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Considerations for index fund investing

Index fund investing and active fund investing: Two sides of the same coin

Considerations for index fund investing is an introductory piece for investors considering investing in index funds and ETFs.

Our framework assumes that an investor seeks exposure to a specific market segment[1] and aims to provide introductory concepts around implementing the desired exposure with an index fund[2]. Such concepts can also be used by investors seeking comparable exposure through an active fund. The decision of how to incorporate index and active strategies in an investment plan should not be viewed in the sense of active versus index. As such, we view the framework in this paper and the framework in its companion piece, *Considerations for active fund investing*, to be two sides of the same coin.

This paper aims to provide a starting point to help investors assess the use of index funds to gain exposure to a market segment. This should be viewed as a foundation on which investors can build into 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*[3] that details the benefits of incorporating goals, balance, cost and discipline into investment planning.

In that regard, index fund investing:

- Focuses on the **goal** of relative[4] performance predictability.
- Provides a **balance** of risk and return by diversifying across the entire market segment.
- Minimises **cost**, an enduring determinant of performance.
- Instills **discipline**, which helps investors increase the likelihood of investment success.

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

2 See, for example, the framework for incorporating both index and actively managed mutual funds in Vanguard's proprietary work *Vanguard Asset Allocation Model: An investment solution for active-passive-factor portfolios (2019)*.

3 Vanguard (2023).

4 All investing is subject to risk. "Relative" in this sense is a comparison of the predictability of index fund returns compared with those of their benchmark relative to the predictability of the active fund returns compared with those of their benchmark. For more details and a broader discussion of Vanguard's views on active fund investing, please see *Considerations for active fund investing (2024)*.

Focusing on the goal of relative return predictability

We start with the expectation that, in devising an investment plan, an investor or their adviser has identified a need for exposure to a specific market segment, such as domestic equities or fixed income markets. Index fund investing stems from a preference for relative return predictability[5]. This preference may be driven by an aversion to the uncertainty of relative performance or a lack of conviction in the ability to predict outperformance in active funds[6].

When choosing between index fund and active fund investing, the primary tradeoff is between return predictability and the opportunity for outperformance. To fully understand this tradeoff, it is important to understand the zero-sum game[7] and the critical role that costs play in determining outcomes.

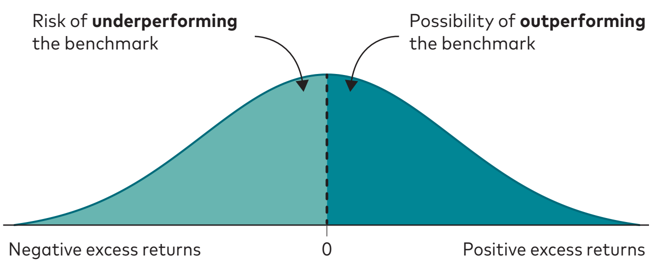
The zero-sum game theory states that, at any given time, a market segment consists of the cumulative holdings of all market participants, and that the aggregate return on the market segment is equal to the asset-weighted return of all market participants. Since the market return represents the average return of all invested euros, for each euros that outperforms the market 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 outcomes centred around zero (see **Figure 1**). Accounting for costs then pulls outcomes to the left, 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[8].

FIGURE 1

For every action there is an equal and opposite reaction

Markets are a zero-sum game before fees



Note: The bell curve consists of stylised data illustrating the theoretical distribution of the excess returns of all invested assets in a market segment. It is centred at 0 because of the zero-sum game.

5 All investing is subject to risk. Relative return predictability refers to the ability or goal of an index fund to track a benchmark and thus be predictable with regard to the expectation of return for the benchmark, not to the frequency or magnitude of positive or negative returns. This can be thought of as market (systematic) risk. Active funds' goal of outperforming a stated benchmark implies greater variability of returns around that of the benchmark and results in active (idiosyncratic) risk, which can be thought of as additive with regard to market (systematic) risk.

6 For a broader consideration of risk preferences, see *Considerations for active fund investing (2024)*. See also Grinold (1989) for a discussion of the importance of conviction in the active management decision.

7 Sharpe (1991).

8 Investors holding these assets would include but not be 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 that buy and sell assets included in the benchmark representing the market segment.

Investors choose a fund to gain exposure to a market segment. Index fund investing seeks to minimise variation from the benchmark and lock in performance close to the centre of the zero-sum distribution.

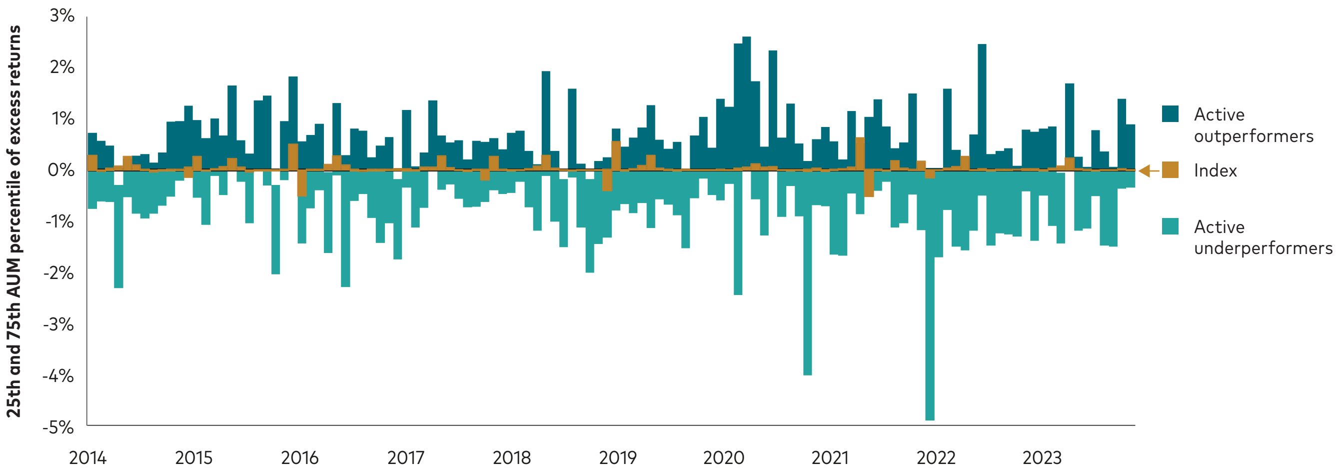
Figure 2 shows that index funds achieved greater relative performance predictability than active funds. The range of outcomes experienced by investors in European active equity funds is much wider than that of index funds. While the fraction of actively managed assets outperforming the benchmark varies from month to month, the monthly performance is widely dispersed around the benchmark with the average index and active fund slightly underperforming the benchmark after fees.

Index fund performance is concentrated in a narrow band around the benchmark. Therefore, an investor looking for relative performance predictability in a market segment can achieve that objective with minimal further oversight in an index fund[9].

FIGURE 2

Index fund investing exhibits greater relative performance predictability

Active funds experience a wider range of outcomes



Note: The chart displays the AUM-weighted interquartile range (25th to 75th percentile) of excess returns (in euros, net of fees with income reinvested) of active and index European equity funds available for sale in the eurozone region relative to their primary prospectus benchmark for the 10-year period ending 31 December 2023.

Sources: Vanguard calculations, using data from Morningstar.

9 Technically, because an investor or fund manager cannot invest directly in a benchmark, an index fund possesses implementation costs and frictions such as expense ratios and transaction costs, as indicated by the dark yellow bars in Figure 2. For certain indices where the index pricing and fund NAVs are calculated at different times of the day, the closing value of the index may temporarily deviate from the fund price, resulting in offsetting excess returns.

Providing balance by diversifying across the entire market segment

Increased relative return predictability is a natural consequence of index fund strategies that increase the number of holdings in order to maximise exposure to the opportunities of individual stocks within a market segment.

If an investor's goal is to replicate rather than outperform the returns of a market segment, the best way to achieve this is by investing in the broadest cap-weighted strategy that most closely resembles the overall market segment – typically a broad market index fund.

The importance of broad diversification is further underscored by comparing the long-term performance of securities in a benchmark index against the aggregate index performance.

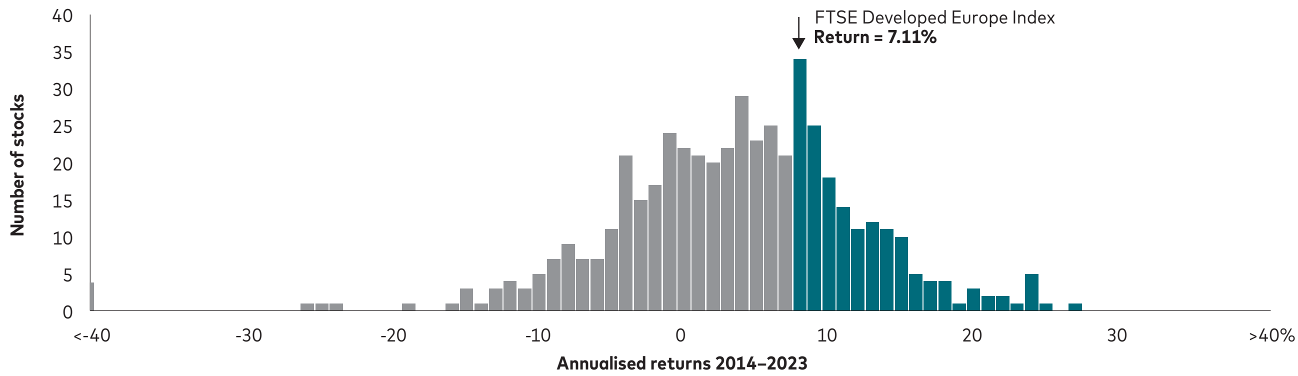
Figure 3 shows the performance of constituent stocks in the FTSE Developed Europe Index (in euros) from 2014 to 2023; significantly less than half of all stocks (37%) outperform the benchmark. Unless investors have high conviction for a well performing, actively managed strategy, beating the index return with a subset of stocks is challenging. During this period, the FTSE Developed Europe Index produced a return of 7.11%, which beat both the mean (3.57%) and median (4.36%) return of individual stocks in the index.

By owning a broad-based index fund that holds as many securities in that segment as possible, investors capture the closest exposure possible to a market segment.

FIGURE 3

The fear of missing out is real

Broad-market index investing diversifies opportunities



Notes: Chart shows the distribution of annualised returns for stock constituents of the FTSE Developed Europe Index (euros, net of fees with income reinvested) as of January 2014. Performance is presented for the period 1 January 2014 through 31 December 2023 with reinvestment of all dividends. Overlaid is the total return performance of the FTSE Developed Europe Index over the same period.

Source: Vanguard calculations, using data from Morningstar.

Minimising costs – an enduring determinant of performance

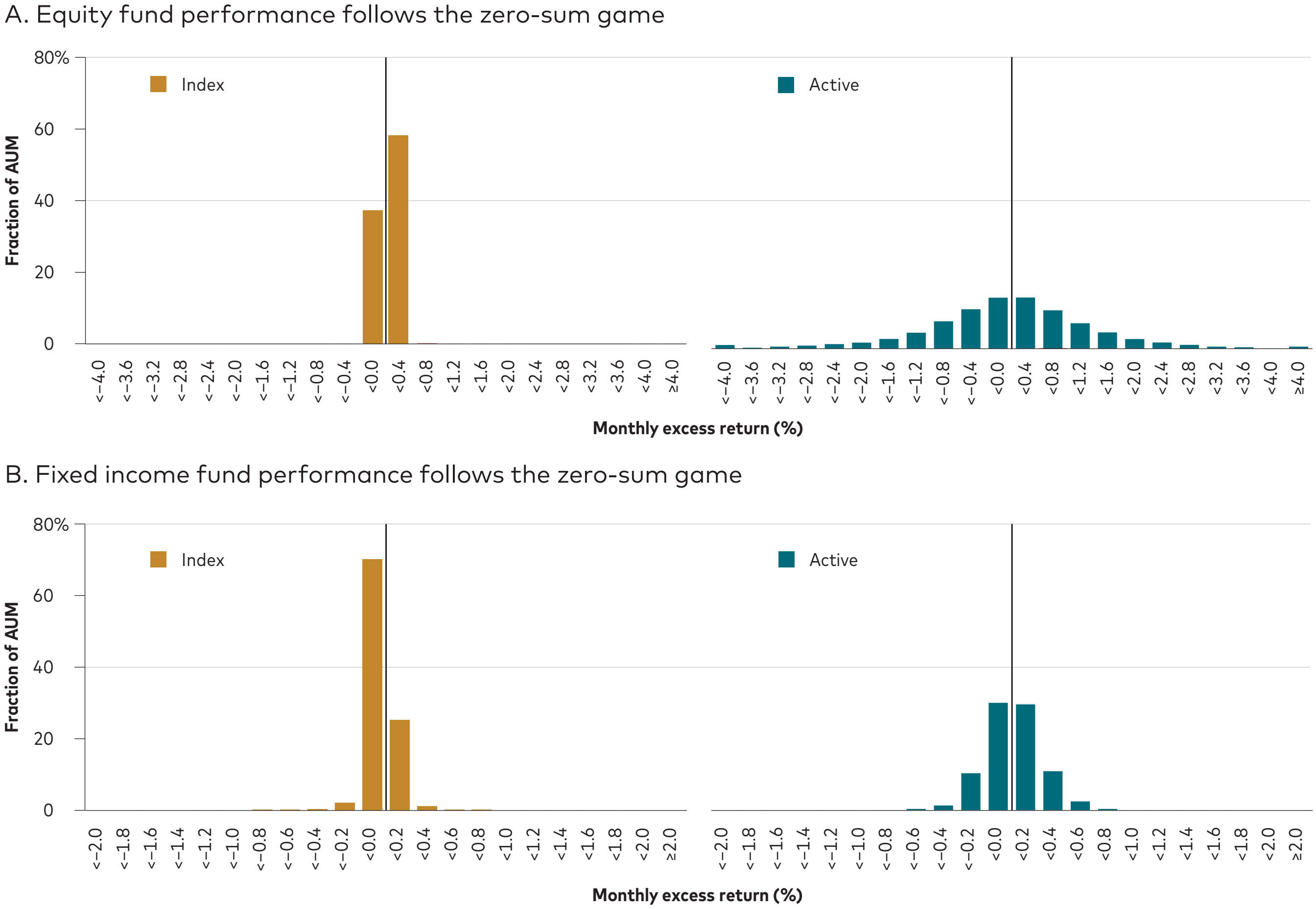
Investors are subject to costs including, but not limited to, expense ratios, transaction costs and, where applicable, taxes — all of which can be a significant drag on net[10] returns over time. Costs shift the distribution of the theoretical zero-sum game as well as those distributions in **Figures 4A** and **4B** to the left for both index and active funds. **Figures 4A** and **4B** show that the distribution of monthly net of cost performance of all assets invested in European equity and fixed income funds available for sale in the eurozone region over the 10-year period is indeed centred near roughly zero for both index and active funds. For equity funds, asset-weighted mean returns are -6.8 basis points (bps) for active funds and 2.4 bps for index funds. For fixed income funds, asset-weighted mean returns are -0.7 bps for active funds and -1.5 bps for index funds.

After deducting expense ratios, actively managed funds exhibit a bell curve of returns spread over a wider range of performance. This highlights the higher relative performance predictability of index funds as well as the opportunity for outperformance and risk of underperformance associated with active funds, which we first addressed in **Figure 1**. Excess equity returns do have a wider distribution than excess fixed income returns given their reliance on capital appreciation rather than income.

10 "Net" refers to performance after costs are considered. All charts in this piece refer to net performance unless otherwise noted.

FIGURE 4

Fees make a zero-sum game even harder to win



Notes: The charts display the AUM-weighted distribution of the monthly net excess returns of active and index European equity and fixed income funds available for sale in the eurozone region relative to their primary prospectus benchmark in euros, net of fees with income reinvested for the 10-year period ending 31 December 2023. Equity funds (panel A) and fixed income funds (panel B) comprise all funds available for sale within the respective Morningstar categories outlined in the appendix. AUM weights are updated each month based on live funds at the beginning of the month.

Source: Vanguard calculations, using data from Morningstar.

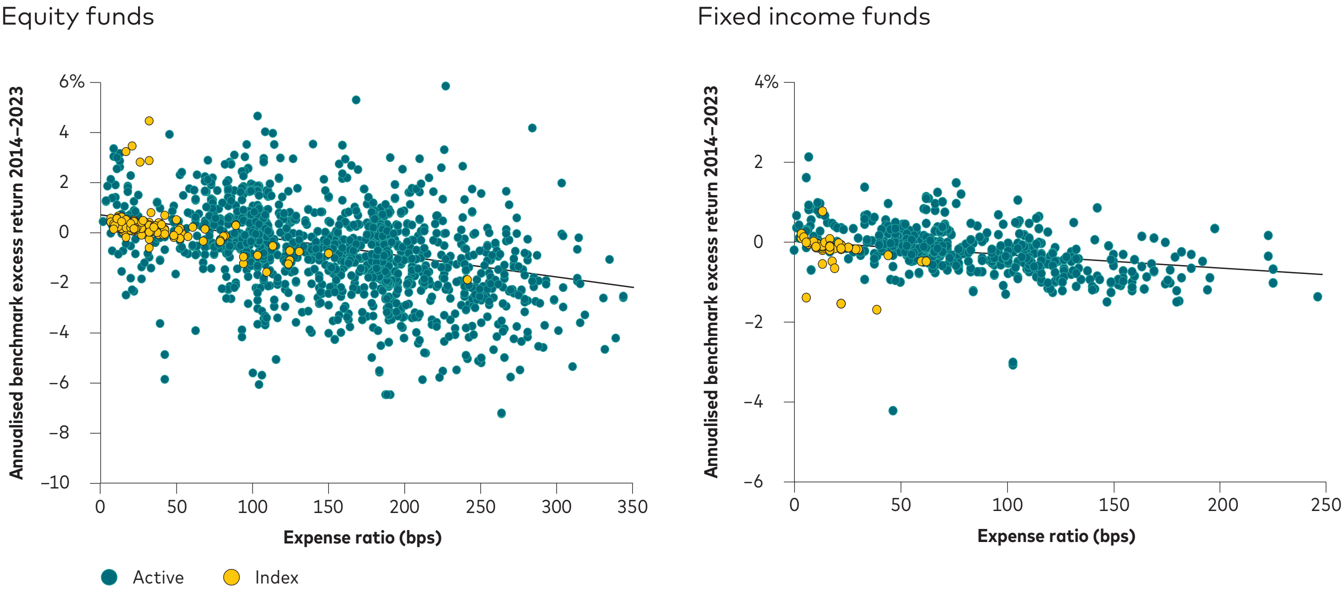
Index funds have a much narrower range, centred close to zero. The combination of relative performance predictability (due to their close tracking of the benchmark index) and lower costs results in performance close to that of the target benchmark index. These results show that the zero-sum game holds for funds investing in European equities; however, the pattern of fund returns centred around zero holds true across other market segments, such as small cap, global and emerging market equities.

The consistent performance of index funds allows investors to simplify their goal-setting by focusing on an asset allocation mix that aligns with the overall return expectations of their investment objectives.

Not only are costs responsible for the average underperformance of funds, but individual costs also explain expected fund underperformance. **Figure 5** shows the resulting strongly negative relationship between expenses and performance for European equity and fixed income funds. For both index and active funds, higher fees do not result in higher excess returns.

FIGURE 5

Higher costs are associated with diminished fund performance



Notes: The chart displays the distribution the expense ratio (as of 2023) and returns in excess of a fund's expense ratio (KIID Ongoing Charge as of 2023) and returns in excess of a fund's prospectus benchmark (in euros, net of fees with income reinvested) for active and index European equity and fixed income funds available for sale in the eurozone region over the time period 1 January 2014 to 31 December 2023. The trend line is the result of an asset-weighted regression of excess returns on expense ratios using December 2013 assets to weight observations.

Source: Vanguard calculations, using data from Morningstar.

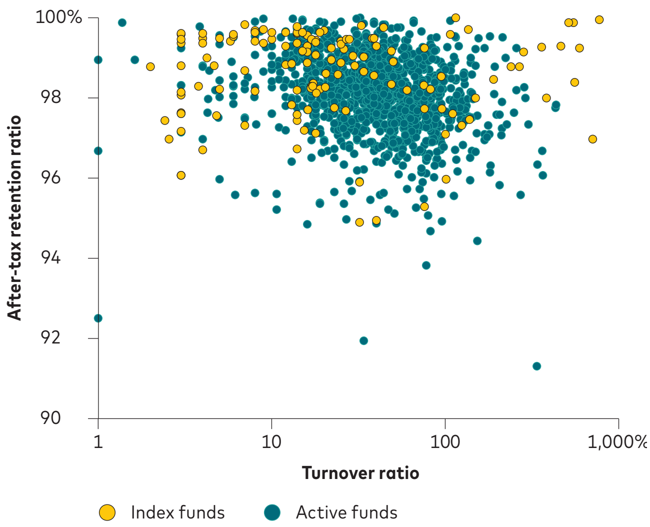
With index funds consistently offering lower expense ratios than active funds, index investing lowers the magnitude of underperformance.

To fully appreciate the cost of fund ownership, it is important to understand how turnover and taxes can affect the cost of ownership[11]. Investors subject to capital gains taxes need to pay close attention to the activity of funds and the risk that realised gains in the portfolio reduce the retained post-tax return. Turnover of assets in a portfolio is a major source of capital gains, as shown in **Figure 6** – a study conducted using US mutual funds. Index funds, by construction, are typically low turnover[12], retaining a significantly larger portion of pre-tax returns.

FIGURE 6

High turnover erodes after-tax performance

Index funds have lower turnover, resulting in greater after-tax return retention



Notes: The chart relates to US funds and thus is for illustrative purposes only. The chart shows the relationship between fund-level turnover ratios and fund-level asset-weighted after-tax retention ratios for index and active US equity mutual funds. Turnover ratio is the median 5-year annual turnover. Asset-weighted after-tax retention ratios are trailing 5-year annualised after-tax retention ratios for each fund, weighted by the proportion of the average monthly AUM of each share-class over the 5-year period relative to the total fund-level average AUM over the same period. Data is from Morningstar and covers the period 31 December 2018 to 31 December 2023. Sample includes mutual funds available for sale in the US investing in the these nine equity Morningstar categories: US Fund Large Blend, US Fund Large Growth, US Fund Large Value, US Fund Mid-Cap Blend, US Fund Mid-Cap Growth, US Fund Mid-Cap Value, US Fund Small Blend, US Fund Small Growth, US Fund Small Value. Dependent variable is 5-year annualised after-tax retention ratio, which we define as (1 + trailing 5-year annualised post-tax return) / (1 + trailing 5-year annualised pre-tax return) and represents the percentage of pre-tax assets (i.e., end-of-period wealth) an investor retains after paying taxes on fund distributions during the given period. Post-tax returns assume the highest US federal income tax bracket 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, which is calculated by taking the lesser of purchases or sales and dividing by average monthly net assets.
Source: Author calculations using data from Morningstar.

11 Dickson (2024).

12 A small subset of funds that are shown in Figure 6 have turnover significantly in excess of 100% per annum. While identified as index funds, these funds either have a mandate to track a benchmark that requires significant turnover to follow accurately or use leverage derivatives to reduce tracking error. In these instances, increased turnover can lead to increased capital gains, which are typically taxable. We include these funds for completeness.

Instilling discipline to help investors achieve investment success

For investors who have identified a suitable index or active fund strategy, Vanguard's final principle for investing success is discipline. If an investor has identified a low-cost index fund that closely tracks the desired market segment, the fund can be held for the long term (or until their goals change). This simplicity can help to encourage sound investing discipline.

Building discipline into an investment plan is important, as many investors react to past fund performance. **Figure 7** highlights the reaction of US investors (as measured through cashflows) to the past performance of funds, with outflows following negative returns and inflows following positive returns. This reactive behaviour is more than twice as strong in active fund investors as it is for index fund investors over multiple short-term horizons.

FIGURE 7

Reactions to short-term returns can undermine an investment strategy

Index fund investors are less likely than active fund investors to trade on past fund performance

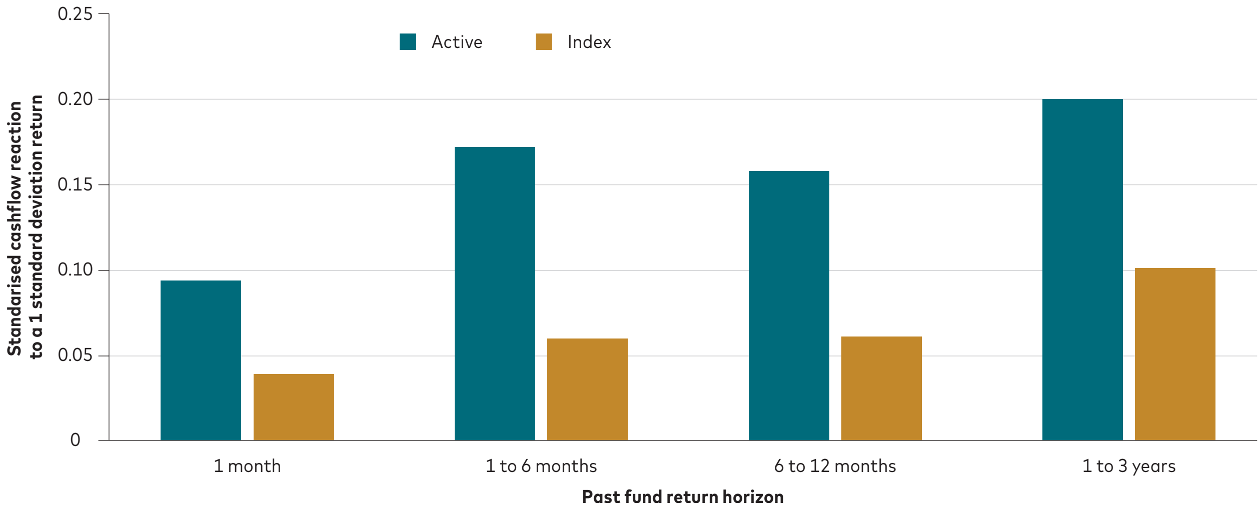


Chart: The chart relates to US funds and thus is for illustrative purposes only. The chart shows the coefficients from a regression of monthly normalised cashflows on fund returns over the previous 1 month, 1-6 months, 6-12 months and 1-3 years for US equity index and active mutual funds over the period 1 January 2003 to 31 December 2022. A coefficient of 1 represents a single standard deviation move in the normalised cashflows of investors in a fund based on a 1 standard deviation move in the underlying return. All coefficients are significant at the 1% level. Regression controls for funds' investment style, age, expense ratio and tracking error as well as the overall volatility and past months of performance of the S&P 500.

Source: Vanguard calculations using Morningstar Data.

The desire to make changes can be particularly problematic for active fund investors. Tidmore and Hon (2021) estimate that more than half of funds outperforming over a 10-year period experienced a drawdown that lasted for up to four years. Based on the above analysis, many investors lack the necessary patience to thrive in an active fund, making the simplicity of index investing more appealing.

Index fund investing does require that investors maintain discipline with their investment strategy. Timing exposure to an index fund with the hope of outperforming the market segment can be a tempting deviation from investment goals that often leads to underperformance, as shown in **Figure 8**. Investors who sell their position in the MSCI World Index (in euros) the day after a 5, 10 or 20% drawdown[13] experience a significant drag on their long-term performance. Investors cannot get in or out of positions exactly as the return crosses a drawdown threshold – the resulting slippage can significantly curtail cumulative performance over the course of an investment lifecycle.

FIGURE 8

Reactions to short-term returns can undermine an investment strategy

Index fund investors are less likely than active fund investors to trade on past fund performance

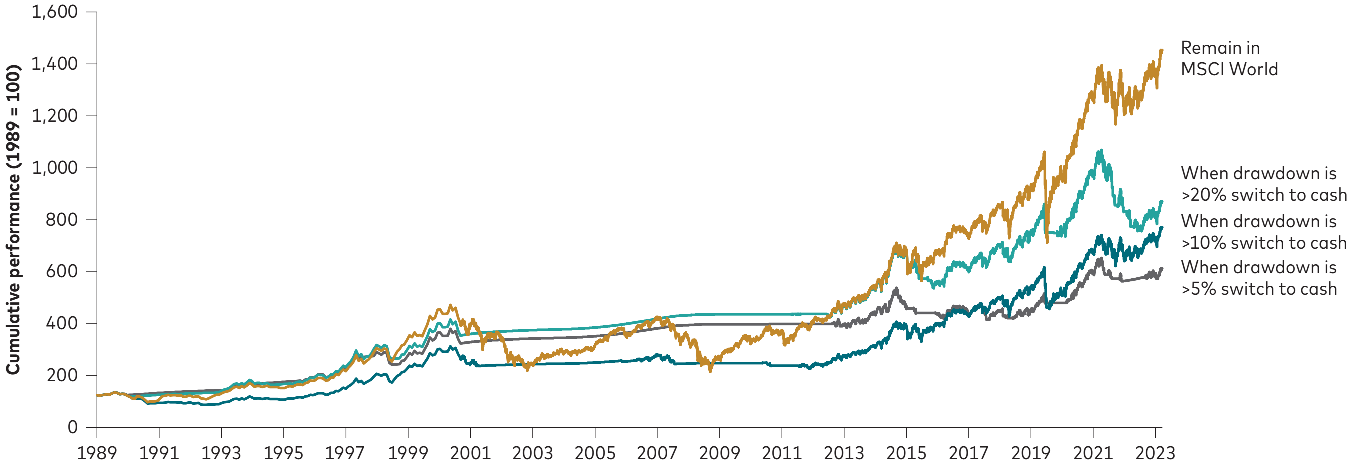


Chart: Chart shows the performance of the MSCI World Index (in euros) and various market-timing strategies based on this index from 1 January 1989 to 31 December 2023. The MSCI World Index (in euros) is used here because data is available for this index for the full duration covered in the chart. The inception date of the FTSE Developed Europe Index, which is referenced earlier in this document, was 31 May 2000. Timing strategies track drawdowns from the previous peak and remain in cash as long as the cumulative drawdown is below a threshold. Timing of entry and exit is assumed to occur at the close of the following business day. Cash is represented by the Bloomberg US Treasury 1-3 Months US Treasury Bill Index, which we use as a global proxy for cash returns. Returns are in nominal terms.

Sources: Vanguard calculations using data from RIMES.

13 We define a "drawdown" as the cumulative underperformance from the previous peak value of the index.

We believe that having the discipline to stick with investment decisions is a product of two things: the rigour of the investor's decision process itself and the conviction[14] that it generates in their ability to successfully navigate market environments over their investment horizon. The path to investment success is bumpy and can be paved with periods of deep and prolonged negative returns. But for those investors with conviction in their investment plan and a willingness to endure the associated risks, index fund investing can play an important role in a well-designed investment plan.

The reflections shared in this paper and its companion, *Considerations for active fund investing*, provide a solid base upon which investors can build a sound and rigorous decision-making framework for strategically selecting funds to provide exposure to a desired market segment. Areas of future research, proprietary and academic examples of which are provided in the footnotes of this paper, may include perspectives on the impact of asset location, metrics that measure and decompose portfolio performance, the ongoing review of your investment plan and the impact of investor-specific goals and investment horizons on the active and/or index investment decision.

Conclusion

Index fund investing provides a straightforward alignment with investment goals, especially for those who seek to maximise relative performance predictability or those who might benefit from the simple discipline of "staying the course".

Investing in low-cost index funds that track a market segment provides a framework that helps investors achieve investment success. Index funds focus on the goal of relative performance predictability; diversify across an entire market segment; minimise costs; and make it easier to instill discipline into the investment process.

14 For further discussion of the incorporation of conviction in investment and portfolio decisions, please see Black and Litterman (1992).

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Appendix

Fund inclusion criteria

For analyses conducted at the fund level, funds are included if they are available for sale in the eurozone region, report sufficient data and are categorised by Morningstar in the following categories:

Equity fund categories:

- EAA Fund Europe Large-Cap Blend Equity
- EAA Fund Europe Large-Cap Growth Equity
- EAA Fund Europe Large-Cap Value Equity
- EAA Fund Europe Flex-Cap Equity
- EAA Fund Europe Mid-Cap Equity
- EAA Fund Europe Small-Cap Equity
- EAA Fund Eurozone Flex-Cap Equity
- EAA Fund Eurozone Large-Cap Equity
- EAA Fund Eurozone Mid-Cap Equity
- EAA Fund Eurozone Small-Cap Equity

Fixed income fund categories:

- EAA Fund EUR Government Bond
- EAA Fund EUR Corporate Bond
- EAA Fund EUR Diversified Bond

Investment risk information

The value of investments, and the income from them, may fall or rise and investors may get back less than they invested.

Past performance is not a reliable indicator of future results.

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