

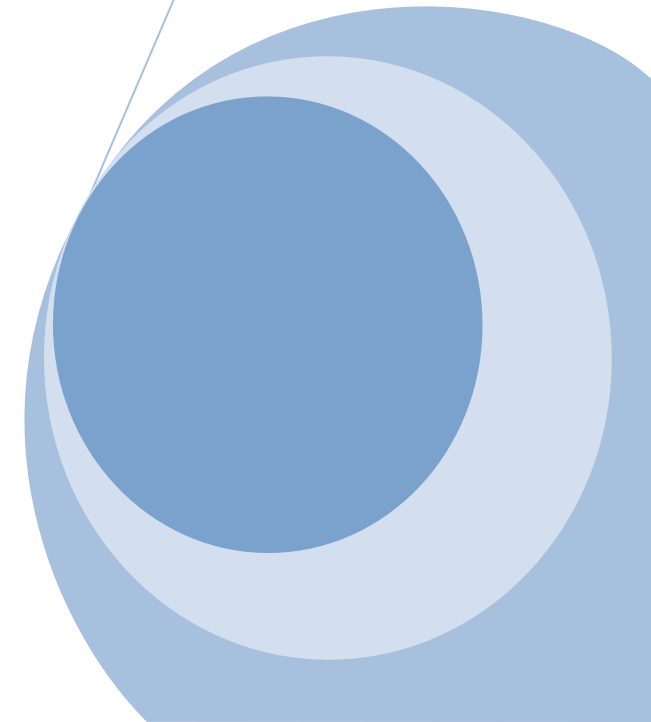
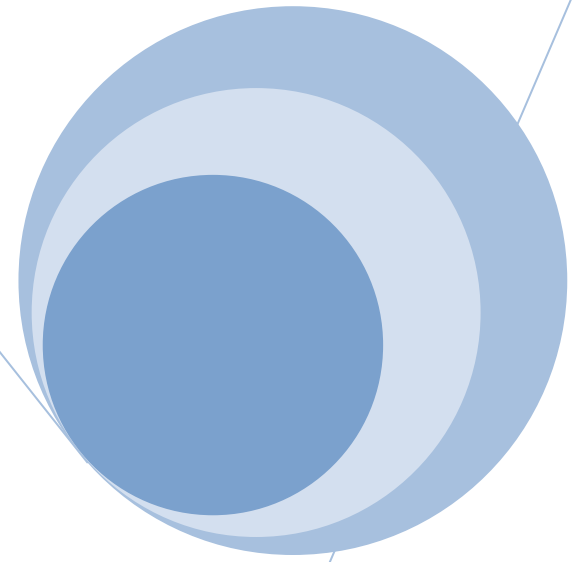
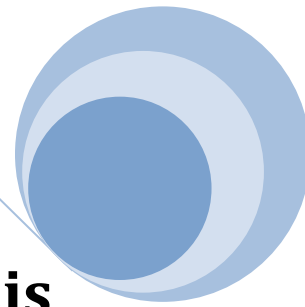


FX Transaction Cost Analysis

Santa Barbara County Employees' Retirement System

Reporting Period Jul 2022 – Jun 2023

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Summary

- Transaction volume for FY22/23 was \$266mln across 4,933 transactions initiated on behalf of seven separately managed accounts.
- BNY Mellon completed 994 transactions for \$50.6mln in FX volume.
 - Nuveen remains the most active investment manager. Initiating 3,315 transactions for a total volume of \$41mln.
 - Artisan trading volume increased again, rising to \$104.8mln, remaining the largest investment manager by volume.
- Average rate analysis was completed for 3,977 transactions; the remaining 956 transactions were analyzed at the timestamp/benchmark level.
 - The spread from session average was good at -0.02%.
 - Execution performance was good by each of the four separately managed accounts analyzed at the session average benchmark.
 - There was no significant underperformance from any of the fx counterparties when analyzing performance against the session average.
- Overall FX execution performance for BNY Mellon improves from -0.11%, to -0.09%.
 - BNY Mellon completed 994 transactions with an average size of \$50,951.
 - 956 of the custodian's transactions were completed using the defined spread program. The transactions were consistent with agreed markup with BNY Mellon, at -0.10%.
 - The remaining 38 transactions were completed with BNY Mellon as a bank negotiated counterparty were completed with a spread of +0.04%, a good result.
 - Artisan Growth completed 43 transactions utilizing BNY Mellon's defined spread program yielding a -0.14% spread performance. All 43 transactions were for Tier 3 currencies.
 - BNY Mellon continues to underperform the pricing performance from 'Other FX counterparties', which came in at -0.02%, unchanged from FY 21/22.
- The combined overall performance for the year remains at -0.03% for FY22/23.

	2011 (Pre TCA)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
% Spread (0.00% is the benchmark)	-0.19%	-0.02%	-0.04%	-0.03%	-0.03%	-0.02%	-0.05%	-0.05%	-0.03%	-0.04%	-0.03%	-0.03%	-0.03%
Estimated cost per \$1mln transacted	\$(1900)	\$(200)	\$(400)	\$(300)	\$(300)	\$(200)	\$(500)	\$(500)	\$(300)	\$(400)	\$(300)	\$(300)	\$(300)

- Overall, the quality of fx execution and transaction cost study indicate no major issues. The investment managers are efficient in use of counterparties and where relevant utilize the effective BNY Mellon execution services.

Overview of FX Transactions

No. Transactions Analyzed	4933
Day Average	3977
Time Stamp	956
Total Volume Transacted	\$266,334,335
Average Trade Size	\$53,990
Spot vs Forward	4882/51
FX Counterparties	17
FX Pairs	23
Investment Managers	7

Table 1. Data Summary

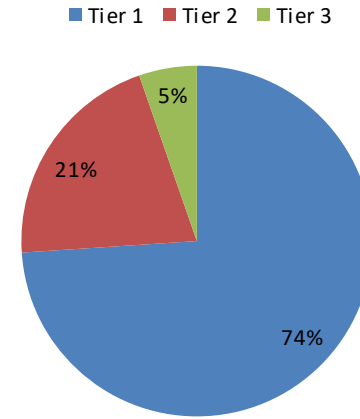


Figure 1. Transactions by currency tier

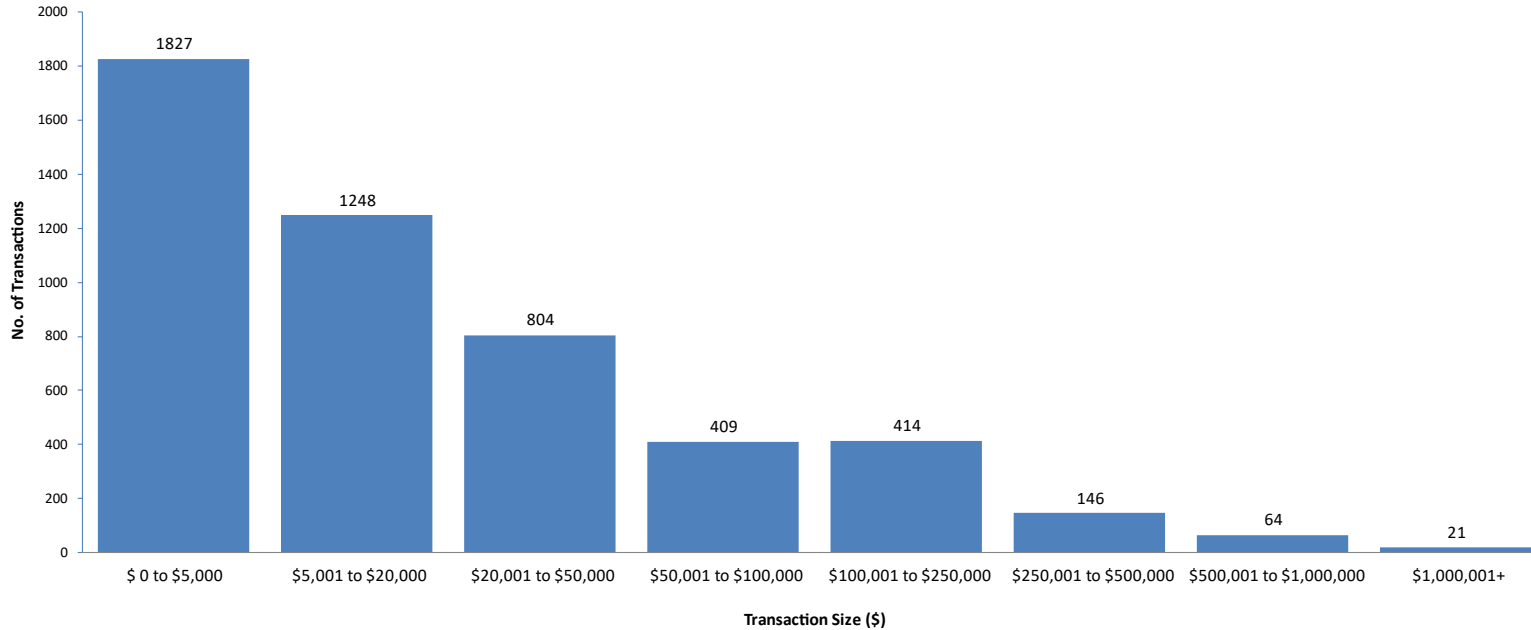
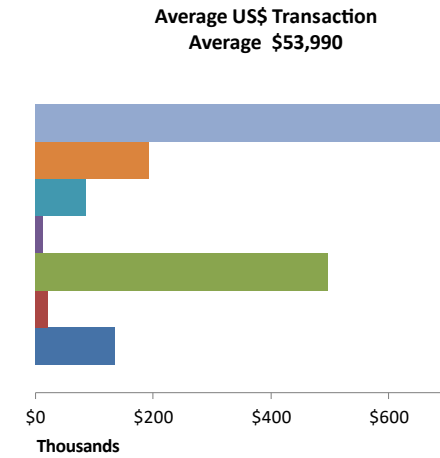
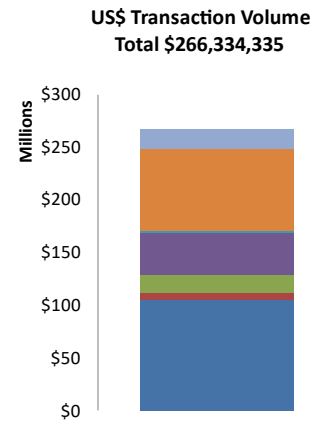
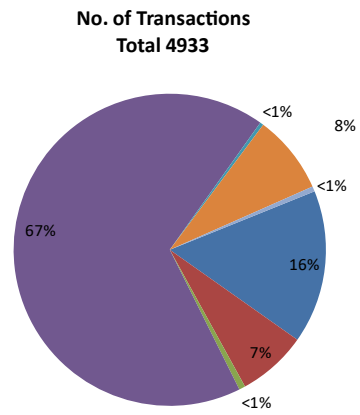


Figure 2. Transaction size distribution (\$)

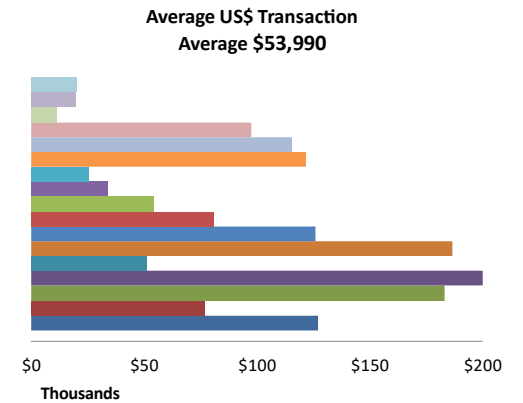
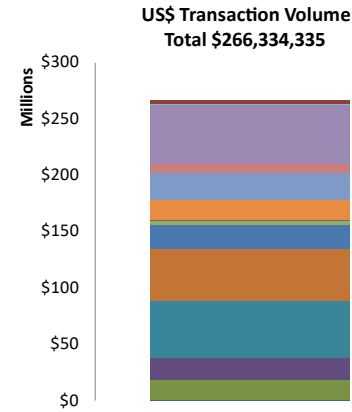
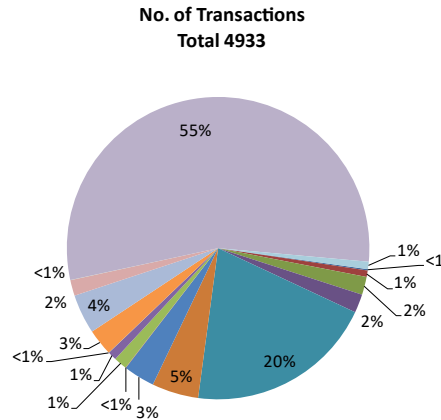
Investment Manager Breakdown



Investment Manager	No. of Transactions	US\$ Transaction Volume	Average US\$ Transaction
ARTISAN INTL GROWTH	784	\$104,837,627	\$133,721
FIRST EAGLE	356	\$7,717,175	\$21,677
HAMILTON LANE PRIVATE EQUITY	32	\$15,913,885	\$497,309
NUVEEN	3315	\$41,028,494	\$12,377
ORG REAL ESTATE	18	\$1,515,200	\$84,178
PANAGORA	402	\$77,475,908	\$192,726
PRIV INFRASTRUCTURE	26	\$17,846,046	\$686,386

Table 2. Investment manager data summary

FX Counterparties Breakdown



BANK OF AMERICA N A	7	\$889,443	\$127,063
BANK OF MONTREAL THE	34	\$2,609,872	\$76,761
BARCLAYS BANK PLC WHOLESALE, LDN	95	\$17,412,764	\$183,292
BNP-PARIBAS SA, PARIS	98	\$19,910,749	\$203,171
BNY MELLON BANK	994	\$50,645,236	\$50,951
BROWN BROTHERS HARRIMAN AND CO, NY	246	\$45,912,528	\$186,636
CITIBANK NA	165	\$20,791,249	\$126,008
CREDIT SUISSE INTERNATIONAL	2	\$161,942	\$80,971
FX CONNECT BROKER (FXC)	70	\$3,786,530	\$54,093
GOLDMAN SACHS BANK USA	46	\$1,549,098	\$33,676
GOLDMAN SACHS INTL LONDON	1	\$25,430	\$25,430
HSBC BANK USA - NEW YORK	140	\$17,066,993	\$121,907
JPMORGAN CHASE BK NA	208	\$24,056,031	\$115,654
MORGAN STANLEY CAPITAL SRVCS INC NY	83	\$8,093,899	\$97,517
NORTHERN TRUST COMPANY CHICAGO	1	\$11,477	\$11,477
STATE STREET BANK AND TRUST CO	2704	\$52,617,273	\$19,459
UBS AG	39	\$793.821	\$20.354

Table 3. FX counterparty data summary

Average Rate Analysis

- Average rate analysis has been completed for 3,977 transactions; the remaining 956 transactions were eligible for timestamp analysis.

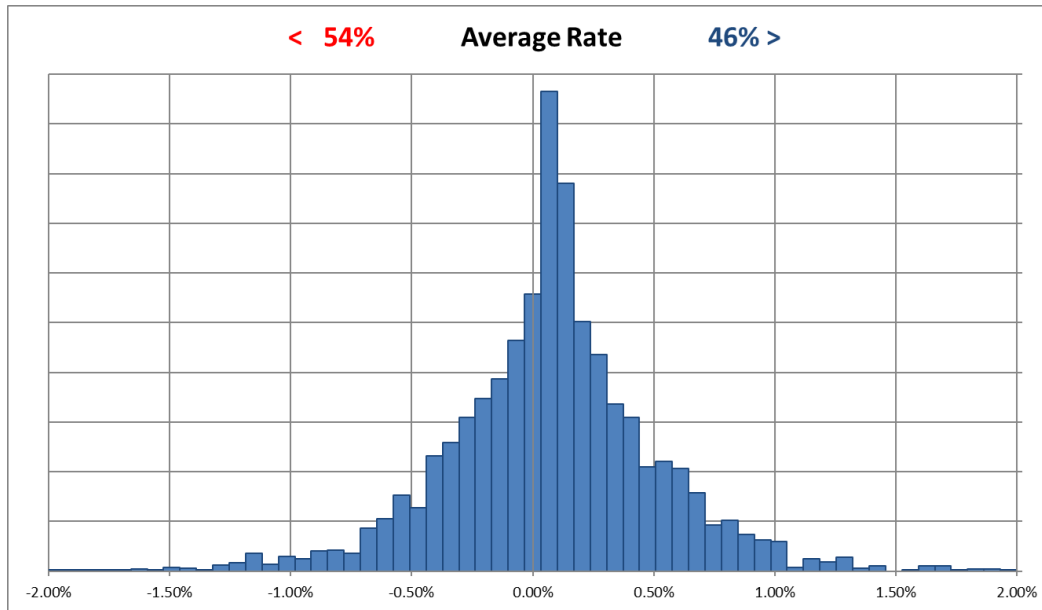


Figure 3. Average rate performance for all transactions

	% Spread from Avg
Tier 1	-0.02%
Tier 2	-0.03%
Tier 3	0.02%
Total	-0.02%

Table 4. Average rate performance by currency tier

\$ Transaction	% Spread from Avg
0-5,000	-0.03%
5,001-20,000	-0.01%
20,001-50,000	-0.01%
50,001-100,000	-0.02%
100,001-250,000	0.00%
250,001-500,000	-0.04%
500,001-1,000,000	-0.05%
1,000,001+	0.04%
Total	-0.02%

Table 5. Average rate performance by transaction size

	% Spread from Avg	Average US\$ Transaction	Worse than Avg	No. of Transactions
ARTISAN INTL GROWTH	0.00%	\$134,539	49%	741
FIRST EAGLE	-0.05%	\$25,408	53%	228
NUVEEN	-0.02%	\$15,069	55%	2606
PANAGORA	-0.02%	\$192,726	54%	402
Grand Total	-0.02%	\$55,879	54%	3977

Table 6. Average rate performance by investment manager

	% Spread from Avg	Average US\$ Transaction	Worse than Avg	No. of Transactions
BANK OF AMERICA N A	0.12%	\$127,063	29%	7
BANK OF MONTREAL THE	-0.01%	\$76,761	53%	34
BARCLAYS BANK PLC WHOLESALE, LDN	-0.02%	\$183,292	56%	95
BNP-PARIBAS SA, PARIS	-0.01%	\$203,171	49%	98
BNY MELLON BANK	0.04%	\$172,151	42%	38
BROWN BROTHERS HARRIMAN AND CO, NY	0.04%	\$186,636	48%	246
CITIBANK NA	-0.01%	\$126,008	48%	165
CREDIT SUISSE INTERNATIONAL	-0.30%	\$80,971	50%	2
FX CONNECT BROKER (FXC)	-0.07%	\$54,093	57%	70
GOLDMAN SACHS BANK USA	0.03%	\$33,676	50%	46
GOLDMAN SACHS INTL LONDON	0.25%	\$25,430	0%	1
HSBC BANK USA - NEW YORK	-0.04%	\$121,907	54%	140
JPMORGAN CHASE BK NA	-0.04%	\$115,654	50%	208
MORGAN STANLEY CAPITAL SRVCS INC NY	-0.05%	\$97,517	58%	83
NORTHERN TRUST COMPANY CHICAGO	0.38%	\$11,477	0%	1
STATE STREET BANK AND TRUST CO	-0.02%	\$19,459	55%	2704
UBS AG	-0.05%	\$20,354	46%	39
Grand Total	-0.02%	\$55,879	54%	3977

Table 7. Average rate performance by FX counterparty

BNY Mellon Focus

The adoption of BNY Defined Spread program allows a timestamp analysis of those transactions, where each transaction is compared to the time-stamped reference rate with the agreed markup of 10 to 15bps.

BNY Mellon completed 994 transactions. 956 transactions were identified as being completed within the defined spread program. The remaining 38 transactions have been analyzed against the session average.

	% Spread from Benchmark	Average US\$ Transaction	No. of Transactions
BNY Defined Spread (timestamp)	-0.10%	\$46,133	956
BNY Bank Negotiated	0.04%	\$172,150	38
Grand Total	-0.10%	\$50,950	994

Table 8. BNY transaction breakdown

	BNY		All Other FX Counterparties		All
	% Spread from Benchmark	No. of Transactions	% Spread from Avg	No. of Transactions	% Spread
\$0-5,000	-0.10%	713	-0.03%	1114	-0.05%
\$5,001-20,000	-0.10%	127	-0.01%	1121	-0.02%
\$20,001 -50,000	-0.07%	45	-0.01%	759	-0.01%
\$50,001-100,000	-0.12%	29	-0.02%	380	-0.03%
\$100,001-250,000	-0.09%	33	0.00%	381	0.00%
\$250,001-500,000	-0.09%	18	-0.04%	128	-0.05%
\$500,001-1,000,000	-0.05%	21	-0.07%	43	-0.06%
\$1,000,001+	-0.11%	8	0.04%	13	-0.01%
	-0.10%	994	-0.02%	3939	-0.03%

Table 9. Comparison of BNY vs. All Other across transaction size

	% Spread from Benchmark	Average Transaction size	No. of Transactions
Tier 1	-0.09%	\$59,540	725
Tier 2	-0.09%	\$9,302	167
Tier 3	-0.12%	\$58,093	102
	-0.10%	\$50,951	994

Table 10. BNY performance by Tier Group

	SBCERS (BNY)	Peer Group	Performance
	% Spread	% Spread	SBCERS/Peer
Grand Total	-0.10%	-0.11%	BETTER

Table 11. SBCERS (BNY) total performance vs. Peer Group

	ARTISAN INT GROWTH	FIRST EAGLE	HAMILTON LANE PRIVATE EQUITY	NUVEEN	ORG REAL ESTATE	PANAGORA	PRIV INFRASTRUCTURE	Grand Total
BNY Defined Spread	43 -0.14%	128 -0.11%	32 -0.11%	709 -0.10%	18 -0.11%		26 -0.10%	956 -0.10%
BNY Bank Negotiated	6 0.09%					32 0.03%		38 0.04%
Grand Total	49 -0.11%	128 -0.11%	32 -0.11%	709 -0.10%	18 -0.11%	32 0.03%	26 -0.10%	994 -0.10%

Table 12. Breakdown of BNY transactions by execution method - count and average spread

Summary Results & Benchmark

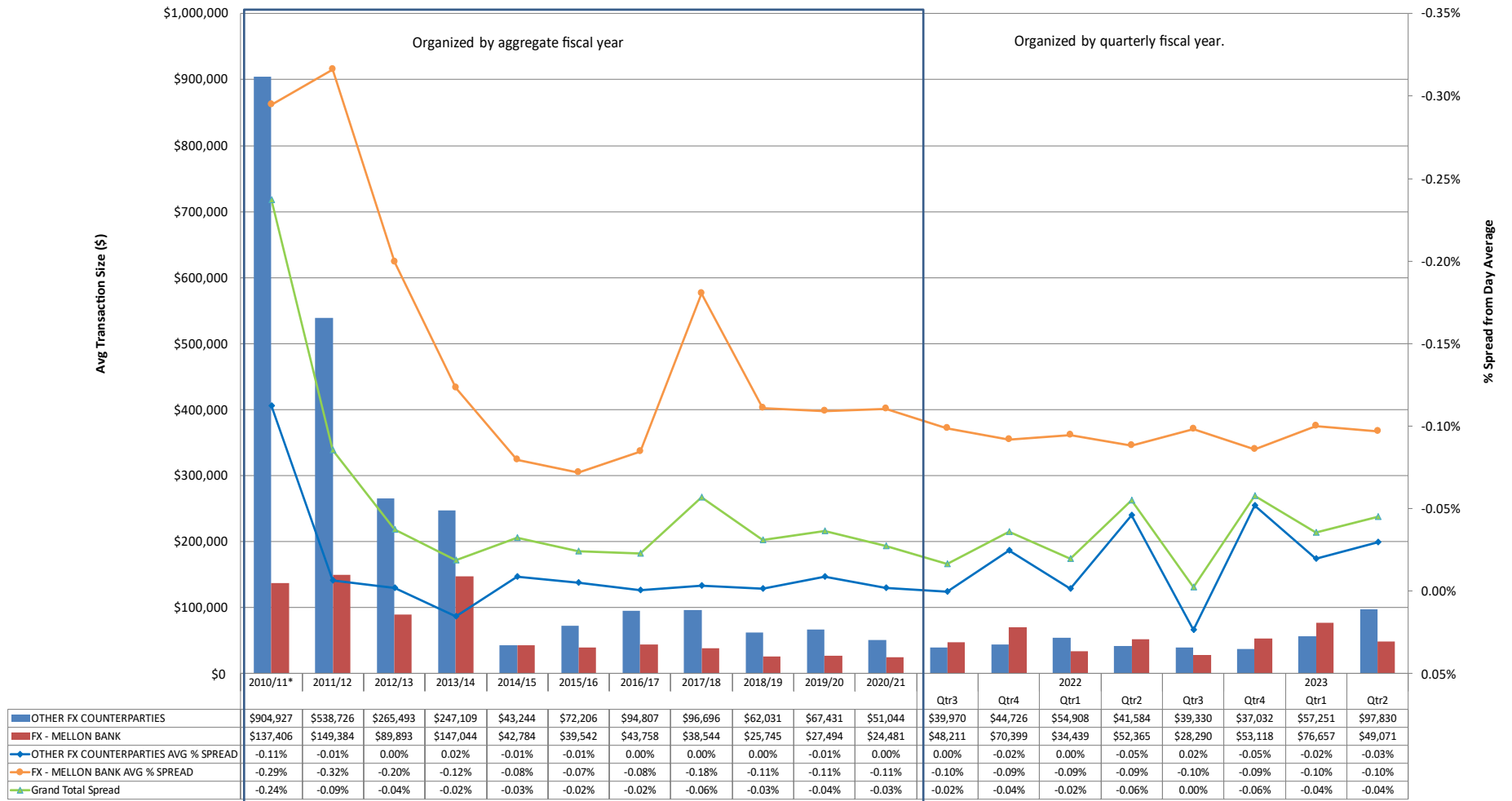


Figure 4. Average % spread performance compared to avg. transaction size for BNY vs. all other FX counterparties, by fiscal year

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022 Q3	2022 Q4	2023 Q1	2023 Q2	Running Total Average % Spread
ARTIO GLOBAL (clsd)	0.00%														-0.02%
ARTISAN INTERNATIONAL		-0.02%	-0.03%	-0.02%	-0.03%	-0.03%	0.00%	-0.01%	-0.02%	-0.02%	-0.03%	0.00%	-0.01%	-0.01%	-0.02%
FIRST EAGLE		-0.05%	-0.04%	-0.04%	-0.01%	-0.02%	-0.04%	-0.04%	-0.04%	-0.02%	-0.04%	-0.11%	-0.03%	-0.11%	-0.03%
HL PRIVATE EQUITY	-0.07%	-0.09%	-0.10%	-0.09%	-0.10%	-0.10%	-0.09%	-0.10%	-0.09%	-0.09%	-0.10%	-0.11%	-0.10%	-0.11%	-0.13%
HARRISON STREET REIT	-0.07%	-0.18%													-0.18%
LORD ABBETT	-0.03%	-0.07%	-0.10%												-0.11%
NEW STAR (clsd)	-0.42%	-0.25%													-0.37%
NUVEEN						-0.10%	-0.04%	-0.05%	-0.03%	-0.04%	0.01%	-0.07%	-0.04%	-0.06%	-0.04%
ORG REAL ESTATE		-0.10%	-0.10%	-0.10%	-0.20%	-0.09%	-0.10%	-0.10%	-0.10%	-0.09%	-0.11%	-0.10%	-0.11%	-0.11%	-0.11%
PANAGORA	-0.05%	0.01%	-0.02%	-0.01%	-0.03%	0.02%	-0.02%	-0.02%	0.00%	-0.02%	-0.02%	0.03%	-0.01%	-0.04%	-0.01%
PRIV INFRASTRUCTURE						-0.20%	-0.28%	-0.19%	-0.10%	-0.07%	-0.08%	-0.10%	-0.11%	-0.11%	-0.12%
PRIV NATL RESOURCES									-0.10%						-0.10%
REAMS															0.19%
TRANS RECORDKEEPING	-0.13%	-0.07%	-0.10%		-0.09%										-0.21%
TRANS RECORDKPING II	-0.18%	-0.06%													-0.04%
UNALLOCATED CASH						-0.07%		-0.10%							-0.09%
Grand Total	-0.04%	-0.02%	-0.03%	-0.02%	-0.02%	-0.06%	-0.03%	-0.04%	-0.03%	-0.03%	0.00%	-0.06%	-0.04%	-0.04%	-0.04%

Table 13. Annual and quarterly performance by Investment Manager +/-0.05% highlighted by fiscal year