RESEARCH

Index Reconstitution Costs Continue to Add Up for Index Strategies

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KEY TAKEAWAYS

- Index-tracking funds seek to match an index's performance, which may lead to constraints and implementation costs that hurt returns.
- Our latest analysis shows there are costs for index-tracking funds from demanding immediacy during reconstitution events.
- A better approach would spread turnover across all trading days, avoiding the costs of demanding immediacy and allowing for a consistent focus on stocks with higher expected returns.

Because of their typically low expense ratios and broad diversification, funds that track indices have significantly grown in popularity in recent years. Yet there are tradeoffs that investors should consider. Index funds primarily seek to match the performance of an index. This objective may lead to constraints and implementation costs that are not reflected in the funds' expense ratios.

To help unpack the implications for investors, we can broadly categorize the costs of index investing as those related to:

- Portfolio design, such as ignoring information about differences in expected returns across securities.
- Portfolio management, such as style drift due to infrequent rebalancing and not using short-term information that impacts security returns.

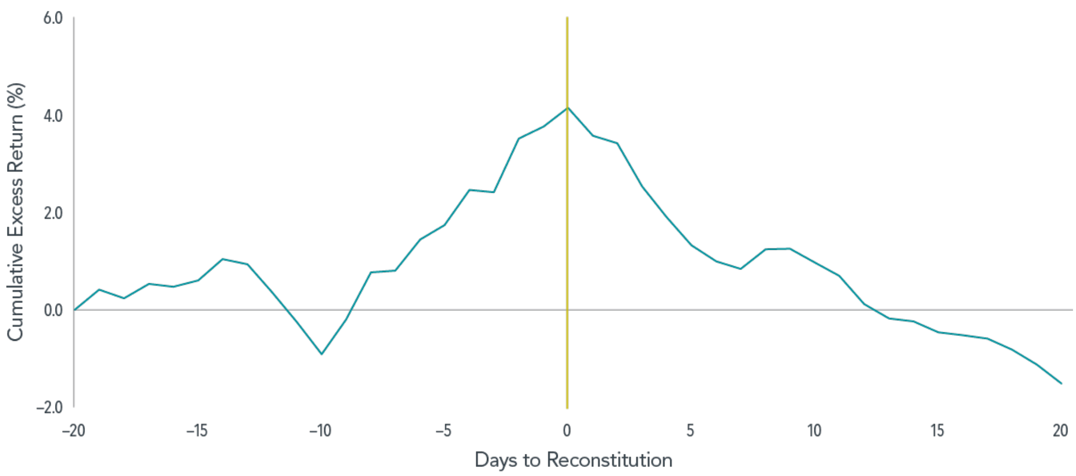
- Trading, such as volume and price pressure around index reconstitution.

In recent research by Dimensional, we focus on the third category: costs related to trading. We measure these costs using data from 2014 to 2023 for 10 widely tracked US indices from S&P, Russell, and CRSP.[1] Consistent with many prior studies, our research finds that index additions tend to rise in price ahead of when a fund would likely want to buy them, and deletions fall in price prior to when an index fund would want to sell, while both exhibit reversals following reconstitution.

Exhibit 1 shows the average cumulative excess return of additions and deletions vs. those of their respective indices, with excess returns for deletions multiplied by –1 to present addition and deletion results together. The average excess return to additions and deletions is around 4% over the 20 days leading up to reconstitution, with a reversal of 5.7% over the 20 days after reconstitution. Results vary across individual indices, but the pattern is consistent for S&P, Russell, and CRSP indices.

Exhibit 1

Average Cumulative Excess Return of Index Additions and Deletions in 20 Days around Reconstitution, 2014–2023



Past performance is no guarantee of future results. Indices are not available for direct investment.

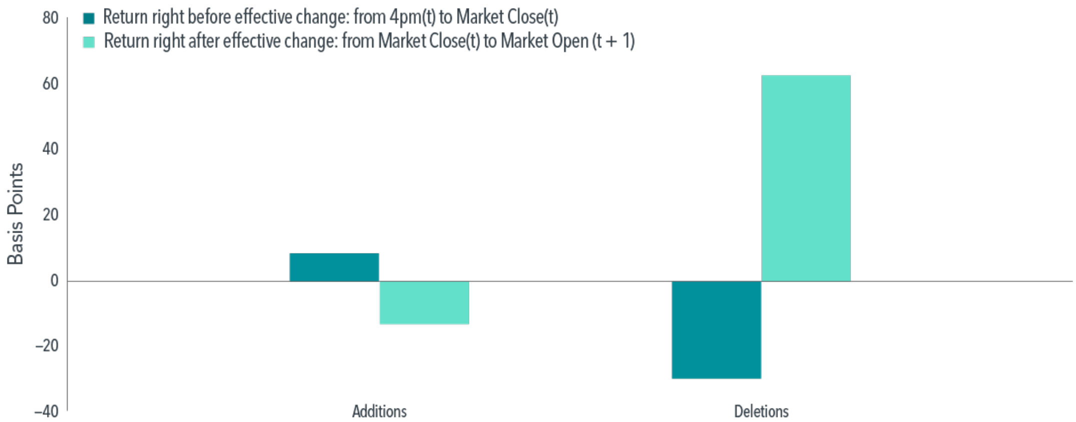
Cumulative excess returns (CERs) are calculated as the cumulative sum of the daily excess returns for an individual security vs. its respective index from market close 20 trading days before reconstitution. Cumulative excess returns for deletions are multiplied by –1 before being averaged with cumulative excess returns of additions. Value-weighted average CERs are calculated by weighting the sets of CERs on a day by the securities' respective free-float market capitalizations as of the most recent month prior to reconstitution. Migrating events for S&P, Russell, and CRSP indices are excluded. Tesla's addition to the S&P 500 on December 18, 2020, is excluded. Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual fund.

Trading volume for stocks involved in reconstitution events also spikes up to 25 times higher on reconstitution day compared to the trading volume 20 trading days prior.

Using high-frequency-trading data from 2019 to 2023, in **Exhibit 2** we zoom in to examine price pressure on reconstitution day. We find that prices for additions move up from the end of continuous trading at 4 pm to the closing auction—a span of roughly 10 seconds—and prices for deletions move down (dark blue bars). Like the longer-time-horizon results, there is a reversal for those stocks by market open the morning following reconstitution (light blue bars). The price of additions on average increases by 9 bps compared to the price of nonrebalanced stocks between 4 pm on reconstitution day and market close when being "bought" by the index, and reverses by a relative 13 bps by market open the next day. The opposite is true for deletions: On average, the price for deletions falls relative to nonrebalanced stocks by 30 bps from 4 pm to market close on reconstitution day, just prior to being "sold" from the index, with a reversal of a relative 63 bps by market open the following day. Therefore, by rebalancing just an hour before market close on reconstitution day, or by delaying rebalancing to the next trading day, significant price pressure costs could be avoided.

Exhibit 2

Price Pressure into Closing Auction on Reconstitution Days and Overnight Price Reversal after Reconstitution, 2019–2023



Past performance is no guarantee of future results. Indices are not available for direct investment.

The exhibit shows the results of regressing the returns of all US stocks on flags indicating if a stock was an addition or deletion on that day. The dark blue bars and light blue bars represent the coefficient estimates for the additions and deletions indicator variables in the models. ***See Hendrix, Liu, and Roberts (2024) for further details****. Samples include all index addition and deletion events, as well as all other US stocks traded on the same index reconstitution days. Index migrations and events due to corporate actions are excluded. For CRSP indices, we include all five days of the transition period in the price pressure regression, but we only include the last day in the overnight reversal regression. Tesla's addition to the S&P 500 on December 18, 2020, is excluded. Indices are not available for direct investment; therefore their performance does not reflect the expenses associated with the management of an actual fund.*

We also see trading volume spikes near market close of over 100 times the average trading volume at the same time over the month prior. For example, stocks added to or deleted from the S&P 500 index, the index with the most tracking assets that we examined, exhibit an increase in trading volume at 4 pm on reconstitution day of around 109x trading volume, compared to the prior month.

Overall, by prioritizing the minimization of tracking error, index-tracking funds face costs in trading the same securities at the same time on the same day as indices. The costs borne by this inflexibility are baked into the returns to the indices themselves, not visible from the performance of an index fund against its benchmark. While some have argued that the index reconstitution effect has gone away, we find that spikes in trading volume and price pressure around reconstitution events are still prevalent for 10 of the most widely tracked US equity asset class indices in the most recent 10 years. Further, efforts by index providers to mitigate some of the impacts do not come for free. For example, designing asset class indices to share boundaries and have buffers so as to minimize net buys and sells is likely to lead to inadvertent style drift, taking investors off their desired course.

Instead, a better approach would be a daily process that uses information from market prices every day and spreads turnover across all trading days in the year, with flexibility across stocks, quantities, and time. Such an approach can help investors target higher expected returns while also managing risks and costs.

1. Indices examined include the S&P 500 index, S&P MidCap 400 index, S&P SmallCap 600 index, Russell 1000 Growth Index, Russell 1000 Value Index, Russell 2000 Index, CRSP US Large Cap Growth Index, CRSP US Large Cap Value Index, CRSP US Mid Cap Index, and CRSP US Small Cap Index.

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