Brief

The Active Side of Indexing

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CFA Institute Research Foundation

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CFA Institute
Research
Foundation

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Introduction

Custom reconciles us to everything.

—Edmund Burke

Index funds are widely considered passive, but if we look closer, we will find a surprising twist. On the surface, they simply mirror benchmarks, such as the S&P 500 Index, Russell 1000 and 2000, Nasdaq-100 Index, MSCI EAFE Index, and MSCI ACWI. Invented in the 1970s, index funds were created to track these indexes by such pioneers as Dean LeBaron, Rex Sinquefield, Bill Fouse, and John Bogle. Touted as low-cost, no-frills options to match the market, investors pay minimal fees and collect market returns—or so we have long been taught. Yet beneath the calm surface lies a decidedly active heart. An index fund with 5% annual turnover could fairly be described as 95% passive and 5% active. Is this active component too small to matter, even boring? Hardly. That 5% is not trivial, especially when the trading is far from neutral, exhibiting a wild style all its own. These modest trades are more like those of a momentum-fueled, story-chasing, emerging growth investor rather than those of a neutral market tracker.

The origins of indexing were simple and noble. Market indexes were originally created not as investment vehicles but as measures of economic reality. The Dow Jones Industrial Average, launched in 1896, and the S&P 500, launched in 1957, sought to measure the pulse of the US economy—to capture its breadth, not to compete with it. Their mission was measurement, not participation. Representativeness was the essence: to reflect the market's performance faithfully, without judgment or discretion. Index providers added and dropped stocks at a measured pace to achieve their objective, and index funds dutifully matched their chosen index.

To understand why today's index funds behave the way they do, we begin with how they were first designed—and how their purpose evolved. Once indexes evolved from *measures* of the market to *mechanisms* for investing, their role fundamentally shifted. The act of replication began to shape the very market it sought to describe, with each rebalancing and reconstitution imposing some price impact, reinforcing recent momentum, and distorting valuation multiples. In the early days, these effects were modest. Today's indexes remain representative, but the path they take to achieve that representation can impose real, recurring costs on investors who follow them.

Traditional market-cap indexes secretly harbor speculative biases that even the index providers may not notice. They systematically favor stocks inflated by hype—what we might call "honeymoon darlings"—while discarding past loves that have fallen out of fashion. Is a pattern of buying stocks at frothy multiples after they have surged and dumping them at deep discounts after they have tumbled truly passive? This momentum-driven churn imposes real migration

costs. Index funds relentlessly buy high and sell low. Although the passive label is *mostly* true, it is outright fiction at the margins where the trading occurs. Recognizing these effects is essential to understanding both the strengths and the limitations of traditional indexing.

Our research exposes the uncomfortable paradox of traditional "passive" indexing. On the fringe, where index funds buy and sell, they dance to a speculative tune far more than most investors realize, *actively* promoting market speculation. Our analysis identifies where traditional indexing stumbles: hidden trading costs from excessive tracking-error aversion, relentless momentum chasing, and too many expensive flip-flops. We systematically explore these challenges. Better still, by recognizing these hidden costs, we can take steps to improve our indexes and our index funds.

We start by challenging common assumptions about index neutrality—the idea that market-cap-weighted indexes are neutral, unbiased, and efficient vehicles for passive investing. We then highlight some unintended attributes of indexing, such as the buy-high/sell-low effect, hidden trading costs from index reconstitution, and the pressure to minimize tracking error that leads index fund managers to make costly trades. Case studies highlight how these effects manifest in the real world.

Whether we are seasoned professionals or curious observers, acknowledging these uncomfortable truths empowers us to build better indexes and to thrive in an unpredictable market.[1] By recognizing the active elements concealed within passive investing, we can identify market inefficiencies and pursue tangible alpha. Beyond diagnosis, we conclude by exploring alternative means of constructing an index—still rule based and transparent but grounded in measures of business scale and stability rather than short-term market enthusiasm. We hope that this work leads to better index funds in the future.

Questioning Common Assumptions

Passive investing has gained widespread popularity over the past half century. At its core, this approach relies on cap-weighted indexes, which are widely viewed as an efficient way to capture broad market returns. These benchmarks—and the low-cost index funds built to track them—are perhaps the most influential financial innovations in the past century, helping democratize market access, reshape retirement savings, and transform the investing landscape.

Their rise rests on both compelling theory and tangible practical benefits. Classical finance models, such as the efficient market hypothesis, assert that market prices fully reflect all available information, leaving little opportunity for persistent outperformance through active selection (see Fama 1970). The capital asset pricing model (CAPM), predicated on an assumption that markets are efficient and trading is free, goes further to show that a cap-weighted portfolio offers the highest expected return per unit of risk (see Sharpe 1964). Beyond theory, practical advantages reinforce this appeal. Market-cap indexing delivers broad diversification with

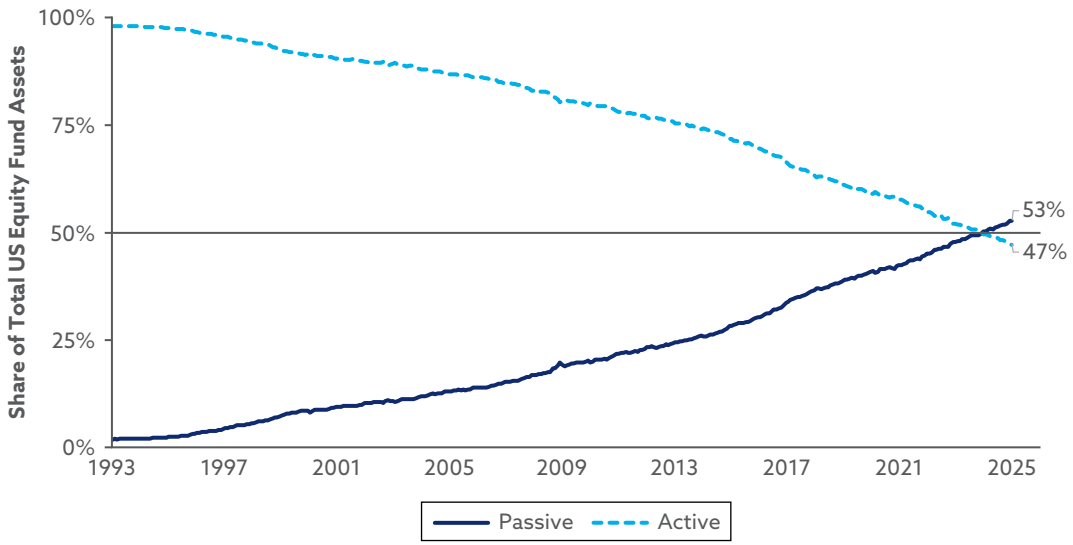
[1]By a "better index," we do not mean one that departs from the core principles of transparency, rules-based construction, and investability that define traditional indexing. Rather, we refer to index designs that preserve these attributes while mitigating the structural inefficiencies embedded in cap weighting—most notably the tendency to buy recent winners at elevated valuations and sell recent losers at depressed prices. In this context, a better index is one that reduces unnecessary turnover and hidden trading costs, limits momentum-driven reconstitution effects, and anchors inclusion decisions more closely to measures of durable business scale rather than short-term price movements. The result is not a more "active" index, but a more efficient representation of the opportunity set that indexing seeks to capture.

minimal turnover and ultra-low costs—traits that appeal to both institutional and retail investors. The transparency of index methodologies and the ease of implementation have further fueled their adoption.

Over the past four decades, passive strategies have evolved from a niche application to the dominant force in fund management. As shown in **Exhibit 1**, a major milestone was reached in early 2024: For the first time, assets in passive US equity funds—broadly defined to include style and sector funds and mechanistic quant strategies—surpassed those in active funds as measured by the assets under management of active and passive exchange-traded funds (ETFs) and mutual funds. This development marked a structural shift in how capital is allocated. In 2000, index funds held a mere $0.4 trillion in assets, barely 3% of US equities. According to S&P Dow Jones Indices (2025), as of December 2024, $13 trillion directly tracked the S&P 500 alone, representing 21% of the value of the entire US stock market and over one-fourth of the value of the S&P 500 member stocks.[2]

The extraordinary growth rests on two widely held assumptions: (1) that cap-weighted index funds are passive and (2) that passive strategies are almost costless.

Exhibit 1. Percentage of Assets in Cap-Weighted Passive vs. Active US Equity Funds, 1993–2024



Sources: Research Affiliates, using data from Morningstar, as of year-end 2024 for US open-end funds and ETFs, with obsolete funds included.

[2]According to Chinco and Sammon (2024), even these astonishing figures may underestimate the real passive footprint by nearly half. After all, many large investors (e.g., pensions, endowments, and sovereign wealth funds) invest in separately managed accounts and commingled trusts, which are not included in most fund surveys.

Assumption 1: Cap-Weighted Index Funds Are Passive

Index funds are often described as the purest expression of passive investing—low cost, broadly diversified, and designed to do nothing more than mirror the market. The conventional view is that they simply hold the market portfolio without judgment or interference, rising and falling with the market's fortunes while keeping costs near zero. But this perception depends heavily on how we choose to define "passive."

If passive investing means avoiding forecasts or discretionary security selection while constructing an index that matches most of a chosen stock market, then cap-weighted indexing satisfies that definition. It holds the market's composition as it evolves, without analyst judgment. But if passive means avoiding unintended factor tilts or ensuring that trading behavior is style neutral, then cap weighting diverges markedly from that ideal. Its holdings may mirror the broad market, but its trading is far from neutral: The allocation shifts mechanically toward stocks that have recently risen in price and away from those that have recently fallen. This pattern does not rely on forecasting, yet it embeds a powerful structural momentum bias into index reconstitutions.

The performance of index funds appears to validate the passive ideal: Index funds have consistently delivered solid returns, closely mirroring the performance of the overall market and beating most active managers, with low fees and low turnover. Sharpe (1991) formalized why: If indexes track the market, then removing the index funds from the market portfolio leaves much the same portfolio to be divided among active managers. This means that in aggregate, active managers will deliver those same market returns, minus their far larger fees and trading costs. They are effectively trading against one another: For an active manager to win, there must be a losing active manager on the other side of his or her trades.[3]

It is important to note three weaknesses in Sharpe's simple proof of the superiority of index funds relative to the composite of all active strategies. First, it relies on index funds owning all assets available to the active managers, which is only approximately true. Second, it tacitly dismisses the fact that some active managers do beat the market. Third, it ignores the possibility that hidden costs may diminish the low-cost advantage of indexing, as indexes consume an overwhelming market share.

That said, Fama and French (2010) showed that active managers, on average, fail to outperform broad market indexes after fees and expenses, partly due to higher transaction costs and management fees.[4] Industry data point to the same conclusion. Morningstar's annual reports consistently show that a majority of actively managed funds underperform their benchmark indexes over the long term. In 2024, only 42% of active funds beat their passive counterparts, according to Armour, Jackson, Gorbatikov, and Kim (2025), and over the prior decade, just 7% of large-cap active funds surpassed passive benchmarks. Active managers may well fare better in

[3]In his 1987 letter to shareholders, Warren Buffett wrote, "As they say in poker, 'If you've been in the game 30 minutes and you don't know who the patsy is, you're the patsy.'" The same applies to active managers: A successful active manager must know why there is a willing loser on the other side of his or her trades.

[4]Others have found similar results. Berk and Green (2004) demonstrated that while active managers can generate positive gross alpha relative to benchmarks, competitive flows and fee-taking dynamics erode these gains, leaving little benefit for investors. Berk and van Binsbergen (2015) estimated that the average mutual fund adds $3.2 million in annual alpha but the value-weighted net alpha is effectively zero, indicating that the entire benefit is captured through fees and does not flow to investors.

other decades: The past decade was particularly awful for value and small-cap stocks, which are underrepresented in most index funds and therefore overrepresented in active funds.

Still, these figures underscore the enduring appeal of index funds: They offer cheap, scalable access to market returns without the need to pick stocks or time the market. However, this apparent triumph hides an important nuance: Those returns are not delivered by a neutral hand. By construction, market-cap weighting systematically overweights companies whose prices have already soared and underweights those that have recently declined. This mechanism locks investors into a pattern of *buying high and selling low*, contradicting the notion of genuine passivity. Understanding the magnitude of this effect requires examining reconstitution behavior—a topic we explore later.

Assumption 2: Passive Strategies Are Almost Costless

The claim that passive strategies are nearly costless has become an article of faith among investors who view index funds as the lowest-cost way to access markets. Although it seems compelling, a closer examination reveals that the assumption of negligible costs beyond headline expense ratios overlooks less visible but consequential frictions embedded in their implementation.

Every time an index reconstitutes, funds tracking the index must trade, often in predictable and crowded ways. These trades can move prices against index investors, forcing them to buy additions at inflated valuations and sell deletions at depressed prices, a phenomenon known as index reconstitution drag. Chen, Noronha, and Singal (2004) documented how stock additions to the S&P 500 experience significant price run-ups prior to inclusion and subsequently underperform and how deletions often rebound after being dropped, creating an implicit performance cost for index fund holders. Those results, however, are not consistent over time: Greenwood and Sammon (2025) showed that the average abnormal return associated with S&P 500 additions fell from about 7.4% in the 1990s to just 0.3% between 2010 and 2020 and that the steep post-deletion sell-offs of earlier decades had nearly vanished, falling from large negative abnormal returns to only 0.1%. More recently, our evidence for the decade of the 2020s documented a robust return of past abnormal addition and deletion returns. *Plus ça change, plus c'est la même chose*.[5]

Each reconstitution or rebalancing forces the index to replace recent laggards with fresh winners, regardless of underlying fundamentals, thereby overexposing investors to stocks whose valuations are most stretched. Arnott, Kalesnik, and Wu (2018) analyzed the index reconstitution effects of additions and deletions for the S&P 500 between 1989 and 2017 and quantified the performance erosion at about 25 bps per year. While this figure may appear modest in isolation, it is a huge difference in the world of index funds. Compounded over decades, an annual drag of 25 bps from trading costs will meaningfully diminish the value proposition of passive strategies. When investors focus narrowly on visible management fees, they risk overlooking these persistent frictions that contradict the perception of index funds as frictionless vehicles.

The perception of indexing as a purely passive, nearly costless strategy has been deeply ingrained. Recall Burke's observation that custom reconciles us to everything. The promise of low fees and broad market access continues to resonate with investors, often overshadowing ways in which indexing is far from passive. Questioning these common assumptions calls for looking beyond the individual investor's experience to consider the impact on the broader market.

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[5]This is a delightful French expression: "The more things change, the more they stay the same."

Hidden frictions—predictable rebalancing trades, price distortions, and concentrated flows—reveal the active side of indexing, a paradox that is often hiding in plain sight. Far from being abstract concerns, these negative effects surface most visibly in the mechanics of index reconstitutions. Every change in membership forces funds to trade, often in predictable and crowded ways, amplifying pricing errors and embedding a subtle but persistent cost. In the next section, we examine these mechanics directly: how index turnover works in practice, the costs it imposes, and the valuation biases it creates.

Index Reconstitution: Mechanics, Costs, and Valuation Biases

Index reconstitution is straightforward in principle but complex in execution. Whether at scheduled intervals, as with FTSE Russell's historical annual reconstitution in June (scheduled to shift to a semiannual cadence beginning in 2026), or using S&P Dow Jones Indices' more opportunistic timing, index providers review eligibility criteria and adjust the composition of their benchmarks. These updates are designed to maintain relevance, ensure investability, and reflect changes in corporate actions, market values, and sector classifications. In most major indexes, such as the S&P 500, Russell 1000, or Nasdaq-100, changes are announced days or even weeks before they take effect.[6] Although the goal is simply to maintain relevance and investability, the implementation process can generate large, predictable trading flows, especially when changes are announced and widely anticipated.

Take the S&P 500 as an example. At present, the index committee meets on an as-needed basis to evaluate which companies should be added or removed based on quantitative and qualitative criteria, including market capitalization, liquidity, domicile, public float, and financial viability.[7] Prior to October 1989, Standard & Poor's policy was to implement index changes retroactively. Announcements were made only after the market had closed, typically on a Wednesday, and the changes were deemed effective at that closing price. In practice, this meant index fund managers had no opportunity to adjust their portfolios ahead of time. They were compelled to execute trades on the following day, effectively buying additions after the index had already incorporated them, often at higher prices, and selling deletions only after removal, after the price had already declined.

This process had two predictable outcomes. First, index-tracking funds incurred material trading costs as they chased the market impact of their own collective demand, a pattern documented by Arnott and Vincent (1986). Second, because these portfolios lagged the index's published holdings by one day, they experienced visible tracking error and could not exactly match their target indexes. These overnight return gaps were both meaningful and persistent, highlighting the frictions baked into mechanical replication.

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[6]The S&P 500 and Russell 1000 are referenced throughout this study and are used solely as representative examples of widely followed capitalization-weighted benchmarks. The discussion and results are not intended as criticism of these indexes or their purveyors, who have done great service to the industry and for their investors. We seek to illustrate general structural features of index design and reconstitution rather than to critique the legacy indexes and their providers.

[7]Decisions are announced after the close of trading, often on Fridays, with changes typically taking effect at the market open on the fifth trading day after the announcement. Eligibility criteria include (1) unadjusted market capitalization exceeding a minimum threshold (currently about $18 billion), (2) at least 50% of shares available in public float, (3) positive as-reported earnings over the most recent quarter and cumulative positive earnings over the most recent four quarters, and (4) US legal domicile and/or primary listing on a US exchange.

Empirical research during this era documented a clear "reconstitution effect."[8] On the day after announcement for the period from January 1970 to September 1989, additions to the S&P 500 experienced an average abnormal return of approximately 3% and deletions declined by about 1.4%. Despite the modest size of index funds at that time, this spread of 4.4% was a direct consequence of index fund rebalancing flows, including the anticipatory trading of market participants who understood the mechanics of forced buying and selling. A round-trip trading cost of 4.4% was and is a very substantial cost, even if turnover is only 5% or less.

Standard & Poor's revised its methodology in October 1989. From that point forward, index changes were announced in advance with an explicit "effective date" set days or sometimes weeks after the announcement. Under the revised process, the composition of the index would be adjusted at the market close on the effective date, giving index funds an opportunity to exactly match the new holdings at that that closing price.

Tracking Precision, Hidden Costs

This shift had important implications. The introduction of a grace period between the announcement and effective dates gave index fund managers an opportunity to trade incrementally, smoothing some of the liquidity pressure and reducing tracking error relative to the index.[9] Funds had time to rebalance portfolios gradually or opportunistically, rather than reacting only after the index had already moved.

But this adjustment also created new incentives. Index funds are judged primarily on how tightly they track their benchmark. A manager who deviates, even modestly, risks reputational damage and client redemptions. As a result, index fund managers are strongly incentivized to trade exactly at the effective date closing price, regardless of market impact. This practice minimizes *visible* tracking error but maximizes *hidden* costs. In effect, tracking-error aversion is rational from a career-risk perspective, and the resulting costs are largely invisible to the end investor. Managers would rather lock in guaranteed slippage that leaves no gap versus the benchmark than attempt more opportunistic execution that might generate outperformance but also introduce visible deviations.

Because the effective date and rebalancing schedule had become transparent, hedge funds and proprietary traders could reliably anticipate index fund flows and position accordingly. This predictability often resulted in share prices drifting higher for additions and lower for deletions in the days between announcement and implementation. While the longer window allowed some mitigation of trading costs, it also institutionalized the opportunity for front-running by arbitrageurs who had no information advantage other than the knowledge of index methodology.[10] This explains why the reconstitution effect persists despite being well documented: The incentives all point toward precise replication, not efficient trading.

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[8]The early studies on S&P 500 reconstitution include Arnott and Vincent (1986), Harris and Gurel (1986), Goetzmann and Garry (1986), Shleifer (1986), Jain (1987), and Lamoureux and Wansley (1987).

[9]We use the term "grace period" to refer to the window between an index change's public announcement and its effective date, during which prices often drift as market participants anticipate and trade ahead of index fund flows.

[10]Note that this form of front-running is based on public information and is therefore entirely ethical and legal. The mystery is that index fund managers leave it to the hedge fund community to capture most of the available profits.

Multiple studies, including Lynch and Mendenhall (1997) and Chen et al. (2004), have documented the tendency for stocks added to major indexes to experience significant price appreciation between the announcement date and the effective date of inclusion, with deletions declining correspondingly. Expanding on earlier work, Arnott, Brightman, Kalesnik, and Wu (2023) analyzed S&P 500 reconstitutions from October 1989 through June 2021 and found that index additions outperformed the broad market by an average of 499 bps during the grace period between announcement and implementation. They also showed that discretionary deletions lagged the market by 723 bps over the same window. These sizable performance gaps, as summarized in **Exhibit 2**, highlight the enduring market impact of rebalancing flows triggered by index changes.[11]

The 12.21% gap in returns between the additions and deletions from announcement to implementation (Panel A of Exhibit 2) is closely linked to the change of index reconstitution practices after

Exhibit 2. Performance of S&P 500 Additions and Deletions Relative to the Market, October 1989–June 2021

A. Cumulative Performance Relative to the Market, Various Time Horizons			
Period	**Additions**	**Discretionary Deletions**	**Additions Minus Discretionary Deletions**
One year before announcement	41.48%	–29.11%	70.59%
Grace period (announcement to trade date)	4.99%	–7.23%	12.21%
One year after trade date	–1.61%	20.43%	–22.03%

B. S&P 500 Stock Characteristics, Average Valuation, Relative to Market						
Type	**Rel. P/B**	**Rel. P/E**	**Rel. P/CF**	**Rel. P/S**	**Rel. P/D**	**Average**
Additions	1.55	1.83	2.11	2.21	1.91	1.92
Discretionary deletions	0.42	0.53	0.45	0.34	0.50	0.45
Additions relative to discretionary deletions	3.7×	3.5×	4.7×	6.5×	3.8×	4.3×

Notes: Rel. P/B = relative price/book value, Rel. P/E = relative price/earnings, Rel. P/CF = relative price/cash flow, Rel. P/S = relative price/sales, and Rel. P/D = relative price/dividends.

Sources: Research Affiliates, based on data from Siblis Research, Wikipedia, CRSP, and Compustat.

[11]Throughout this report, we classify index deletions into two broad categories. *Nondiscretionary deletions* are removals driven solely by corporate actions—such as mergers, acquisitions, liquidations, or ticker discontinuations—where the index has no effective choice. All other removals are treated as *discretionary deletions*, regardless of whether they arise from committee judgment (as in the S&P 500) or from rule-based annual reconstitution and eligibility screens (as in the Russell 1000). In both cases, the deletion reflects an assessment—explicit or mechanical—of the company's characteristics rather than a corporate event.

October 1989. Before then, S&P 500 component changes were announced and implemented on the same day, leaving index funds scrambling to adjust and often generating substantial tracking error. The introduction of preannounced changes gave index fund managers a window to prepare and execute trades, allowing portfolios to align almost perfectly with the index. Yet this precision came at a cost, as highlighted in Panel B of Exhibit 2. Concentrated trading around the index reconstitution date further exacerbates the valuation gap between stocks entering and exiting the index.

At the time of index inclusion, newly added stocks tend to trade at much higher valuation multiples than the stocks they replace. This dynamic reflects the fact that additions typically arrive after sustained price appreciation and deletions often depart after protracted declines. With preannouncements, achieving near-zero tracking error became a legitimate possibility, but zero tracking error does not mean zero trading costs.

The performance gap of 12.21% between the announcement and effective dates is a very real trading cost. Before 1989, when trades started being preannounced, these costs were borne by the index funds and not the index because the performance gap occurred after the index was changed. The costs are now borne equally by the published index and the index tracker funds. This dynamic creates the illusion that trading is effectively costless because investors see almost no gap between index fund returns and benchmark returns. The closer a manager trades to the closing price on the effective date, the more precisely the fund will match the index and the more surely it will incur the entirety of these rebalancing costs. In practice, the drive to minimize tracking error has institutionalized these hidden costs, allowing them to persist largely unnoticed.

Persistence or Change? New Evidence from Recent Rebalancing

The historical evidence on S&P 500 reconstitutions reveals substantial time variation in index effects. As noted earlier, short-horizon announcement and grace-period reactions have declined dramatically over the past several decades.[12] What remains less clear—and what our study is designed to illuminate—is how the longer-horizon patterns surrounding additions and deletions have evolved in recent years.

To answer this question, we extend our earlier analysis with a new out-of-sample window, covering S&P 500 additions and deletions announced between July 2021 and May 2024. This period offers a fresh perspective on whether the performance patterns seen in prior decades—particularly the tendency for index additions to rise before inclusion and mean revert afterward—have persisted in a different market environment. Our analysis focuses on the year-by-year performance of additions and deletions relative to the broad market. Using a consistent empirical framework, we evaluate cumulative excess returns of S&P 500 component changes over three distinct intervals:

- the year before announcement,
- the grace period between the announcement and effective dates (including the trade date), and
- the year following index inclusion or deletion.

[12]See Greenwood and Sammon (2025) for more recent findings, which underscore how market responses to index changes have evolved as index membership has become increasingly predictable and widely arbitraged.

These intervals allow direct comparison with the historical record and help identify where longer-horizon dynamics have persisted and where they appear to have changed.

Panel A of **Exhibit 3** presents average results for S&P 500 additions and deletions from July 2021 to May 2024, providing a fresh perspective on the durability of the reconstitution effect in recent history. To ensure a consistent measurement window, we restricted the sample to events with at least one full year of post-trade return data. Although our source data extend into 2025, this requirement limits the coverage to index changes announced through May 2024. The resulting sample includes 38 additions and 29 discretionary deletions.

The out-of-sample evidence summarized over the full July 2021–May 2024 period is broadly consistent with the historical experience of S&P 500 reconstitutions on the addition side but reveals a meaningful shift in post-deletion performance. Additions continue to display the familiar buy-high/sell-low pattern, with strong excess returns ahead of announcement followed by economically significant underperformance after index inclusion—contrary to the muted addition effects reported by Greenwood and Sammon (2025) for the decade ending in 2020.

On the deletion side, stocks continue to exit the index at deeply discounted valuations relative to the market, reinforcing the long-standing valuation asymmetry between additions and deletions. However, unlike much of the earlier evidence, recent discretionary deletions have not exhibited a systematic rebound following removal. Instead, they have continued to underperform the market, on average, in the year after deletion.

Exhibit 3. Out-of-Sample Performance and Valuation of S&P 500 Additions and Deletions, July 2021–May 2024

A. Average Results for S&P 500 Additions and Deletions			
	Additions	**Discretionary Deletions**	**Difference**
Count	38	29	
One year before announcement	65.5%	−41.3%	106.8%
Grace period (announcement to trade date)	3.7%	−2.1%	5.8%
One year after trade date	−11.3%	−11.9%	0.6%

B. Valuation Characteristics of S&P 500 Component Changes					
Type	**Rel. P/B**	**Rel. P/E**	**Rel. P/CF**	**Rel. P/D**	**Average**
Additions	1.16	1.13	1.33	1.07	1.12
Discretionary deletions	0.23	0.25	0.23	0.28	0.23
Additions relative to discretionary deletions	5.1×	4.5×	5.8×	3.8×	4.9×

Sources: Research Affiliates, based on data from Wikipedia, CRSP, and Compustat.

These results point to continuity in the valuation mechanics of index reconstitution but also to a possible evolution in the information content of deletion decisions. While cap-weighted index turnover continues to reward recent winners and shed recent losers, the latter group appears increasingly populated by firms facing deeper or more durable challenges. Whether this represents a lasting change in committee behavior or a cyclical feature of the recent market environment remains an open empirical question, best assessed over longer horizons and broader datasets.

Highfliers and Hard Landings

During the period from July 2021 through May 2024, S&P 500 additions continued to confirm historical patterns, with strong performance ahead of announcement (65.5% cumulative excess return relative to the market one year before), modest gains during the grace period (3.7%), and notable underperformance of 11.3% in the year following index inclusion (as shown in Panel A of Exhibit 3).

Some names stand out more vividly than others. Moderna, added in July 2021, offers a striking example. Riding the crest of pandemic-era vaccine optimism, the stock surged 190% relative to the market ahead of its announcement and gained another 30% during the grace period. But once included in the index, the trend sharply reversed. Over the next year, Moderna underperformed the market by 40.5% as tailwinds related to COVID-19 faded and vaccine demand normalized. Similarly, Supermicro, the poster child of the AI hardware boom, rose an eye-popping 755.6% relative to the market before its March 2024 inclusion. Powered by demand for AI servers and Nvidia-aligned infrastructure, Supermicro's surge was fast and euphoric. Yet in the year after joining the index, it gave back most of those gains, underperforming by 72.4% as enthusiasm cooled, competition intensified, and stretched valuations began to face mean reversion.

These examples illustrate a larger pattern. Index inclusion often locks in exuberant valuations near the peak of a narrative. Benchmark changes—*by design*—reward what has already performed well, amplifying gains on the way in and crystallizing reversals thereafter.

Not all reversals are purely mechanical. In some cases, the post-inclusion decline reflects not just a cooling of enthusiasm but a more fundamental unraveling. Signature Bank, a mid-sized financial institution that was added to the index in December 2021 during the digital asset boom, surged over 124% relative to the market in the year leading up to its inclusion, buoyed by its rapid deposit growth, active courting of crypto clients, and perceived fintech edge. At its peak, more than a quarter of its deposits were tied to the digital asset ecosystem. Yet, by late 2022 (well before its formal collapse in March 2023), the stock had already begun to unwind, underperforming the market by 46.6% in the year following index inclusion. The story of Signature Bank illustrates an important point: When index additions coincide with companies exposed to concentrated risks or shifting market dynamics, the post-inclusion reversal may reflect more than just valuation normalization; it can also reveal vulnerabilities that benchmark construction methods are not designed to guard against.

In contrast to the results from 1989–2021, the results from 2021–2024 show that although discretionary deletions underperformed by 43.4% (−41.3% + −2.1%) relative to the market ahead of deletion, they continued to lag the market after their deletion by another 11.9% on average (see Panel A of Exhibit 3). Aggregate results do not tell the whole story. Beginning in 2023, several companies removed from the S&P 500 continued to slide well after their deletion,

suggesting that the index committee may be increasingly attuned to early signs of distress, whether by deliberate design, happenstance, or greater awareness of reconstitution effects.

Panel B of Exhibit 3 further examines the valuation characteristics of S&P 500 component changes in recent years. Additions during the 2021–24 period entered the index at a premium valuation multiple of 1.12 relative to the market, but discretionary deletions exited at just 0.23. In other words, additions came in, on average, 4.9 times more expensive than the names they replaced. In our 2023 study (Arnott, Brightman, Kalesnik, and Wu 2023) covering October 1989 to June 2021, the corresponding relative valuation gap was 4.3-fold. The widening gap underscores a recurring theme: Many recent additions were priced for continued momentum, leaving little margin for disappointment once included, but discretionary deletions left the index at deep discounts, often priced as though their troubles would never end and creating ample room for recovery once outside the benchmark.

But the story does not end with individual additions and deletions. A deeper question remains: Does membership in the largest-capitalization tier itself carry a lasting valuation premium? In other words, are the companies inside the market's largest cohort systematically more expensive than otherwise similar firms just outside that boundary, and if so, is the premium justified by superior fundamental growth?

Membership Has Its Privileges[13]

To investigate whether large-cap companies are systematically trading at a premium and whether this potential premium is justified by fundamentals, we compare a mechanically defined largest-cap portfolio—the "TrueCap 500," consisting of the 500 largest US companies by market capitalization at each reconstitution—with the "Next 500" portfolio of firms ranked immediately below those 500 companies. This construction isolates the effects of size-based inclusion without committee discretion or qualitative screens. As a real-world reference, we also include the S&P 500, whose constituents largely overlap with the largest companies in the market, allowing us to assess whether patterns observed in the purely size-based portfolios also appear in practice.

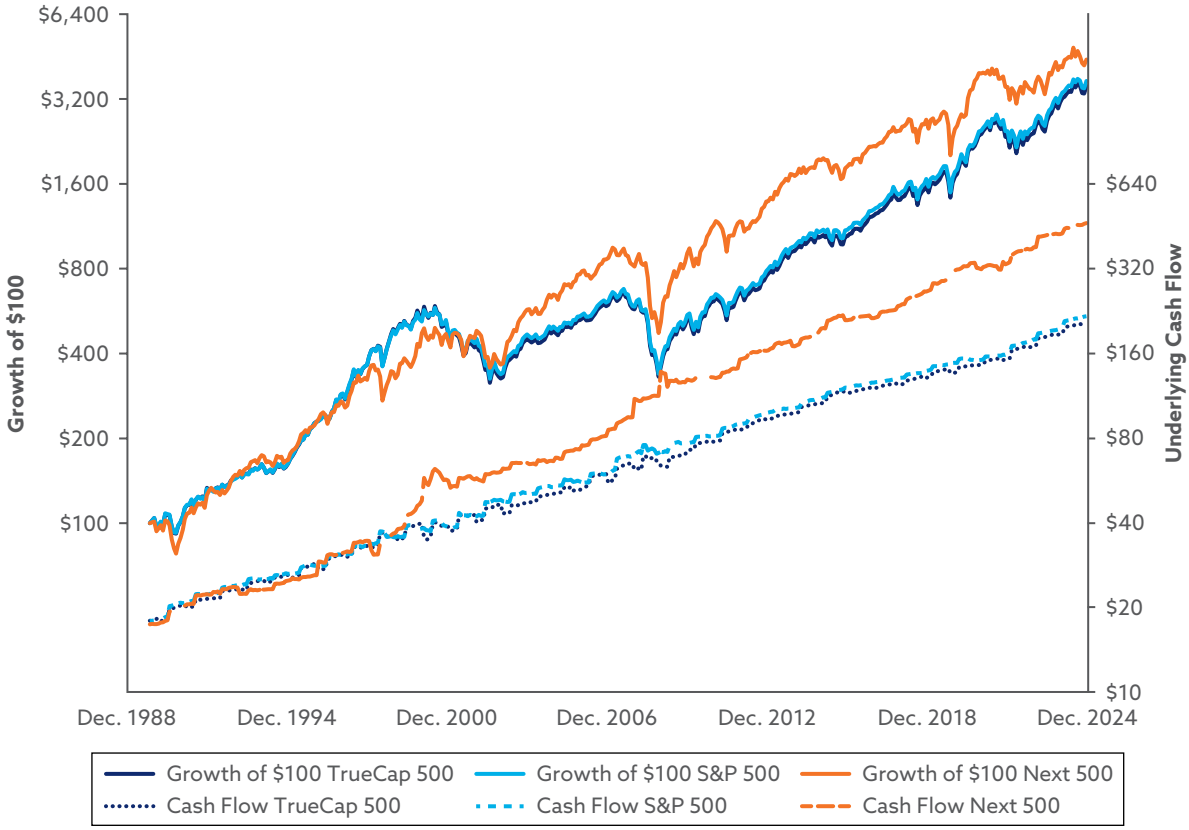
Exhibit 4 tracks the growth of $100, a total return index, for the TrueCap 500, the S&P 500, and the Next 500, from October 1989 through May 2025. The three have delivered similar returns, with the S&P 500 beating the TrueCap 500 by 0.13% per year, with modestly less risk.[14] The Next 500 beats the TrueCap 500 by 0.58% per year, a nice margin of victory, albeit with higher risk (17.5% versus 14.9%) and a lofty tracking error (7.4%). Note that the TrueCap 500 and the S&P 500 have both been converging toward the Next 500, meaning that the large-cap names have been outperforming the Next 500 for over a decade.

If the stocks are performing better, are the underlying large-cap companies performing better than the mid-cap companies to validate the relative performance? Not even close! The lower lines in the graph show the growth of the cash flow for the stocks in the TrueCap 500, the S&P 500, and the Next 500. The cash flow for the Next 500 has more than doubled relative

[13]With apologies to American Express for repurposing its famous tagline.

[14]The S&P 500 has also done better than the TrueCap 500 at identifying growing companies, with cash flow growth 0.20% faster per year than that of the TrueCap 500.

Exhibit 4. Wealth Accumulation and Underlying Cash Flow Growth: Large-Cap Cohort vs. Next 500, October 1989–May 2025



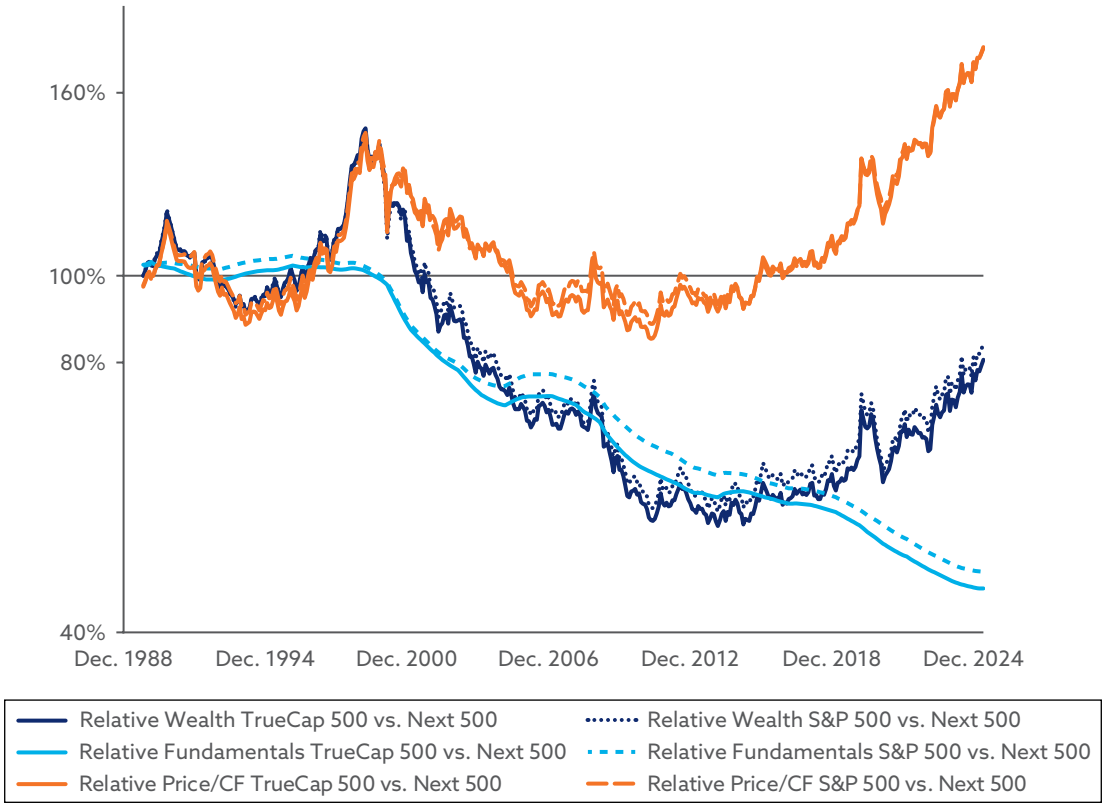
Sources: Research Affiliates, based on data from CRSP and Compustat.

to the cash flow for either the TrueCap 500 or the S&P 500 over the last 35 and a half years. In general, even when the large-cap 500 indexes are outpacing the Next 500, the opposite is true for the cash flow of the underlying stocks.

The gap in underlying cash flow growth is far larger than the difference in wealth accumulation. Starting from similar base levels near $18 of cash flow for a $100 investment in 1989, operating cash flow with reinvestment of dividends for the TrueCap 500 and the S&P 500 rose to about $203 and $217, respectively, by May 2025. The Next 500 increased to approximately $464 over the same period. These endpoints correspond to annualized growth of about 6.5% for both the TrueCap 500 and the S&P 500, compared with roughly 9% for the Next 500. Firms just outside the largest-cap tier therefore expanded operating cash flow about 2.5 percentage points per year faster than the largest-cap cohort—a substantial fundamental advantage over more than three decades. Over long horizons, a gap of this magnitude compounds into a dramatic divergence in business scale, even if it is only partially reflected in investor returns.

To better understand the forces underlying these differences, **Exhibit 5** recasts the comparison in relative terms, plotting the relative valuation of the TrueCap 500 and S&P 500 versus the Next 500 alongside the difference in their realized subsequent cash flow growth. The blue lines trace the relative valuation multiples (TrueCap 500 versus Next 500 and S&P 500 versus Next 500).[15] The dark blue lines trace the relative wealth of an investor starting in late 1989 with $100 and reinvesting all dividends, again comparing the large-cap 500 indexes with the Next 500. Finally, the light blue lines trace the relative growth in cash flow for the large-cap 500 indexes with the Next 500. The light blue lines are based on five-year moving averages of relative cash flow, much like the cyclically adjusted price-to-earnings ratio (CAPE), pioneered by Robert Shiller, to minimize out the effects of economic peaks and troughs.

Exhibit 5. Relative Valuation, Fundamentals, and Wealth: Largest-Cap Cohort vs. Next 500, October 1989–May 2025



Sources: Research Affiliates, based on data from CRSP and Compustat.

[15]Some readers might wonder whether we compared the S&P 500 with its own Next 500—in other words, the 500 largest market-cap names that are not in the S&P 500. We did that comparison and realized that it was too strange to merit inclusion in our paper. On average, the TrueCap 500 has 120 names that are not in the S&P 500, and vice versa. So, an "S&P Next 500" will include an average of 120 large-cap names that are not in the S&P 500, which will utterly dominate the performance and relative valuation metrics for a Next 500 index. Consider that when Tesla was added to the S&P 500 in late 2020, it was among the 10 most valuable stocks in the world. Prior to Tesla's move into the S&P 500, an "S&P Next 500" might have been described as an index of "Tesla and the 499 dwarfs."

Several patterns are evident. First, valuation differences have been substantial and highly time varying, as shown by the blue lines. During the late 1990s, the largest companies commanded a pronounced premium relative to the Next 500, as reflected in elevated price-to-cash flow ratios.[16] This premium compressed sharply following the technology bust and remained subdued through much of the subsequent decade, before widening again in recent years amid the resurgence of megacap dominance. Over the full sample, members of the largest-cap cohort traded at materially higher multiples on average: The historical price-to-cash flow ratio was approximately 9.8 for the TrueCap 500 and 9.7 for the S&P 500, compared with about 8.4 for the Next 500—equivalent to a valuation premium of roughly 17% for firms inside the largest tier.

Second, relative fundamentals—represented by the light blue lines—show a pronounced shift over time. Prior to the dot-com bubble, members of the largest-cap cohort exhibited slightly faster cumulative cash flow growth than the Next 500, consistent with valuations that hovered around a modest discount of roughly 10%. From 1996 through the end of the decade, however, valuations surged dramatically, rising to a premium of about 40% relative to the Next 500 (using a smoothed CAPE-style five-year average of cash flows)—bubble, indeed. After the technology boom collapsed, both the valuation premium and the relative fundamental advantage dissipated: By 2011, the largest-cap cohort traded again at a 10%–15% discount, while relative growth remained subdued for much of the following decade.

In recent years, the gap between relative wealth and relative fundamentals has widened sharply once more—but with a crucial difference from the late 1990s. Relative valuations for the TrueCap 500 relative to the Next 500 have doubled in the past dozen years, to an unprecedented premium of roughly 80% by mid-2025, even as cumulative cash flow growth for the largest companies has continued to lag the cash flow growth of the Next 500. This divergence means that the recent dominance of megacap firms reflects rising valuation multiples rather than superior business expansion, reinforcing the view that market leadership has been driven more by pricing dynamics than by fundamentals.

Third, relative wealth, represented by the dark blue lines in Exhibit 5, largely followed the path of relative valuation rather than relative fundamentals. Periods when the members of the largest-cap cohort outperformed tended to coincide with expanding valuation premiums, while phases of relative underperformance aligned with valuation compression. This pattern suggests that changes in investor pricing, rather than differences in business growth, played a central role in driving the relative performance of the largest firms.

The close alignment between the mechanically defined TrueCap 500 and the S&P 500 across all three dimensions indicates that these dynamics are not primarily attributable to index construction choices. Instead, they appear to reflect broader market forces associated with size, capital flows, and the life cycle of large firms.

[16]Our use of the term "cash flow" refers to operating cash flow, which is defined as net income plus depreciation and amortization (plus other noncash charges). Compared with earnings, sales, or book value, cash flow is less prone to accounting distortions and more closely aligned with shareholder returns. Price to cash flow is therefore the cleanest, most theoretically grounded metric. In our study, we use five-year-average cash flow.

What looks like a valuation premium for the largest companies is likely a direct consequence of cap-weighted indexing rather than a reward for superior growth. By design, the process channels capital toward firms whose prices have already risen enough to place them at the top of the market-cap hierarchy, reinforcing elevated valuations even when subsequent fundamentals fail to keep pace. The result is a persistent pattern: The biggest companies command the highest multiples despite delivering slower fundamental expansion than the firms just below them. In this mechanical sense, membership carries privileges—but those privileges stem from pricing pressure, not business performance.

Crossing the boundary into or out of the largest-cap tier therefore has real consequences. Whether through additions that follow strong price run-ups or deletions that come after prolonged declines, index changes tend to ratify market movements rather than anticipate them, embedding a systematic buy-high/sell-low discipline at the margin. What appears to be neutral representation of the market is, in practice, a momentum-driven migration process that rewards past winners and abandons past losers. Membership may confer prestige, visibility, and a flood of passive capital, but it does not confer superior future growth. And in recent years, that prestige premium has only widened!

Flip-Flops: When Additions Turn Out to Be Mistakes

Beyond one-time additions and deletions, some companies take a more circuitous route through the index: They are first added and later dropped, or they are initially deleted and subsequently rejoin the index. When this reversal happens in a decade or less, we call these *addition flip-flops* (added and later dropped) and *deletion flip-flops* (dropped and later re-added).

Such round-trip cases provide a compact illustration of how traditional cap-weighted indexes sometimes struggle with timing. When stocks are added during peak optimism and removed after that optimism disappears, the tendency to buy high and sell low is captured within a single arc. The reverse (removing a stock during a slump only to bring it back after a rebound) reflects a different kind of miss, when an index provider tacitly underestimates the potential for a fallen angel to recover. In both cases, the churn is costly. Each round trip involves not one but two forced index fund trades. They are initiated because of large price movements, so they rarely occur at favorable prices.

Importantly, the economics of flip-flops are governed by long-horizon valuation dynamics, not short-horizon announcement effects. The price impact between announcement date and trade date is measured in hundreds of basis points in just a few days. Flip-flops unfold over years and impose costs measured in thousands of basis points over a span of several years. Thus, even as short-run index effects have diminished, the long-run consequences of buying late-stage winners and later selling them as laggards are underrecognized and substantial.

Of course, all deletions are technically flip-flops in the broadest sense, since every index constituent was added at some point. We focus on deletions that were added within the previous 10 years. When the stock is added because it is beloved (and its stock price has performed well) but dropped after a handful of years because it failed to measure up to the earlier lofty expectations, it suffers an average loss of about two-thirds of its value relative to the market.

Once deleted, the stock may rejoin the index at an average of about triple the price it exited, again measured relative to the market.[17]

The recurrence of these round-trip cases invites a methodological clarification. Although our classification of flip-flops is applied *ex post* and might seem vulnerable to look-back bias, the analysis is not designed to forecast which deletions will return. Rather, we aim to expose the structural asymmetry embedded in the reconstitution process itself. By observing how reentry candidates behave outside the benchmark, we can distinguish between genuine deterioration and temporary misalignment with index criteria. The exercise thus highlights the mechanical frictions that shape migration at the margin (rather than any predictive signal).

Nothing lasts forever. Since the original Dow 30 was formed in 1928 as a roll call of America's most successful and powerful companies, every original Dow member eventually has fallen out of the index in the subsequent 90 years. General Electric, once the very symbol of industrial might, was the last to go, in 2018, although Chevron rejoined in 2008. Of those original 30, only five still exist and only one—Exxon Mobil (called Standard Oil Company of New Jersey in 1928)—still sits among the nation's top 20 companies by market capitalization.[18]

The pace of change in US equity leadership is striking. Companies that did not exist 30 years ago account for half of the current market capitalization of the Russell 1000, and the rotation at the very top has been just as dramatic. **Exhibit 6** traces the 10 largest US companies by market capitalization every five years since 1980. In 1980, IBM, AT&T, Exxon, and General Motors towered over the list. By 2000, technology and telecom names, such as Microsoft, Cisco, Intel, and Lucent, had crowded in, with only four of the ten giants of 1980 left (GE, Exxon Mobil, AT&T, and IBM). By 2020, none of the 1980 giants remained. Fast forward to 2025, and the top 10 would have been almost unrecognizable in the 1980s for a simple reason: Most did not yet exist. For every five-year span, three to five companies in the top 10 were pushed out of the top 10 list by the next five-year period, with no exceptions.

Turnover at the top is also faster than most investors realize. Markets are arenas of relentless competition and constant creative destruction. Yesterday's top dog is often today's forgotten has-been. Half of the churn among the top 10 from 1980 to 2025 came from new entrants that did not stick. Many fresh arrivals in the top 10 had short stays, having been added amid peak optimism only to fall back just a few years later. This "rise and fade" dynamic at the very top of the market sets the stage for our broader flip-flop analysis.

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[17]Each number represents relative performance. For example, if the S&P 500 triples while a stock is a member of the index but the stock is then kicked out of the index at the same price as when it entered the index, that stock will have lost two-thirds of its value relative to the market. In other words, the flip-flop will cost index fund investors two-thirds of the wealth they invested in the stock when it was initially added.

[18]Those fives names are (1) Standard Oil of New Jersey, now Exxon Mobil; (2) General Electric, which has since split up; (3) Texas Company, subsequently Texaco and now part of Chevron; (4) General Motors, which went bankrupt in 2009; and (5) United States Steel. The rest disappeared through bankruptcy, breakup, merger, or acquisition. Schumpeter's "creative destruction" is an important part of a healthy capital economy. A "right to fail" should be celebrated, not decried.

Exhibit 6. 10 Largest US Stocks by Market Cap, 1980–2025

Rank	1980	1985	1990	1995	2000
1	IBM	IBM	Exxon	General Electric	Microsoft
2	AT&T Corp.	Exxon	General Electric	AT&T Corp.	General Electric
3	Exxon	General Motors	IBM	Exxon	Cisco
4	General Motors	General Electric	AT&T Corp.	Coca-Cola	Walmart Stores
5	Standard Oil of Indiana	AT&T Corp.	Philip Morris	Philip Morris	Exxon Mobil
6	Mobil	Shell Oil	General Motors	Walmart Stores	Intel
7	General Electric	Amoco	Merck	Merck	AT&T Corp.
8	Standard Oil of California	Dupont	Bristol-Myers Squibb	General Motors	Lucent Technologies
9	Atlantic Richfield	Sears	Dupont	IBM	IBM
10	Shell Oil	Eastman Kodak	Amoco	Procter & Gamble	Citigroup
Rank	**2005**	**2010**	**2015**	**2020**	**2025**
1	General Electric	Exxon Mobil	Apple	Apple	Apple
2	Exxon Mobil	Microsoft	Exxon Mobil	Microsoft	Nvidia
3	Microsoft	Walmart Stores	Microsoft	Amazon	Microsoft
4	Citigroup	Apple	Berkshire Hathaway	Alphabet	Amazon
5	Walmart Stores	Johnson & Johnson	Alphabet Inc.	Berkshire Hathaway	Alphabet
6	Pfizer	Procter & Gamble	Johnson & Johnson	Facebook	Tesla
7	Bank of America	IBM	Wells Fargo	JP Morgan Chase	Meta
8	Johnson & Johnson	JPMorgan Chase	Walmart Stores	Johnson & Johnson	Broadcom
9	AIG	AT&T Inc.	General Electric	Walmart	Berkshire Hathaway
10	IBM	General Electric	Procter & Gamble	Visa	Eli Lilly

New Addition to List Drops Off List Within Next 5 Years Flip-Flop: New Then Drops

Sources: Research Affiliates, based on data from CRSP and Compustat.

Round Trips: Adding Russell 1000 to the Picture

Focusing solely on the S&P 500 provides a limited sample of flip-flops to study. To better understand these dynamics, we extend the scope to include another index, the Russell 1000. Unlike the S&P 500's committee-driven process, the Russell 1000 follows a mechanical, rule-based reconstitution each year, which generates a much larger number of entry and exit events. Studying both indexes side by side allows us to disentangle idiosyncrasies of a committee-based process from the systematic churn inherent in a rule-driven benchmark, offering a more complete view of how round-trip membership arises in cap-weighted indexing.

Our sample of component changes for the S&P 500 and the Russell 1000 begins in October 1989 and ends in May 2025. **Exhibit 7** summarizes the scale of component changes across both indexes. Panel A reports the total number of discretionary additions and deletions, as well as nondiscretionary changes (such as mergers, acquisitions, or bankruptcies). Unsurprisingly, the Russell 1000 had far more events than the S&P 500 during this period, with nearly three times as many discretionary changes, because of its annual rule-based reconstitution and much broader stock universe. By contrast, the S&P 500's committee-driven approach produced fewer changes but still generated more than a thousand additions and discretionary deletions during this span. Taken together, the two indexes experienced more than 4,000 discretionary changes over 35 years, yielding a very large pool of index turnover.

Exhibit 7. Index Component Changes and Flip-Flop Counts: S&P 500 and Russell 1000, October 1989–May 2025

A. Historical Index Component Changes					
	Discretionary Additions	**Nondiscretionary Additions**	**Discretionary Deletions**	**Nondiscretionary Deletions**	**Discretionary Changes**
S&P 500	722	*110*	311	*516*	1,033
Russell 1000	1,931	*476*	1,087	*1,209*	3,018
Total	2,653	*586*	1,398	*1,725*	4,051

B. Historical Addition and Deletion Flip-Flops within 10 Years			
	Addition Flip-Flops	**Deletion Flip-Flops**	**Total Flip-Flops**
S&P 500	98	22	120
Russell 1000	508	188	696
Total	606	210	816

Sources: Research Affiliates, based on data from FactSet and CRSP.

Panel B narrows the focus to the subset of flip-flops: companies that make a round trip through an index—an addition followed by a deletion or a deletion followed by a re-addition—within 10 years. The Russell 1000 accounts for the bulk of the observations, having produced almost 700 flip-flops, compared with just over 100 for the S&P 500.

To quantify how often index changes ultimately reverse course, we restrict the sample to cases in which the first index action (addition or deletion) occurred by May 2015. This ensures a full 10-year window in which to observe whether a stock later exited or reentered the index, allowing us to measure the true incidence of round trips. This restriction is used solely to obtain a clean statistic on the incidence of flip-flops over a complete 10-year horizon.

From October 1989 to May 2015, as shown in **Exhibit 8**, more than 2,100 discretionary additions and nearly 1,000 discretionary deletions occurred for the S&P 500 and Russell 1000, totaling more than 3,000 discretionary changes. For two indexes that cover about 1,500 companies combined (albeit with roughly 500 overlapping), these data highlight the dynamic nature of the US economy. More than a quarter of all stocks added to the S&P 500 or the Russell 1000 from October 1989 through May 2015 were removed from one or both indexes within a decade (not even counting the nondiscretionary deletions from mergers, acquisitions, and bankruptcies). Even more shocking, well over half of all discretionary deletions were flip-flops! This means that flip-flops are more common than 10-year survivors. Much of the churn reflects the mechanics of cap-weighted reconstitution rather than corporate mortality. These reversals underscore how often cap-weighted benchmarks end up retracing their own steps and how costly that timing can be for investors. Given that flip-flops are so very costly, thank goodness turnover is so low!

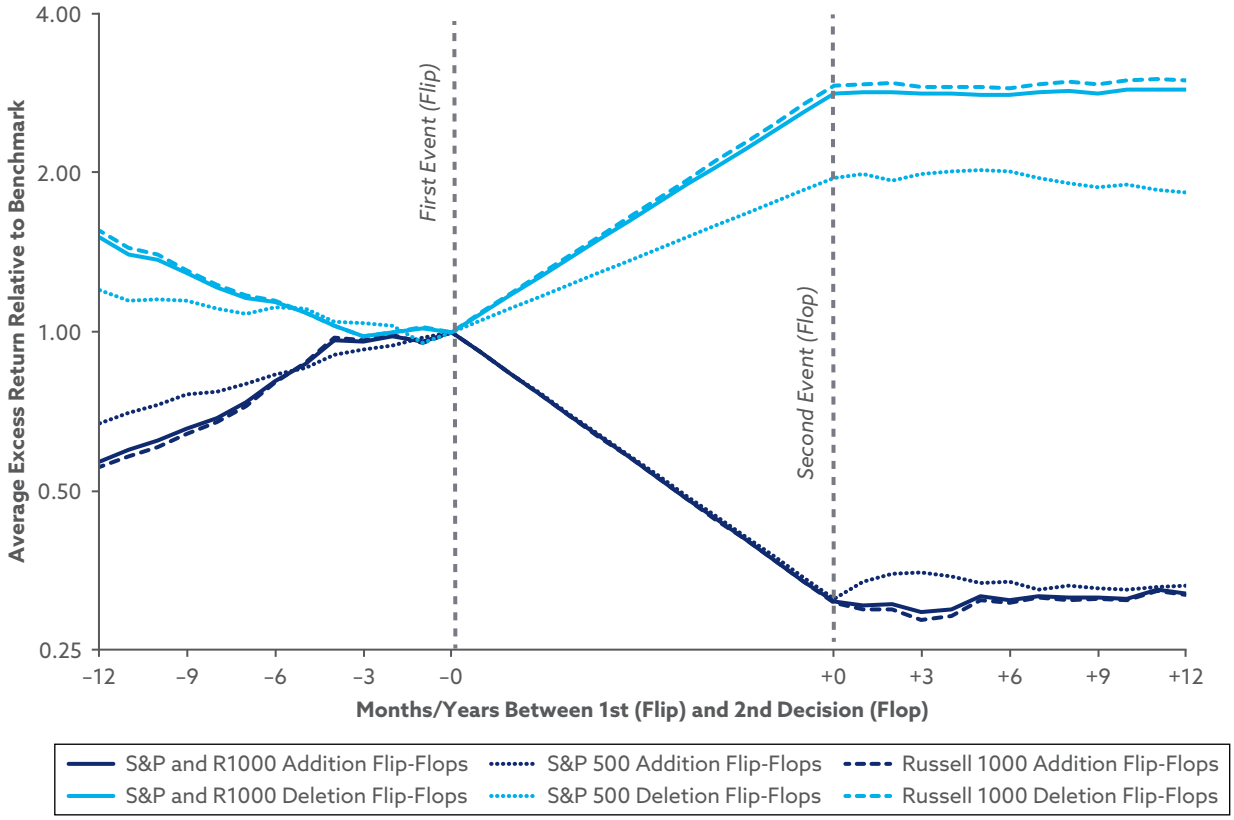
While this restricted window is useful for measuring completed flip-flop rates, it necessarily leaves out more recent cases that are still in progress. In the analysis that follows, we drop this cutoff restriction. This broader perspective lets us study the performance dynamics of flip-flops even when they have not yet had a full decade to play out.

Exhibit 8. S&P 500 and Russell 1000 Flip-Flops within 10 Years, October 1989–May 2015

	Discretionary Additions	Nondiscretionary Additions	Discretionary Deletions	Nondiscretionary Deletions
Oct. 1989–May 2015	2,102	316	960	1,338
Flip-Flops, First Action by May 2015	**Addition Flip-Flops**	**% of Deletions**	**Deletion Flip-Flops**	**% of Deletions**
	541	56%	175	18%

Sources: Research Affiliates, based on data from FactSet and CRSP.

Exhibit 9. Addition and Deletion Flip-Flops within 10 Years for the S&P 500 and Russell 1000: Performance *Before* the "Flip," *Between* the "Flip and Flop," and *After* the "Flop," October 1989–May 2025



Sources: Research Affiliates, based on data from FactSet and CRSP.

Exhibit 9 shows the average excess performance of flip-flops drawn from the S&P 500 and Russell 1000 before, between, and after their two index events. To keep the analysis clean, we restrict it to cases in which both actions (either add-then-drop or drop-then-add) occurred within a 10-year span. Addition flip-flops typically trounced the market by about 75% in the run-up to their initial inclusion. Between addition (flip) and deletion (flop), the stocks underperformed the market by nearly 70%. After missing the performance surge that led to the stock being added, index fund investors lost over two-thirds of the wealth that was tied up in that flip-flop.

Deletion flip-flops show the opposite trajectory. A drop ahead of removal was followed by a sharp recovery (nearly tripling relative to the index investor) while outside the index. In both cases, however, the return profile flattened after the second index event. If the index was hoping to catch a breakout or a bounce, the gains (or losses) were mostly behind them.

Exhibit 10 quantifies these dynamics. Panel A shows that addition flip-flops are especially costly for index investors. On average, these names outperformed the market by 75.6% in the year prior to entry—gains that the index missed. After the index missed the performance surge that led to the stocks' inclusion, they underperformed post-inclusion by an average of 69.2% before being dropped and then posted a modest 3.7% rebound relative to the market in the year after deletion, an outcome consistent with prior research on deletions (Arnott and Henslee 2024). The past decade tells a similar story. A still-large pre-inclusion rally of 48.3% is followed by a post-inclusion slump of 71.8% and a one-year post-deletion bounce of 5.4%. In short, by the time these names reach the index, most of the upside is already gone.

The pattern runs in reverse with deletion flip-flops, as shown in Panel B. On average, these stocks lagged the market by 33.6% in the year leading to deletion, staged a dramatic rebound of 182.3% relative to the index while outside of the index, and settled back to near-flat relative returns (1.6%) in the year after reentry. The last decade looks much the same: −32.3% before removal, 165.6% while excluded, and flat (−0.4%) after rejoining. Again, the key moves happened before and between the committee's actions, not so much after. And in a mirror image of the addition flip-flops, the index fund investor participated in the 33% loss that led to the deletion and missed the near tripling that was a key element in the decision to reintroduce the stock to the index.

Exhibit 10. S&P 500 and Russell 1000 Flip-Flops within 10 Years: Excess Returns Before, During, and After Index Round Trips, October 1989–May 2025

A. Addition Flip-Flops				
	Total Count	**Average Excess Return, One Year Before Addition**	**Average Excess Return, Between "Flip" and "Flop"**	**Average Excess Return, One Year After Deletion**
S&P 500 and Russell 1000	606	75.6%	−69.2%	3.7%
Last 10 Years	65	48.3%	−71.8%	5.4%
B. Discretionary Deletion Flip-Flops				
	Total Count	**Average Excess Return, One Year Before Deletion**	**Average Excess Return, Between "Flip" and "Flop"**	**Average Excess Return, One Year After Rejoining**
S&P 500 and Russell 1000	210	−33.6%	182.3%	1.6%
Last 10 Years	35	−32.3%	165.6%	−0.4%

Sources: Research Affiliates, based on data from FactSet and CRSP.

These asymmetries highlight a deeper issue: Cap-weighted indexes often act on lagged price information. Stocks are added after strong rallies and deleted after long declines; indeed, the price movement was an important driving force behind the decision to add or drop a stock. If those turning points coincide with peaks or troughs, the resulting turnover effectively locks in the buy-high/sell-low behavior. Suppose index additions required 5% turnover and roughly 30% of those additions became flip-flops that underperformed by two-thirds before deletion: The hidden cost to index investors would be on the order of 99 bps per year (5% turnover × 30% flip-flop share × −66% underperformance)! Because indexes serve as their own benchmarks, this drag remains invisible yet is economically large, often dwarfing fund fees.

Valuation data reinforce the point. At the time of first inclusion, addition flip-flops were trading at rich multiples, but deletion flip-flops (removed after long losing streaks) were dropped at discounts. On average, the valuation gap between the two groups was 4.7-fold at the time of the first index action, illustrating how quickly sentiment can swing from euphoria to despair.[19]

The Ultimate Flip-Flop: An On-Again, Off-Again Romance

The aggregate patterns are revealing, but the most memorable lessons often come from individual stories. One of the most colorful is that of Dillard's, the Arkansas-based department store chain. Since 1990, Dillard's has had an on-again/off-again relationship with the Russell 1000 that borders on comedy. It has been added, dropped, and re-added so many times that some investors may have felt as if the index could not make up its mind. Each change was sparked not by sudden reinventions of its business but by the market's shifting mood, with enthusiasm lifting the stock into the index only for sentiment to fade and send it tumbling back out.

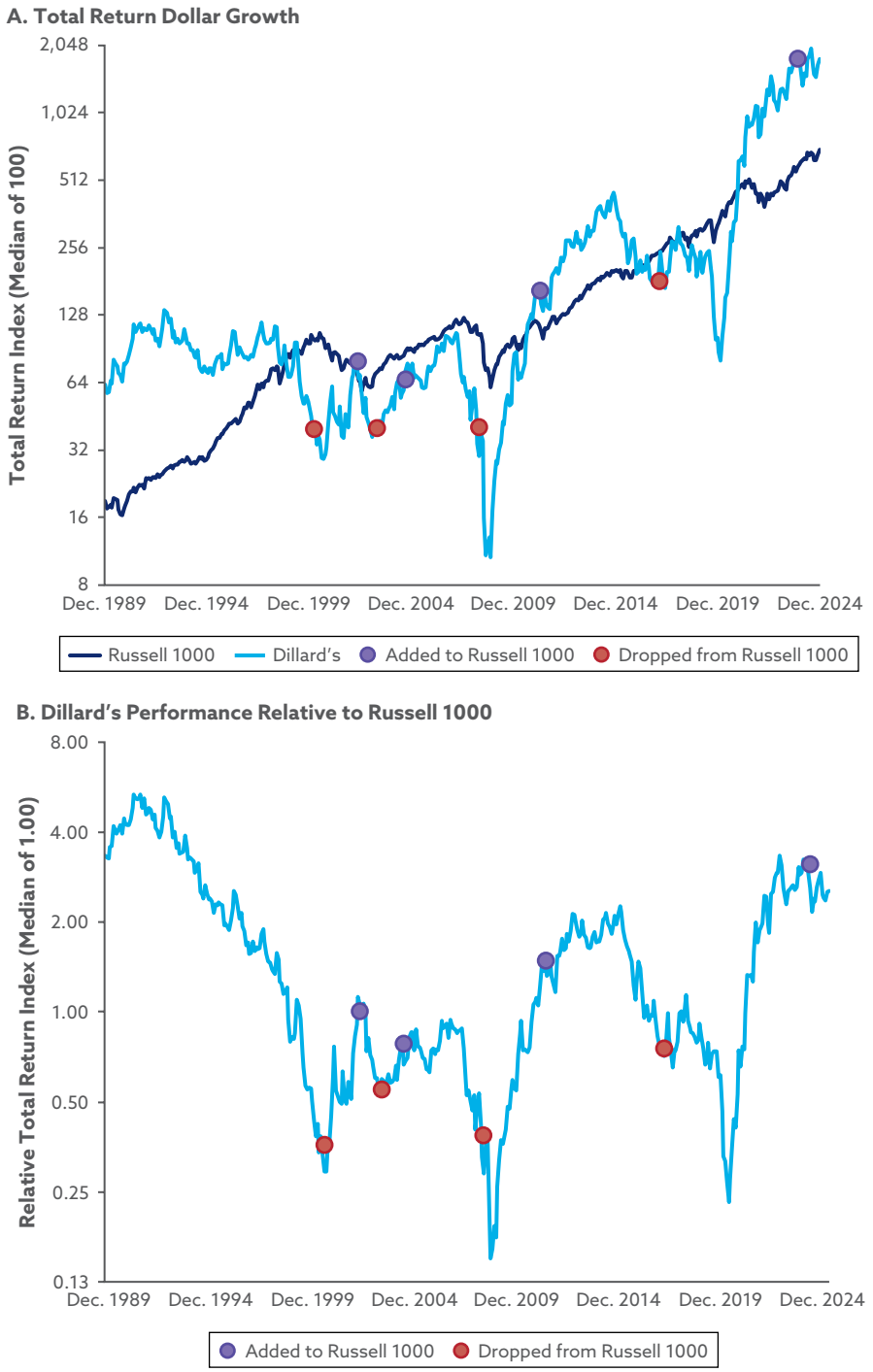
Over the company's history, the same pattern repeated. Inclusion near cyclical highs was followed by removal near troughs, with each round trip producing two sets of forced trades—additions at premium valuations and deletions at depressed ones. **Exhibit 11** shows this roller-coaster pattern of total and relative returns versus the Russell 1000 since 1990, normalized to a median of 100 for comparability. Each entry followed a performance surge; each exit followed underperformance. The repetition seems like a caricature of a churning index: Sell after a slump, buy after a rally—four times each in 25 years.

What makes this case instructive is the structural timing it reveals. The benchmark effectively mirrored market mood. When valuations surged, the company crossed the inclusion threshold; when sentiment faded, its market cap fell below the cutoff. None of this churn reflected an error in judgment by index providers. The process itself simply translated market volatility into portfolio turnover.

The pattern could hardly be more textbook. As **Exhibit 12** shows, when this stock was an "addition flip-flop" (added and then dropped within 10 years), it had typically outpaced the

[19]As we stated in a previous piece (Arnott and Wu 2025), "any valuation multiple will create a distorted picture. For example, price/earnings can make a cyclical stock seem attractive just as its earnings crest ahead of an economic downturn. Accordingly, whenever we do not specify a particular ratio, we are using the average of five relative valuation measures (relative price/earnings, relative price/sales, relative price/cash flow, relative price/dividends, and relative price/book value) so as not to anchor on a single metric."

Exhibit 11. A History of Flip-Flops: Dillard's vs. the Russell 1000, December 1989–June 2025



Sources: Research Affiliates, based on data from FactSet, Bloomberg, and CRSP.

Exhibit 12. Relative Performance of Dillard's Before, During, and After a Flip-Flop, December 1989–June 2025

Episode	First Move		Second Move		One Year Before		Between Move Dates		One Year After	
	Type	Date	Type	Date	Total Return	Relative Return	Total Return	Relative Return	Total Return	Relative Return
1	Drop	June 2000	Add	June 2002	−64.8%	−67.8%	119.1%	213.8%	−48.2%	−48.7%
2	Add	June 2002	Drop	June 2003	73.7%	111.5%	−48.2%	−48.7%	67.1%	39.8%
3	Drop	June 2003	Add	June 2004	−48.2%	−48.7%	67.1%	39.8%	5.7%	−2.0%
4	Add	June 2004	Drop	June 2008	67.1%	39.8%	−46.7%	−57.1%	−18.4%	11.3%
5	Drop	June 2008	Add	June 2011	−67.5%	−62.9%	368.2%	320.1%	22.6%	17.5%
6	Add	June 2011	Drop	June 2017	143.7%	84.7%	19.6%	−42.2%	64.7%	43.8%
7	Drop	June 2017	Add	June 2024	−4.3%	−19.0%	816.8%	267.9%	0.7%	−12.9%
8	Add	June 2024			42.3%	14.9%				
Addition Flip-Flops, Average Return					81.7%	62.7%	−25.1%	−49.3%	37.8%	31.6%
Deletion Flip-Flops, Average Return					−46.2%	−49.6%	342.8%	210.4%	−4.8%	−11.6%

Sources: Research Affiliates, based on data from FactSet, Bloomberg, and CRSP.

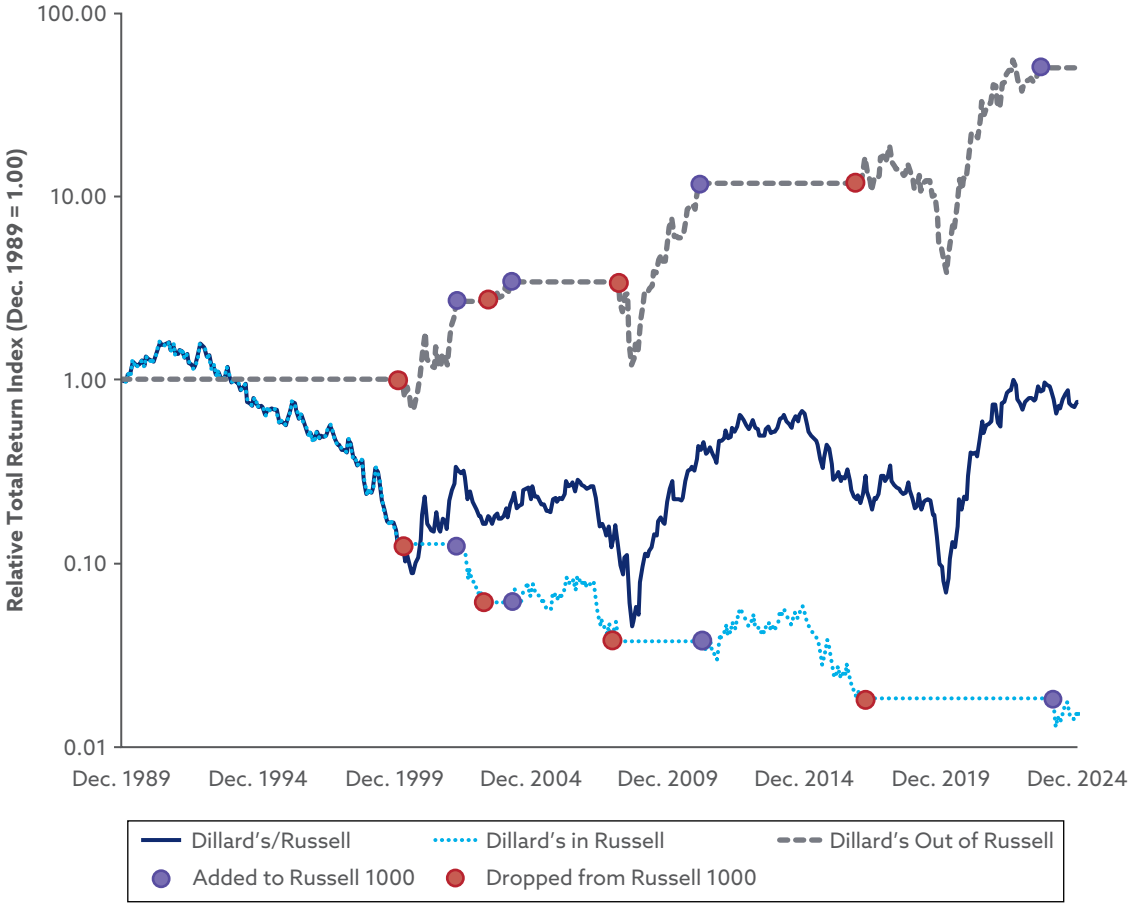
Russell 1000 by more than 60% in the year before it was added—gains the index missed. By the time it was removed (from one to six years later), the stock had underperformed by nearly 50%—losses the index fund investor fully absorbed. And in the year after deletion, it bounced back by an average of 31% above the return for the Russell 1000—a rebound the index again missed. For index investors, that pattern meant paying up at the heights, riding through the slump, and stepping aside just before the rebound.

The flips look just as bad in reverse. When the stock was dropped and later re-added, it had usually lagged the Russell 1000 by an average of 46% before removal, then staged a massive recovery—roughly tripling relative to the market while out of the index—before being welcomed back. On reentry, it promptly lagged again by about 10% in the following year. Another triple whammy, this time from the other side.

Why does this damage go unnoticed? Because the index has no mirror. It is its own benchmark, its own yardstick, so the "give-ups" and missed rebounds never show up as "underperformance." The churn gets buried inside the benchmark itself. From the investor's perspective, however, the costs are real. Money is deployed after rallies, eroded during subsequent slumps, and sidelined just before recoveries. If a fund manager produced that sequence of decisions—buying late, selling low, and missing the rebound—we would call it disastrous timing. Yet when an index does it, the effect vanishes into the benchmark. The flip-flop trap is invisible in relative performance but fully visible in investor outcomes.

The most astonishing view comes from **Exhibit 13**, which splits Dillard's performance into periods inside the Russell 1000 versus periods outside. Purple dots mark the dates when Dillard's was added, and red dots show when it was dropped. The light blue dotted line tracks performance when it was in the index; the gray dashed line tracks performance while it was out.

Exhibit 13. Dillard's vs. Russell 1000: Relative Performance When a Member or Not a Member of the Russell 1000, December 1989–June 2025



Sources: Research Affiliates, based on data from FactSet, Bloomberg, and CRSP.

With each membership change, one line stops and the other picks up, creating a record of how the stock fared in and out of the index.

The contrast is extraordinary. From 1990 until mid-2025, Dillard's was a member of the Russell 1000 five times for a collective 22.5 years and was excluded from the index four times for a combined 13 years. During the 22.5 years Dillard's spent as a member of the Russell 1000, it underperformed the index by 99-fold, leaving an investor 1% as wealthy as an investor in the Russell 1000 during those years. Over the 13 years it spent outside, it outpaced the index by 67-fold.[20] That staggering 6,000-fold difference in performance lays bare the cost of flip-flops. When membership is dictated by volatile swings in market capitalization, investors wind up systematically owning during the worst stretches and missing the stellar rebounds.

Dillard's is an outlier, the only stock in our sample to endure four addition flip-flops and four deletion flip-flops. Most companies go through this cycle once, sometimes twice. But Dillard's story emphasizes a deeper point: Turnover is not costless, and when entry and exit hinge on market enthusiasm, index investors end up crystallizing bad timing again and again. Each addition flip-flop loses index investors two-thirds of the wealth they invested in a stock. Each deletion flip-flop misses a tripling of the stock relative to the market.[21]

The evidence paints a clear picture. Cap-weighted benchmarks succeed at delivering transparency and replicability but at the cost of efficiency. Their reliance on price as the sole weighting mechanism ensures that turnover often locks in past price movements rather than anticipating future fundamentals. Membership premiums, valuation asymmetries, and costly flip-flops all underscore the same lesson that cap weighting is *not* passive. It is systematic and *active*, and its biases are measurable. The question, then, is whether investors must accept these flaws as the unavoidable price of indexing or whether better alternatives exist.

Beyond Cap Weighting: Moderate and Immoderate Alternatives

Cap-weighted indexing has earned its dominance because of its simplicity, liquidity, negligible fees, and tight tracking of the market portfolio. Yet its reliance on price as both the selection and weighting metric means it inevitably inherits the market's enthusiasm and dislocations. The result, as we have seen, is a systematic tendency to buy into stocks at peak valuations and sell at troughs.

If cap weighting is simple but incurs surprising (and hidden) costs, can we mitigate those costs? The past two decades have seen a surge of innovation in index design, ranging from modest tweaks to wholesale reinventions. Some approaches seek to preserve the low-cost, rule-based

[20]During this span, the Russell 1000 delivered an excellent 1,015% gain in wealth. So, if we had the prescience and luck to own the Russell 1000 whenever Dillard's was a member of the index and to own *only* Dillard's during its years of exile, we would have enjoyed a 75,605% gain! Of course, this result depended on Dillard's regaining its footing after each time it was removed from the index. Most deletions do not rejoin the index. We like to joke that some deletions go on to achieve great failure! This again reflects Schumpeter's "creative destruction."

[21]Dillard's performance during each flip-flop is quite normal. Only the remarkable number of flip-flops is unusual. Dillard's 6,000-fold difference in relative wealth (between times that it was a member of the Russell 1000 and times that it was excluded) is nothing more than this three-fold relative wealth difference taken to the eighth power ($3^8 = 6{,}561$).

spirit of indexing while correcting its most obvious inefficiencies. Others pursue more radical departures, redefining what an index should measure.

At the heart of this evolution lies one key insight. The problem with cap weighting is not the core companies that remain in the index year after year but rather the names at the margin—firms that drift in and out as their prices rise or fall, indeed trading *because* the prices rise and fall. Reconstitution ensures that these boundary cases are bought after rallies and sold after declines, locking in trades at unfavorable valuations and amplifying hidden costs.

The natural place to seek improvement is in how we define "size." Price (and hence market capitalization) is a volatile and sometimes misleading signal. Alternative definitions, whether averaging market capitalization over time or using fundamentals that reflect the scale of a business, can provide a steadier anchor. Each approach keeps the mechanics of cap weighting intact but changes the entry rules. And this subtle shift makes a substantial difference at the margin because it reshapes turnover, portfolio valuation multiples, and (ultimately) the performance investors realize.

In this section, we explore four variations on this theme. First, we ask a simple but surprising question: Who really makes the cut? The S&P 500 is not composed of the 500 largest companies by market capitalization; comparing it with a "TrueCap 500" reveals how committee judgment alters the portfolio. Second, we consider averaging market capitalization over time, which smooths out short-term spikes and slumps, creating a calmer path into and out of the index. Third, we shift the focus from prices to businesses themselves, defining company size by such fundamentals as sales, cash flow, book value, and dividends. Finally, we look at stability mechanisms—banding and seasoning—that reduce pointless churn by requiring larger or more persistent moves before a company is added or dropped. Together, these alternatives offer practical ways to keep the benefits of indexing while mitigating its hidden costs.

Rethinking the 500: Who Makes the Cut?

The S&P 500 is often mischaracterized as a portfolio of the "500 largest US companies." In practice, that definition has never been true. On average between 1991 and 2022, the index overlaps with only about 380 of the 500 largest companies in terms of market cap at any point in time. This means that 120 of the true top 500 market-cap names are excluded and a similar number of smaller-cap firms take their place.[22]

This discrepancy is not a trivial rounding error. It reflects the fact that the S&P 500's composition is determined as much by committee judgment as by market capitalization. The index committee considers qualitative factors, such as profitability, float, and "sector balance," which can lead to the exclusion of giants that do not fit the mold (e.g., Tesla before 2020) and the inclusion of mid-sized firms that do.

The result is that the "TrueCap 500" (the largest 500 stocks by current market capitalization) and the official S&P 500 are very different portfolios. The differences have real consequences and affect turnover (because companies at the margin are added and dropped at a pace that

[22]See Arnott, Brightman, Liu, and Nguyen (2023). Also note that because of current unprecedented stock market concentration, there are "only" 70 nonoverlapping stocks at present.

varies over time), valuations (recent highfliers may be favored over temporarily out-of-favor giants), and long-term performance.[23]

Averaging Out the Noise: Five-Year Market Cap

If the "TrueCap 500" solves one problem—ensuring the index really holds the most valuable stocks by market capitalization—it leaves another untouched: sensitivity to short-term price moves. Market capitalization is a function of price, and prices can be noisy. A stock that surges on a wave of exuberance may temporarily enter the top 500 only to fall back out once the enthusiasm fades. Conversely, a fundamentally solid company facing a temporary slump may be unfairly pushed aside.

One way to mute this noise is to look at market cap through a longer lens. By ranking companies according to their average market capitalization over the past five years (as just one example), we smooth out the spikes and dips that drive unnecessary churn.[24] A company has to "season" for a while before it earns its place in the index. Similarly, a firm that stumbles for a year or two is not automatically punished with exclusion.[25]

This approach changes the character of turnover. Instead of reacting to short-term price momentum, the index captures businesses with more durable scale. The additions are less likely to be frothy highfliers, and the deletions are less likely to be oversold names near their trough. In practice, using five-year average market cap narrows the valuation gap between inclusions and exclusions, reducing the buy-high/sell-low bias and lowering trading costs. At the same time, the five-year average market cap will allow us to buy the next Nvidia two or three years later than we would if we were using a rule focused on current market values.

By construction, this method still produces a cap-weight portfolio, with weights assigned using today's market values. What changes is the selection pool. Instead of chasing whichever names happen to pop into the top 500 this year, we require a bit more sustained value to earn a spot.

Both methods (the "TrueCap 500" and relying on a five-year average of market cap) rely on price, but the price is viewed over different horizons. If prices are a noisy estimate of fair value, even a smoothed version may fail to capture the real scale of a business.

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[23]For our purposes, we reconstitute our TrueCap 500 every 31 March, even though one could choose any of a myriad of alternative rebalancing rules. There is also the question of whether to "float adjust" the market capitalization to exclude shares that are closely held. If so, we would need to define float. For example, Bloomberg and S&P Dow Jones Indices have similar rules but are not the same.

[24]This approach borrows lightly from some past research into what we have called "Rip Van Winkle" indexing; see Arnott, Beck, and Kalesnik (2015), who weighted stocks based on stale index weights. Weighting stocks by 5-, 10-, and 20-year-old market-cap weights boosts returns by 130–180 bps per year and reduces annualized risk by 30–60 bps per year, but this method is not weighted by current market cap. By contrast, we select by stale market cap, averaging the past years' market cap to choose which stocks to add, retain, or drop, and then we weight them by their current market cap. Rip Van Winkle indexing adds substantial value but with large tracking error; stale selection paired with current market-cap weighting adds modest value but with small tracking error.

[25]Major headline US equity benchmarks, such as those published by S&P Dow Jones Indices and FTSE Russell, weight companies by float-adjusted market capitalization measured on designated reference dates, using the most recent price and free float data available at the reconstitution cutoff. The multiyear averaging approach discussed here is presented as an illustrative alternative rather than a description of current practice.

Anchoring on Business Metrics: Fundamental Size

Here we question the use of price in defining size. Instead of asking which companies have the largest market value, we can ask which companies are the largest businesses, measured in terms of their current economic footprint. While market value reflects the consensus expectations for the future scale of a company's success, its sales, cash flow, dividends, and book value are all useful measures of the company's current economic footprint in the macroeconomy. By anchoring selection on these measures of business scale—while still weighting by market capitalization—we can keep the transparency and investability of traditional indexing but with a sturdier foundation.

Price tells us what investors believe a company will deliver to its shareholders in the decades ahead. Fundamentals tell us what the company already produces, earns, and distributes to its shareholders. A fundamental-selection approach to index construction starts with the premise that a business should earn its place in the index because of its current scale in the economy, not simply because of market enthusiasm or expectations that may be illusory.

One way to implement this idea is to select the 500 largest companies based on a composite of fundamental measures, such as book value, sales, profits, and shareholder distributions (dividends plus buybacks). These measures are scaled to capture a company's economic footprint, not its latest stock price.

Once the 500 largest companies by fundamentals are selected, the index can still be cap weighted using current market values. Fundamental selection preserves the liquidity and investability of standard indexes but ensures that entry and exit decisions are grounded in business size rather than price momentum. The effect is subtle but powerful. Additions to a fundamentals-based index are companies that have steadily grown their businesses, not only their share prices. Deletions are firms whose economic footprint has shrunk, not simply those caught in a temporary price downdraft.

Less Whipsaw, Less Cost: Banding and Seasoning

Even with better definitions of "size"—whether based on current market cap, five-year averages, or fundamentals—an index still faces the problem of boundary churn. Companies hovering near the cutoff can bounce in and out year after year not because their business meaningfully changed but because they briefly crossed an arbitrary line. Each flip generates unnecessary turnover, amplifies trading costs, and adds noise to long-term returns.

Banding and seasoning are two straightforward fixes. Banding introduces a buffer zone around the cutoff to ensure that companies hovering near the cutoff do not get swapped in and out on minor moves. For example, with banding at 20%, if the target list is the top 500, a stock already in the index will be dropped only if it falls to rank 600 or below and a stock outside the index will get added only if it climbs to rank 400 or above. This buffer zone prevents small, temporary shifts around the cutoff from triggering trades. *Seasoning* adds an extra layer of patience, requiring a company to stay above or below the threshold for a sustained period before any action is taken. For example, for a company to be added, it must qualify at rank 400 or higher for two consecutive years; likewise, to be dropped, it must fall to rank 600 or lower for two

consecutive years. This requirement filters out one-off spikes or slumps, ensuring that only persistent changes in company size result in index turnover.

The effect of these rules is twofold. First, turnover drops meaningfully because many borderline cases resolve themselves naturally without forcing trades. Second, the whipsaw of buying recent winners at elevated valuations and selling temporary losers at distressed valuations is sharply reduced. In practice, these changes mean fewer instances of chasing highfliers just before their peak or abandoning struggling firms just before they rebound.

Importantly, banding and seasoning do not alter the core construction of the index. Investors still hold the largest companies by whichever measure of size is chosen—market cap, five-year average market cap, or fundamentals. With banding and seasoning, we change the path to that outcome, which is made smoother, less reactive, and less costly.

Do Simple Tweaks Make a Difference? Evidence from Alternative 500-Stock Portfolios

To move from concept to evidence, we simulated six simple 500-stock portfolios and compared them with the S&P 500. Each portfolio keeps cap weighting intact but alters how companies enter and exit. These rules may look like small tweaks, yet the long-term consequences are meaningful.

Exhibit 14 summarizes the results for these six strategies from October 1989 through June 2025:

- *Top 500 by Market Cap:* Select the 500 largest US companies each year based on current market capitalization.
- *Top 500 by Five-Year Average Market Cap:* Rank companies by their average market cap over the past five years, and select the top 500.
- *Top 500 by Fundamental Size:* Select the 500 largest firms using a composite of fundamentals: book value (plus intangibles), five-year average sales, five-year average cash flow, and five-year average dividends (plus buybacks).
- *Top 500 by Market Cap with Banding and Seasoning at 20%:* Apply a 20% buffer around the cutoff—adding stocks when they rank in the top 400 and dropping them when they no longer rank in the top 600—so that borderline names do not bounce in and out, combined with a seasoning rule requiring two consecutive years of qualification before entry or exit.
- *Top 500 by Five-Year Average Market Cap with Banding and Seasoning at 20%:* Combine the smoothing benefits of multiyear averaging with the stability of banding and seasoning.
- *Top 500 by Fundamental Size with Banding and Seasoning at 20%:* Apply the same stability rules to the fundamentals-based selection.

The Top 500 by Market Cap portfolio provides a natural starting point. Simply selecting the 500 largest US companies each year delivers 3 bps per year of excess return relative to the S&P 500 but with higher turnover relative to the S&P 500 (5.0% versus 4.0%) and a perhaps surprising tracking error of 1.01%. The takeaway is straightforward: The S&P 500 is not "the top 500 stocks

Exhibit 14. Performance of Alternative Index Selection Measures of Top 500 Stocks, October 1989–June 2025

Index	Return	Volatility	Sharpe Ratio	Value Added vs. S&P 500	Tracking Error vs. S&P 500	Information Ratio vs. S&P 500	Annual Turnover
S&P 500	10.62%	14.79%	0.53	—	—	—	4.0%
Top 500 by Market Cap	10.65%	14.89%	0.53	0.03%	1.01%	0.03	5.0%
Top 500 by Five-Year Average Market Cap	10.71%	14.84%	0.54	0.09%	0.76%	0.12	4.1%
Top 500 by Fundamental Size	11.03%	14.55%	0.57	0.41%	0.91%	0.45	4.0%
Top 500 by Market Cap with Banding and Seasoning at 20%	10.75%	14.85%	0.54	0.13%	0.77%	0.17	3.9%
Top 500 by Five-Year Average Market Cap with Banding and Seasoning at 20%	10.80%	14.78%	0.55	0.18%	0.68%	0.27	3.8%
Top 500 by Fundamental Size with Banding and Seasoning at 20%	10.99%	14.52%	0.57	0.37%	0.94%	0.40	3.7%

Sources: Research Affiliates, based on data from FactSet and CRSP.

by market cap." The tracking error makes it clear that the two portfolios travel on similar but divergent paths.

The Top 500 by Five-Year Average Market Cap portfolio takes a longer view of company size, ranking firms by their average capitalization over the prior five years. This smoothing helps filter out temporary spikes and dips, admitting only those firms that sustain their scale over time. The strategy outperformed the S&P 500 by 9 bps a year and had turnover of 4.1%, slightly higher than the S&P 500's 4.0% but well below the 5.0% required by the simple market-cap approach.

Selecting companies based on their fundamental scale rather than by price delivers the strongest results among the strategies that we tested. The Top 500 by Fundamental Size portfolio outperformed the S&P 500 by 41 bps per year with identical turnover. By anchoring on such

measures as book value, sales, cash flow, and dividends, this approach avoids the buy-high/sell-low bias that creeps in when membership is tied directly to price.[26]

Instead of rewarding or punishing short-term price momentum (buying after the price has soared and selling after the price has tanked), this strategy recognizes firms that have built durable business scale, typically adding stocks at more reasonable valuations (after the fundamentals have validated the previous price action). And it removes companies only when their fundamentals have eroded. The combination of a meaningful performance edge and stable turnover suggests that fundamentals offer a sturdier anchor for index construction than price alone.

Banding and seasoning prove to be effective refinements for taming unnecessary turnover. The logic is simple: Many changes at the index boundary are driven by temporary price moves or short-lived shifts in rank. By introducing a buffer around the cutoff and requiring persistence before names move in or out, these rules reduce the noise of boundary trades. Across all three selection methods, applying a 20% buffer and seasoning rule consistently trimmed turnover and reduced annual turnover across the board. For example, with banding and seasoning, the turnover of the Top 500 by Market Cap strategy falls by more than 20%, from 5.0% to just 3.9%.

Risk measures show a broadly consistent profile across approaches. Both volatility and tracking error remain similar across all portfolio constructions, with annualized volatility ranging from 14.5% to 14.9% and tracking error ranging from 0.7% to 1.0%.[27] These results suggest that adjustments to entry and exit rules—whether through multiyear averaging, fundamental anchors, or stability buffers—affect efficiency and turnover far more than they affect overall risk exposure. These refinements improve how the index earns returns over time without altering the magnitude of market fluctuations it must endure.

To better understand what drives the performance differences, we examine the six portfolios through the lens of the Fama–French–Carhart (Carhart 1997) four-factor model, which posits a market factor plus factors for size, value, and momentum. **Exhibit 15** reports annualized alphas alongside loadings on the market, size, value, and momentum factors.

The results confirm what intuition suggests. Strategies that continue to anchor membership on current market capitalization—whether with or without banding and seasoning—show little evidence of alpha after accounting for factor exposures. The annualized alphas for the approaches that continue to rely on market capitalization are all near zero. The simple Top 500 by Market Cap portfolio comes in slightly negative, at about −5 bps a year, and adding banding and seasoning nudges it to +9 bps per year. Both results are statistically indistinguishable from zero. The story is much the same for the Top 500 by Five-Year Average Market Cap portfolio. In plain

[26]Specifically, for this exercise, we measured the size of a business using four fundamental measures: book value plus intangibles, sales adjusted for debt-to-equity ratio, cash flow plus intangibles, and dividends plus buybacks. The latter three use a five-year average to mitigate exposure to the business cycle. Each of the four is measured as a percentage of all public US companies (e.g., sales as a percentage of all public companies). The average of the four measures is used to select stocks for the portfolio. Weighting is then done based on float, using the Bloomberg float measure.

[27]This finding begs the question, tracking error relative to what? Any of these is a perfectly reasonable way to construct a "passive" cap-weighted 500-stock index, equally defensible to the committee-based approach used by S&P Dow Jones Indices.

Exhibit 15. Performance Attribution of Alternative Index Selection Measures of Top 500 Stocks, October 1989–June 2025

Index	Carhart Four-Factor Model				
	Annual Alpha	Market	Size	Value	Momentum
S&P 500	0.00%	1.00	0.00	0.00	0.00
Top 500 by Market Cap	−0.05%	1.01**	0.02***	−0.04***	0.02***
Top 500 by Five-Year Average Market Cap	0.08%	1.00*	0.01	−0.02***	0.02
Top 500 by Fundamental Size	0.40%***	0.99***	−0.01***	0.03***	0.00
Top 500 by Market Cap with Banding and Seasoning at 20%	0.09%	1.00**	0.01	−0.02***	0.01
Top 500 by Five-Year Average Market Cap with Banding and Seasoning at 20%	0.18%	1.00*	0.00	−0.01	0.00
Top 500 by Fundamental Size with Banding and Seasoning at 20%	0.36%**	0.98***	−0.01***	0.04***	0.00

Notes: The Carhart (1997) four-factor model, including momentum, is used to analyze performance. Significance tests are two tailed. The market factor is tested relative to a null hypothesis (neutral expectation) of 1.00; size, value, and momentum are tested relative to 0.00. The benchmark in each case is the S&P 500, not the Fama–French market portfolio. Asterisks denote statistical significance: *, **, and *** correspond to 90%, 95%, and 99% confidence levels, respectively.

Sources: Research Affiliates, based on data from FactSet, the Kenneth R. French Data Library, and CRSP.

form, it generates a modest positive alpha of 8 bps a year, which rises to 18 bps when banding and seasoning are added. But as before, neither estimate reaches statistical significance.

The broader message is clear: The outcome is the same whether one selects the largest companies by current size, smooths the measure over several years, or buffers the boundary with stability rules. Once factor exposures are considered, these variations of market-cap selection do not deliver economically or statistically significant outperformance.

By contrast, the strategies anchored on fundamentals tell a different story. The raw Top 500 by Fundamental Size and its banded and seasoned counterpart deliver annual alphas of 40 bps and 36 bps, respectively, and these results are highly significant. More importantly, their factor loadings reveal a shift away from the growth and momentum tilts embedded in capitalization-based selection. Instead, these portfolios lean modestly toward value while maintaining broadly similar risk exposures otherwise. Over this span, the minimal value bias would not have helped us; value has underperformed growth by a wide margin since 2007. This finding means that anchoring on business fundamentals provides a sturdier, more rewarding foundation for index construction. Furthermore, fundamentals vary less from year to year than share price or market cap, so banding and seasoning are not needed to reduce turnover.

Although the fundamentals-based constructions show statistically significant alphas, we need to clarify what those alphas represent. One interpretation is that fundamental measures provide a more efficient selection rule, one that better reflects the enduring economic footprint of companies and thus yields higher realized returns for a given level of risk. An alternative explanation is that the residual alpha reflects exposures not fully captured by the standard Fama–French–Carhart four-factor model. In this view, part of the return arises from systematic tilts that the model classifies as "unexplained," even though they stem from the structural mechanics of index design. A third and more practical interpretation is that these strategies benefit simply from *not* trading with the index tracking crowd, thereby avoiding the hidden costs embedded in predictable index turnover and crowded rebalancing trades. All three may well be true.

The fundamentals-based strategies are distinguished not only by their modest tilt toward value but also by the way they reshape the mechanics of turnover. By grounding membership in business scale rather than market enthusiasm, these approaches dampen the buy-high/sell-low dynamic that plagues cap-weighted reconstitutions. A company that drifts in or out of the top 500 because of a recent large price move is far less likely to qualify when judged on multiyear sales, cash flow, or dividends. The result is that additions and deletions happen at more reasonable valuations, with less noise and therefore with less performance drag.

Taken together, the evidence shows that even small design choices at the index boundary carry long-run consequences. The typical cap-weighted index looks passive, but its reconstitution rules quietly embed a momentum-like bias—adding companies after they have surged and dropping them after they have slumped. Although this "active" slice might look trivial because it accounts for only a few percentage points of turnover each year, it behaves more like a momentum-chasing growth manager than a studiously neutral core manager. Our simulations confirm that this bias systematically erodes returns.

The alternatives demonstrate that this performance erosion is not inevitable. By keeping the weighting system intact—because portfolios still consist of cap-weighted "top 500" stocks—and modestly adjusting how those names are selected and how boundary stability is enforced, we can shift the results meaningfully. With multiyear averages, fundamental anchors select for durable business scale, rather than fleeting popularity; banding and seasoning then tamp down the churn of borderline names.[28] The result is higher returns, lower turnover, and no added risk.

Critics may say that this approach is no longer a passive cap-weighted index because the selection criteria are not based on market value. We would ask such critics to define "passive." If it means spanning the macroeconomy with minimal turnover, we will point out that both selection by market cap and selection by business scale are passive. If it means a lack of subjective judgment, the S&P 500 itself will not qualify. If it means spanning the entire market in a fashion consonant with the CAPM, neither method will qualify because the CAPM requires that the market portfolio must span all investable assets.

Edmund Burke's (1757) observation that "custom reconciles us to everything," highlighted earlier, can illuminate the evidence we have assembled here. What appears passive is shockingly active at the margins, but custom has reconciled investors to this paradox. Indeed, custom encourages us to disregard the peculiar nature of index fund trading. The more widespread

[28]Banding and seasoning do not help the performance of a strategy that uses fundamental selection, though they do reduce the turnover from 4.0% to 3.7%.

investing in cap-weighted index funds become, the more its supposed optimality is accepted as conventional wisdom. Market-cap weighting is efficient at scale but systematically embeds momentum, valuation asymmetries, and costly turnover.

The lesson from our experiments is not that indexing fails but that its specific design matters. By grounding index membership in economic scale rather than market enthusiasm, investors can preserve the transparency and scalability of passive investing while dialing back its speculative heart. In that sense, the most sustainable form of passive investing may not be one that avoids activity altogether—an impossible goal in any event—but one that is not motivated to trade as a direct consequence of past price moves.

Rethinking Growth: Expensive Does Not Mean Growth

The world of finance theory and practice has widely embraced a binary duality, dividing stocks into growth and value. Cheap valuation multiples are deemed to suggest value, while expensive stocks are deemed to suggest growth. To be sure, index providers have shifted the definition to include measures of past growth or growth expectations so that "value" includes a blend of cheap stocks and stocks with sluggish "growth" and growth includes a blend of expensive and rapid growth. But the duality persists.

We would not challenge the accepted definition of value, acknowledging of course that this definition embraces all the value traps (i.e., stocks that look cheap all the way to zero). We *do* challenge the notion that expensive means growth. No! Expensive means expensive. A tacit implication of our worldview is that there are stocks that are neither growth nor value, rather both expensive and slow growing. We question whether these belong in our portfolios at all.

Up to this point, we have shown that redefining *size*—whether through multiyear average market capitalization or a composite of fundamental measures—can reduce boundary noise and mitigate the buy-high/sell-low tendencies embedded in cap-weighted reconstitution. Anchoring on *fundamental size* improves index efficiency because it identifies companies based on the scale of their economic footprint rather than on transient price enthusiasm.

Fundamental size, however, describes only where a business stands today. It tells us nothing about where the business is heading nor whether today's fundamentals are improving, stagnating, or eroding. Two companies of similar scale may have radically different trajectories. In many cases, the market's enthusiasm for a prospective index addition is not simply about how large the company already is but also about how quickly its underlying economics have been changing. This gap creates the conceptual need for *forward-looking* fundamentals.

Expectations based on such fundamentals as anticipated growth in sales, earnings, cash flows, and dividends may reflect meaningful information about a company's prospective growth, but price also reflects other factors (such as sentiment, flows, liquidity pressures, and noise) that say nothing about the outlook for a stock in economic terms. Consensus narratives of prospective growth are often true, but they are already *entirely* reflected in current share prices.

If fundamental size captures the static footprint of a firm, then measures of fundamental growth may capture the dynamic evolution of that footprint. The idea is not new: Academic research has long argued that relying on prices to identify "growth" stocks is problematic

because expensive stocks are not necessarily growing stocks. Much of what traditional growth indexes capture is simply high valuation, a mediocre predictor of future business expansion, innovation, or improving profitability. The consequence, as documented in the growth literature, is chronic misclassification: Slow-growing but expensive companies are labeled as "growth," while fast-growing firms trading at reasonable valuations are often overlooked.

Fundamental growth seeks to restore this distinction. By focusing on observable changes in a company's economic activity—such as sustained increases in sales, gross profits, or investment in innovation—growth becomes grounded in *realized* progress, not in market optimism or forecast bias. Fundamental growth measures will not capture market expectations of future growth, but those expectations will not help us achieve investment success for the simple reason that these expectations *are already in the price*.

This shift mirrors the logic of our earlier discussion about size. Just as fundamental size avoids price-driven distortions by selecting index members based on the economic scale of the underlying companies, backward-looking fundamental measures of growth avoid glamour-driven distortions by grounding growth in actual business results.[29] The prospects of companies are often revealed by the evolution of their own fundamentals well before markets fully reflect the information. Consistent improvements in revenues, gross profits, cash flows, or R&D spending point to genuine business progress. Unlike growth inferred from valuation multiples or analyst forecasts, realized fundamental growth reflects economic reality rather than sentiment. It provides a tangible, auditable signal of forward-looking value creation.[30]

This contrast becomes particularly sharp when we consider conventional cap-weighted "growth" indexes. Because selection and weighting hinge on price movements and valuation multiples, recent price action *alone* can cause companies to move in and out of the market portfolio and its growth subset. In effect, this dynamic forces a growth index to double-down on its active component, producing a systematic buy-high/sell-low pattern driven more by crowd enthusiasm than by genuine economic expansion.

A more robust approach is to define growth using observed growth rates in underlying fundamentals rather than valuation multiples that fluctuate with market mood. Evidence in Arnott, Brightman, Harvey, Nguyen, and Shakernia (2026) shows that these realized growth measures are far less sensitive to valuation noise and have historically identified companies whose fundamentals were strengthening—regardless of whether that progress had already been priced in. Realized growth therefore offers a practical way to approximate the growth component of intrinsic value without relying on market prices.

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[29]Importantly, incorporating fundamental growth does not require the same variables used in the size composite. Size and growth naturally rely on different inputs: One captures a level; the other measures change. Both measures share a common spirit—anchoring index construction on the economics of the business rather than on how the market happens to price it. If fundamental size helps avoid buying trendy companies simply because they carry a large market value, fundamental growth helps avoid chasing high-multiple companies simply because we treat high valuation multiples as an expected attribute of "growth stocks." Taken together, these two dimensions—level and change—offer a richer and more forward-looking foundation for understanding how companies migrate into and out of cap-weighted benchmarks.

[30]The "Fundamental Growth Composite" follows Arnott, Brightman, Harvey, Nguyen, and Shakernia (2026). It measures five-year compounded growth in three core fundamentals—sales, gross profits, and R&D spending (if available). If only three or four years of data are available, we will use the slightly shorter span. The composite is defined as the average of these real growth rates. See Arnott et al. (2026) for full details.

A Practical Path Forward: Realized Fundamental Growth as an Alternative to Price-Implied Growth

Several approaches exist for defining a measure of fundamental growth. One can focus on single indicators (e.g., sales growth, earnings growth, or cash flow growth), but these often overweight particular industries or capture only cyclical surges. Other approaches prioritize higher-quality forms of growth, such as increases in gross profit or operating cash flow, which better reflect genuine economic improvement. A more comprehensive method is to use a composite of multiple fundamental signals, reducing measurement error and acknowledging that economic growth is multidimensional. Regardless of the specific inputs, the underlying principle is the same: A growth measure should be transparent, economically grounded, and independent of valuation multiples.

This stands in contrast to conventional cap-weighted growth indexes, where selection and weighting hinge on price and valuation ratios. These approaches tend to magnify the active side of indexing: Stocks migrate into and out of growth portfolios, often based on recent price performance rather than sustained improvement in business fundamentals. A growth signal tied to realized fundamentals avoids this instability by focusing on changes in the firm's economic footprint rather than changes in market sentiment.

Arnott et al. (2026) showed that realized growth measures—constructed from five-year changes in key fundamentals—tend to be persistent, economically meaningful, and far less correlated with valuation noise. They often identify firms whose underlying business performance has been improving, irrespective of whether markets have yet rewarded that improvement.

This line of argument leads naturally to an empirical evaluation. We examine a portfolio of the top 500 US companies ranked by a composite of realized fundamental growth in sales, cash flow, and R&D expenditures, weighted by market capitalization. To maintain consistency with earlier sections of this report, we focus on the same sample period that we used previously—October 1989 through June 2025—and compare four large-cap US equity portfolios:

- *S&P 500:* the conventional benchmark as constituted and maintained by the index committee
- *Top 500 by Market Cap:* the top 500 US companies by market capitalization
- *Top 500 Growth:*[31] out of the 1,000 largest US companies by market capitalization, the growth-oriented half of the core universe, identified using a composite of book-to-price ratios, forecast earnings growth, and historical sales growth and weighted by market capitalization
- *Top 500 by Fundamental Growth:* the 500 US companies with the strongest five-year growth in sales, profits, and R&D expenditures, weighted by market capitalization

[31]Growth and value classifications are based on a composite style score in the spirit of the Russell Value/Growth methodology, applied within the core large-capitalization universe. The composite combines (1) book-to-price ratios as a measure of relative valuation (lower book-to-price indicating more growth-oriented firms), (2) medium-term forecast earnings growth based on two-year analyst estimates, and (3) historical sales-per-share growth measured over the prior five years. Securities are assigned to growth and value styles probabilistically, with market capitalization determining final portfolio weights; as a result, the growth portfolio represents approximately half of the core index by market capitalization.

Exhibit 16. Performance of Alternative Index Selection Measures of Top 500 Stocks, October 1989–June 2025

Index	Return	Volatility	Sharpe Ratio	Value Added vs. S&P 500	Tracking Error vs. S&P 500	Information Ratio vs. S&P 500
S&P 500	10.62%	14.79%	0.53	—	—	—
Top 500 by Market Cap	10.65%	14.89%	0.53	0.03%	1.01%	0.03
Top 500 Growth	11.53%	17.16%	0.51	0.91%	5.81%	0.16
Top 500 by Fundamental Growth	12.31%	16.36%	0.59	1.69%	4.19%	0.40

Sources: Research Affiliates, based on data from FactSet and CRSP.

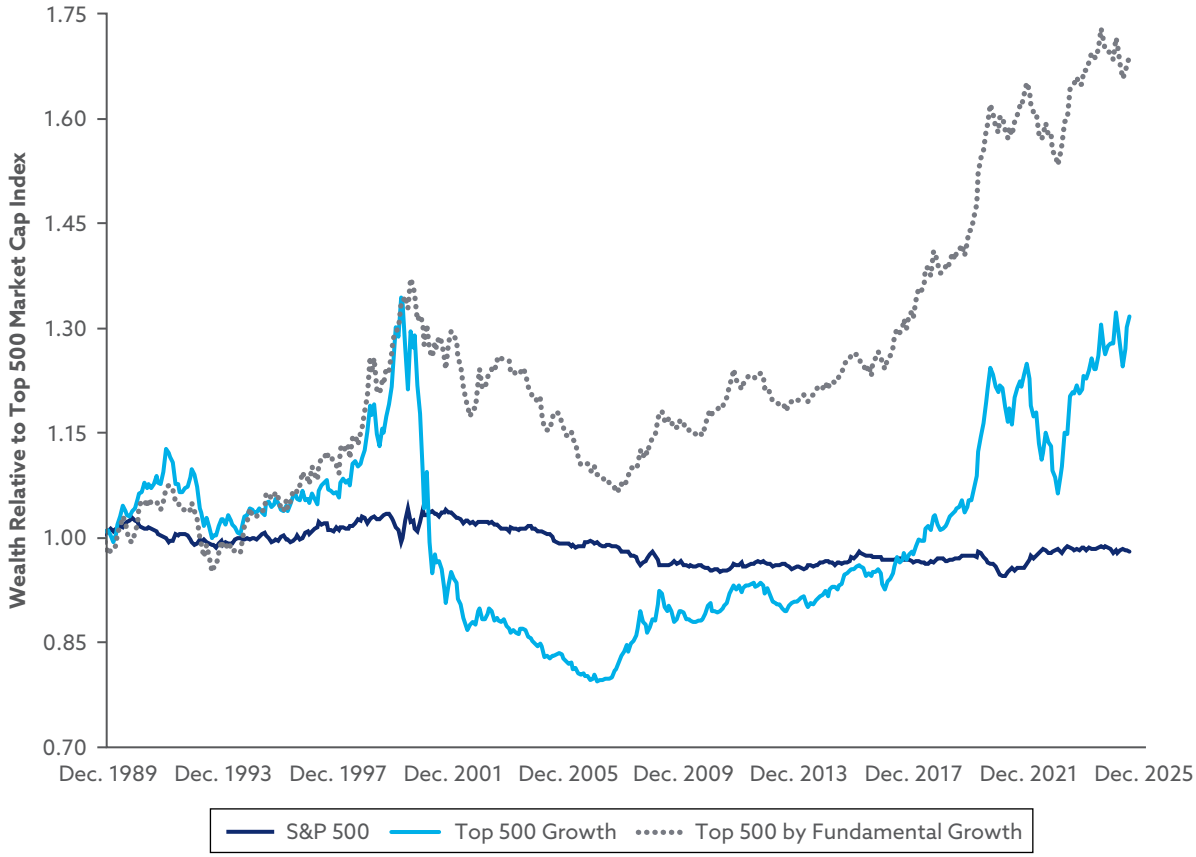
Arnott et al. (2026) also examined a portfolio selected and weighted by fundamental growth. The selection is based on the percentage growth rates in sales, profits, and R&D expenditures, and the weighting is based on the dollar magnitude of the five-year growth. Because we are entirely focused on cap-weighted indexes, we do not include this variant of a growth index.

Over the 1989–2025 sample, shown in **Exhibit 16**, the results follow a pattern consistent with what we observed for the fundamental size portfolios. The Top 500 by Fundamental Growth portfolio beats the Top 500 Growth portfolio by 78 bps a year with lower volatility. Notably, the strategy's information ratio is more than twice that of the valuation-based growth portfolio, despite having a lower tracking error. It also compares favorably with both the TrueCap 500 and the S&P 500, offering over 160 bps a year of incremental return with only modest additional risk.

Further, as shown in **Exhibit 17**, portfolios selected on realized fundamental growth tend to show more stable and persistent relative performance than their valuation-based counterparts. The fundamental growth portfolio steadily pulls away from both the Top 500 Growth and the market-cap-based portfolios (S&P 500), with long intervals of consistent relative strength punctuated by shorter periods of consolidation. The valuation-based growth portfolio (Top 500 Growth), by contrast, exhibits pronounced boom-and-bust cycles—periods of sharp outperformance followed by extended drawdowns—reflecting its reliance on price movements rather than underlying business progress.

Taken together, these results suggest that selecting large-cap stocks based on realized improvements in fundamentals offers a more stable expression of the growth style—one that depends less on swings in sentiment and more on the economic trajectory of the underlying businesses. This framework is neither a redefinition of "growth stocks" nor an engagement with the growth-versus-value taxonomy. The motivation is structural: to explore whether forward-looking information can be incorporated into index design without relying on price-based selection rules that amplify volatility and embed timing effects. Fundamental size captures the *scale* of a company's economic footprint; fundamental growth captures its *trajectory*. Used together, they offer a

Exhibit 17. Growth of a $1 Investment in Three Large-Cap US Equity Portfolios Relative to the Top 500 by Market Cap Portfolio, October 1989–June 2025



Sources: Research Affiliates, based on data from FactSet and CRSP.

more complete and economically coherent foundation for index construction, grounded in business evolution rather than transient valuation swings.

Afterword: Beyond Passive, Toward Balance

Diversification remains the closest thing investing has to a free lunch. That simple principle underlies much modern portfolio construction and helps explain why capitalization-weighted indexing has earned its central role in long-term investing. We would never recommend that investors abandon their existing allocations to cap-weighted index funds in favor of one of our proposed alternatives. Capitalization weighting has great merit, is far from obsolete, and will remain central to portfolio design for the foreseeable future. Furthermore, switching imposes tax consequences that can be daunting.

That said, cap weighting is not without costs, most of them hidden. As we have shown, the mechanics of index reconstitutions can impose unnecessary costs: forced trades at unfavorable valuations, avoidable turnover, and the occasional "flip-flop" that crystallizes bad timing. Alternative approaches—whether smoothing market capitalization over time, anchoring on fundamentals, or applying banding and seasoning rules—cannot eliminate these frictions, but they can help reduce them. The point is not to discard cap weighting but to recognize its limits and consider complementary tools that hedge its weaknesses.

With that in mind, we expand the discussion. Although our analysis so far has focused on portfolio-level effects, the rise of indexing has not only reshaped portfolios but also reshaped markets. This transformation has sparked an intense debate. For some observers, indexing represents one of the greatest social goods in financial history, democratizing access, slashing costs, and improving long-term outcomes for ordinary investors. For others, it undermines price discovery, distorts valuations, and creates hidden economic fragilities that may cause lasting damage in times of stress. Both seemingly incompatible views have some merit.

The Indexing Edge: The Case for Passive Investing's Benefits

The extraordinary rise of index funds marks one of the quiet revolutions of modern finance. What began as a niche idea in the 1970s is now the dominant way capital is allocated in US equity markets, and increasingly worldwide. This ascent did not happen by accident; it rests on both compelling theory and tangible practical benefits.

Management theorist Peter Drucker, in his 1976 book *The Unseen Revolution: How Pension Fund Socialism Came to America*, observed a profound shift: Through pension funds, millions of workers collectively owned an increasing share of corporate equity. He called this "pension fund socialism"—not in the sense of state control but in the sense of ownership of the means of production by workers, mediated through markets (Drucker 1976).

By sheer coincidence, John Bogle launched the first index mutual fund in that same year, a financial innovation that would dramatically accelerate this "pension fund socialism" concept. By providing a low-cost, transparent vehicle to broadly invest in the market, indexing enabled pension funds and individual investors alike to efficiently build diversified portfolios that reflected the overall economy's growth. Over time, index funds became a cornerstone of retirement savings for millions, expanding access to wealth accumulation while minimizing the fees and behavioral pitfalls.

Theory reinforced practice. Sharpe (1991) offered a powerful insight: Because active investors trade against one another and incur costs, they must, on average, trail the market after expenses. For every active winner, there must be an active loser—and fees, commissions, and trading costs ensure that the average active investor underperforms. With the caveat that no index spans the entire investable market, by avoiding these costs, index funds naturally align with market returns. We have already explored the vulnerabilities of this thesis, but it is largely correct.

Building on this theoretical framework, French (2008) quantified the long-term drag imposed by active management fees, arguing that the erosion of returns from active management represents a persistent headwind for investors hoping to accumulate wealth, especially over long horizons where compounding magnifies even modest fee differentials. Fama and French (2010)

confirmed that net of fees, most active funds fail to beat the benchmarks they chase. Against that backdrop, index funds, by avoiding costs, emerged as the default rational choice.

Bogle viewed indexing as a great financial equalizer, allowing ordinary investors to participate in the wealth-creation process once reserved for institutions and the affluent (Bogle 2016).[32] By delivering broad market exposure at minimal cost, index funds reduce conflicts of interest, mitigate the emotional pitfalls of market timing and performance chasing, and provide a simple, consistent framework for long-term wealth building.

From a governance perspective, the benefits of index funds are equally compelling. For pension funds bound by clear mandates (particularly those with strict mandates and aversions to tracking error), passive indexing simplifies and de-risks the decision-making process. By automatically aligning portfolio composition with benchmark weights, trustees avoid complex debates over security selection, discretionary timing, and performance chasing. This approach not only reduces governance friction but also supports fiduciary obligations that emphasize transparency, consistency, and accountability. Indeed, strong governance is widely recognized as essential for efficient pension management and benefit security. Moreover, the streamlined decision-making process reduces expenses for pension administration, which results in higher returns for investors.

Systemic Shadows: Emerging Risks in the Rise of Index Funds

In February 2024, passive investing surpassed active management in the mutual fund and ETF markets. Was this development a reason to celebrate? Yes and no. Even though the rise of indexing has brought undeniable benefits, its growing dominance also casts a shadow over market functioning and financial stability.

Consider this troubling irony: The very strengths of passive investing—the broad market exposure, low fees, and predictable flows designed to diversify risk—may be increasingly synchronizing stock movements and magnifying systemic vulnerabilities beneath the surface. Index funds are indifferent to fundamentals or valuation (except in the rebalancing process, where they amplify recent price moves) and allocate primarily on the basis of market capitalization. Their pattern of automatically buying rising stocks and selling falling ones perpetuates price distortions. As a result, stocks increasingly move in parallel, correlations rise, and indexes start to behave less like diversified portfolios and more like concentrated momentum bets. The expanding influence of indexing arguably threatens to weaken price discovery and inflate hidden fragilities that could unravel in times of stress, thereby undermining the foundations of well-functioning markets.

Research supports these concerns. Cremers, Ferreira, Matos, and Starks (2016) demonstrated that the dominance of indexing diminishes incentives for active managers to conduct thorough security analysis, thereby weakening market efficiency. The study showed that as passive investing grows, active funds increasingly resort to "closet indexing," tracking benchmarks closely rather than pursuing independent research. As money flows ever more rapidly from

[32]It seems stunning by today's standards, but the First Index Investment Trust (the original name of Bogle's S&P 500 index fund) not only had an annual fee of 0.43% but also had a front-end load of 6% (eliminated a year later). Both were considered low by the standards of the era.

active strategies to index funds, the incentives shift from a desire to beat the market by enough to get hired to a desire to not lag the market by enough to get fired.

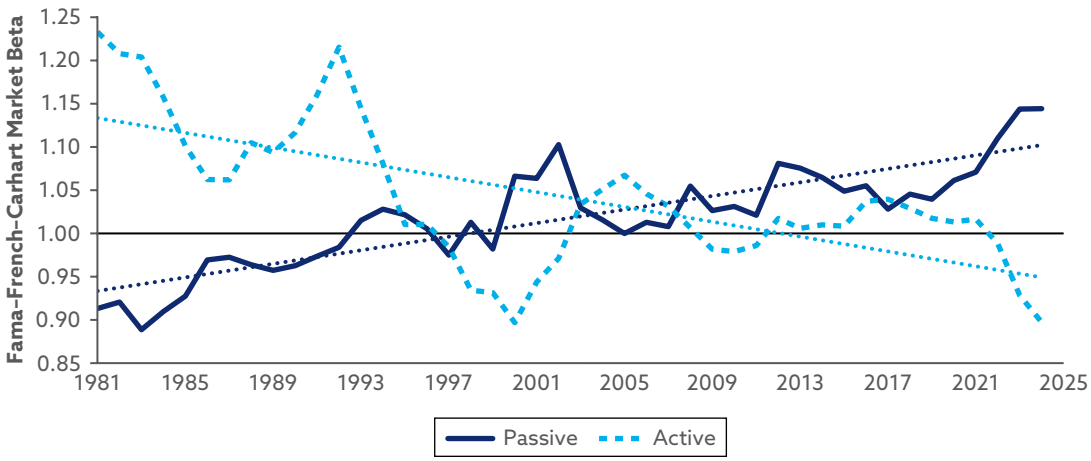
This behavioral shift reduces informed trading and thereby impairs the essential price discovery process by which markets efficiently incorporate new information into asset prices. The diminished role of active management creates the risk of greater mispricing and increased market fragility, which raises doubts about whether markets can remain efficient as passive investing dominates.

Adding to the complexity, Anadu, Kruttli, McCabe, and Osambela (2020) explored the implications for financial stability. They suggested that passive investing can amplify market volatility and increase concentration within asset management, potentially reducing competition and heightening systemic risks. However, the authors also noted that the shift has reduced certain liquidity and redemption risks, as passive funds typically have more predictable cash flows and lower turnover rates. Overall, their findings suggest that while passive investing offers benefits, it also introduces new risks that could undermine financial stability if not responsibly managed.

Concerns about passive investing's broader economic impact are not new. Fraser-Jenkins, et al. (2016), in a research note provocatively titled "The Silent Road to Serfdom: Why Passive Investing Is Worse Than Marxism," argued that a capitalist system dominated by passive investment could be more detrimental to price discovery and macroeconomic growth than centralized planning. Although the report's rhetoric is intentionally provocative, the core argument underscores the unease some market participants feel about indexing's growing influence.

Further caution comes from Brightman, Harvey, and Henslee (2025), who showed that passive inflows are not neutral. Because cap-weighted indexes allocate proportionally to rising stocks, they inherently reinforce price momentum and increase stock comovement. These effects are clearly visible in **Exhibit 18**, which shows a long-term rise in beta sensitivity among index-heavy

Exhibit 18. Divergence of Comovement, 1981–2024



Notes: The graph shows annual value-weighted averages of market betas from the Fama–French–Carhart four-factor model for portfolios sorted by ownership type. Trend lines were fitted across the full sample. A beta above 1 indicates heightened market sensitivity and below 1 indicates dampened exposure.

Sources: Research Affiliates, based on data from CRSP and Compustat.

portfolios. This dynamic diminishes diversification and may weaken the relationship between prices and fundamentals. Moreover, during periods of market stress, passive portfolios may face synchronized redemptions, turning these structural patterns into sources of fragility.

Rethinking Efficiency: A Counterpoint

Warnings of systemic collapse should be tempered. Markets were never perfectly efficient to begin with. Shiller (1981) and Campbell, Lo, and MacKinlay (1997) documented persistent excess volatility—fluctuations in prices that far exceeded what fundamentals could explain. Richard Roll's (1984) seminal study of orange juice futures drives this point home: Even when weather should have been the clearest driver of price, much of the volatility remained unexplained. In this context, the rise in indexing does not represent a breakdown of price discovery and may be a response to its long-term failure. With fewer trades driven by noise or overconfidence, indexing may even dampen volatility and promote stability.

Seen through this lens, the shift to passive is less a systemic threat than a long-overdue market correction. For decades, active management dominated, but as Sharpe (1991) famously showed, it cannot outperform in aggregate, especially after accounting for costs.

Grossman and Stiglitz (1980) reminded us that a perfectly efficient market would leave no room for informed trading and no incentive to actively manage. The market requires a balance, with enough active participants to keep prices honest but not so many that their costs outweigh their benefits. What we are witnessing is *not* a threat but may simply be the bursting of an overgrown active management bubble, as capital migrates toward the lower-cost, more transparent structure of passive funds.

Conclusion: Balance, Not Abandonment

Indexing has democratized investing, transformed retirement saving, and created trillions in wealth. These achievements are tremendous, but the rise of indexing has also exposed a set of tensions embedded in its design. Structural biases, hidden turnover costs, and growing systemic interdependencies coexist with the simplicity, transparency, and scalability that make cap-weighted benchmarks so appealing. As diversification becomes an automatic feature of investing for the masses, perceived risk may decline and investors may become willing to accept a lower equity risk premium and hence more willing to pay higher valuation multiples. Of course, higher valuation multiples inflate past returns in exchange for lower future returns, a fact that is too easily overlooked. Paired with demographic forces, such as rising life expectancy and longer investment horizons, elevated valuations and lower future returns may well be a "new normal."

Cap-weighted broad market indexes, originally intended as a neutral way to measure the market, have become a powerful force shaping it. When indexes were first conceived, they were meant to observe the market, not move it. They began as mirrors—quiet instruments of measurement—reflecting the ebb and flow of economic progress. But over time, those mirrors became engines of capital allocation themselves, their every adjustment rippling back through the very markets they were intended to describe. Recognizing this evolution is essential; denying it is folly.

For all their low fees and hands-off appeal, index funds are anything but passive. Market-cap weighting systematically overweights overvalued stocks and underweights undervalued ones relative to the unknowable eventual fair value, embedding a momentum-like bias that few investors recognize. These effects surface most clearly at moments of reconstitution and rebalancing, when index funds must trade in predictable and crowded ways to maintain precise tracking. Such trades create opportunities for others to anticipate and profit from index flows, imposing costs that remain largely invisible because they are absorbed by the benchmark itself. In this sense, indexing is best understood not as inactive but as systematically reactive—efficient in form yet consequential in practice.

If we want a portfolio that inexpensively tracks the market with low turnover, we need cap weighting, but we should recognize its limits. Alternative index designs can reduce buy-high/sell-low dynamics, smooth turnover, and align more closely with business fundamentals. For practitioners, the opportunity lies in blending the best of both worlds by preserving the scale and simplicity of passive investing while refining its mechanics to reduce hidden costs.

One such refinement is to anchor index membership on measures of firms' real economic footprint—such as revenues, cash flows, or balance-sheet scale—rather than relying solely on market prices. Incorporating fundamental growth alongside fundamental size restores the forward-looking component of intrinsic value that pure price or pure size alone cannot capture, offering a refinement to indexing that strengthens rather than replaces what works.

Cap weighting will remain central, but as our evidence has shown, it is not free. And for investors willing to question assumptions, experiment with refinements, and diversify their approach, the future of indexing need not be one of blind acceptance. It can be one of balance—between passive and active, between theory and practice, between efficiency and resilience.

While our study is US-centric, we have little doubt that the hidden costs we observe—buying high, selling low, and costly flip-flops—are no less prevalent in non-US markets. Indeed, in markets that are less efficient, as with emerging markets, they may impose more of a performance drag than in the United States (see Arnott and Brightman 2026).

We need not concentrate our core investments in a single index. We can choose to use competing cap-weighted indexes so that not all of our trading follows a single index. Indexes that are less crowded may enjoy markedly lower hidden trading costs. If index fund trading resembles a herd of elephants trying to go through a revolving door at the same time, why not choose a less crowded door? Why would an investor choosing index funds for their market-tracking diversification not want to *also* diversify their choices of index funds?

Our goal is not to advocate abandoning the index's original mission of representativeness but to refine the way it is achieved—so that tracking the market does not mean reinforcing its excesses. In this way, improving indexing is less about revolution than restoration: returning the benchmark closer to its founding spirit of neutrality and measurement while making it more efficient for investors who rely on it today.

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