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The Slings and Arrows of Passive Fortune

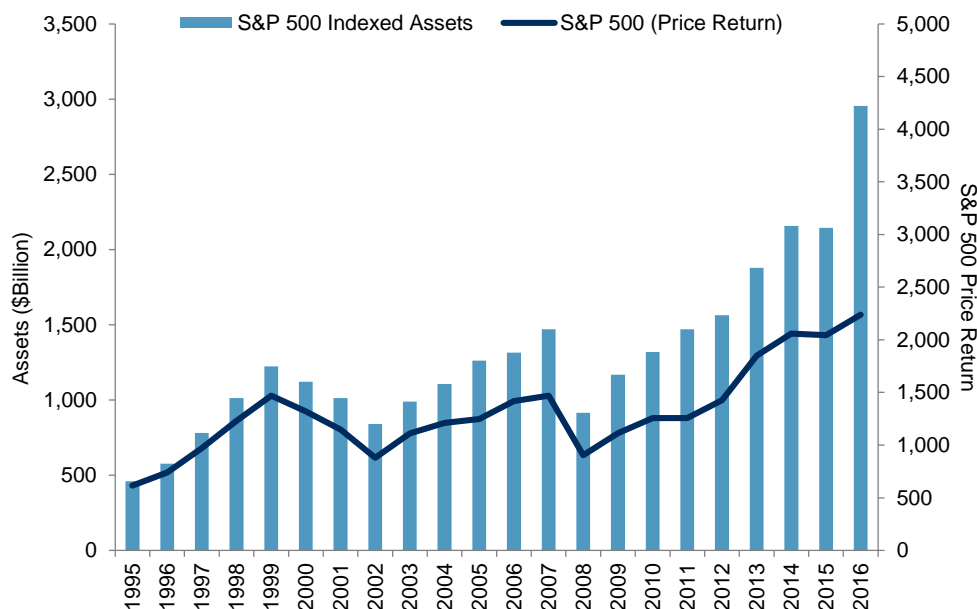
“When sorrows come, they come not single spies, but in battalions.”

Hamlet, Act 4

EXECUTIVE SUMMARY

Passively managed assets have grown dramatically since the inception of indexing in the 1970s. (Exhibit 1 illustrates this for the [S&P 500®](#), arguably the most widely tracked index in the world.) Unsurprisingly, some active managers, as well as other critics, have raised questions about the impact of the growth of indexing. The charges leveled at index funds include suggestions that they encourage collusive behavior, that they are poor stewards of their customers' assets, that they contribute to market bubbles, and that they diminish market efficiency. We offer rebuttals to each of these concerns, and suggest how an eventual equilibrium between active and passive assets under management might arise.

Exhibit 1: Approximately \$3 Trillion Tracks the S&P 500



Source: S&P Dow Jones Indices LLC. Data as of Dec. 30, 2016. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

O TEMPORA! O MORES!

Recent years have witnessed a plethora of criticism directed at passive management by the advocates of a more traditional, active approach. To appreciate the extent of these claims, consider the following simple exercise. We performed a Google News search for “danger of passive investing” and found 171,000 news items. A search for “danger of passive smoking” yielded 29,700 news items.¹ Yet **does any reasonable person believe that index funds are more dangerous than cigarette smoke** (which might, after all, actually kill you)?

The critics of passive management sometimes conflate issues that all market participants face with issues uniquely attributable to index funds.

Passive investing has attracted so much criticism in part because its critics sometimes conflate issues that all market participants face with issues uniquely attributable to index funds. For example, the authors recently heard an active manager describe what he characterized as flaws in executive compensation and stock option plans, which supposedly operate to the detriment of investors.² These were described as “the hidden cost of passive investing.” His argument may or may not be correct (we are skeptical), but if it is, it describes a problem for *all* market participants, not just for investors in index funds.

Nonetheless, a number of respectable sources have also directed criticisms at passive management. We’ll address the following assertions:

- Common ownership: Index funds own stakes in many of the competitors in most industries. Does this encourage or facilitate collusive behavior?
- Stewardship: Do index funds exercise proper diligence over the management of the companies in which they invest?
- Bubbles: Do flows into passive vehicles exacerbate, or even cause, market bubbles?³
- Market efficiency: Passive investors are “price takers” who buy a stock because it’s in an index, not because they think the stock is cheap. Does price taking impede market efficiency?

We’ll conclude with some thoughts about how an ultimate equilibrium between active and passive investors might evolve.

COMMON OWNERSHIP

Passively invested assets, at least in the U.S., are dominated by three large entities: BlackRock, Vanguard, and State Street. They (or, in BlackRock’s

¹ These numbers come from a Google news search on Feb. 1, 2018. Results of this exercise vary day by day, but the majority for investing over smoking has been quite stable. “Dangers” (plural) gives a different answer than “danger” (singular). If someone can explain why, we’ll be grateful.

² See LaFon, Holly, “[David Winters Takes Aim at Passive Investing](#),” Jan. 16, 2018.

³ This is distinct from asking whether the *inclusion* of a stock in an index affects the stock’s valuation.

case, its predecessor companies) were among the pioneers of index funds in the 1970s, and today the big three manage approximately \$13 trillion.⁴

Fully passive index funds manage approximately 20% of the total float-adjusted capitalization of the U.S. stock market.

We've estimated previously that fully passive index funds manage approximately 20% of the total float-adjusted capitalization of the U.S. stock market.⁵ Assume (incorrectly, but for the sake of argument) that the entire 20% is controlled by the three largest indexers, and assume further (correctly, this time) that they also manage factor-based "smart beta" funds as well as fully active portfolios. Then it's plausible to argue that the big three, on behalf of their clients, own between one-quarter and one-third of nearly every large company in the U.S.

So what? Critics claim that ownership of a substantial fraction of most or all of the competitors in an industry could lead to "softer competition among product rivals" and higher consumer prices.⁶ The most often-cited example of this putative problem is the claim that U.S. airline ticket prices are "3-7% higher because of common ownership."⁷ Therefore, it is argued, public policy should require that "investors in firms in well-defined oligopolistic industries...choose either to limit their holdings of an industry to a small stake...or to hold the shares of only a single 'effective firm' per industry."⁸

In response, we offer three observations:

- First, **there is by no means an academic consensus** that common ownership has raised the price of airline tickets.⁹ Moreover, the critics' statistics are, like any statistical analysis, indicative of *correlation* rather than *causation*.¹⁰ The critics' data on airline ticket prices span 2001-2014. Ticket prices may have risen, and the importance of index funds has certainly increased, but without a clearly identified causal mechanism, we should be cautious in attributing the first effect to the second.¹¹

The critics' statistics are indicative of *correlation* rather than *causation*.

⁴ Not all of which is fully passive. See Krouse, Sarah, "[At BlackRock, Vanguard and State Street, 'Engagement' Has Different Meanings](#)," *Wall Street Journal*, Jan. 20, 2018.

⁵ Ganti, Anu and Craig J. Lazzara, "[Shooting the Messenger](#)," December 2017.

⁶ Posner, Eric A., Fiona Scott Morton, and E. Glen Weyl, "[A Proposal to Limit the Anti-Competitive Power of Institutional Investors](#)," Nov. 29, 2016.

⁷ Azar, Jose, Martin C. Schmalz, and Isabel Tecu, "[Anti-Competitive Effects of Common Ownership](#)," Mar. 15, 2017.

⁸ Posner et al., *op. cit.*, p. 1.

⁹ See Dennis, Patrick J., Kristopher Gerardi, and Carola Schenone, "[Common Ownership Does Not Have Anti-Competitive Effects in the Airline Industry](#)," Feb. 5, 2017; and Kennedy, Pauline, Daniel P. O'Brien, Minjae Song, and Keith Waehrer, "[The Competitive Effects of Common Ownership: Economic Foundations and Empirical Evidence](#)," July 2017. A particularly useful summary can be found in Committee on Capital Markets Regulation, "[Common Ownership and Antitrust Concerns](#)," November 2017.

¹⁰ See CCMR, *op. cit.*, p. 10.

¹¹ For a cautionary tale about the dangers of the *post hoc* fallacy, see Leinweber, David J., "[Stupid Data Miner Tricks: Overfitting the S&P 500](#)," *Journal of Investing*, January 2007. The article was initially written in 1995.

Why increase the profits of 0.5% of your portfolio and raise the expenses of the other 99.5%?

- One company's revenue is another company's expense. Airlines accounted for 0.5% of the float-adjusted market capitalization of the S&P 500 as of year-end 2017. Even if index funds could cause airline executives to raise prices, why would they do so? Why increase the profits of 0.5% of your portfolio and raise the expenses of the other 99.5%?
- Price fixing and collusion are proscribed under applicable anti-trust laws. If such behaviors were suspected, appropriate legal remedies are presumably near at hand.

Finally, even if we accept the critics' view that indexers' common ownership of competitors is a problem for the economy, their proposed solution may be a cure worse than the disease. We estimate that **the passive management industry, at its current scale, saves investors more than \$20 billion annually in management fees alone**, a benefit that accrues to institutional and retail investors alike.¹² Handicapping an industry that delivers benefits of this magnitude on weak evidence of an ill-defined problem strikes us as a bridge too far.

STEWARDSHIP

Some critics of passive management question whether index fund managers are good stewards of their investors' assets. They argue that index funds hold a stock because of its index membership, not because they necessarily believe in its virtues as an investment. Since index fund managers compete vigorously to reduce costs, it's at least plausible that they might treat governance research and company engagement as expensive luxuries not relevant to their price-sensitive clients.¹³ As indexing grows, therefore, some critics argue that investor engagement with corporate management will diminish, and the overall quality of corporate governance will suffer as a result.

Many indices are explicitly designed to incorporate ESG criteria into the constituent selection process.

In this discussion, it's important to distinguish between the construction of indices in general and the construction of indices with a tilt toward governance issues. Index funds hold a company's stock to replicate an underlying index. The underlying index includes constituents based on predetermined eligibility rules, which are typically published in a methodology document.¹⁴ If the objective of an index is to measure a particular market segment (as, for example, the S&P 500 is designed to measure the largest-capitalization segment of the U.S. market), the index methodology might not include corporate governance considerations. On the other hand, many indices are explicitly designed to incorporate environmental, social, and governance (ESG) criteria into the constituent

¹² Ganti and Lazzara, *op. cit.*, pp. 11-12.

selection process.¹⁵ Such diverse index offerings facilitate investors' efforts to reflect their views of appropriate corporate behavior in their portfolios.

Even so, it's not correct to suppose that index funds without an explicit ESG mandate are indifferent to corporate governance issues. The most obvious reason for this turns the critics' argument on its head. Index funds will hold every stock in an index, regardless of their view of its fundamental merits. They don't have an option to sell a holding with whose management they're uncomfortable. **Because they're essentially permanent capital, index investors have a greater incentive to engage with corporate managements, not a lesser incentive.**

Index funds are permanent capital. They have a greater incentive than active managers to engage with corporate management.

In fact, objective observers report that "the world's largest index managers have expanded their stewardship or corporate-governance teams and...are increasingly committed to improving the ESG practices of their holdings through proxy voting and engagement."¹⁶ Evidence suggests that passive management is associated with "more independent directors, removal of takeover defenses, and more equal voting rights."¹⁷ Passive investing has also been found to facilitate the ability of activist investors to achieve board representation or otherwise to achieve successful, value-enhancing outcomes.¹⁸

The largest indexers are not shy about their views of corporate stewardship. BlackRock has been particularly vocal,¹⁹ and has recently demanded that "companies in which it invests should have at least two female directors."²⁰ Vanguard has publicly declared its interest in monitoring "appropriate compensation, board composition, governance structure and risk oversight."²¹ State Street, having previously expressed its discomfort with all-male boards, has recently begun to take a more aggressive view of executive compensation.²² Whether such initiatives ultimately benefit the indexers' clients' portfolios is an open issue. But they are hardly indicative of a weak approach to corporate stewardship.

¹³ Authers, John, "[Stewardship and cross-ownership top the passive worries](#)," *Financial Times*, Dec. 14, 2017.

¹⁴ See, e.g., "[S&P U.S. Indices Methodology](#)," March 2018.

¹⁵ See Nadig, Dave, "[The 'ESG' Umbrella Has Leaks](#)," Mar. 13, 2018.

¹⁶ Bioy, Hortense, Alex Bryan, Jackie Choy, Jose Garcia-Zarate, and Ben Johnson, "[Passive Fund Providers Take an Active Approach to Investment Stewardship](#)," *Morningstar*, December 2017.

¹⁷ Appel, Ian, Todd A. Gormley, and Donald B. Keim, "[Passive Investors, Not Passive Owners](#)," *Journal of Financial Economics*, forthcoming, Feb. 6, 2016.

¹⁸ Appel, Ian, Todd A. Gormley, and Donald B. Keim, "[Standing on the shoulders of giants: The effect of passive investors on activism](#)," Feb. 2, 2018.

¹⁹ Krouse, Sarah, "[BlackRock CEO to Companies: Pay Attention to 'Societal Impact'](#)," *Wall Street Journal*, Jan. 16, 2018.

²⁰ Krouse, Sarah, "[BlackRock: Companies Should Have at Least Two Female Directors](#)," *Wall Street Journal*, Feb. 2, 2018.

²¹ Kozlowski, Rob, "[Vanguard releases proxy-voting report, outlines governance goals in letter to public companies](#)," *Pensions & Investments*, Aug. 31, 2017.

²² McLannahan, Ben and Robin Wigglesworth, "[State Street ramps up pressure on excessive executive pay](#)," *Financial Times*, Feb. 3, 2018.

BUBBLES

Some critics of passive management argue that indexing can lead to an inflation or distortion of stock prices as assets flow into passive vehicles. For instance, in April 2017, it was reported that “Unruly trading in the shares of some small gold companies is rekindling investor concern about the pressure that fast-growing passive funds can exert on the stocks they are meant to track.”²³ “Waves of money” flowing into a number of exchange-traded funds tracking gold-mining companies had supposedly caused pricing distortions in the underlying stocks—a classic case of the supposed tail wagging the supposed dog.

We have no opinion on whether there was a bubble in gold stocks in April 2017. The bubble, if there was one, had nothing to do with passive management, and is only tangentially related to the ETF in question.

Consider what would have happened if no ETFs invested in gold stocks, but actively-managed mutual funds did. Then presumably the assets that flowed into the gold ETF would have gone into an actively-managed fund. An active portfolio would almost certainly be less diversified than the ETF, which means that **the same asset flows would have been directed to a smaller number of stocks** where they would presumably have been even more disruptive.²⁴

This episode is illustrative of a more general criticism of passive management—the **claim that it’s hard for active managers to outperform because too much money goes into index funds**. The critics argue that since “every new indexed dollar goes to the same places as previous dollars did, this guarantees that the most valuable company stays the most valuable, and gets more valuable and keeps going up.” Without valuation parameters, the market supposedly becomes a “bubble machine” which “inflates already large companies, blind to whether they’re actually selling more widgets or generating bigger profits.”²⁵ Capitalization-weighted indices like the S&P 500 are therefore “too trusting of the market’s judgment on a handful of very large stocks.”²⁶

This, say the critics, leads to a vicious cycle. When managers underperform, they risk termination. The asset owner might then reinvest with an index fund. Underperforming managers own underperforming stocks; the index funds that gain assets own outperforming stocks (as well

Without ETFs, the same asset flows would have been directed into fewer stocks.

²³ Loder, Asjlynn and Chris Dieterich, “[How a \\$1.4 Billion ETF Gold Rush Rattled Mining Stocks Around the World](#),” *Wall Street Journal*, Apr. 23, 2017.

²⁴ Lazzara, Craig, “[The Wrong Diagnosis](#),” Apr. 24, 2017.

²⁵ Ledbetter, James, “[Is Passive Investment Actively Hurting The Economy?](#),” *The New Yorker*, Mar. 9, 2016. The author is quoting Timothy O’Neill of Goldman Sachs.

²⁶ Rennison, Joe and John Authers, “[‘Momentum’ investing bubble worries fanned by focus on market cap](#),” *Financial Times*, Oct. 10, 2017.

Underperforming managers own underperforming stocks; the index funds that gain assets own outperforming stocks as well.

as the underperformers); the shift from one to the other “lead[s] to the amplification of the prevailing price trends. A version of this is happening now as investors shift funds from active managers...into passive ETFs.”²⁷ This supposedly produces “exploitative momentum investing,” which gives short shrift to the analysis and valuation of company fundamentals.

Notice that this complaint is quite distinct from the so-called “inclusion effect,” which denotes the tendency of a stock’s price to rise when it becomes a member of an index. There is evidence of such an effect, although it may be shrinking over time, and some analysts suggest that it is strictly temporary.²⁸ The critics’ argument is not about the changes in an index’s composition, but rather about the effect of assets moving into an index with unchanging constituents.

So understood, this argument is a classic example of the critics attributing to passive management conditions that, if they exist at all, are a function of investment management in general. Overvalued and undervalued stocks exist regardless of index funds. So does the practice of momentum investing, although we’re not quite sure what’s “exploitative” about it. It is true that underperforming managers are more likely to be fired than outperformers, and it’s tautological that underperforming managers are disproportionately invested in underperforming stocks. Thus, if assets move from underperformers to index funds, those flows are likely to result in low momentum stocks being sold and high momentum stocks being bought.

To whatever degree assets would have moved into high momentum stocks, the move would still have happened without index funds.

But consider what would happen if there were no index funds. Underperforming active managers would still be fired, and presumably replaced with active managers who had been more successful in the recent past. To whatever degree assets would have moved from low momentum stocks to high momentum stocks, **the move would still have happened even in the absence of passive management.** In fact, the effect would be even greater without index funds, since the active managers who gained assets would typically be less diversified, and therefore arguably have a higher momentum bet, than a comparable index.²⁹

We would go further and argue that **flows into index funds produce no distortion in the relative valuations of index constituents.** Suppose an asset owner makes a large contribution to an S&P 500 index fund, requiring the purchase of all 500 issuers. Apple Inc. is the largest component of the index, with a weighting of approximately 4%. For every \$1,000,000 going into the index, \$40,000 goes into Apple. The result of the investment of the

²⁷ Wooley, Paul and Dimitri Vayanos, “[Why investors should be weaned off tight tracking to market indices](#),” *Financial Times*, Dec. 20, 2017.

²⁸ See, e.g., Soe, Aye M. and Srikant Dash, “[The Shrinking Index Effect: A Global Perspective](#),” November 2008 and Kasch, Maria and Asani Sarkar, “[Is There an S&P 500 Index Effect?](#),” *Federal Reserve Bank of New York Staff Reports*, November 2012.

²⁹ See Edwards, Tim, Craig J. Lazzara, and Luca Ramotti “[The Volatility of Active Management](#),” August 2016.

asset owner's contribution is simple: **Apple was 4% of the index before the hypothetical trade, was 4% of the amount purchased, and is 4% of the index after the trade.** The flow of funds into the S&P 500, in other words, **had no impact** on the stock's relative valuation.³⁰

This by no means demonstrates that Apple is fairly valued. It may very well be overvalued, as the critics imply. But if it's overvalued, it got to be that way because investors bought Apple, not because they bought the entire S&P 500.

Bubbles have inflated and deflated long before the existence of index funds.

Finally, we note that bubbles have inflated and deflated long before the existence of index funds. "If index funds cause market bubbles, they're not nearly as good at it as human beings are. Why should we be more afraid of index funds causing a bubble today than anybody was of active investors causing one in 1999 or 1972 or 1929? The Panic of 1907, the Panic of 1873, the Panic of 1857, the Panic of 1837, the crash of 1792 and the pan-European bubble of 1720 were all inflamed by human stock-pickers long before the idea of an index fund had ever occurred to anybody."³¹

Why Active Management Has Become More Difficult

Importantly, to say that index funds don't create bubbles is not to say that index funds don't make life more challenging for active managers. They do, but not because they promote the persistent overvaluation of the index's largest holdings. The difficulty arises because, in any market, there is **no net supply of alpha**. The outperformance of above-average investors is precisely offset (before costs) by the underperformance of below-average investors. **When professionals become the dominant force in a market, the average professional cannot expect to outperform.**³²

The outperformance of the winners is precisely offset by the underperformance of the losers.

Exhibit 2 provides a simple illustration. We posit two scenarios, both for a market valued at \$20 trillion. In Scenario A, the entire market is assumed to be actively managed. Thus \$10 trillion will have above-average performance, and \$10 trillion will suffer below-average performance. By how much will the winners win? It depends on the answer to another question: by how much do the losers lose?

In Scenario A, we've (arbitrarily) assumed that the average underperformance of the losers is 5%. Then the total alpha available for the above-average managers to harvest is \$500 billion (5% of \$10 trillion).

³⁰ See Siegel, Laurence B., "[Index Fund Silliness: Indexing Doesn't Distort Anything](#)," AJO, August 2017.

³¹ Zweig, Jason, "[And Now For Something on Index Funds](#)," Apr. 13, 2017.

³² Ganti and Lazzara, *op.cit.*, pp. 6-8. See also Lazzara, Craig J., "[The Shrinking Supply of Alpha](#)," Oct. 10, 2013.

Exhibit 2: A Passive Alternative Shrinks the Supply of Alpha		
	SCENARIO A	SCENARIO B
Total Market Cap (\$ Trillion)	20.0	20.0
Percentage Actively Managed (%)	100%	80%
Value Actively Managed (\$ Trillion)	20.0	16.0
Value Outperforming (\$ Trillion)	10.0	8.0
Value Underperforming (\$ Trillion)	10.0	8.0
Average Underperformance of Underperformers (%)	5%	4%
Total Underperformance (\$ Billion)	500	320

Source: S&P Dow Jones Indices LLC. Table is provided for illustrative purposes.

In Scenario B, we make two changes. First, we assume that 20% of the market is now managed by index funds, leaving \$16 trillion for active managers. Half of this value will underperform, meaning that \$8 trillion of assets will lag the market. **What is the average underperformance of the underperformers now?** We argue that it should be *better* than the 5% lag in Scenario A. When a passive alternative is available, presumably **it is the least capable active managers who lose the most assets. Index investing thus has the effect of culling the worst active managers.** The ability level of the average active manager goes up, which means that the average underperformance of the laggards improves. **If the losers' underperformance improves, however, the winners' outperformance must also diminish.**

By reducing the number of underperforming active managers, indexing reduces the rewards for those who remain.

We've assumed in Scenario B that the losers' underperformance improves from -5% to -4%. Then the aggregate alpha available to the above-average managers is \$320 billion (4% of \$8 trillion). The hypothetical aggregate alpha pool falls by 36% as a consequence of a 20% decline in actively managed assets. **By reducing the number of potentially underperforming active managers, indexing reduces the rewards for those who remain.**

This may seem paradoxical, since the flow of assets from active to index managers raises the quality of the active managers who survive, increasing their average absolute ability. Why do more able active managers not achieve better results? Because **what matters is not absolute, but relative skill.** Passive management makes the active management game harder.³³

MARKET EFFICIENCY

Index funds buy the stocks they buy because those stocks are included in the index the funds are trying to track. Unlike active investors, who devote

³³ See Mauboussin, Michael J., Dan Callahan, and Darius Majd, "[Looking for Easy Games: How Passive Investing Shapes Active Management](#)," Jan. 4, 2017.

Market prices may not always be correct, but they're sufficiently correct that it's not worthwhile to try to detect when they're not.

considerable resources to some combination of fundamental, technical, and quantitative analysis, index funds rely on an index provider's rules and methodologies. Market prices may not always be correct, they'll argue, but they're sufficiently correct that it's not worthwhile to try to detect when they're not.³⁴ Indexers, in that sense, can be called "price takers," at least for individual stocks.

This ungrudging acceptance of market prices leads the critics of passive management to complain that index funds are both parasitic and potentially destructive. "Markets are efficient only because active managers buy underpriced assets and sell overpriced ones...By making markets more efficient, active managers are creating an environment where index fund investing is more appealing."³⁵ More importantly, observers have asked what will happen if passive management continues to take market share from active. Can there be too much indexing, and if there is, would the efficiency of capital markets be impaired?³⁶

Factor indices are not price takers.

Although it's correct to say that most passive investors are price takers, this is *not* true of the factor indices that underlie "smart beta" portfolios. Factor indices are based on metrics like value or momentum; they seek much the same end as active managers, although by different means.³⁷ A broad-based index like the S&P 500 may hold some richly-valued stocks, but a value-oriented index will avoid them in the same way that a value-driven active manager will avoid them.³⁸

That said, investors in non-factor-based index funds do indeed function as price takers. **In this respect, they resemble most of the world's population most of the time**, or at least that fraction of the world's population that doesn't live in a barter economy. When I bought my lunch today, I didn't bargain with the restaurant or otherwise engage in "price discovery"—I simply used the posted prices. The absence of bargaining was a feature, not a defect: "Widespread availability of market prices for everything from industrial commodities to manicures is what allows independent agents to make free economic choices that lead to far more liberty and prosperity than central planners could ever deliver."³⁹ **Passive investors, in other words, are hardly unique in their willingness to be price takers.**

³⁴ See Eugene Fama's comments in *Chicago Booth Review*, "[Are Markets Efficient?](#)," June 30, 2016.

³⁵ Pozen, Robert and Theresa Hamacher, "[Has the death knell of active management been rung too soon?](#)," *Financial Times*, Feb. 1, 2015.

³⁶ For a recent, and reasonable, summary of these concerns, see Landsman, Stephanie, "[Passive investing is a 'chaotic system' that could be dangerous, warns Robert Shiller](#)," Nov. 14, 2017. A less understated version can be found at Fraser-Jenkins, Inigo, et al., "[The Silent Road to Serfdom: Why Passive Investing is Worse Than Marxism](#)," Aug. 23, 2016.

³⁷ For an overview of factor investing, see Mainie, Sunjiv, "[The Story of Factor-Based Investing](#)," February 2015 and Doll, Christopher, "[Q&A: What is factor investing?](#)," Feb. 28, 2017. See also Lazzara, Craig, "[The Teleology of Smart Beta](#)," Mar. 29, 2016.

³⁸ Examples of such value-oriented indices would include the [S&P 500 Pure Value](#) and the [S&P 500 Enhanced Value Index](#).

³⁹ Asness, Cliff, "[Indexing Is Capitalism at Its Best](#)," *Bloomberg View*, Sept. 2, 2016.

Misvaluation is like street crime; active managers are like police officers on the beat.

A more important issue is whether there is a point beyond which the expansion of indexing causes market efficiency to degrade. At the limit, if 100% of assets were passively managed, misvaluation would be rife. One academic observer compares misvaluation to street crime and active managers to police officers on the beat.⁴⁰ **More police, less crime; more active managers, less misvaluation.** This is an important issue for indexers no less than for active investors, since the assumption of market efficiency is one of the underpinnings of the case for passive management.⁴¹ We find the argument that the growth of indexing is damaging market efficiency unconvincing:

- First, we can't resist observing that not all active investing contributes to market efficiency and efficient capital allocation. Those of us old enough to remember names like [Pets.com](#) or [Drkoop.com](#) will recognize that active managers are fallible human beings; they sometimes get it wrong, and when they do, capital can be badly misallocated. One of the ways the economy might adjust to such misallocations is by reducing the assets entrusted to those who made them—for example, by moving from active managers to index funds.
- Second, when index funds are offered in a market that was formerly controlled entirely by active managers, where do the passive assets come from? As we implied in our discussion of market bubbles, anyone who believes that some active managers are more skillful than others, and that their skill is manifested in outperformance, presumably must also believe that **the least skillful active managers lose the most assets.** Therefore **the growth of passive management must raise the quality of the surviving active managers.** If the quality of active managers rises, market efficiency is enhanced.
- Third, active traders trade with other active traders. If an active manager spots what he believes to be an opportunity and wants to allocate capital to a putatively undervalued stock, he will have to buy it from another active manager (or from a dealer who will lay off the position to another active manager).⁴² An index fund would have no reason to be the source of liquidity for such an information-driven trade. Whether index funds represent 10% of assets or 90%, **all information-driven trades are between two active managers.**
- Finally, active management's share of trading is far higher than its share of assets; it is trading that sets prices and drives market efficiency. **Passive assets under management (AUM) can rise**

The growth of passive investing raises the quality of the surviving active managers. This enhances market efficiency.

Active traders trade with other active traders, regardless of the fraction of assets active managers manage.

⁴⁰ Pastor, Lubos, "[Active Funds Have Time on Their Side: Lubos Pastor](#)," *Bloomberg View*, Mar. 7, 2012.

⁴¹ But not the only one! See Ganti and Lazzara, *op. cit.*, pp. 6-10.

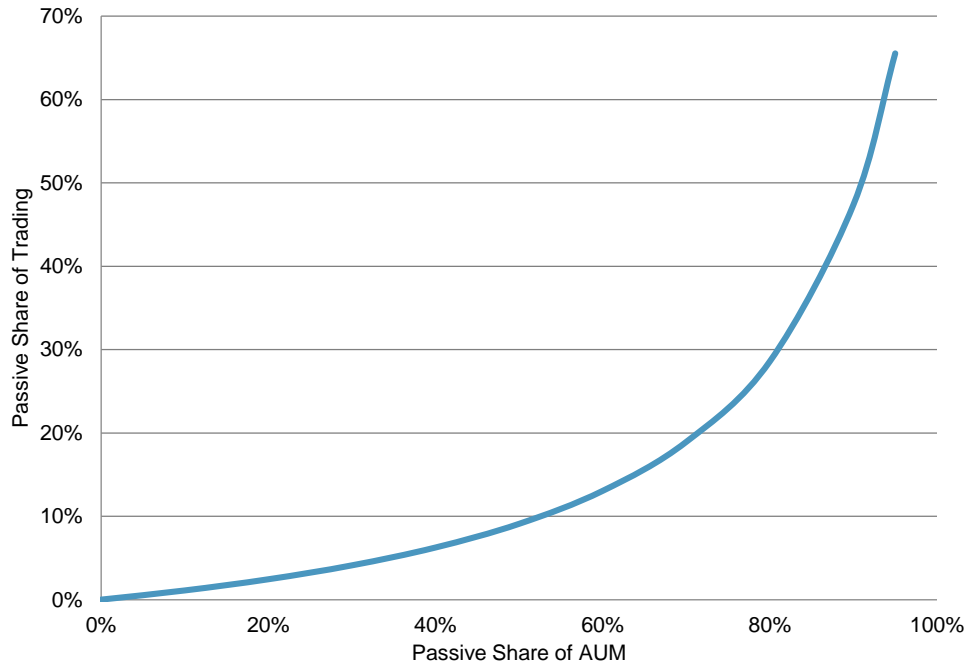
⁴² See Smetters, Kent, "[Why Critics of Passive Investing Are Wrong](#)," *Wall Street Journal*, Sept. 24, 2017.

dramatically without significantly diminishing the share of trading done by active investors.⁴³ Exhibit 3 shows the nature of the relationship under conservative assumptions.

We posit in Exhibit 3 that there are two categories of assets, active and passive, and that turnover is 50% annually for the active assets and 10% annually for the passive assets.⁴⁴ As assets shift from active to passive, the share of trading done by the passive managers naturally rises, but is always less than the passive share of AUM. For example, if 20% of the assets are passive, active managers will do 95% of the trading. If the share of passive AUM doubles to 40%, active managers will still do 88% of the trading. Under Exhibit 3's assumptions, in fact, passive AUM share has to rise above 83% before active managers' share of trading drops below 50%.

Exhibit 3: Passive Management's Share of Trading is Less Than Its Share of Assets

Active managers' share of trading is much greater than their share of assets managed. Trading sets prices and adjusts valuations.



Source: S&P Dow Jones Indices LLC. Chart is provided for illustrative purposes. Assumes that passive turnover is 10% annually and active turnover 50% annually.

It is trading, and not asset management per se, that sets prices and putatively corrects misvaluations. If active trading makes for an efficient market, **indexing has a long way to go before market efficiency is impaired.**⁴⁵

⁴³ See Ellis, Charles D, "[The Rise and Fall of Performance Investing](#)," *Financial Analysts Journal*, July/August 2014.

⁴⁴ These assumptions are quite conservative on both sides. Turnover for the S&P 500 has averaged 3.68% for the last 5 years, and active managers' average turnover is quite a bit higher than 50%. See, e.g., White, Amanda, "[Equity Portfolios' Tell-Tale Turnover](#)," Mar. 3, 2017.

⁴⁵ Vanguard founder John Bogle recently opined that indexing's market share might rise to as much as 90% without damage to market efficiency. See Platt, Eric, "[Vanguard's Jack Bogle predicts passive investing takeover](#)," *Financial Times*, Oct. 27, 2017.

Unavailable Shares

One way to test our intuition about the interaction of passive ownership and market efficiency comes from a natural experiment. The S&P 500, like most indices, is float-weighted—in other words, a stock’s weight in the index depends not on its total capitalization, but on the amount of its capitalization that’s available for public investors to buy. Unavailable shares—e.g., founders’ control blocks, or government holdings—are not included in the index.⁴⁶ The largest such excluded block in the S&P 500 comes from Walmart Inc., where approximately half of the total capitalization is closely held (by members of the founding Walton family), and is therefore not part of the index.

Half of Walmart’s capitalization is held by a de facto one-stock index fund. Does anyone argue that Walmart is not efficiently priced?

Effectively, therefore, half of the capitalization of Walmart is held in a one-stock index fund owned by one family. Like other index funds, this figurative one doesn’t trade actively—it just sits there, presumably votes its proxies, and collects its dividends. If, as we’ve estimated, 20% of the U.S. equity market is indexed, that means that an additional 10% of the total capitalization of Walmart is held in funds tracking the S&P 500 and its competitors. Why, one wonders, should we be concerned about that 10%, when the 50% permanently off the market evokes not a whimper? **No one, to our knowledge, has ever argued that Walmart is inefficiently priced because half of its cap is closely held.**

Correlations

A related criticism of passive management is the claim that the increase in index trading “contributes to...higher return correlations among stocks.”⁴⁷ This argument is of a piece with concerns about market efficiency—if correlations rise, it might imply that stocks are moving together simply because of their membership in a common index, without regard to the characteristics of the stocks themselves. In rebuttal, we submit Exhibit 4, which graphs the average pairwise correlation of the constituents of the S&P 500 between 1992 and 2017.⁴⁸ Correlations were relatively high during and after the 2008 financial crisis, but since then have been on a downtrend, finishing 2017 near their 26 year low. Importantly, note that correlations have been below their median level since mid-2016, despite the ongoing growth in passive assets. **Whatever the growth of index funds may have done, it has not driven correlations higher.**

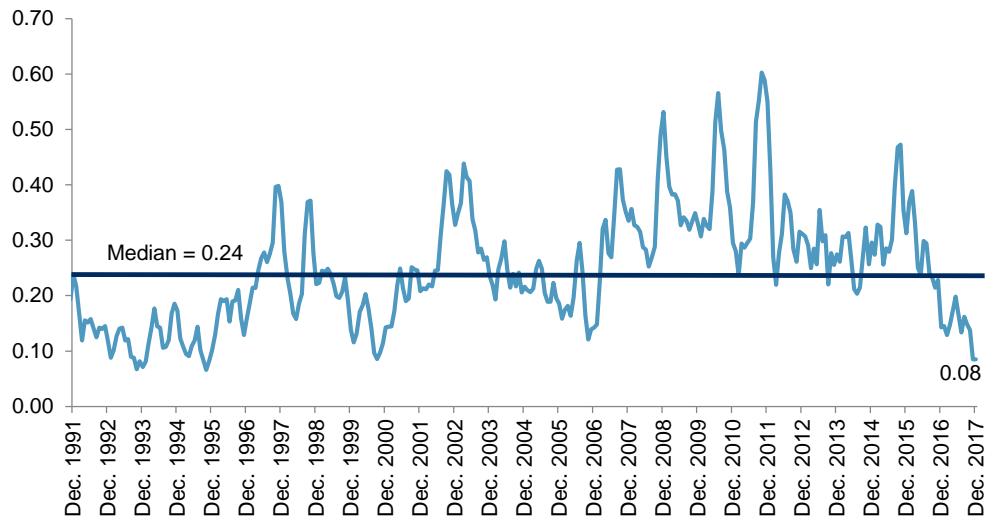
⁴⁶ Float weighting became common practice among index providers in the early years of this century, largely in response to the realization that stocks with less than 100% availability would be squeezed upward by the growth of passive assets under management. Float adjustments are typically much greater outside the U.S.

⁴⁷ Sullivan, Rodney N. and James X. Xiong, “[How Index Trading Increases Market Vulnerability](#),” *Financial Analysts Journal*, March/April 2012.

⁴⁸ See Edwards, Tim and Craig J. Lazzara, “[At the Intersection of Diversification, Volatility and Correlation](#),” April 2014.

Exhibit 4: S&P 500 Correlation Has Recently Been Near Its All-Time Low

At the end of 2017, correlations were near an all-time low, while index fund assets were at an all-time high.



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 1990, to Dec. 31, 2017, plotting three-month moving average of monthly correlations. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Corporate Activity and Macroeconomic Price Discovery

Even in a world completely dominated by passive investors, we shouldn't overlook the role played by corporate issuers in driving market efficiency. Corporations take part in price formation via stock issuance, buybacks, and mergers. Additionally, corporations have a unique advantage: "Issuers not only have the means to play an equilibrating role, they are also the agents who most likely possess the requisite information."⁴⁹

Finally, it's important to **recognize the role that index vehicles play in setting market prices at a macro level**. The most frequently-traded security in the U.S. is an ETF tracking the S&P 500, and S&P 500 futures are among the world's most actively-traded derivative contracts. **The active trading of these passive vehicles is itself an expression of investor sentiment and thus contributes directly to price discovery.** Thanks to arbitrageurs, that discovery is then inevitably reflected in the index's component securities. In that sense, therefore, index vehicles may be price takers at a microeconomic level, but help to set prices at a macroeconomic level.

APPROACHING EQUILIBRIUM

"The test of a first-rate intelligence is the ability to hold two opposed ideas in the mind at the same time, and still retain the ability to function."⁵⁰ Here are two opposed ideas, both of which we believe to be true.

⁴⁹ Cornell, Bradford, "[Passive Investing and Market Efficiency](#)," June 20, 2017.

⁵⁰ Fitzgerald, F. Scott, "[The Crack-Up](#)," *Esquire*, February 1936.

Some active management is required in order for prices to approximate fair value.

- The average active manager will underperform most of the time.⁵¹ This gives asset owners an incentive to move assets from active managers to index funds. If it continues indefinitely, this trend will endanger the survival of active management.
- Some active management is needed in order for prices to approximate fair value; index investors therefore have an interest in the preservation of at least some of their active competitors. If there are no active managers, market efficiency will suffer.

The tremendous recent growth of passive investing prompts a natural question: what might the ultimate equilibrium between active and passive management look like? Academics have been concerned with this question for many years.⁵² We suggest a simple and intuitive way of thinking about the problem.

Exhibit 5: If the Majority Underperform by a Little, the Minority Can Outperform by a Lot		
	SCENARIO B	SCENARIO C
Total Market Cap (\$ Trillion)	20.0	20.0
Percentage Actively Managed (%)	80%	80%
Value Actively Managed (\$ Trillion)	16.0	16.0
Value Outperforming (\$ Trillion)	8.0	4.0
Value Underperforming (\$ Trillion)	8.0	12.0
Losers' Underperformance (%)	4.00%	2.67%
Winners' Outperformance (%)	4.00%	8.00%
Total Underperformance (\$ Billion)	320	320

Source: S&P Dow Jones Indices LLC. Table is provided for illustrative purposes.

Exhibit 5 is an extension of Exhibit 2. We ended Exhibit 2 with Scenario B, in which the \$20 trillion equity market was 80% actively managed and 20% passively managed. Of the \$16 trillion managed actively, equal amounts were managed by below-average and above-average managers. We assumed that the average underperforming manager underperformed by 4% per year. Then the total alpha available for the above-average managers to harvest was \$320 billion (4% of \$8 trillion). This is consistent with our earlier argument that there is no natural source of alpha: the outperformance of the winners is provided by the underperformance of the losers.

⁵¹ Soe, Aye M. and Ryan Poirier, "[SPIVA U.S. Scorecard](#)," Year-End 2017.

⁵² See, e.g., Grossman, Sanford J. and Joseph E. Stiglitz, "[On the Impossibility of Informationally Efficient Markets](#)," *The American Economic Review*, June 1980.

But Scenario B is too simplistic. Although the total outperformance of the winners comes from the underperformance of the losers, **it's not necessary that winners and losers manage the same quantity of assets.** In Scenario C, we assume that three-quarters of the actively-managed \$16 trillion underperforms—so that \$12 trillion is run by below-average managers, and \$4 trillion is run by above-average managers. If the losers underperform by an average of 2.67%, their gross underperformance amounts to the same \$320 billion we had in Scenario B. But now, the winners outperform by an average of 8%.

Outperformance and underperformance need not be symmetric. If a majority of assets underperform by “a little,” the minority can outperform by “a lot.”

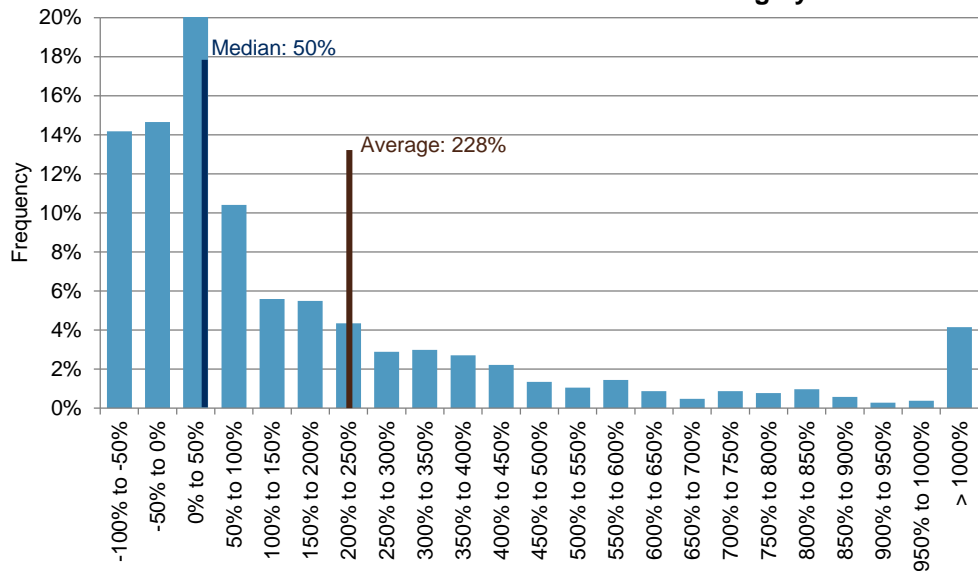
What this example illustrates is that, while the aggregate under- and outperformance remain constant, their **distribution need not be symmetric.** In Scenario C, a large majority of active managers underperforms by a relatively small amount. This enables a minority to outperform by a much larger amount.

This is, of course, a stylized example, and admittedly imprecise, not least about the exact definition of “relatively small.” A good working definition of “relatively small” would be “not so large that you're in jeopardy of being summarily fired.” **If relative performance losses are acceptable, the risk of an active manager being replaced by an index fund diminishes, and a rough equilibrium between active and passive AUM might be maintained.**

Equilibrium between active and passive requires that the majority of assets underperform.

The nature of the asymmetry is critical to achieving equilibrium. Exhibit 5 shows an underperforming majority and an outperforming minority. Computationally, those positions could be reversed. If \$4 trillion of actively managed assets *underperformed* by 8%, then the remaining \$12 trillion could *outperform* by 2.67%. The trouble isn't arithmetical, it's behavioral: lagging by 8% is so egregious that the managers who did it wouldn't survive for long. **If there is to be a stable asymmetry, it has to be one where the absolute value of the average underperformance is tolerably small. This requires that the majority of assets underperform.**

Exhibit 6: Constituent Returns for S&P 500 Members Are Highly Skewed



Source: S&P Dow Jones Indices LLC, FactSet. Data from Dec. 31, 1997, to Dec. 29, 2017. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Stock prices are positively skewed. Active managers start with a disadvantage, which produces a majority of underperformers.

Majority underperformance, of course, is **consistent with the observed behavior of both active manager performance and equity market returns**. As Exhibit 6 demonstrates, U.S. equity returns are positively skewed over time. Active managers typically hold only a small minority of the names in an index. Every stock they select has a 50/50 chance of being above median, but when returns are skewed, they have less than a 50/50 chance of being above average. Active stock selection therefore starts with a disadvantage—a disadvantage that results in **a majority of underperformers and a minority of outperformers**.⁵³

FINAL THOUGHTS

The growth of index funds and passive management has been one of the most significant developments in modern financial history. The dollars saved by the customers of index funds—in terms of reduced fees and reduced active underperformance—now certainly must be reckoned in the hundreds of billions. This benefit did not materialize out of thin air, of course—fees saved by index customers are fees not received by active managers.

It is not surprising, therefore, that active managers would mount a stubborn resistance to the growth of index funds. Some of their commentary is risible and can easily be dismissed, but we take issue even with the more substantive complaints. Common ownership has not been shown to lead to collusive behavior; passive managers are not demonstrably poor stewards of their customers’ assets; if the equity market is in a bubble, it was not

⁵³ See Soe and Poirier, *op. cit.* and Ganti and Lazzara, *op. cit.*, pp. 9-10. See also Lazzara, Craig, “[The Skew Is Not New](#),” Feb. 22, 2018.

inflated by index funds; and there's no evidence that passive management has damaged market efficiency. **The growth of index funds in itself evidences the value that passive management delivers to the investment community.**

We anticipate that index funds will continue to take market share from active managers. This trend may eventually diminish. An equilibrium between active and passive management would require that the majority of actively managed assets underperform by a relatively small amount, enabling a minority of assets to outperform by more.

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