

Considerations for active fund investing

- In this piece and its companion, *Considerations for Index Fund Investing*, we aim to provide foundational implementation considerations for investors to include in the decision to use active or index strategies in gaining exposure to a chosen market segment.
- Such foundational implementation considerations should be accounted for by both index and active fund investors, particularly given the ongoing convergence in the applications of both strategies.
- Incorporating considerations outlined in this paper into a sound and rigorous decision framework regarding the inclusion of active funds in your investment plan can strengthen your conviction in—and can increase—your chances of investment success.

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Active fund investing and index fund investing: Two sides of the same coin

Considerations for Active Fund Investing is an introductory piece for those considering investing in active funds.

The framework in this paper assumes that an investor seeks exposure to a specific market segment and aims to provide introductory concepts to consider when implementing the exposure with an actively managed fund.¹ Investors can also use such concepts when implementing exposure to a market segment with an index fund.² The decision of how to incorporate active and index strategies in an investment plan should not be regarded as active versus index. We view the framework in this paper and the one in its companion paper, *Considerations for Index Fund Investing*, as two sides of the same coin.

This piece aims to provide a starting point to help investors assess the use of active funds to gain exposure to a market segment. It should be viewed as a foundation on which investors can build more advanced and detailed concepts, notably those related to portfolio construction and manager selection.

To highlight this, we use a framework developed in *Vanguard's Principles for Investing Success* that details the benefits of incorporating goals, balance, cost, and discipline into investment planning.³

In that regard, successful active fund investing:



Provides the opportunity to achieve the **goal** of outperformance.



Requires **balance** between diversification and the magnitude of outperformance.



Curtails **cost** to increase the likelihood of outperformance.



Requires **discipline** to realize the benefits of active funds.

¹ Market segments can be defined as broadly, such as equities and bonds, or as narrowly, such as industries, as investors choose. This paper, for data availability and consistency purposes, focuses on equity and fixed income funds available for sale and invested domestically. However, the perspectives and results discussed here hold for nondomestic funds as well.

² See the framework for incorporating both index and actively managed mutual funds in a portfolio containing multiple market segments in Vanguard's proprietary work by Aliaga-Díaz et al. (2019). Also see Plagge, Wang, and Rowley (2022) for a discussion of the increasingly similar application of index and active strategies in portfolio construction.

³ See Vanguard (2023).



Providing the opportunity to achieve the goal of outperformance

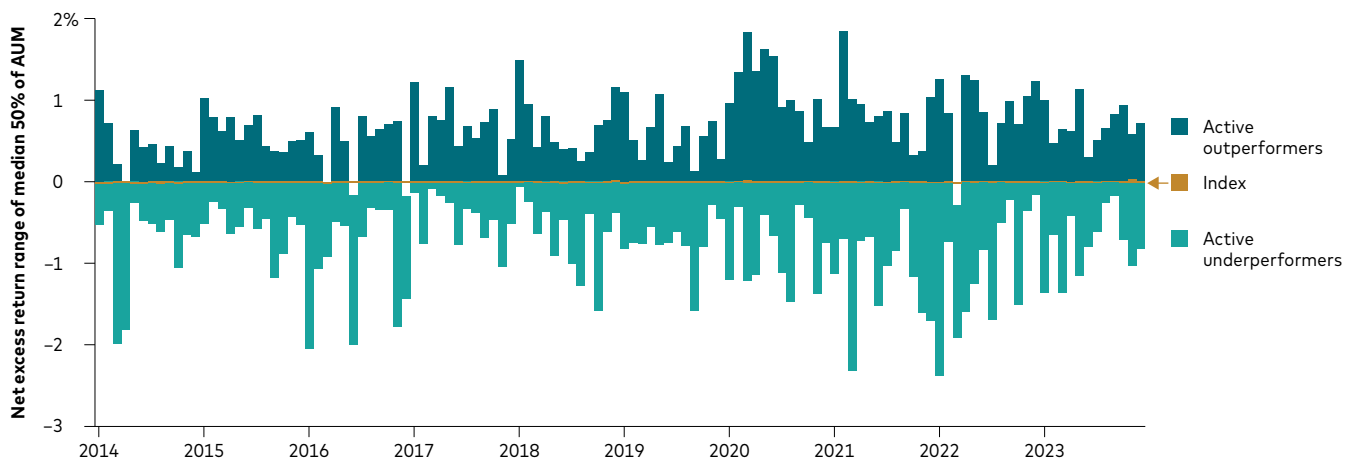
We start with the assumption that an investor desires exposure to a specific market segment, such as domestic equity or fixed income markets. The goal of active fund managers is to outperform a particular market segment and its representative benchmark over time. To provide the potential for outperformance, active managers must position their funds differently from the benchmark in the number of securities held or their respective portfolio weights, or both.⁴ In doing so, the active fund exposes investors to what is referred to as active risk.⁵

Figure 1 shows that active funds expose investors to greater active risk than index funds. Although deviations from benchmark performance do occur for index funds, they are relatively small compared with those of active funds.⁶ An active manager strives to outperform its benchmark consistently over time. In this pursuit, investors are exposed to the risk of the manager's underperforming. This dispersion around benchmark returns over time—or active risk—can be quantified by metrics such as tracking error and should be included in any risk assessment of active managers or incorporation of active funds into a portfolio.⁷

FIGURE 1

No free lunches: Outperformance comes at the risk of underperformance

Relative-performance predictability falls with active fund investing



Notes: The chart displays the assets under management (AUM)-weighted interquartile range (25th to 75th percentile) of monthly net excess returns of active and index U.S. equity funds available for sale in the United States relative to their primary prospectus benchmark for the 10 years ended December 31, 2023. See the Appendix on page 16 for fund inclusion criteria.

Sources: Vanguard calculations, based on data from Morningstar, Inc.

- 4 Outside of security selection and weighting decisions within benchmark constituents, style drift can occur when active fund managers hold securities that are not included in the benchmark they seek to outperform. Many funds do this to varying degrees, but it can affect expected performance and a fund's place in, or impact on, a portfolio when it results in a fund risk profile that differs significantly from that of the market segment an investor wants exposure to. This can be taken into account with a factor-adjusted approach to calculating excess returns, as outlined in Fama and French (1993). A further discussion would exceed the scope of this paper.
- 5 All investing is subject to risk. Index fund investing seeks to track a benchmark and thus provide relative-performance predictability compared with that of active fund investing regarding the expected return of the benchmark. The benchmark's realized positive and negative returns represent the risk of the market segment (systematic risk). Active fund investing's goal of outperforming a stated benchmark implies greater variability of realized returns around those of the benchmark and results in active (idiosyncratic) risk that should be accounted for alongside market (systematic) risk in any fund or portfolio risk assessment. Sharpe (1966) outlines the role that expected risk and return should play in portfolio construction and performance analysis.
- 6 Technically, index fund investing also exposes investors to a degree of active risk, but index funds attempt to minimize this through benchmark replication or sampling strategies.
- 7 For a discussion of methods of formally incorporating tracking error into various approaches to portfolio construction, see Aliaga-Díaz et al. (2022).

Investors choose a fund to gain exposure to a market segment. When choosing between index and active funds, the primary tradeoff is between relative-return predictability and the opportunity for outperformance. To fully understand this trade-off, which informs an investor's active risk preference, it is important to understand the zero-sum game and the critical role that costs play in determining outcomes.⁸

The zero-sum game theory states that, at any given time, a market segment consists of the cumulative holdings of all market participants, and that the aggregate return on the market segment is equal to the asset-weighted return of all market participants.⁹ Because the market segment return represents the average return of all invested dollars, for each dollar that outperforms the segment, there must be one that underperforms by the same amount. Therefore, the excess return of all invested assets equals zero.

Before costs, this results in a bell curve of performance outcomes centered around zero (**Figure 2**). Accounting for costs will then pull all outcomes toward the left side of the curve, such that a fund with zero excess returns before costs will have negative excess returns after costs. This relationship holds on average for any market segment across the sum of all invested assets over a given period.

One of the prerequisites for investing in an active fund is a subjective expectation of outperformance in which the fund manager or investor has conviction.¹⁰ In Figure 2, we make additions to the theoretical zero-sum game bell curve to account for active management theory. Active fund managers and investors in actively managed funds believe that an active fund will outperform a benchmark over time, leading to positive excess returns on the right side of the distribution.¹¹ Figures 1 and 2 imply that, over time, you'll likely end up on the right side of the bell curve in certain periods and on the left in others.¹² But there are methods for increasing the likelihood of ending up on the right side more often.¹³ At their core, these methods rely on investor preferences regarding risk and return.

⁸ Risk preferences are often referred to in financial literature as risk tolerances. For consistency, we refer throughout this paper to risk preferences. Sharpe (1991) outlines the theory of the zero-sum game.

⁹ Investors managing these assets include but are not limited to open-end-fund managers (from which the bulk of the data in this paper are pulled), closed-end-fund managers, individual investors, hedge funds, and other institutional investors who buy and sell assets that are included in the benchmark representing the market segment.

¹⁰ Grinold (1989) outlines the need for conviction in, and an accurate assessment of skill on the part of, active managers or investors in active funds that should inform the subjective outperformance expectation. If you don't believe that active managers will outperform the benchmark of a market segment that you want to invest in over your time horizon, consider investing instead in an index fund that tracks that benchmark.

¹¹ Excess returns are relative to those of a benchmark that will itself realize positive and negative returns over time. The average of expected excess returns of index and active fund managers that deviate from those ebbs and flows should theoretically be zero, based on the zero-sum game theory.

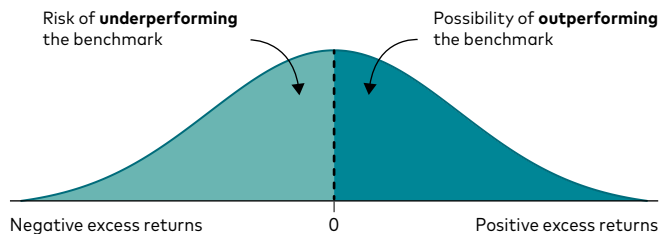
¹² See Wallick, Wimmer, and Balsamo (2015).

¹³ Waring and Siegel (2003) present one such method that relies on optimization techniques.

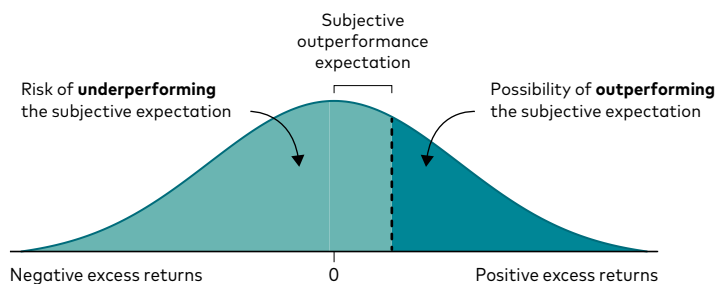
FIGURE 2

Conviction is key: Active fund investors expect to outperform a benchmark over time

In aggregate, investing remains a zero-sum game



Active fund managers and investors expect that the fund will outperform the benchmark over their investment horizon



Notes: The bell curve in each image consists of stylized data comparing the theoretical distribution of the excess returns of all invested assets in a market segment, an illustration of the concept of the zero-sum game, with net zero excess returns at the center. The figure images do not incorporate the impact of costs, which would shift each distribution to the left. Investors managing these assets include but are not limited to open-end-fund managers, closed-end-fund managers, individual investors, hedge funds, and other institutional investors who buy and sell assets that are included in the benchmark representing the market segment.

Source: Vanguard.



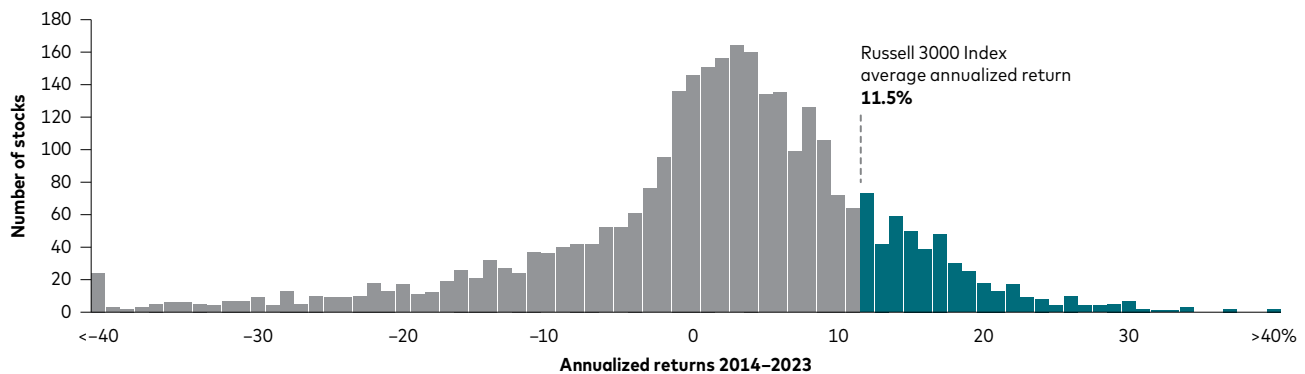
Balancing the benefits of diversification and outperformance

Broad portfolio diversification involves spreading investment risk across multiple assets to reduce tracking error relative to the market segment of the benchmark.¹⁴ Adding more portfolio holdings increases the chances of including outperforming securities. **Figure 3** highlights that a minority of stocks outperformed the Russell 3000 Index over the 10 years ended December 31, 2023.¹⁵ Over this period, the index returned an annualized 11.5%; that beat both the mean return (+1.8%) and the median return (+3.2%) of individual stocks in the index.

During the period, more than 80% of the stocks underperformed the index. Using this period of returns as an example, an active manager aiming to outperform the Russell 3000 selects and/or overweights securities from the pool of higher-performing stocks while avoiding and/or underweighting those from the pool of underperformers.¹⁶ This process of selecting and weighting securities determines the proportion of portfolio holdings that differ from benchmark holdings. This can be measured by a metric referred to as active share and, along with decisions about when to buy and when to sell securities, is one of the drivers of outperformance and contributors to active risk.¹⁷

FIGURE 3
A smaller pool of relative winners

A minority of constituents tend to outperform the index



Notes: The chart shows the distribution of annualized returns for stock constituents of the Russell 3000 Index in U.S. dollars as of January 31, 2014. The performance shown is for January 1, 2014, through December 31, 2023, with reinvestment of all dividends. Overlaid is the index's total return performance for the same period. **Past performance is no guarantee of future results. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.**

Sources: Vanguard calculations, based on data from Rimes.

¹⁴ See Markowitz (1952).

¹⁵ Bessembinder (2018) explains that this is typically the case, noting that over the period analyzed in his journal article (1926–2016), less than half of common stocks purchased and held for their lifetime exhibit positive returns.

¹⁶ We assume that managers are long-only and unlevered, meaning they cannot sell stocks short or borrow money to take additional risk in the pursuit of outperformance.

¹⁷ Cremers and Petajisto (2009) introduce the methodology for active share.

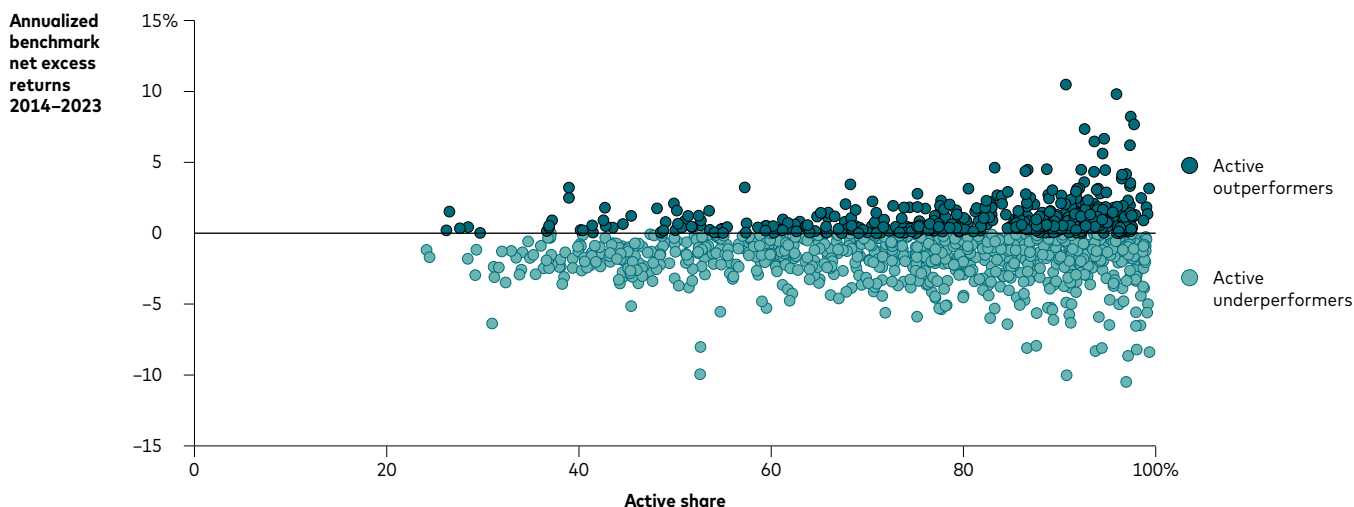
Active managers by nature expose themselves to active risk, because to outperform their benchmark, they hold a portfolio of securities that differs in number and/or weight from the securities held in the benchmark. The higher a fund's active share, the more pronounced the differences in portfolio composition are between a fund and its benchmark. All else being equal, this will increase tracking error.¹⁸ As the active share of funds increases, so does the magnitude of excess returns relative to their benchmark (**Figure 4**).¹⁹

There are methods that can increase investors' likelihood over their investment horizon of selecting one of the managers above the x-axis shown in the figure—and that should, in turn,

increase the investors' conviction in their expectation of outperformance.²⁰ Such methods typically involve a combination of quantitative and qualitative analysis and can include evaluating the active management firm, its culture, its philosophy, the skills of those who work there, and their processes.²¹ Any rigorous and thoughtful qualitative manager-selection process that seeks to identify top talent should be paired with quantitative metrics, including active share, tracking error, and perhaps most notably, cost—or, more specifically, a focus on lower-cost funds. Cost is one quantitative factor that has proven to improve the odds of outperformance.²²

FIGURE 4
For better or worse: Funds with higher active share exhibit greater performance dispersion

Potential for larger tracking error increases with active share



Notes: This figure is an application of work presented in Tidmore (2022) and Schlanger, Philips, and LaBarge (2012). We evaluated the oldest share class of all active equity funds within the fund inclusion criteria specified in the Appendix with monthly net returns available for the full 10-year period ended December 31, 2023. We plotted the annualized net excess returns relative to these funds' respective primary prospectus benchmarks as a function of the funds' latest "active share" data points as available in May 2024 from Morningstar, Inc. An active share of 0% would require an exact matching of all benchmark index weights, whereas a long-only active fund with zero overlap with its benchmark index would have an active share of 100%. We truncated the top and bottom 1% of active shares for data-cleaning purposes. Morningstar uses suitable exchange-traded funds (ETFs) as proxies for the funds' benchmark indexes.

Source: Vanguard calculations, based on data from Morningstar, Inc.

18 While outside the scope of this paper, research has shown that bundling active managers within a portfolio can reduce the portfolio's tracking error relative to the individual managers while maintaining a similar level of expected outperformance. This results in an increase in a portfolio's information ratio, which is a measure of outperformance per unit of risk (for example, tracking error). Forthcoming Vanguard research will explore this topic.

19 See Schlanger, Philips, and LaBarge (2012). In addition, Tidmore (2022) examined the impact of concentration, regardless of the level of similarity with the benchmark, on the dispersion of excess returns and found similar results. For further discussion of concentration and its relationship to manager skill, see Brown, Tiu, and Yoeli (2020).

20 See Wallick, Wimmer, and Balsamo (2015).

21 See Siegel and Scanlan (2014).

22 See Wallick, Wimmer, and Martielli (2013).



Curtailing cost: An enduring determinant of performance

Investors are subject to costs that include but are not limited to expense ratios, transaction costs, and, where applicable, taxes—all of which result in a drag on net returns over time.²³ Costs shift the distribution of the theoretical zero-sum game as well as the distributions in both panels of **Figure 5** to the left, as costs apply to both index and active funds. The figure shows that the distribution of monthly performance net of cost for all assets invested in U.S. equity and fixed income funds over the 10 years ended December 31, 2023, is indeed centered near roughly zero for both index and active funds.

The majority of excess returns for dollars invested in index funds—which aim to maximize return predictability relative to a selected benchmark—fall below zero after accounting for costs, highlighting the drag that costs have on fund returns relative to those of the benchmark. After

fees, actively managed dollars still exhibit a bell curve of returns spread over a wider performance range than index funds. This is the result of the higher relative-performance predictability of index funds that we first addressed in Figure 1 and the opportunity for outperformance of active funds highlighted in Figure 4.

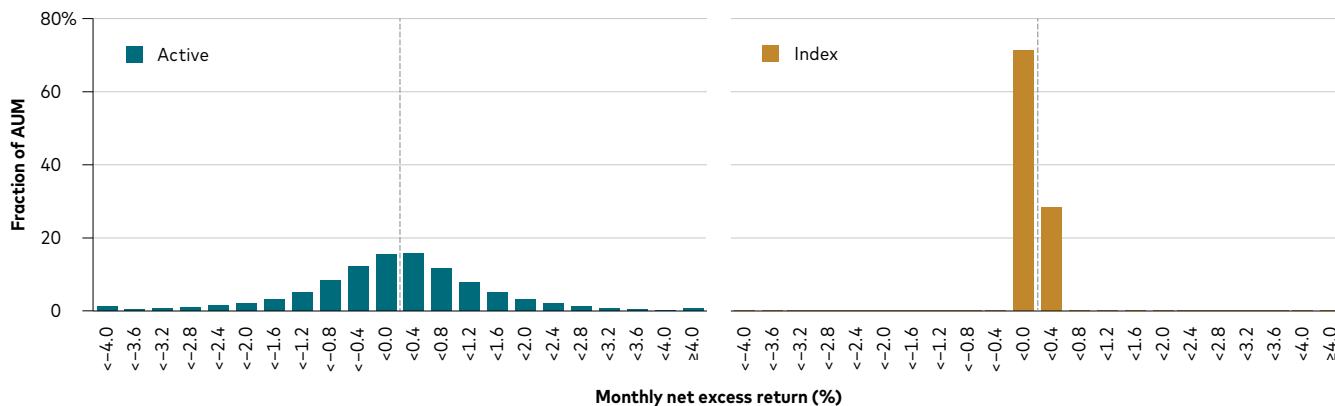
Equity excess returns have a wider distribution than fixed income excess returns given their reliance on capital appreciation rather than income. The same pattern of fund returns centered around zero holds true across other market segments such as small-capitalization, global, and emerging-market equities. These markets may well have greater informational asymmetries and wider distributions of returns, but the zero-sum game still holds for the period analyzed.

²³ *Net returns* refers to performance after costs are considered. All figures in this paper refer to performance net of expense ratios unless otherwise noted.

FIGURE 5

Costs represent a persistent hurdle in winning the zero-sum game

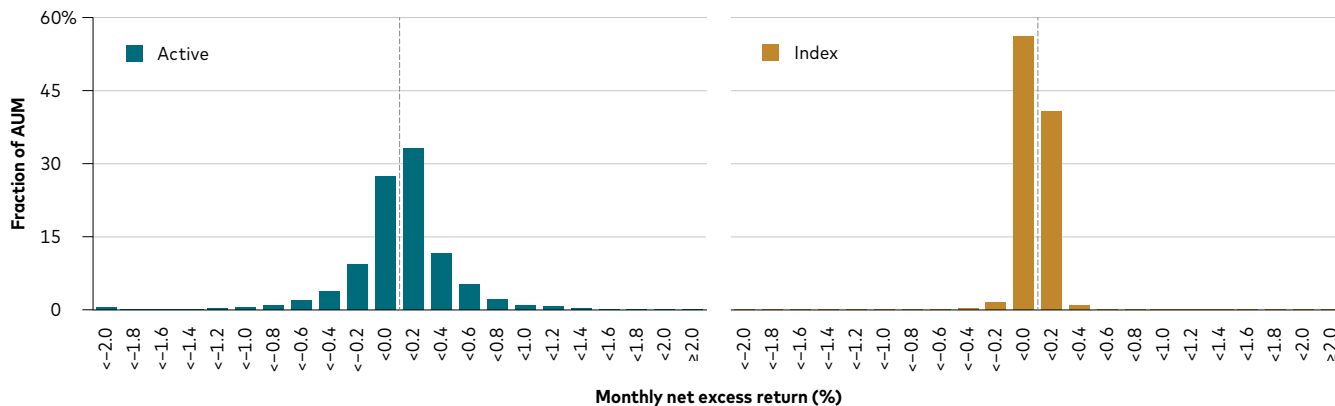
a. Equity fund performance follows the zero-sum game



Notes: The chart displays the AUM-weighted distribution of the monthly net excess returns of active and index equity funds relative to their primary prospectus benchmark in U.S. dollars for the 10 years ended December 31, 2023. AUM weights are updated for each month during the 10-year period based on live funds at the start of the month. See the Appendix for fund inclusion criteria. **Past performance is no guarantee of future results.**

Sources: Vanguard calculations, based on data from Morningstar, Inc.

b. Fixed income fund performance (almost) follows the zero-sum game



Notes: The chart displays the AUM-weighted distribution of the monthly net excess returns of active and index fixed income funds relative to their primary prospectus benchmark in U.S. dollars for the 10 years ended December 31, 2023. AUM weights are updated for each month during the 10-year period based on live funds at the start of the month. See the Appendix for fund inclusion criteria. **Past performance is no guarantee of future results.**

Sources: Vanguard calculations, based on data from Morningstar, Inc.

Beyond the operational costs of running a mutual fund, expense ratios can be associated with the accumulation of better information or skills by an active manager who then can effectively apply them to their strategies for pursuing outperformance.²⁴ That said, higher costs do not necessarily equate to better net performance. The usefulness of information and the skills required to effectively apply it to investment

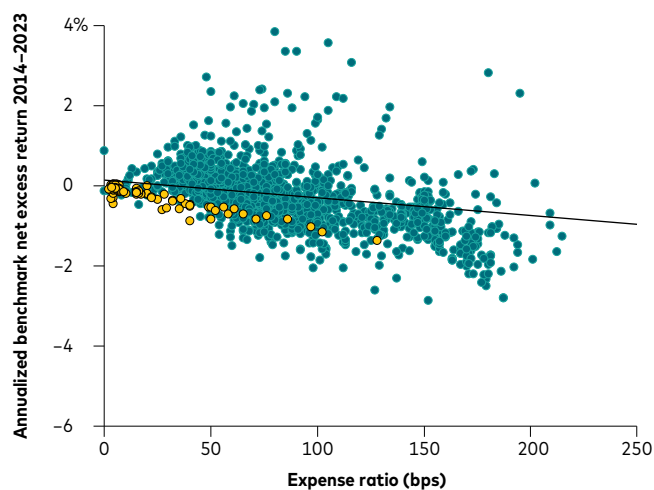
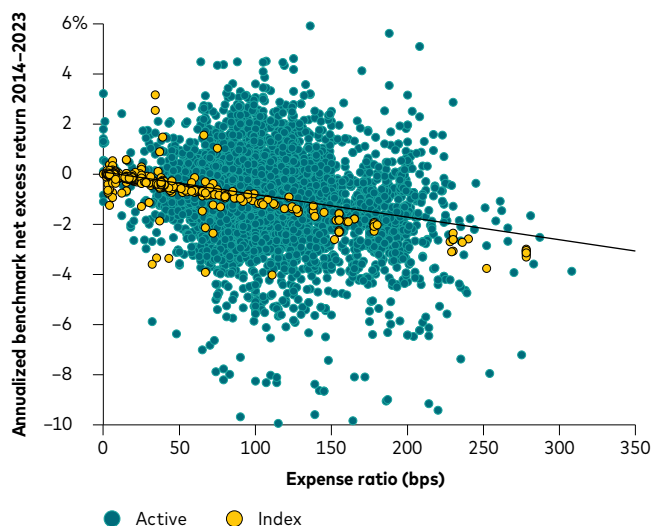
management processes evolve over time, affecting the active managers' performance both individually and systemically.²⁵ **Figure 6** shows a clear negative relationship between expense ratio and excess return. It shows the prevalence of outperformance increasing as you move left along the x-axis as the expense ratio of funds declines.

FIGURE 6
Higher expense ratios introduce a higher hurdle to outperformance

As costs increase, so does the propensity to underperform

Equity funds

Fixed income funds



Notes: The chart displays the distribution of the expense ratio (as of year-end 2023) and net returns in excess of a fund's prospectus benchmark in U.S. dollars for active and index equity and fixed income funds within the inclusion criteria specified in the Appendix over the period January 1, 2014, through December 31, 2023. The trend line results from a regression of excess returns on expense ratios, weighting the observations using net assets as of December 31, 2013. Basis points (bps) are one-hundredth of a percentage point. **Past performance is no guarantee of future results.**

Sources: Vanguard calculations, based on data from Morningstar, Inc.

²⁴ Berk and Green (2004) make a case for active managers' skill making up for funds' costs in most instances. Grossman and Stiglitz (1980) outline why, theoretically, active managers can add value relative to benchmark returns.

²⁵ Bernstein (1998) details the challenges faced by active managers and how they have evolved over time.

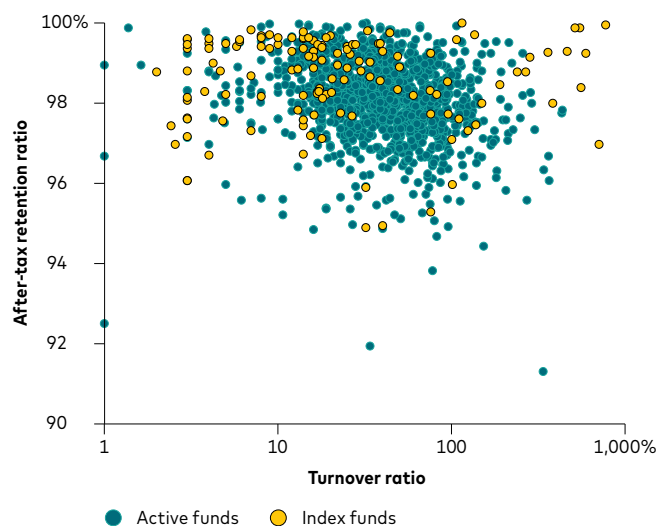
Active funds with lower expense ratios have lower hurdles to overcome in trying to land further to the right on the net performance bell curve or, in the case of Figure 6, higher on the y-axis.²⁶ Even funds with higher expense ratios can and do outperform, but they must overcome a higher hurdle in order to do so.²⁷

To fully appreciate the cost of fund ownership, it is important to understand how turnover and taxes can affect the all-in cost of ownership. Turnover is a proxy for the level of a fund's transaction activity, which can result in transaction and tax costs.²⁸ Transaction costs, such as bid/ask spreads, directly erode fund returns, while tax costs are more situational in nature.²⁹ Investors subject to capital gains taxes should pay close attention to the turnover of funds and the risk that realized gains in their portfolio will reduce the retained post-tax returns. **Figure 7** makes clear that higher turnover is associated with lower after-tax retention.

Just as with higher expense ratios, funds with higher transaction and tax costs can and do outperform their benchmarks. But lower costs of all types allow investors to retain more of the returns they've earned and present a lower hurdle to outperformance.

FIGURE 7
High turnover erodes the after-tax retention ratio

Lower-turnover funds tend to retain more of their pretax returns



Notes: The chart shows the relationship between fund-level turnover ratios on a logarithmic scale and fund-level asset-weighted after-tax retention ratios for index and active U.S. equity mutual funds. Turnover ratio is the median five-year annual turnover. Asset-weighted after-tax retention ratios are trailing five-year annualized after-tax retention ratios for each fund, weighted by the proportion of the average monthly AUM of each share class over the five-year period relative to the total fund-level average AUM over the same period. Data cover December 31, 2018, through December 31, 2023. The dependent variable is the five-year annualized after-tax retention ratio, which we define as $([1 + \text{trailing five-year annualized post-tax return}] / [1 + \text{trailing five-year annualized pre-tax return}])$ and represents the annual percentage of pre-tax assets—that is, end-of-period wealth—that an investor retains after paying taxes on fund distributions during the given period. Post-tax returns assume the U.S. highest federal income tax bracket applied at the time of each distribution of income or capital gains. State and local income taxes are not reflected in the calculations. Post-tax distributions are assumed to be reinvested, and post-tax returns are adjusted for loads and fees, including deferred loads or redemption fees. We use portfolio turnover ratio as the independent variable, which is calculated by taking the lesser of purchases or sales and dividing it by average monthly net assets. See the Appendix for fund inclusion criteria. **Past performance is no guarantee of future results.**

Sources: Vanguard calculations, based on data from Morningstar, Inc.

²⁶ Index funds similarly benefit from lower costs in that there is less of a hurdle for them to more closely track the returns of their benchmarks.

²⁷ See Wallick et al. (2017).

²⁸ See Dickson (2024) for a discussion of the impact of taxes specifically and costs generally. The implementation of strategies, whether index or active, also results in transaction costs, which are not directly factored into the expense ratio for a fund but which do affect fund performance. An example would be bid/ask spreads. One of the skills associated with index and active fund managers is the ability to minimize the impact of such costs on performance.

²⁹ For example, investors should consider the tax-advantaged nature of accounts in making decisions about index and active fund investing. This decision framework, referred to as asset location, is discussed in detail in Padmawar and Jacobs (2022).



Investing with discipline to realize the benefits of active funds

Discipline in investing is the ability to adhere to an investment plan or strategy. This includes plans that incorporate active management. Building discipline into an investment plan is important, as many investors react to past performance. Without discipline, investors are more likely to abandon their plan and thus reduce the likelihood of achieving their goals.³⁰

Even active managers who ultimately outperform their benchmarks over long time horizons often endure periods of potentially prolonged and deep underperformance along the way (**Figure 8**). Figure 8a shows that a large majority of outperforming equity and fixed income funds actually underperformed their benchmark in at least three of the 10 years analyzed. Figure 8b shows that a significant majority of outperforming active equity funds experienced a maximum cumulative underperformance (MaxCU) of more than 5%, and nearly half experienced such underperformance of more than 10% over the decade.³¹ A minority of outperforming active fixed income funds experienced relative underperformance of more than 5% during this period. This speaks to the differences in volatility associated with equity and fixed income returns.

To realize the benefits of outperformance, investors must endure periods of underperformance over their investment horizon. The benefits of selecting and remaining invested with a manager that outperforms can be substantial.³² Having the discipline to remain invested even during periods of active manager underperformance thus increases the likelihood of investment success.

We believe that investors' discipline to stick with their decisions is a product of the rigor of the decision process itself and the conviction that it generates in their ability to successfully navigate market environments over their investment horizon.³³ The path to outperformance is bumpy and can be paved with deep and prolonged periods of underperformance. But for investors with conviction in the ability of a manager, fund, or portfolio to outperform and a willingness to endure the associated risks, active management can play an important role in a well-designed investment plan.

We hope the reflections shared in this paper and its companion, *Considerations for Index Fund Investing*, provide a solid base on which investors can build a sound and rigorous decision framework for strategically selecting funds that provide exposure to a desired market segment. Areas of future research may include perspectives on approaches to active management, the performance of active management in different market segments or environments, the impact of asset location, metrics that assess and decompose active fund management performance, the ongoing review of an investor's active fund managers and portfolios, and the impact of investor-specific goals and investment horizons on the active and/or index fund investment decision. Proprietary and academic examples of these research areas are provided in this paper's footnotes.

30 See Tidmore and Hon (2021a) for perspectives on discipline in active equity fund investing and Tidmore and Hon (2021b) for perspectives on discipline in active fixed income fund investing.

31 See Khang and Ertl (2023). MaxCU assumes that an investor entered the active fund at the start of the period of interest, and it expresses—as a percentage of that initial investment—the worst difference in the cumulative performance of the active fund and its benchmark that the investor could have realized by exiting at any point during the period.

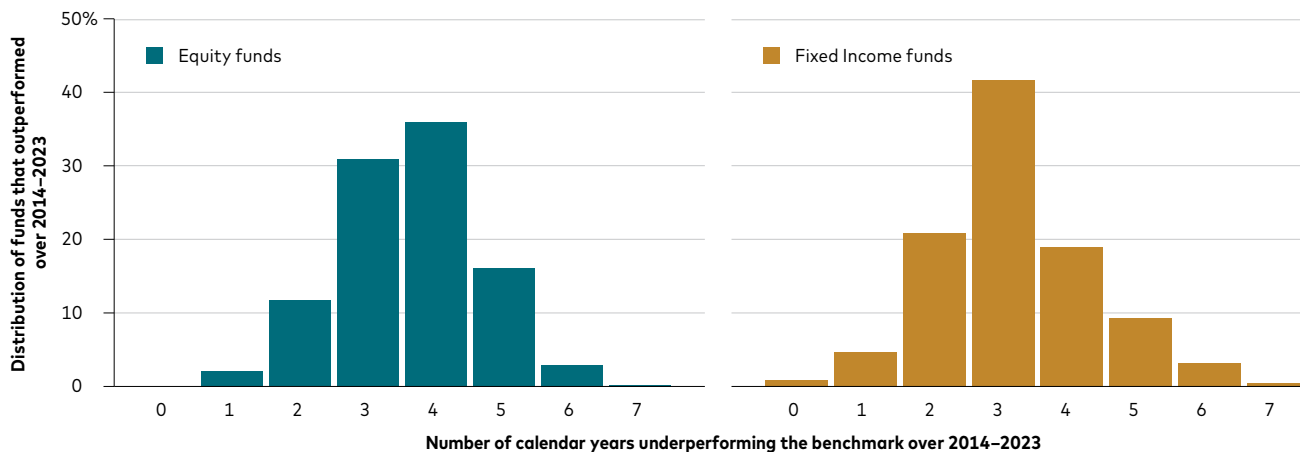
32 If an investor had allocated \$500,000 to the median outperforming equity manager in our sample and remained invested for the entire 10-year period, reinvesting their capital gains and dividends each month, they would have accumulated an additional \$85,000 in wealth after 10 years of outperforming. Had they invested in the median outperforming fixed income manager under similar circumstances, they would have earned an additional \$20,000 over the benchmark returns.

33 For more discussion on incorporating conviction in investment and portfolio decisions, see Black and Litterman (1992).

FIGURE 8

The road to outperformance is often paved with underperformance

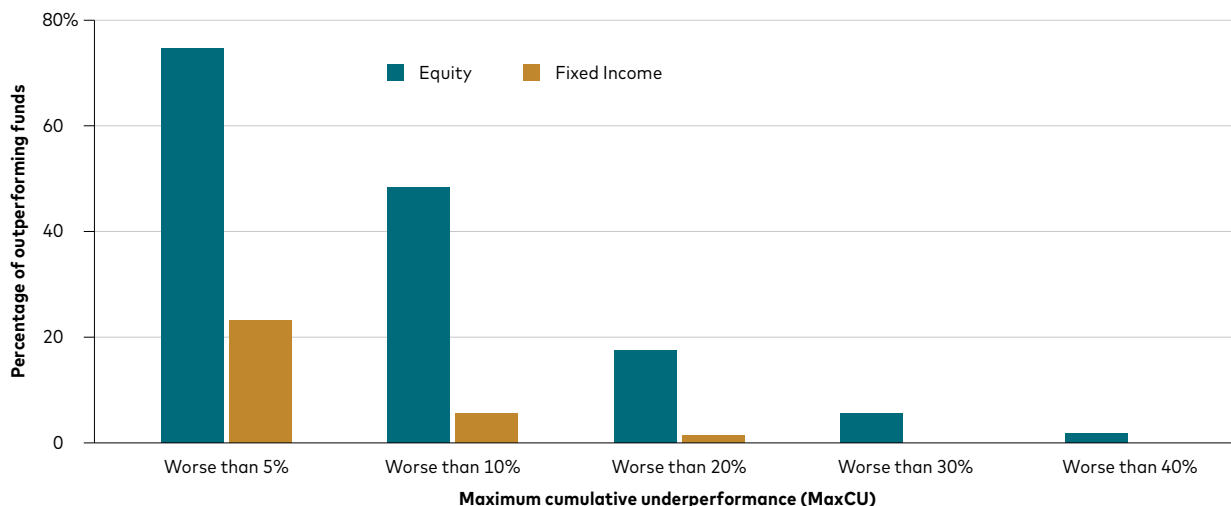
a. A majority of funds outperforming over 10 years lagged in at least three of them



Notes: This figure replicates work first presented in Tidmore and Hon (2021a) and Tidmore and Hon (2021b). We evaluated the oldest share class of all active funds within the inclusion criteria specified in the Appendix with monthly net returns in excess of those funds' respective primary prospectus benchmarks available for the full 10 years ended December 31, 2023. For funds that outperformed their benchmark over the full period, we calculated the number of calendar years during which they underperformed during that period. These charts plot the distribution of these ultimately outperforming funds across the number of individual calendar years with underperformance. **Past performance is no guarantee of future results.**

Sources: Vanguard calculations, based on data from Morningstar, Inc.

b. A majority of funds outperforming over 10 years experienced maximum cumulative underperformance over 5%



Notes: This figure is an application of work first presented in Tidmore and Hon (2021a) and Tidmore and Hon (2021b) and of a new metric for active performance management first introduced by Khang and Ertl (2023). We evaluated the oldest share class of all active funds within the inclusion criteria specified in the Appendix with monthly net returns in excess of their respective primary prospectus benchmarks in U.S. dollars available for the full 10-year period ended December 31, 2023. For funds that outperformed over the full period, we calculated the maximum cumulative underperformance relative to their respective primary prospectus benchmark that they experienced over those 10 years. MaxCU assumes that an investor entered the active fund at the start of the period of interest and expresses, as a percentage of that initial investment, the worst difference in the cumulative performance of the active fund and its benchmark that the investor could have realized by exiting at any point during the period. This figure plots the cumulative distribution of these ultimately outperforming funds across key thresholds of MaxCU. **Past performance is no guarantee of future results.**

Sources: Vanguard calculations, based on data from Morningstar, Inc.

Conclusion

Active funds can play an important role in an investment plan. Success is defined differently for every investor, so it is vital to construct an individualized plan that focuses on your specific goals, aligns the risks of investing with your preferences regarding them, and incorporates an awareness of costs that minimize the hurdles to outperformance. Constructing a plan that is built on a sound and rigorous decision framework—including whether to gain exposure to a market segment with active and/or index fund strategies—instills discipline and increases your chances for investment success. Incorporating into that framework the considerations outlined in this paper can increase the odds of, and strengthen your conviction in, the likelihood of realizing the benefits of active fund investing.

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Appendix

Fund inclusion criteria

For analyses discussed in this paper and conducted at the fund level, funds are included if they are available for sale in the United States, report sufficient data, and are organized by Morningstar in the following categories:

U.S. equity fund categories

- Large Blend
- Large Growth
- Large Value
- Mid-Cap Blend
- Mid-Cap Growth
- Mid-Cap Value
- Small Blend
- Small Growth
- Small Value

U.S. fixed income fund categories

- Long Government
- Intermediate Government
- Short Government
- High-Yield Bond
- Intermediate Core Bond
- Intermediate Core-Plus Bond
- Long-Term Bond
- Short-Term Bond

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