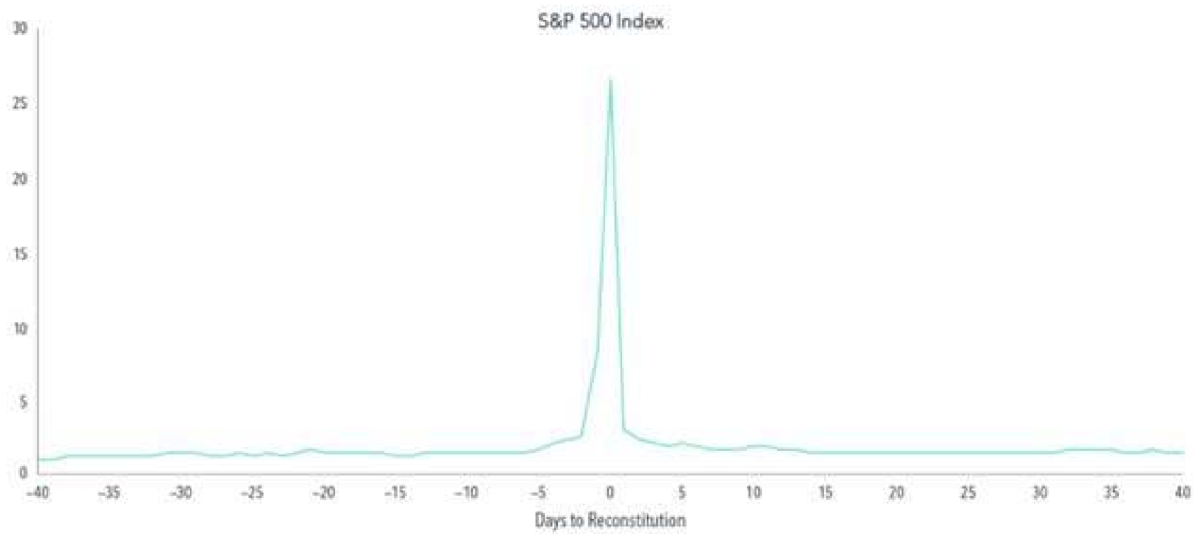
CLIENT QUESTION OF THE MONTH: What was the impact of Tesla joining the S&P 500?

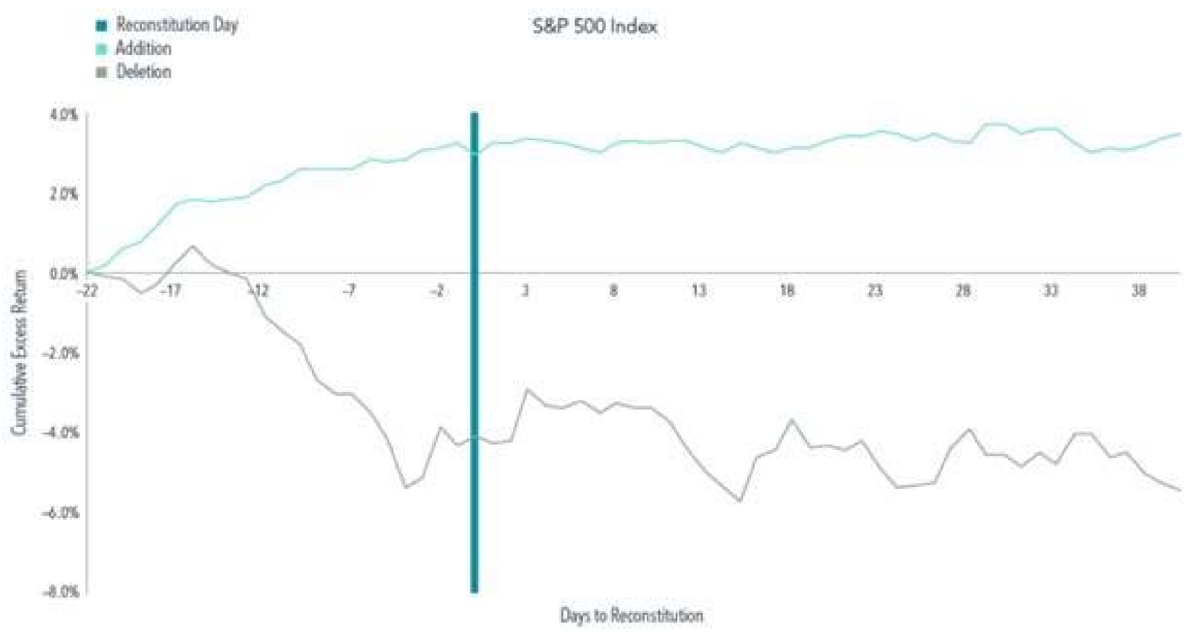
- When a commercial index is revised, some securities may be added to its list of constituents while others may be deleted in a process known as reconstitution. The goal of reconstitution is to periodically rebalance the index to account for historical changes in the market and their constituents during the prior period. Index fund managers, who track an underlying index, may be forced to buy the additions and sell the deletions, with no discretion regarding the securities they hold and when to change their relative weights. They're generally forced to do this in order to minimize tracking error relative to the index, which may result in sub optimal portfolios and increased costs.
- On December 18th, 2020, Tesla joined the S&P 500 index, becoming the largest company to ever join and the 6th largest company within the popular index which has over $4.6 trillion tracking it.[1] Index funds, constrained by the objective of maintaining low tracking error versus the index, found it necessary to buy Tesla stock on the day it was officially added to the index, putting substantial liquidity demands on the stock. Abnormally high trading volume is a potential indication that demanding immediacy to trade in such stocks in the same direction may be costly. We illustrate such abnormal trading volume in **Exhibit 1**, which compares trading volume in stocks added to or deleted from the S&P 500 on reconstitution day with trading volume in the same stock on days before and after the reconstitution day from 2015–2019. We find that trading volume for rebalanced stocks spikes more than 25 times relative to volume over the prior 40 days.[2]
- Demanding such unusually large trade volume can result in price pressure. But this price pressure does not have to manifest itself all on the day of reconstitution. By spreading trading over several days and incorporating a daily process that allows for flexibility in managing the portfolio, costs can be mitigated, and expected returns can be improved. At Dimensional, we believe market prices are forward-looking and our dynamic portfolio management process focuses on what should be in the portfolio each day to pursue higher expected returns.
- Our research shows that stocks added to an index tend to outperform their respective indices prior to rebalancing, while stocks deleted from an index tend to underperform, Tesla's performance is consistent with this pattern. **Exhibit 2** illustrates that the prices of additions (deletions) start to move higher (lower) than those of their index peers one month before the reconstitution day for the S&P 500.[3] This behavior suggests pricing adjustments may be occurring well before the reconstitution day for those indices and an approach that is constrained to rebalance on the same day as an index may suffer.
- The reconstitution effect is one example showing the lack of flexibility of an index approach, which can leave returns on the table. At Dimensional, we believe our approach helps us pursue higher expected returns in a cost-effective manner and creates opportunities to add value.

Exhibit 1: Abnormal Trading Volume in S&P 500 Index, 2015-2019



Equal-weighted average daily trading volume multiples for S&P 500 Index additions and deletions over the most recent five-year period, from 2015 through 2019. The security level trade volume multiple is based on the ratio of observed daily volume levels over the event horizon relative to the observed daily volume 40 days prior to the reconstitution date.

Exhibit 2: Average Cumulative Excess Return of S&P 500 Additions and Deletions, 2015-2019



Notes: Daily excess returns are calculated as the equal-weighted average of individual security returns minus the respective index returns. The cumulative excess return for day t+i is calculated as the sum of the daily equal-weighted average excess return from t–22 for S&P, where t+0 is the reconstitution date.

[1] Total assets indexed to S&P indices is from Annual Survey of Assets published by S&P Dow Jones Indices, as of December 31, 2019.
[2] Reconstitution events for S&P indices sometimes fall on triple-witching dates, or days on which stock index futures, stock index options, and stock options all expire simultaneously. We examine reconstitution events outside of normal rebalancing dates, and therefore on days that do not overlap with triple-witching dates, and find that stocks added to or deleted from the S&P 500 Index still experience, on average, trading volume 26 times greater on the date of rebalancing relative to the trading volume 40 days earlier.
[3] The initial increase in the gray deletion line is primarily driven by ENSCO PLC, which was dropped from the S&P 500 Index on March 29, 2016, due to an international merger. See "Ensco plc and Rowan Companies plc Merge to Form Ensco Rowan plc, Industry-Leading Offshore Driller," *Business Wire*, April 11, 2019.