

Taking a closer look at our data **Equity Transaction Cost**

Peer Universe Summary

Asset manager trading processes often significantly impact overall investment performance. To this end, 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 these legal requirements are achieved.

Our company views these universes as the next step in the evolution of trade cost analysis, and an important tool in evaluating the degree to which a manager's trading process contributes or detracts from bottom-line performance. Just as fund fiduciaries use investment performance peer group universes to help identify managers with superior stock picking ability, Zeno's Peer Group Universes help evaluate the skill and efficiency with which managers implement those stock picks.

Our featured universe highlights the range of trading costs, commissions, turnover, and impact to performance incurred by managers in our **US Small Cap Growth Peer Group Universe**.

SPRING 2022 Featured Universe:

Q4 2021 US SMALL CAP GROWTH MANAGERS

Consistent with historical averages, **Q4 2021 Small Cap Growth stocks** tended to incur higher trading costs than most value and large cap strategies. Interestingly, while the median trading cost has decreased about 10% from a year ago, the range of costs has widened significantly (almost 60%).

As shown in the table below, over the trailing four quarters ending December 31st, 2021, the median trading costs incurred by US Small Cap Growth managers was -91 bp; approximately 10% less expensive than a year ago (-101 bp). In contrast, the difference between the top and bottom quartile trading processes widened to 176 bp, from only 111 bp in 4Q 2020.

It should also be noted that the average commission rate paid during this period by US Small Cap Growth Managers was -1.7¢, with 4th quartile commission rates averaging about 2.4¢. These rates are also slightly less compared to prior years.

From an investment perspective, after taking into account turnover rates, the median impact that trading had on annual returns was -61 bp; and managers ranking in the 4th quartile of Zeno's Trade Cost Universe incurred a performance hit of almost -2½% (-218 bp)! Equally important, the difference between the top quartile and bottom quartile managers (in terms of the impact that trading had on

their annual performance) was 263 bp. Interestingly, while the <u>median</u> impact on performance has trended lower over the last three years, the spread between the 25th and 75th percentile managers has widened to -263 bp (more than 2.5-fold greater than the spread in 2019)!

This helps quantify the risk to asset owners associated with having a manager with an expensive trading process. What is most striking about these numbers is that during the three-year period ending December 31, 2021, the difference between the median and 4th quartile Small Cap Growth Managers' overall net returns was only 3.6%. Similarly, the difference between the median and top quartile Small Cap Growth managers' overall net returns was only 2.7%.

This suggests that the systematic trading costs incurred by many Small Cap Growth managers explains upwards of $\frac{3}{2}$ or more of the manager's performance relative to their peers. It also supports the notion that an efficient trading process can be a significant contributor to investment success.

From a performance attribution analysis, this is an example of why we encourage clients not to ignore or underestimate the impact that trading can have on returns.

| | US Small Cap Growth | | | | | |
|--------------|---------------------|----------------------------------|--------------|--------------------|----------------------------------|--|
| Ranking | Total Costs (bp) | Impact on Annual Returns (bp) | Turnover (%) | Commissions (¢) | Execution Price vs. VWAP (bp) | |
| Top (25%) | +37 | +45 | 45% | -1.35 | +1 | |
| Median (50%) | -91 | -61 | 72% | -1.724 | -7 | |
| Bottom (75%) | -139 | -218 | 106% | -2.43 | -13 | |

ADDITIONAL ZENO AN SOLUTIONS UNIVERSE DATA

Q4 2021 Equity Transaction Cost Peer Summary

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 December 31, 2021. A glossary of terms is provided at the end.

US Large Cap Growth

Total Costs **Commissions Execution Price** Impact on Annual Ranking Turnover (%) Return (bp) (¢) vs. VWAP (bp) (bp) Top (25%) -24 -17 26% -1.54 -2

¹ Based on SPIVA US Scorecard 2021 Year-end Research report

| Median (50%) | -58 | -41 | 37% | -2.03 | -4 |
|--------------|------|------|-----|-------|----|
| Bottom (75%) | -126 | -113 | 67% | -2.79 | -9 |

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 -58 bps; and the difference between the Top and Bottom quartile manager was 102 bps.
- The median "Execution Price vs. VWAP" in Zeno's US Large Cap Growth Peer Universe was -4 bps; and the difference between the Top and Bottom quartile manager was 7 bps.
- The average Commission rate over the trailing four-quarter period in Zeno's US Large Cap Growth Peer Universe was $-2.0 \, \phi$; and the difference between the Top and Bottom quartile manager was $1.3 \, \phi$.
- The average Turnover rate over the trailing four-quarter period in Zeno's US Large Cap Growth Peer Universe was 37%; 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 Growth Peer Universe was -41 bps; and the difference between the Top and Bottom quartile manager was 96 bps.

US Large Cap Value

| Ranking | Total Costs (bp) | Impact on Annual Return (bp) | Turnover (%) | Commissions (¢) | Execution Price vs. VWAP (bp) |
|--------------|---------------------|---------------------------------|--------------|--------------------|----------------------------------|
| Top (25%) | +8 | +4 | 22% | -1.09 | +1 |
| Median (50%) | -20 | -9 | 32% | -1.55 | -2 |
| Bottom (75%) | -51 | -37 | 52% | -2.23 | -6 |

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 -20 bps; and the difference between the Top and Bottom quartile manager was 59 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 7 bps.
- The average Commission rate over the trailing four-quarter period in Zeno's US Large Cap Value Peer Universe was $-1.6 \, \phi$; and the difference between the Top and Bottom quartile manager was $1.1 \, \phi$.
- The average Turnover rate over the trailing four-quarter period in Zeno's US Large Cap Value Peer Universe was 32%; and the difference between the Top and Bottom quartile manager was 30%.
- 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 -9 bps; and the difference between the Top and Bottom quartile manager was 41 bps.

US Small Cap Growth

| Ranking | Total Costs (bp) | Impact on Annual Return (bp) | Turnover (%) | Commissions (¢) | Execution Price vs. VWAP (bp) |
|-----------|---------------------|---------------------------------|--------------|--------------------|----------------------------------|
| Top (25%) | +37 | +45 | 45% | -1.35 | +1 |

| Median (50%) | -91 | -61 | 72% | -1.72 | -7 |
|--------------|------|------|------|-------|-----|
| Bottom (75%) | -139 | -218 | 106% | -2.43 | -13 |

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 -91 bps; and the difference between the Top and Bottom quartile manager was 176 bps.
- The median "Execution Price vs. VWAP" in Zeno's US Small Cap Growth Peer Universe was -7 bps; and the difference between the Top and Bottom quartile manager was 14 bps.
- The average Commission rate over the trailing four-quarter period in Zeno's US Small Cap Growth Peer Universe was -1.7 ϕ ; and the difference between the Top and Bottom quartile manager was 1.0 ϕ .
- The average Turnover rate over the trailing four-quarter period in Zeno's US Small Cap Growth Peer Universe was 72%; and the difference between the Top and Bottom quartile manager was 61%.
- 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 -61 bps; and the difference between the Top and Bottom quartile manager was 263 bps.

US Small Cap Value

| Ranking | Total Costs (bp) | Impact on Annual Return (bp) | Turnover (%) | Commissions (¢) | Execution Price vs. VWAP (bp) |
|--------------|---------------------|---------------------------------|--------------|--------------------|----------------------------------|
| Top (25%) | +21 | +22 | 33% | -0.98 | +4 |
| Median (50%) | -35 | -53 | 49% | -1.61 | -7 |
| Bottom (75%) | -130 | -131 | 67% | -2.33 | -11 |

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 -35 bps; and the difference between the Top and Bottom quartile manager was 151 bps.
- The median "Execution Price vs. VWAP" in Zeno's US Small Cap Value Peer Universe was -7 bps; and the difference between the Top and Bottom quartile manager was 15 bps.
- The average Commission rate over the trailing four-quarter period in Zeno's US Small Cap Value Peer Universe was -1.0¢; and the difference between the Top and Bottom quartile manager was 1.4¢.
- The average Turnover rate over the trailing four-quarter period in Zeno's US Small Cap Value Peer Universe was 33%; and the difference between the Top and Bottom quartile manager was 34%.
- 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 -53 bps; and the difference between the Top and Bottom quartile manager was 153 bps.

Non-US Developed Markets

| Ranking | Total Costs (bp) | Impact on Annual Return (bp) | Turnover (%) | Commissions (bp) | Execution Price vs. VWAP (bp) |
|--------------|---------------------|---------------------------------|--------------|---------------------|----------------------------------|
| Top (25%) | -14 | -6 | 12% | -3 | +1 |
| Median (50%) | -37 | -15 | 25% | -4 | -2 |
| Bottom (75%) | -70 | -44 | 50% | -6 | -3 |

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 -37 bps; and the difference between the Top and Bottom quartile manager was 56 bps.
- The median "Execution Price vs. VWAP" in Zeno's Non-US Developed Markets Peer Universe was -2 bps; and the difference between the Top and Bottom quartile manager was 4 bps.
- The average Commission rate over the trailing four-quarter period in Zeno's Non-US Developed Markets Peer Universe was -4 bp; and the difference between the Top and Bottom quartile manager was 3 bp.
- The average Turnover rate over the trailing four-quarter period in Zeno's Non-US Developed Markets Peer Universe was 25 %; and the difference between the Top and Bottom quartile manager was 38 %.
- 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 -15 bps; and the difference between the Top and Bottom quartile manager was 38 bps.

Emerging Markets

| Ranking | Total Costs (bp) | Impact on Annual Return (bp) | Turnover (%) | Commissions (bp) | Execution Price vs. VWAP (bp) |
|--------------|---------------------|---------------------------------|--------------|---------------------|----------------------------------|
| Top (25%) | -13 | -6 | 31% | -5 | -1 |
| Median (50%) | -52 | -54 | 51% | -7 | -5 |
| Bottom (75%) | -94 | -119 | 79% | -9 | -9 |

Total Costs (Implementation Shortfall) Quarterly Review

- The average trading costs over the trailing four-quarter period in Zeno's Emerging Markets Peer Universe was -52 bps; and the difference between the Top and Bottom quartile manager was 81 bps.
- The median "Execution Price vs. VWAP" in Zeno's Emerging Markets Peer Universe was -5 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 Emerging Markets Peer Universe was -7 bp; and the difference between the Top and Bottom quartile manager was 4 bp.
- The average Turnover rate over the trailing four-quarter period in Zeno's Emerging Markets Peer Universe was 51%; and the difference between the Top and Bottom quartile manager was 48%.
- 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 -54 bps; and the difference between the Top and Bottom quartile manager was 113 bps.

Background

In early 2014, **Zeno AN Solutions** ("Zeno"), then known as Zeno Consulting Group, introduced its trade cost Peer Group Universes. Unlike most other trade cost comparisons, Zeno's Peer Group Universes rank managers against other managers charged with the same investment mandate (e.g., Small Cap Growth, Large Cap Value, Non-US Developed Markets, etc.). Further, the costs tracked in the universes include not just broker-related costs, but also the trading costs incurred by asset managers "working" their orders over multiple days. Equally important, the universes measure turnover rates, thereby enabling the quantification of how much each manager's trading process impacts their annual investment return.

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.

Zeno AN Solutions helps institutional asset owners to proactively monitor and manage the trading costs and processes of their asset managers. Our clients are solely plan sponsors/pension funds and other asset owners. Our transaction cost analysis services are therefore provided by an independent third party, free from conflicts of interest.

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