

Skillful Implementation in Index Reconstitutions

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Indexing is a complex, time-intensive process that requires a dedicated and collaborative investment team. A close look at a sample index reconstitution illustrates the complexities of managing an index strategy, and the criticality of collaboration and developing a trading strategy to achieve optimal outcomes for investors.

Often, investors think indexing is a simple, quasi-mechanical investment technique. Indexing, however, is a complex and time-consuming process that requires a strong team of investment professionals. Importantly, an index team collaborates to achieve the competing goals of effectively tracking the underlying index and minimizing wealth destruction caused by reconstitution trades and their associated market impacts. In this article, we focus on a reconstitution of a smart beta index to shed light on the complexities of managing an index strategy, as well as to underscore the importance of collaboration and developing a trading strategy to deliver the best outcomes for investors in their index investments.

Reconstitution Case Study

In this case study we showcase a recent reconstitution of a smart beta index that rebalances annually. Reconstitution, by way of background, involves the re-evaluation of a market index and the process involves sorting, adding, and removing securities to ensure that the index reflects up-to-date market style and capitalization. In this particular example, the smart beta index selects securities in the mid- and small-cap universe and follows an equal-weight approach to determine individual security weights. The total two-way turnover for this event was 120%.

Notably, index funds assume that 100% of a reconstitution takes place on a single day (the effective date), but most importantly, at one single point in time at the market-on-close (MOC) price. Explicit transaction costs, such as commissions or taxes, are not considered. Another key factor is that there is no consideration for the implicit cost associated with trades executed at the MOC. For example, if a security trades at \$10 at 3:59 PM, yet due to MOC demand the security closes at \$11, as long as the index investor bought it at \$11, there will not be any tracking implications. However, in this example, the market impact of index activity led to a strong price

movement effectively reducing the investor’s wealth by \$1. For transactions in the United States and other developed markets, particularly in the large-cap space, these impacts represent fractions of basis points, but in less liquid markets the impacts can be very large.

In cases where we estimate that our size needs will be too large to trade all on the close, we will build a strategy that balances out market liquidity with benchmark risk. In some scenarios that means we will commence trading earlier in the day to provide intra-day market liquidity as well as closing liquidity. This tactic can be very productive, for nearly 30% of a day’s volume in small-cap trades in the last 30 minutes of the day.

Initial Analysis

When a new index reconstitution is approaching, the Portfolio Management (PM) team at State Street Global Advisors initiates what is called a “Pre-Trade Cost Analysis (TCA).” The PM team compares the existing portfolio holdings to the index holdings after the reconstitution to assess what the rebalance trade looks like. This analysis sheds light on many features, such as sector and country flows, as well as what the most illiquid securities are that will have to be traded.

The PM team works with our Transaction Cost Analysis team as it assesses the estimated market impact cost of trading 100% of the rebalance, given historical transaction cost data, such as bid-ask spread, expected market movement given asset size to be traded, commissions, and any other costs. With this information, the PM team is able to determine not only the overall cost of the rebalance, but also the granular details on each individual name. From there, the PM team is more effectively able to work on a trading strategy with the following two main objectives:

- Minimize return dispersion between the portfolio and the benchmark
- Minimize market impact and wealth destruction

Balancing these two objectives is often a challenging endeavor, and experience managing these types of strategies is deemed a key determinant to success.

Figure 1

Case Study Reconstitution Pre-Trade Cost Analysis

Side	No. Trades	Weight (%)	No. Shares	Notional Value (US\$)	% of ADV	Avg 1/2 Spread ¹	Weighted Average Costs (bps)			
							Impact Cost ²	Commission	Fees	Total Cost
Buy	161	50	19,980,211	297,488,407	31.24%	11.5	126.8	4.7	0.0	131.6
Sell	144	50	15,444,533	297,774,035	34.06%	10.8	131.3	3.6	0.1	135.0
Total	305	100	35,424,744	595,262,442	32.65%	11.1	129.1	4.2	0.0	133.3

Source: BEOS Analytics, State Street Global Advisors analysis.

In this case study example, Figure 1 illustrates the Pre-Trade Cost Analysis. As Figure 1 shows, the total notional for this rebalance was \$595.2 million. Given that this example is a reconstitution, the notional value of sells is similar to buys, leading to a cash neutral trade. Moreover, the weighted average daily volume for the entire trade was 32.6%. The average spread was 11.1 basis points (bps), while expected commissions were 4.2 bps. By far the largest estimated cost was what we call “impact cost” or expected price impact of our trades. This was estimated at 1.29%, resulting in a negative total impact of 1.33%. In other words, this report was telling the team that if we were to trade 100% of this rebalance on a single day, we would potentially face a 1.3% impact caused by our trading.

Figure 2

Case Study Top 5 Worst Names

Name	Side	No. Shares	Notional Value (US\$)	% of ADV	Avg 1/2 Spread	Estimated Execution Costs (bps)			
						Impact Cost	Commission	Fees	Total Cost
XBiotech USA	Sell	130,401	1,197,081	257.48	37.3	1066.7	7.6	0.1	1074.4
Great Ajax	Buy	229,000	2,498,390	226.71	14.0	355.4	6.4	0.0	361.8
Banco Latinoamericano de Comercio Exterior	Buy	162,100	2,497,961	197.87	9.4	330.1	4.5	0.0	334.7
PC Connection	Sell	53,581	2,763,172	189.17	34.4	561.2	1.4	0.1	562.7
VirnetX Holding Corp.	Sell	459,650	859,546	176.74	33.1	1019.5	37.4	0.1	1057.0

Source: State Street Global Advisors analysis.

Figure 2 shows the top 5 worst names from an expected total cost perspective. As shown, all of our demand and supply for these names exceeded 150% of the expected daily average volumes. This granular data allows the PM and trading teams to dissect the reconstitution and to craft a trading strategy.

Developing a Trading Strategy

Armed with the Pre-Trade Transaction Cost Analysis, the PM team engages our trading team to craft an implementation strategy. Trading 100% of this rebalance on the close of the effective date is not feasible. Therefore, we need to set a strategy that will enable the portfolio to remain fully invested at all times, will be able to buy and sell the required names in an orderly fashion, and at the same time, will minimize tracking error.

After careful consideration of the need to balance out the time for implementation, the liquidity situations that exist, and the exposures we are managing, we decide to focus on the most illiquid names and start pre-trading in a balanced, cash-neutral fashion a few days before the effective date.

Our trading activity is scheduled to take place over the next four days. The goal is to navigate across a myriad of execution avenues, including but not limited to, dealer advertisements, dark pool venues, and other electronic channels to source the maximum liquidity while also minimizing information leakage, and avoiding price impact while balancing cash. Broker selection is important especially in the small-cap arena as we want to have a dealer(s) that transacts in this space and can add value in finding larger-than normal-blocks in the process. Dark or “hidden” liquidity is nearly impossible to forecast, so patience is required as liquidity may show up for a moment, only to then evaporate. Part of the challenge is to balance opportunity cost with market impact; if we are able to find contra flows, then trading as a large portion of the volume is not a concern as long as we are not impacting the price (i.e. being price makers, not takers). With this in mind, we would start to trade in an orderly manner, while trying to maximize our chances at matching buyers and sellers with the least amount of friction as possible.

Lastly, our goal is to finalize this rebalance within a week. We believe we can optimize the market conditions around quarter end — a time when we expect a large asset allocation shift that will improve liquidity conditions.

Rebalance Week Trading

During the rebalance week, as set in our trading strategy, we pre-traded approximately \$210 million or about 35% of the total notional rebalance amount. Over an entire week, traders and the PM team worked closely to not only ensure portfolio exposures were aligned, but also to maximize our chances of executing at the lowest possible cost.

Finally, on the effective date, we separated the remaining illiquid names from the liquid ones. The illiquid names were traded throughout the day. Our expectation of enhanced liquidity on month end turned out to be accurate. The remaining trades with low estimated impact cost, were deemed market-on-close (MOC) eligible, and therefore were traded towards the close of the trading session.

Outcomes

After a week of patience and hard work, we were able to complete this rebalance trade. The total execution value relative to the effective date's close was a positive 0.63%, or approximately \$925,000 in added value relative to the benchmark. Of course, this figure could have been negative or quite different. While the trades were buoyed by market dynamics outside of our control, this example highlights the importance of teamwork and dedication when managing index funds.

Figure 3
Case Study Trading Results

Notional Trade Value (US\$)	vs Effective Date Close (bp)	Explicit Costs (bp)		Total (bp)
		Commission	Taxes	Implicit + Explicit
593,127,433	+63.7	-4.1	0.0	+59.6

Source: State Street Global Advisors analysis.

Although we highlight a small-cap smart beta strategy example, similar work and discipline go into each and every index rebalance. Unlike this example, most rebalances do not require this type of strategy, and estimated costs to implement for most regular rebalances are not this large. However, more often than not, there are individual names in client portfolios that do require this level of rigorous analysis and approach.

At State Street Global Advisors, we believe that wealth preservation and market impact minimization are equally important objectives to achieve as tightly tracking an index. Careful consideration for implementation should be paramount, and is particularly relevant in smart beta and/or mid- and small-cap spaces.

Endnotes

- 1 Average half spread = Half of the weighted average bid-ask spread, expressed in basis points. Shown for informational purposes only, this cost is included as part of the impact cost estimate.
- 2 Impact cost = Citigroup BEOS Expected Impact Cost = Estimated Spread Cost + Estimated Temporary Impact + Estimated Permanent Impact based on completing the order over one full day unless otherwise noted.

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* Pensions & Investments Research Center, as of December 31, 2020.

† This figure is presented as of March 31, 2022 and includes approximately \$73.35 billion USD of assets with respect to SPDR products for which State Street Global Advisors Funds Distributors, LLC (SSGA FD) acts solely as the marketing agent. SSGA FD and State Street Global Advisors are affiliated.

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