.79	10.29
04/01/2020-06/30/2020	903,498	445	148	+70.23	+0.78	+10.08	840.37	9.30
01/02/2020-03/31/2020	1,053,957	691	217	+198.86	+1.89	+10.64	922.37	8.75
Year-Ending 2020	3,584,426	2093		+222.27	+0.62	+10.69	3,607.70	10.06
10/01/2019-12/31/2019	759,298	479	127	17.36	0.23	+9.45	734.68	9.68
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	2,670,246	1683		+33.50	+0.13	+10.09	2,661.79	9.97
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



SACRAMENTO COUNTY

Global Fixed Income Analysis

Period End December 31, 2022



Sacramento County
Period End December 31, 2022
(Global Fixed Income Analysis)

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 October 01,2022 to December 31,2022. The analysis included trading of 251 trades in 50 different issues representing \$192,855,698 in principal across 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.

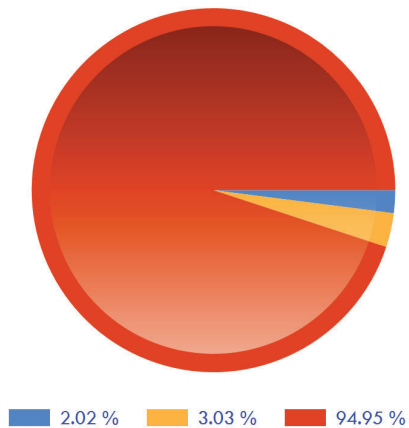
Results:

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	Q3 2022	Q2 2022	Q1 2022	Q4 2021
BUYS	93	110	31	33.94	3.66	+5.06	80.84	8.72	0.10	1.47	1.88	0.36
SELLS	100	141	41	+31.18	+3.11	+5.06	19.50	1.95	+7.94	+1.27	+0.35	6.90
GRAND TOTAL	193	251	50	2.76	0.14	+5.06	100.34	5.20	+3.53	+0.66	0.84	3.35

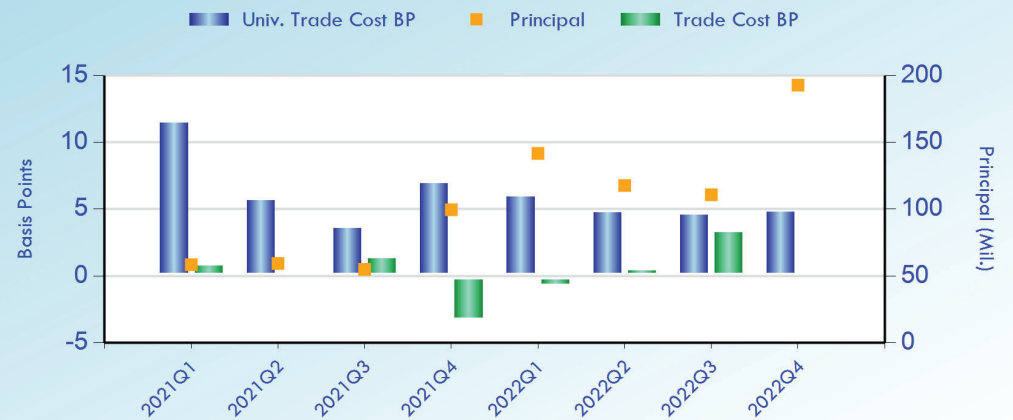
EXECUTIVE SUMMARY

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	Q3 2022	Q2 2022	Q1 2022	Q4 2021
Mortgages	182	211	24	+4.67	+0.26	+5.06	87.31	4.80	+2.54	-	1.14	1.71
Governments	6	11	7	4.60	7.16	+5.06	7.86	12.22	+2.20	1.51	+0.38	6.21
Corporates	5	29	19	2.82	6.06	+5.06	5.18	11.12	+15.29	+5.11	1.72	7.75

Bonds by Principal Traded



Historical Trade Cost Trend





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	Q3 2022	Q2 2022	Q1 2022	Q4 2021
PRUDENTIAL INVESTMEN	193	251	50	2.76	0.14	+5.06	100.34 5.20	+3.53	+0.66	0.84	3.35

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
10/01/2022-12/31/2022	192,856	251	50	2.76	0.14	+5.06	100.34	5.20
07/01/2022-09/30/2022	110,817	182	52	+39.17	+3.53	+4.83	14.39	1.30
04/01/2022-06/30/2022	117,631	182	117	+7.80	+0.66	+5.02	51.29	4.36
01/01/2022-03/31/2022	141,661	180	61	11.95	0.84	+6.20	99.78	7.04
Year-Ending 2022	562,964	795		+32.27	+0.57	+5.29	265.80	4.72
10/01/2021-12/31/2021	99,582	147	64	33.35	3.35	+7.19	104.95	10.54
07/01/2021-09/30/2021	54,920	94	62	+8.68	+1.58	+3.84	12.40	2.26
04/01/2021-06/30/2021	59,342	157	66	+0.43	+0.07	+5.92	34.70	5.85
01/01/2021-03/31/2021	58,367	140	85	+6.08	+1.04	+11.71	62.28	10.67
Year-Ending 2021	272,210	538		18.15	0.67	+7.21	214.34	7.87
10/01/2020-12/31/2020	57,483	102	61	+77.99	+13.57	+11.66	+10.97	+1.91
07/01/2020-09/30/2020	46,840	61	47	14.12	3.02	+6.30	43.63	9.32
04/01/2020-06/30/2020	85,881	143	98	183.09	21.32	+4.82	224.49	26.14
01/02/2020-03/31/2020	75,943	157	84	1.05	0.14	+4.93	38.49	5.07
Year-Ending 2020	266,147	463		120.27	4.52	+6.59	295.65	11.11
10/01/2019-12/31/2019	76,119	174	90	16.90	2.22	+5.07	55.50	7.29
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	325,391	699		41.02	1.26	+5.40	216.61	6.66
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