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## Indexing: Phantom Promotions, Defiant Demotions

As passive investing continues to grow, so too has the impact of index changes. For the largest US companies, passive managers may hold more than 20% of a company's public float. Changes to the underlying composition of these indices leads to significant liquidity events and, often, significant price impact.

These index events attract participants from all facets of the market, from index funds rebalancing their portfolios to active managers seeking liquidity to hedge funds seeking short-term alpha through advance prepositioning. Because of these competing forces, performance of index changes is widely uncertain and is accompanied by heightened volatility.

However, over the past year, we began to observe some consistent patterns. With the goal of quantifying these trends, we decided to investigate S&P 1500 (i.e., S&P 400, 500, 600) changes over the past year. In an effort to isolate index-related impact from other factors, namely corporate actions, our analysis considers only discretionary additions and deletions. We also excluded index changes where a company experienced significant price movement due to earnings, either in the days before or after an index announcement.

The results are counterintuitive, but are in line with our recent observations. What is truly surprising, are the driving factors behind this trend.

### EXPECTATIONS

The S&P 500 is one of the most passively benchmarked indices in the world, with more than \$3.4 trillion tracking the index. The S&P 400 and S&P 600 are also large, but do not have nearly as many assets as the S&P 500.

Below, we outline the various constituent change scenarios, as well as their expected performance outcomes. These outcomes are based on a simplified market where index managers are the sole participants during these events.

Any company not a constituent of the S&P 1500 that is added to any one of the S&P 400, 500 or 600 will see significant demand for its stock as index funds buy shares to rebalance their portfolios. One would expect the sudden surge in demand to drive the price of the company higher. Conversely, a sudden surge in supply due to an index deletion is expected to drive the price lower.

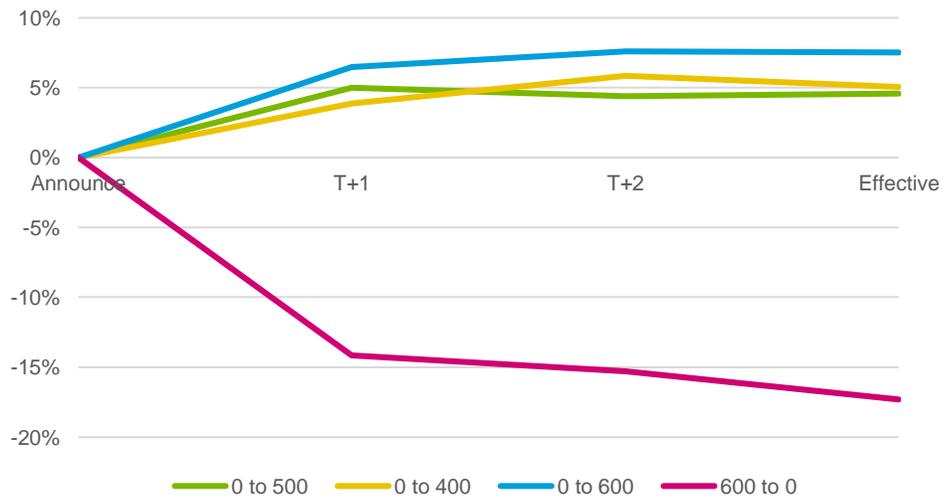
Where things get slightly more complicated is around index migrations—companies moving from one index to another. Given the S&P 500 has far greater assets than the S&P 400 and 600 combined, a company migrating from the S&P 400 or 600 to the S&P 500 will have significant net indexer demand. Conversely, a company migrating from the S&P 500 to either the S&P 400 or 600 will have significant net indexer supply. Given the net supply/demand imbalance, one would expect price impact to accompany the migration.

We also must consider migrations between the S&P 400 and 600. Although the S&P 400 has twice the assets indexed to it than the S&P 600, the asset sizes are such that S&P 600 indexers would own slightly more stock of the company than if the company were in the S&P 400. This happens because the same company in the S&P 600 would have a much greater weight in the index than if it were in the S&P 400. On that basis, a company migrating between the S&P 400 and 600 would experience only marginal net indexer supply or demand as the fund inflows and outflows would largely cancel out.

### OBSERVATIONS

Non-migrating index changes generally performed in line with expectations. Companies not in the S&P 1500 that were added to any of the S&P 400, 500 or 600 experienced strong performance from the announcement date. Conversely, companies removed from the S&P 1500 were significant underperformers. Note that discretionary deletions typically occur at the expense of S&P 600 constituents because they rank at the bottom of the S&P 1500. The sample size of discretionary S&P 500 and S&P 400 removals is far too small to have any statistical significance.

### US S&P Performance—Non-Migrating Adds/Deletes

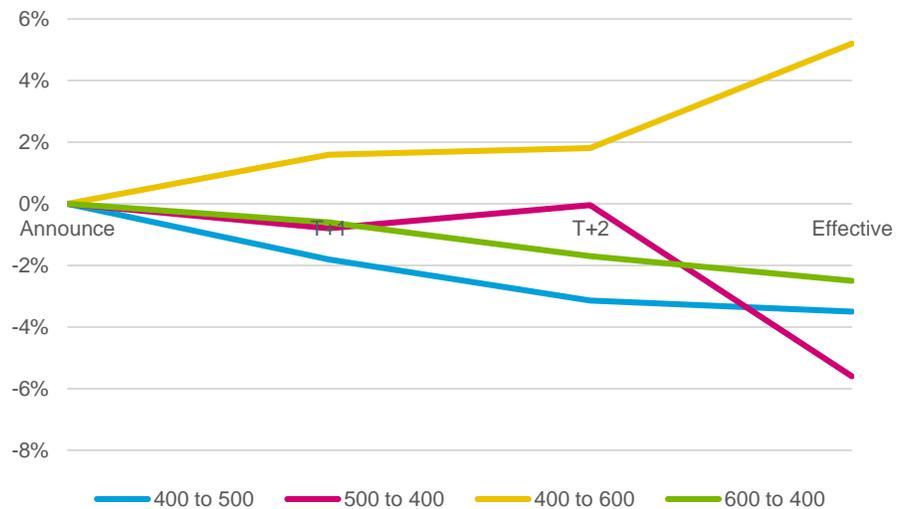


Source: ITG

Constituent migration is where things get interesting. The results show that, on average, the exact opposite of what is expected is happening. We have dissected the various migration scenarios below. Note that migrations between the S&P 500 and S&P 600 have been excluded because a jump from small cap to large cap status (or vice versa) is very uncommon.

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## US S&P Performance—Constituent Migrations



Source: ITG

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### Migrations between S&P 400 and S&P 500

Given that S&P 500 assets eclipse S&P 400 assets, a promotion to the S&P 500 leads to substantial net demand in a company's stock. However, performance has been very consistently *wrong way*; all but one instance in our sample size experienced negative performance from announcement to effective date.

On the flip side, companies demoted from the S&P 500 to the S&P 400 are also sizable underperformers. This is more in line with expectations.

### Migrations between S&P 400 and S&P 600

As we explained previously, a migration between the S&P 400 and S&P 600 would lead to minimal net supply or demand, as fund inflows and outflows would largely cancel out. However, companies promoted to the S&P 400 have been consistent underperformers, while companies demoted to the S&P 600 have been consistent outperformers.

## THEORIES

We put forth multiple theories to explain the performance anomalies in S&P changes and investigate each one in detail below.

### Prepositioning

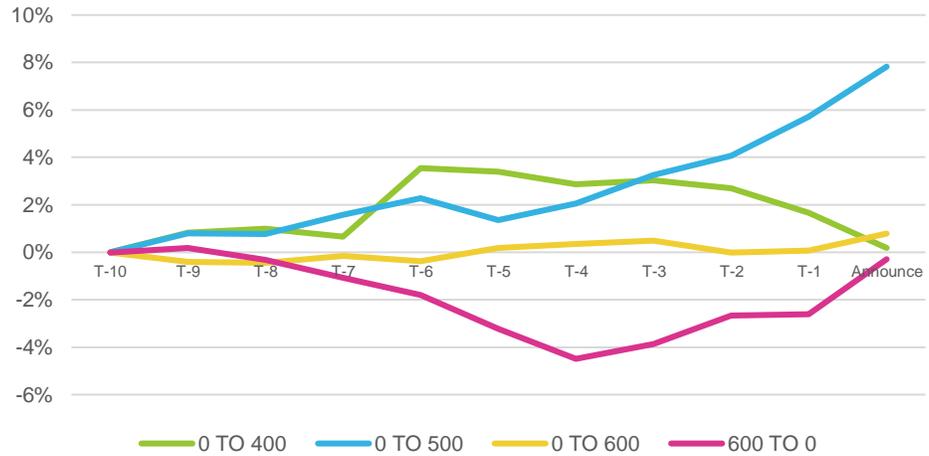
Short-term alpha strategies around index changes have existed since the dawn of passive investing. Investors attempt to replicate the index methodology and predict which companies are likely to be added or removed from the index. The objective is to position these companies well in advance of the index change and unwind into the indexer supply or demand.

Depending on the number of participants engaged in this activity, the prepositioned flows can be substantial enough to overwhelm the indexer flows. This can cause a wrong-way outcome (i.e., additions underperform while deletions outperform).

We looked at the performance of index changes in the days and weeks leading to the announcement date in an attempt to identify prepositioning activity. We expected to see significant right-way movement in that time frame.

Performance of non-migrating additions and deletions has been compellingly right way across the board.

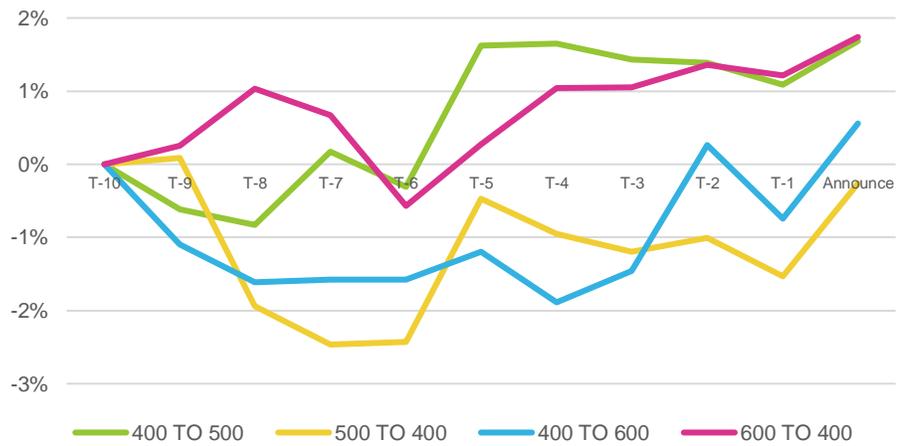
### S&P Adds/Deletes—Pre-Announcement Performance



Source: ITG

Meanwhile, performance of migrations has been mixed. We generally saw right-way moves across S&P 400 and 500 migrations, while S&P 400 and 600 migrations did not show a convincing pattern.

### S&P Migrations—Pre-Announcement Performance



Source: ITG

**Verdict:** The heightened volatility across all categories of S&P changes in the days leading to announcement certainly suggests some degree of repositioning. As has historically been the case, the performance and level of activity vary greatly on index-by-index and change-by-change bases.

### Growth of Index Assets

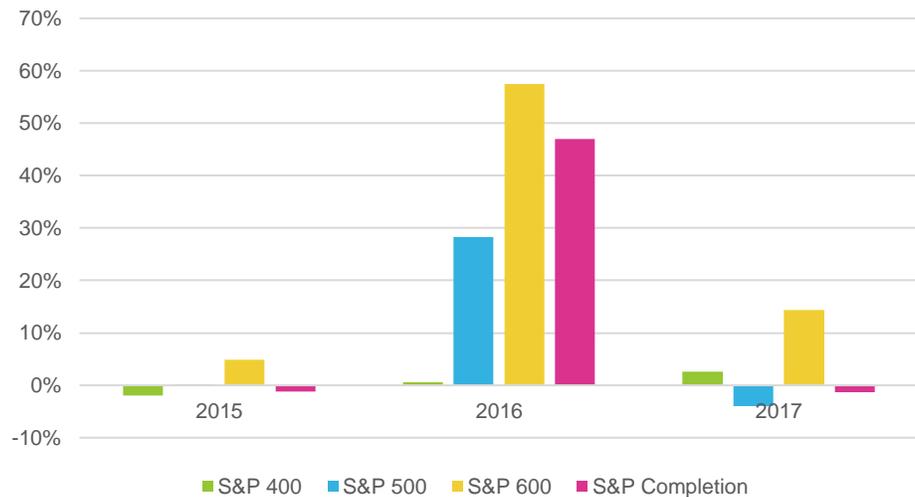
The size of assets tracking an index ultimately dictates the amount of supply and demand that originates off the back of index changes. One index that has quietly been amassing assets and largely flies under the radar is the S&P Completion

Index (i.e., the S&P 400 + 600). The Completion Index and S&P 600 have been among the fastest growing indices in recent years.

S&P publishes an annual survey of assets each year.<sup>1</sup> Below, we highlight the year-over-year asset growth across numerous S&P indices on a performance-adjusted basis (i.e., if assets grew by 10% but the index was up 9% that year, performance-adjusted asset growth would be 1%).

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### S&P Performance-Adjusted Asset Growth



Sources: S&P Dow Jones Indices

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The S&P 600 has been the fastest growing index compared with peers, followed by the S&P Completion index. In 2017, however, Completion assets were largely unchanged. It is possible that the index has been garnering additional assets over the past 11 months, but we won't have insight into the figures until S&P publishes its asset survey at the end of the year.

Nevertheless, S&P 400 assets, when combined with S&P Completion, is sizable enough to offset a substantial amount of S&P 500 supply or demand. However, the Completion alone would not explain the recent performance trend of S&P 400 and 600 migrations because a company in either index is, by default, a constituent of the S&P Completion Index.

**Verdict:** S&P 600 assets have seen significant growth, which likely explains some of the performance phenomenon of S&P 400 and 600 migrations. Meanwhile, the S&P Completion Index also has a significant amount of passive assets which, when combined with S&P 400 assets, might explain some of the performance skew between S&P 400 and 500 migrations.

### Synthetic Indexing

Synthetic indexing is the practice of replicating a portfolio using derivative instruments outside the underlying cash basket. The dealers who offer these synthetic arrangements will hedge most of their short exposure in the cash market. However, some of the exposure can be offset to other clients who are looking for a short hedge on their own portfolios. As a result, a portion of the synthetic market does not find its way to the underlying securities.

This practice has been around for many years. However, the size of the synthetic market is astounding, and it has been growing in recent years.

The two most common instruments of synthetic indexing involve owning index futures or total return swaps. For non-US index funds, this proves to be particularly advantageous because these instruments are not subject to dividend withholding tax, while owning the underlying securities is. The US government introduced Section 871(m) of the Internal Revenue Code last year that was intended to close this tax loophole. However, certain broad market indices such as the S&P 400, 500 and 600 are exempt from Section 871(m), because there were fears that it would lead to widespread liquidation.

Currently, open interest in S&P 500 futures exceeds \$400 billion compared with S&P 400 futures, where open interest is only \$13 billion, and the S&P 600, where open interest is \$0. The majority will find its way back to the equity market as dealers hedge their positions, but a substantial portion will not.

The much larger but more opaque market where this takes place is the swap market. According to the Bank of International Settlements, the total size of US OTC equity swaps and forwards is \$1.2 trillion and has grown over the past year and a half.<sup>2</sup>

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### Asset Growth of US Swaps & Forwards vs. S&P 500 Performance



Source: Bank of International Settlements

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Very conservatively, we estimate that at least 50%—\$600 billion—of the \$1.2 trillion is linked to the S&P 500, with the remainder split across single-stock and other indices. Across the combined S&P 500 futures and swap markets, which exceeds \$1 trillion, there is likely a meaningful amount of indexed assets that will not flow back to the equity market.

**Verdict:** Given that a substantial amount of S&P 500 assets are replicated synthetically and never flow back to the equity market, we believe that the amount of indexer stock demand is overstated. In that case, the spread between S&P 400 and 500 stock ownership is much narrower.

## CONCLUSION

As the evidence suggests, it is very likely a culmination of all three factors—prepositioning, index asset growth, synthetic indexing—that is driving the recent performance anomalies.

Through our back-testing, we observed an unexpected absence of close volume around S&P 500 changes. We attribute this, at least in part, to the growth of the synthetic market. Combined with the overwhelming evidence of prepositioning, sizable S&P Completion assets and lackluster (performance-adjusted) asset growth in the S&P 500, the performance outcomes across S&P 400 and 500 migrations are no longer surprising.

We believe that the absence of derivative products linked to the S&P 600, combined with the impressive asset growth, has resulted in greater stock ownership by S&P 600 indexers than S&P 400 indexers. Consequently, companies migrating from the S&P 400 to the 600 would experience substantial net demand, which could lead to the outperformance trend we have been observing.

Based on our findings, combined with our back-testing of market-on-close volumes, we have adjusted our US S&P models to use revised asset estimates for the S&P 400, 500 and 600. This will have a profound impact on our flow projections. Although this may not align with other index models on the Street, we are confident that it will significantly improve accuracy. We welcome any thoughts or discussion on the subject.

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<sup>1</sup> As of Dec. 31, 2017, the combined indexed assets of the S&P Completion and S&P Total Market indices was \$395 billion. Upon request, S&P informed us that the total of S&P Completion Index assets was \$219 billion. Unfortunately, historical breakdowns for S&P Completion assets are not available; they are combined in a single category under Completion/Total Market. We used a similar ratio of Completion to Total Market assets to extrapolate historical S&P Completion assets.

<sup>2</sup> Bank of International Settlements. *Equity-linked derivatives*. Retrieved from <https://stats.bis.org/statx/srs/table/d8>

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