

Will the success of indexing lead to its downfall

Passive investing poses little overall
threat to the price discovery process





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Executive summary

The growth of passive investing has raised questions about its effect on market efficiency and price discovery. Is price discovery hindered if a large portion of the market is held by investors who are passively seeking long-term exposure to an asset class, and not actively pursuing relative value on an individual security basis?

Charles Schwab Investment Management's findings suggest that despite their growing market share, indexed products (mutual funds and ETFs) do not interfere with the price discovery process. In addition, indexed products are often used to fine tune market exposures based on perceived changes in relative value, suggesting that price discovery is enhanced, rather than hindered. Moreover, a relatively new category of indexed products, strategic beta, occupies the middle ground between active and passive approaches, capturing a portion of what historically has been considered alpha, thus also contributing to market efficiency, and by extension, the price discovery process.

Ultimately, if indexed products were to begin interfering with rational pricing, we believe that the dynamic forces driving the financial markets would adjust to the resulting distortions to eliminate excess profits, once again ensuring that market prices reflect the underlying fundamentals.



Key takeaways

- Questions have arisen regarding whether the growth of passively managed products will hinder the price discovery process for stocks.
- One strong counterargument to this concern is that indexed products do little trading compared with active products, objectively limiting their potential pricing influence.
- In addition, many investors use passive instruments actively, contributing to price discovery.
- Strategic beta products focus on criteria other than market capitalization, thereby supporting the price discovery process even as this segment of the market has grown.
- History has demonstrated that when pricing dislocations occur, the dynamic forces that move the financial markets quickly eliminate excess profits and return prices to equilibrium.

Introduction

Over the past several decades, investors have increasingly adopted index-based products, particularly index funds and exchange-traded funds (ETFs). Indexing's market share has grown from just under 20% of total market assets in 2010 to more than 34% today, representing \$6.8 trillion in total assets under management.¹

With such dramatic growth, indexing has gone from occupying a small corner of the investing universe to a core allocation in many portfolios. As indexing continues to grow in popularity, investors naturally start to think about potential implications for markets, and both academics and practitioners have increasingly raised a variety of questions. For example, does indexing lead to greater volatility? Does it produce higher intra-market correlations? Alternatively, does it interfere with the price discovery process? In this article, we address the concern about indexing's impact on price discovery.

To tackle this question, we looked at the effect indexing has on market prices, how flows into and out of index funds (hereafter, mutual funds and ETFs) inform prices, and some important trends within indexing. We concluded by examining the nature of markets and how they may counter any detrimental effects on price discovery that could result from indexing.

Price discovery in efficient markets

Price discovery is the process by which the value of an asset is determined in the marketplace through the interaction of buyers and sellers, with the agreed-upon price essentially representing a point of equilibrium between the two.

Under the efficient market hypothesis, an asset's market price is assumed to be "informationally efficient," that is, to reflect all available relevant information. However, this assumes that buyers and sellers are sensitive to a specific asset's valuation. That is, they have conducted research, have some idea of how the asset is valued, and are not buying or selling indiscriminately.

The explosion of indexing has prompted some observers to question whether the large market presence of passive investors—who generally invest to gain overall exposure to a given market, rather than to make a valuation statement about a specific security—is now interfering with this price discovery mechanism, leading to the widespread mispricing of securities.

The majority of passive vehicles are based on market capitalization-weighted indexes, amplifying this concern. The rationale behind these indexes stems from the idea that market capitalization represents the collective wisdom of active investors on a company's prospects. If these investors believe a stock's price is attractive relative to the firm's prospects, they will buy the company's stock, drive up the price, and raise the company's market capitalization in the process. The opposite scenario also occurs. Essentially, this means that passive investors benefit from the collective wisdom of active investors, who effectively set market prices.

However, the concern with passive funds is that because investors will buy a proportionate amount of each stock in an index, stocks with the biggest market capitalizations will be purchased in the largest amounts, irrespective of their valuations. The corresponding belief is that this has the potential to overwhelm the price discovery process resulting from the actions of active investors. If the influence of active investors was impeded, market efficiency would be impaired and the rational allocation of capital hindered. In addition, by concentrating allocations in larger-cap stocks that could become increasingly overvalued, passive investors would be inadvertently harming their future prospects.

Trading volume, not AUM, drives prices

The growth in indexing has been hypothesized as proof that indexing represents a threat. While the AUM is important, we believe that trading volumes are more informative in assessing whether indexing affects price discovery.

Security prices are determined by the collective interactions of buyers and sellers. If there are more buyers than sellers—other elements held constant—then prices will rise. If there are more sellers than buyers, prices decline. Holders of a security reduce the availability of supply but do not directly influence price movements until they attempt to trade their position. Therefore, when we consider the impact of indexing on securities prices and price discovery, we should look at the trading volumes of indexed versus active funds.

Some arguments point to trading volumes of ETFs as evidence that these investment vehicles may be overwhelming the price discovery process. However, it is important to recognize that the trading of shares

in ETFs is not synonymous with trading the underlying stocks. As counterarguments point out, the vast majority of ETF trades occur in the secondary market among existing ETF shares, with only 10% to 20% involving the underlying securities.²

We used Morningstar, Inc. data to inform our perspective, examining the average portfolio turnover of U.S. and international equity funds with a three-year performance history as of December 31, 2017. The total assets under management for the funds in the 15 index categories that we sampled was more than \$8.2 trillion as of the end of 2017, which we considered a sufficient sample size to be informative regarding the effects of passive investing on price discovery. We selected Morningstar index categories that included a cross-section of the asset-management industry, from U.S. to international funds, and including active and passive, but excluding strategic beta funds, which generally have higher turnover rates relative to market capitalization-weighted index funds. Our findings are captured in Exhibit 1.

Exhibit 1: Industry assets and trading volumes

	AUM (B)	3-Year average annual turnover rates	3-Year estimated average annual trading volume (B)
Active funds	\$5,026.5	37%	\$1,837.0
Index funds	\$3,212.3	5%	\$168.8

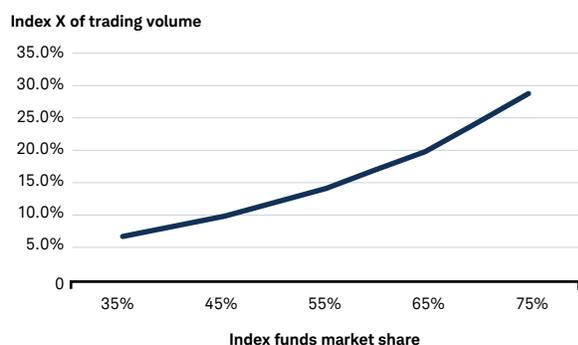
Sources: Charles Schwab Investment Management. Morningstar, Inc.; Morningstar DirectSM; AUM-weighted average annual data for 2015, 2016, and 2017, as of 12/31/17. Morningstar categories included the following, U.S. Fund Foreign Large Blend; U.S. Fund Foreign Large Growth; U.S. Fund Foreign Large Value; U.S. Fund Foreign Small/Mid Blend; U.S. Fund Foreign Small/Mid Growth; U.S. Fund Foreign Small/Mid Value; U.S. Fund Large Blend; U.S. Fund Large Growth; U.S. Fund Large Value; U.S. Fund Mid-Cap Blend; U.S. Fund Mid-Cap Growth; U.S. Fund Mid-Cap Value; U.S. Fund Small Blend; U.S. Fund Small Growth; and U.S. Fund Small Value. See morningstar.com for category and classification information.

Not surprisingly, the index funds in our sample universe had significantly lower 3-year average annual turnover rates than active funds: 5% versus 37%, respectively. Correspondingly, the lower annual turnover rates for index funds resulted in lower estimated 3-year average annual trading volumes of \$169 billion compared to \$1.8 trillion for active, or just 8% of total trading volume.

What would happen if the market share of indexing continued to grow? To better understand the implications, we conducted sensitivity analysis to determine how trading volume might evolve at elevated levels of market share for index products.

To inform our insights, we applied the 3-year estimated average annual turnover rates shown in Exhibit 1 to the hypothetical size of index and active category market share, generating the results in Exhibit 2. As shown, even if indexing grew to a hypothetical 75% of the market and active represented 25%—all elements otherwise held constant—index funds would only drive approximately 29% of the total trading volume, based on our research.

Exhibit 2: Index funds' real and hypothetical share of trading volumes



Sources: Charles Schwab Investment Management. Morningstar, Inc. For illustrative purposes only.

Taken collectively, these findings lead us to believe that the price discovery process for equities is alive and well, and that it will remain so, even as the market share of indexing continues to grow. This point of view is further substantiated by other market participants that actively contribute to the price discovery process, such as individual security investors.

Passive investors are more active than expected

Based upon these observations, we believe trading volumes resulting from existing AUM in passive funds do not inhibit price discovery. Will the flood of new money flowing into index funds and ETFs eventually cause this dynamic to shift? Monthly flows into retirement accounts, for example, typically occur automatically, and because indexing investors are generally thought to be seeking exposure to an asset class, little reallocation may occur. Could these massive flows lead to overvaluation and impair price discovery?

Investors in index funds might be considerably more attentive—and active—to stock prices than expected. According to Bloomberg data as of June 30, 2018, more than 2,100 ETFs are listed in the U.S. alone, giving investors many opportunities to slice and dice the market in a variety of ways to achieve targeted exposures. Moreover, investors seem to do so actively, expressing their views on the relative attractiveness of particular market segments. For example, consider sector ETF flows for the one-year period ended June 30, 2018 (see Exhibit 3).

Exhibit 3: Passive investors shifted sectors

Sector	Fund flows
Consumer Staples	-7%
Consumer Discretionary	-7%
Utilities	-6%
Health Care	-6%
Real Estate	-1%
Communication Services	5%
Multi-sector	9%
Energy	9%
Industrials	12%
Information Technology	15%
Financials	16%
Materials	18%

Sources: Charles Schwab Investment Management; Bloomberg. Change in flows into S&P 500® sector ETFs for the 12 months ended 06/30/18, reflecting fund flows as a percentage of the funds' market capitalizations.

While overall sector ETF flows were positive during this period, they varied considerably from one sector to another, likely based on the relative appeal of each. Over this period, U.S. economic growth was healthy, unemployment was trending lower, and the Federal Reserve was raising interest rates.

Historically speaking, cyclical sectors have performed best in such environments. Looking at the data on fund flows, this pattern played out, with investors positioning themselves in Industrials, Technology, and Financials. In addition, investors avoided “income plays,” sectors that have generally provided higher dividend yields—Consumer Staples, Utilities, and REITs—and have historically tended to underperform in rising-rate environments.

Investors in index products were also attentive to international equities. Over the same timeframe, investors heavily favored international developed and emerging markets over U.S. markets. Although U.S. large-cap stocks significantly outperformed international stocks in the wake of the financial crisis, as the global recovery took shape, investors increasingly shifted into overseas markets (see Exhibit 4).

Exhibit 4: Passive investors recognized when international markets became attractive

Asset class	Percentage of flows
International	15%
Emerging markets (equity)	15%
U.S.	8%

Sources: Charles Schwab Investment Management; Bloomberg. Data for the 12 months ended 06/30/18, reflecting fund flows as a percentage of the funds’ market capitalizations.

More recently, investors in index funds pulled back from international products, and flows to these investment vehicles reversed course amid concerns about tariffs and trade wars (see Exhibit 5).

Exhibit 5: Passive investors recognized the growing overseas risks

Asset class	Percentage of flows
International	-1%
Emerging markets (equity)	-3%
U.S.	3%

Source: Bloomberg. Data from 03/23/18 to 08/30/18, reflecting fund flows as a percentage of the funds’ market capitalizations.

Considering these flows, we believe that many investors use index products to express tactical and/or strategic views and do more than passively allocate assets. According to one report, \$2 trillion in ETF assets were owned by more than 3,400 institutions as of year-end 2017, a rise of 39% over 2016.³ We believe, therefore, that these flows are informed based on market information regarding sectors and macroeconomic trends, and that they correspondingly aid the efficiency of the price discovery process.

Strategic beta represents an active bet

Another class of indexed products is not market capitalization-weighted, and we believe the use of these products also supports price discovery. “Strategic beta” or “smart beta” funds have attracted an increasing portion of passive AUM, and the available strategies within this class of products have proliferated.

Strategic beta products consider factors other than market capitalization in determining index constituents and weightings. These products cover a broad range of strategies, with some of the more popular categories being value, growth, and dividends. Other strategies weight constituents according to one or more risk factors, such as quality, size, volatility, and momentum. Among strategic products are Fundamental Index[®] strategies, which use a rules-based discipline to select and weight securities.

Exhibit 6: Strategic beta funds have proliferated

Style	Assets (\$B)
Growth	199
Value	190
Dividend	165
Factor	144
Equal weighted	41
Fundamental weighted	33
Smart beta total	772
% of total ETFs	21%

Sources: Charles Schwab Investment Management; Morningstar, Inc. Data as of 08/31/18.

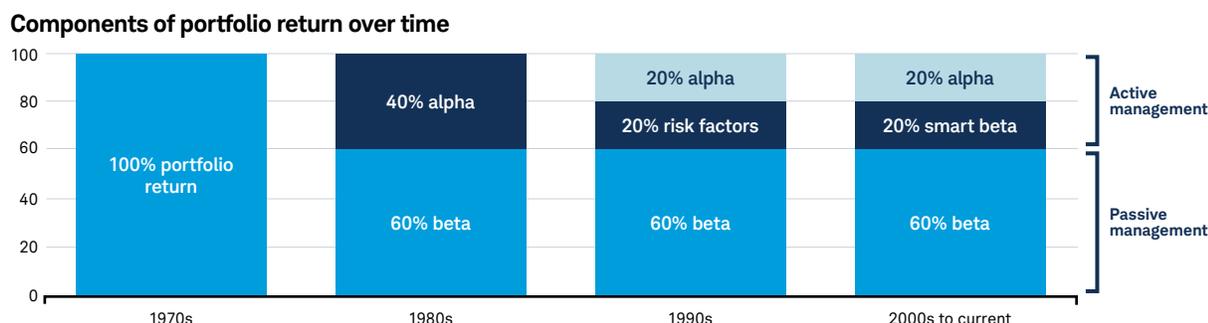
What is the significance of strategic beta funds to price discovery? While these investment products are typically considered passive, many observers believe they incorporate aspects of both active and passive approaches. We agree with this perspective.

Like other passive investment products, the holdings of strategic beta products are transparent compared with most actively managed funds, while typically involving lower fees. On the other hand, relative to market capitalization-weighted funds, strategic beta funds take “active” positions by weighting fund constituents according to risk factors, or sources of return—such as value and momentum—or fundamentals

such as sales or cash flows. Because these strategies enable investors to express a view on the relative attractiveness of well-known risk factors, we believe strategic beta funds help inform price discovery.

Strategic beta products attempt to capture a portion of “alpha” by focusing on a selection of factors often historically associated with active management (see Exhibit 7). By weighting constituents by risk factors, strategic beta products have essentially reduced the size of the available alpha pool, enhancing market efficiency in ways similar to actively managed investment products, and, by extension, the price discovery process.

Exhibit 7: Strategic beta products have captured a portion of alpha, increasing market efficiency



Source: Charles Schwab Investment Management. For illustrative purposes only.

Strategic beta funds tend to have higher turnover than market capitalization-weighted index funds, and therefore have a larger proportional effect on trading volume than their status as “passive” products suggests. We believe price discovery should be further enhanced if these products continue to grow.

An active check on price distortions

If there is one thing the massive growth of passive investing has highlighted over the past two decades, it is that the performance of market capitalization-weighted index funds—and the collective market intelligence they represent—is tough to beat. This intelligence is always evolving and adapting.

We believe that even if market capitalization-weighted index funds reached a sufficient size to interfere with price discovery, active and strategic beta funds, hedge funds, and other institutions would target the perceived price dislocations and identify opportunities to generate excessive profits. Investors would then shift assets accordingly. Eventually, a new equilibrium would emerge. This equilibrium might fluctuate, but our analysis suggests that given the negligible price distortion currently resulting from indexed products, it will not occur anytime soon.

Charles Schwab Investment Management

With a straightforward lineup of core products and solutions for building the foundation of a portfolio, Charles Schwab Investment Management advocates for investors of all sizes with a steadfast focus on lowering costs and reducing unnecessary complexity.

Past performance is no guarantee of future results.

1. Strategic Insight; Simfund[®]; Charles Schwab Investment Management. Data as of 06/30/18.

2. Investment Company Institute, 2017 Investment Company Fact Book.

3. Ibid.

Unlike mutual funds, shares of ETFs are not individually redeemable directly with the ETF. Shares of ETFs are bought and sold at market price, which may be higher or lower than the net asset value (NAV). Fundamental Index is a registered trademark of Research Affiliates LLC.

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