

Taking a closer look at our Universe Equity Transaction Cost Peer Universe Summary

SECOND QUARTER 2019

An asset manager's trading process is often a significant component of their overall investment performance. Managers have a fiduciary obligation to both obtain best execution (so as to minimize the impact their trading has on their clients' portfolio returns) and avoid paying excessive commissions. Asset owners, in turn, have a fiduciary obligation to monitor their managers to ensure those managers are in fact receiving best execution and paying reasonable commission rates.

The tables below show the range of trading costs, commissions, and impact to performance, incurred by managers within each peer group universe. In addition, key observations regarding each peer group universe are provided in bullet points. The tables cover the four-quarter average as of June 30, 2019. A glossary of terms is provided on page 4.

Ranking	Total Costs (bp)	Impact on Annual Return (bp)	Turnover (%)	Commissions (¢)	Execution Price vs. VWAP (bp)
Тор (25%)	-15	-15	28%	-1.55	-1
Median (50%)	-50	-40	49%	-1.92	-7
Bottom (75%)	-114	-89	86%	-2.74	-10

US Large Cap Growth

Total Costs (Implementation Shortfall) Quarterly Review

- The average trading costs over the trailing four quarter period in Zeno's US Large Cap Growth Peer Universe was -50 bps; and the difference between the top and bottom quartile manager was 99 bps.
- The median "Execution Price vs. VWAP" in Zeno's US Large Cap Growth Peer Universe was -7 bps; and the difference between the top and bottom quartile manager was 9 bps.
- The average commission rate over the trailing four quarter period in Zeno's US Large Cap Growth Peer Universe was -1.9 ¢; and the difference between the top and bottom quartile manager was 1.2 ¢.
- The average turnover rate over the trailing four-quarter period in Zeno's US Large Cap Growth Peer Universe was 49 %; and the difference between the Top and Bottom quartile manager was 57 %.
- The average "Impact on Annual Returns" (caused by the combination of trading costs and turnover rates) over the trailing four quarter period in Zeno's US Large Cap Growth Peer Universe was -40 bps; and the difference between the top and bottom quartile manager was 74 bps.

US Large Cap Value

Ranking	Total Costs (bp)	Impact on Annual Return (bp)	Turnover (%)	Commissions (¢)	Execution Price vs. VWAP (bp)
Тор (25%)	+1	+1	23%	-1.06	+4
Median (50%)	-22	-13	38%	-1.76	-2
Bottom (75%)	-45	-43	64%	-2.15	-5

Total Costs (Implementation Shortfall) Quarterly Review

• The average trading costs over the trailing four quarter period in Zeno's US Large Cap Value Peer Universe was -22 bps; and the difference between the top and bottom quartile manager was 46 bps.

- The median "Execution Price vs. VWAP" in Zeno's US Large Cap Value Peer Universe was -2 bps; and the difference between the top and bottom quartile manager was 9 bps.
- The average commission rate over the trailing four quarter period in Zeno's US Large Cap Value Peer Universe was -1.8 ¢; and the difference between the top and bottom quartile manager was 1.1 ¢.
- The average turnover rate over the trailing four quarter period in Zeno's US Large Cap Value Peer Universe was 38 %; and the difference between the top and bottom quartile manager was 41 %.
- The average "Impact on Annual Returns" (caused by the combination of trading costs and turnover rates) over the trailing four quarter period in Zeno's US Large Cap Value Peer Universe was -13 bps; and the difference between the top and bottom quartile manager was 44 bps.

US Small Cap Growth

Ranking	Total Costs (bp)	Impact on Annual Return (bp)	Turnover (%)	Commissions (¢)	Execution Price vs. VWAP (bp)
Тор (25%)	-65	-83	61%	-1.55	-1
Median (50%)	-118	-146	75%	-2.22	-9
Bottom (75%)	-159	-239	90%	-2.75	-11

Total Costs (Implementation Shortfall) Quarterly Review

- The average trading costs over the trailing four quarter period in Zeno's US Small Cap Growth Peer Universe was -118 bps; and the difference between the top and bottom quartile manager was 94 bps.
- The median "Execution Price vs. VWAP" in Zeno's US Small Cap Growth Peer Universe was -9 bps; and the difference between the top and bottom quartile manager was 10 bps.
- The average commission rate over the trailing four quarter period in Zeno's US Small Cap Growth Peer Universe was -2.2 ¢; and the difference between the top and bottom quartile manager was 1.2 ¢.
- The average turnover rate over the trailing four-quarter period in Zeno's US Small Cap Growth Peer Universe was 75 %; and the difference between the top and bottom quartile manager was 29 %.
- The average "Impact on Annual Returns" (caused by the combination of trading costs and turnover rates) over the trailing four quarter period in Zeno's US Small Cap Growth Peer Universe was -146 bps; and the difference between the top and bottom quartile manager was 156 bps.

US Small Cap Value

Ranking	Total Costs (bp)	Impact on Annual Return (bp)	Turnover (%)	Commissions (¢)	Execution Price vs. VWAP (bp)
Тор (25%)	-4	-4	34%	-1.36	+3
Median (50%)	-48	-38	53%	-1.82	-2
Bottom (75%)	-96	-83	71%	-2.52	-8

Total Costs (Implementation Shortfall) Quarterly Review

- The average trading costs over the trailing four-quarter period in Zeno's US Small Cap Value Peer Universe was -48 bps; and the difference between the top and bottom quartile manager was 92 bps.
- The median "Execution Price vs. VWAP" in Zeno's US Small Cap Value Peer Universe was -2 bps; and the difference between the top and bottom quartile manager was 11 bps.
- The average commission rate over the trailing four quarter period in Zeno's US Small Cap Value Peer Universe was -1.8 ¢; and the difference between the top and bottom quartile manager was 1.2 ¢.
- The average turnover rate over the trailing four quarter period in Zeno's US Small Cap Value Peer Universe was 53 %; and the difference between the top and bottom quartile manager was 37 %.

• The average "Impact on Annual Returns" (caused by the combination of trading costs and turnover rates) over the trailing four quarter period in Zeno's US Small Cap Value Peer Universe was -38 bps; and the difference between the top and bottom quartile manager was 79 bps.

Non-US Developed Markets

Ranking	Total Costs (bp)	Impact on Annual Return (bp)	Turnover (%)	Commissions (bp)	Execution Price vs. VWAP (bp)
Тор (25%)	-13	-5	18%	-3	+1
Median (50%)	-41	-26	32%	-5	-3
Bottom (75%)	-64	-62	55%	-9	-7

Total Costs (Implementation Shortfall) Quarterly Review

- The average trading costs over the trailing four quarter period in Zeno's Non-US Developed Markets Peer Universe was -41 bps; and the difference between the top and bottom quartile manager was 51 bps.
- The median "Execution Price vs. VWAP" in Zeno's Non-US Developed Markets Peer Universe was -3 bps; and the difference between the top and bottom quartile manager was 8 bps.
- The average commission rate over the trailing four quarter period in Zeno's Non-US Developed Markets Peer Universe was -5 bp; and the difference between the top and bottom quartile manager was 6 bp.
- The average turnover rate over the trailing four quarter period in Zeno's Non-US Developed Markets Peer Universe was 32 %; and the difference between the top and bottom quartile manager was 37 %.
- The average "Impact on Annual Returns" (caused by the combination of trading costs and turnover rates) over the trailing four quarter period in Zeno's Non-US Developed Markets Peer Universe was -26 bps; and the difference between the top and bottom quartile manager was 57 bps.

Ranking	Total Costs (bp)	Impact on Annual Return (bp)	Turnover (%)	Commissions (¢)	Execution Price vs. VWAP (bp)
Тор (25%)	-24	-19	23%	-5	-2
Median (50%)	-54	-48	49%	-8	-4
Bottom (75%)	-95	-104	78%	-11	-7

Emerging Markets

Total Costs (Implementation Shortfall) Quarterly Review

- The average trading costs over the trailing four quarter period in Zeno's Emerging Markets Peer Universe was -54 bps; and the difference between the top and bottom quartile manager was 71 bps.
- The median "Execution Price vs. VWAP" in Zeno's Emerging Markets Peer Universe was -4 bps; and the difference between the top and bottom quartile manager was 5 bps.
- The average commission rate over the trailing four quarter period in Zeno's Emerging Markets Peer Universe was -8 ¢; and the difference between the top and bottom quartile manager was 6 ¢.
- The average turnover rate over the trailing four quarter period in Zeno's Emerging Markets Peer Universe was 49 %; and the difference between the top and bottom quartile manager was 55 %.
- The average "Impact on Annual Returns" (caused by the combination of trading costs and turnover rates) over the trailing four quarter period in Zeno's Emerging Markets Peer Universe was -48 bps; and the difference between the top and bottom quartile manager was 85 bps.

Glossary of Terms

Ranking - Displays the results of the managers who ranked in the 25th, 50th, and 75th percentile of their respective peer group universes.

Total Costs - The four-quarter average of total execution costs (sum of multi-day delay, daily market impact and commission costs) paid in order to build/unwind trade orders. The difference between the more efficient vs. more expensive managers can often exceed 100 bp in trading costs.

Performance Impact - The loss of asset value incurred as a result of a manager's trading activity (calculated by multiplying the manager's "total cost" by that manager's turnover). In evaluating the factors contributing to manager returns (i.e. "performance attribution"), "performance impact" describes the impact that trading costs had on a manager's overall performance.

Commissions – Commissions (the explicit fees paid to brokers to execute trades) are typically the smallest, but most controllable part of a manager's total execution costs – "*The tip of the iceberg*."

Execution Price vs. VWAP - The difference between the execution price of a manager's trade, versus the average price paid for that security in the marketplace throughout the full day ("VWAP"). Negative figures indicate that the manager's executed price was worse than that day's VWAP.

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