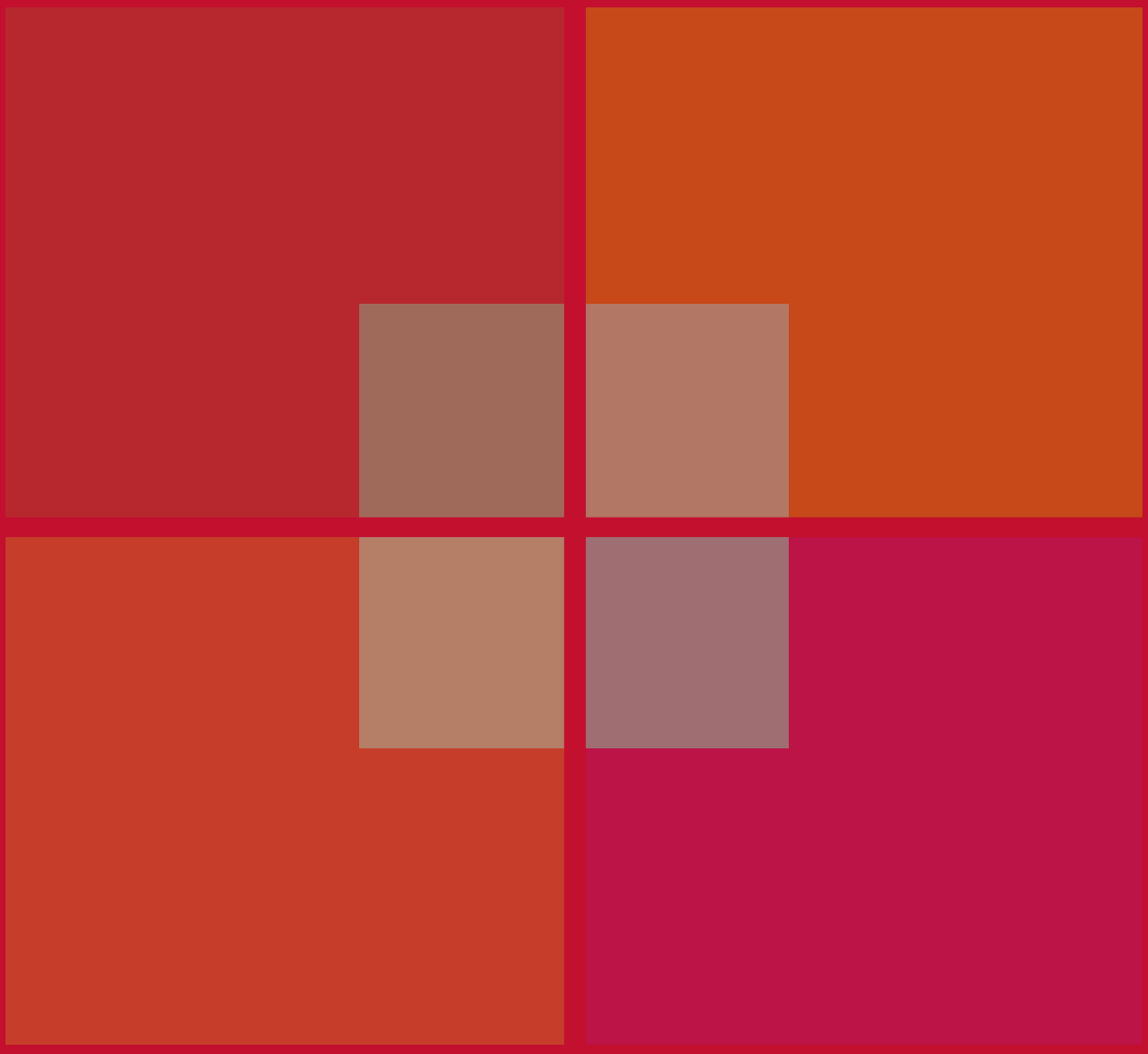
Vanguard's Principles for Investing Success



Vanguard®

Successful investment management companies base their business on a core investment philosophy, and Vanguard is no different. Although we offer many specific strategies through both internally and externally managed funds, an overarching theme runs through the investment guidance we provide to clients—focus on those things within your control.

Instead, too many focus on the markets, the economy, manager ratings, or the performance of an individual security or strategy, overlooking the fundamental principles that we believe can give them the best chance of success.

These principles have been intrinsic to our company since its inception, and they are embedded in its culture. For Vanguard, they represent both the past and the future—enduring principles that guide the investment decisions we help our clients make.

Goals

Create clear, appropriate investment goals.

An appropriate investment goal should be measurable and attainable. Success should not depend upon outsize investment returns, nor upon impractical saving or spending requirements.

Defining goals clearly and being realistic about ways to achieve them can help protect investors from common mistakes that derail their progress. Here we show that:

- Recognizing constraints, especially those that involve risk-taking, is essential to developing an investment plan.
- A basic plan will include specific, attainable expectations about contribution rates and monitoring.
- Discouraging results often come from chasing overall market returns, an unsound strategy that can seduce investors who lack well-grounded plans for achieving their goals.
- Without a plan, investors can be tempted to build a portfolio based on transitory factors such as fund ratings—something that can amount to a "buy high, sell low" strategy.

Defining the goal and constraints

A sound investment plan—or policy statement, for institutions—begins by outlining the investor's objective as well as any significant constraints. Defining these elements is essential because the plan needs to fit the investor; copying other strategies can prove unwise. Because most objectives are long-term, the plan should be designed to endure through changing market environments, and should be flexible enough to adjust for unexpected events along the way. If the investor has multiple goals (for example, paying for both retirement and a child's college expenses), each needs to be accounted for. Once the plan is in place, the investor should evaluate it at regular intervals.

Figure 1. Example of a basic framework for an investment plan

Objective	Save $1,000,000 for retirement, adjusted for inflation.
Constraints	30-year horizon.
	Moderate tolerance for market volatility and loss; no tolerance for nontraditional risks.[1]
	Current portfolio value: $50,000.
	Monthly net income of $4,000; monthly expenses of $3,000.
	Consider the effect of taxes on returns.
Saving or spending target	Willing to contribute $5,000 in the first year.
	Intention to raise the contribution by $500 per year, to a maximum of $10,000 annually.
Asset allocation target	70% allocated to diversified stock funds; 30% allocated to diversified bond funds.
	Allocations to foreign investments as appropriate.
Rebalancing methodology	Rebalance annually.
Monitoring and evaluation	Periodically evaluate current portfolio value relative to savings target, return expectations, and long-term objective.
	Adjust as needed.

This example is completely hypothetical. It does not represent any real investor and should not be taken as a guide. Depending on an actual investor's circumstances, such a plan or investment policy statement could be expanded or consolidated. For example, many financial advisors or institutions may find value in outlining the investment strategy; i.e., specifying whether tactical asset allocation will be employed, whether actively or passively managed funds will be used, and the like.

Source: Vanguard.

1 There are many definitions of risk, including the traditional definitions (volatility, loss, and shortfall) and some nontraditional ones (liquidity, manager, and leverage). Investment professionals commonly define risk as the volatility inherent to a given asset or investment strategy. For more on the various risk metrics used in the financial industry, see Ambrosio (2007).

Most investment goals are straightforward—saving for retirement, preserving assets, funding a pension plan, or meeting a university's spending requirements, for example. Constraints, on the other hand, can be either simple or complex, depending on the investor and the situation. The primary constraint in meeting any objective is the investor's tolerance for market risk. Importantly, risk and potential return are generally related, in that the desire for greater return will require taking on greater exposure to market risk.

In most cases, the investment time horizon is another key constraint; for example, a university endowment with a theoretically infinite horizon might take some risks that would be unwise for an investor looking to fund a child's college education. Other constraints can include exposure to taxes, liquidity requirements, legal issues, or unique factors such as a desire to avoid certain investments entirely. Because constraints may change over time, they should be closely monitored.

The danger of lacking a plan

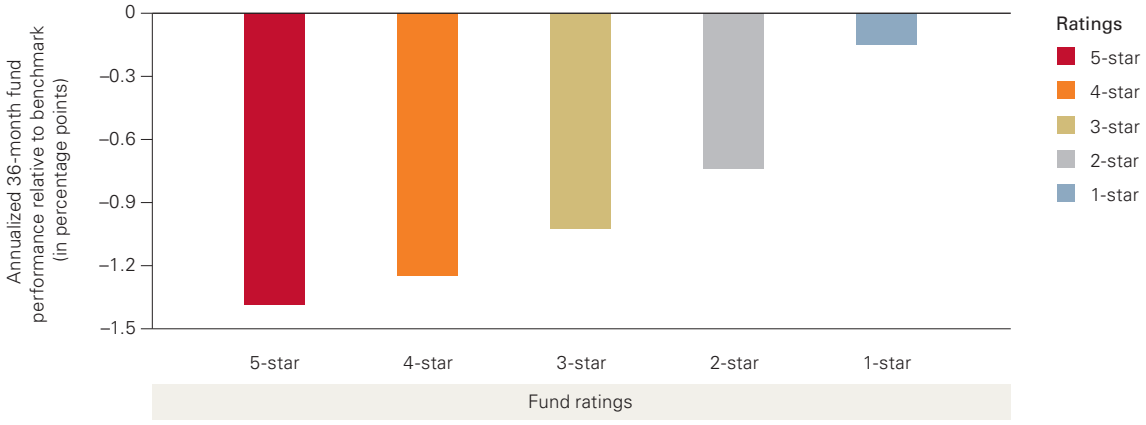
Without a plan, investors often build their portfolios bottom-up, focusing on investments piecemeal rather than on how the portfolio as a whole is serving the objective. Another way to characterize this process is "fund collecting": These investors are drawn to evaluate a particular fund and if it seems attractive, they buy it, often without thinking about how or where it may fit within the overall allocation.

Figure 2 demonstrates a risk of such behavior. It shows how investors have tended to flock to funds with high performance ratings, and also how those highly rated funds have tended to underperform immediately after receiving the high marks.

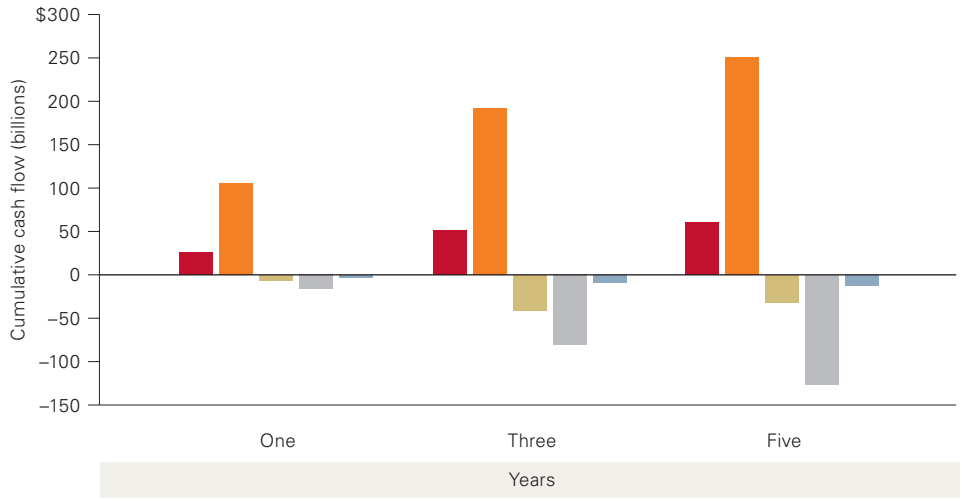
While paying close attention to each investment may seem logical, this process can lead to an assemblage of holdings that doesn't serve the investor's ultimate needs. As a result, the portfolio may wind up concentrated in a certain market sector, or it may have so many holdings that portfolio oversight becomes onerous. Most often, investors are led into such imbalances by common, avoidable mistakes such as performance-chasing, market-timing, or reacting to market "noise."

Figure 2. Investors tend to buy highly rated funds even as they underperform

Median performance of stock funds versus style benchmarks over the 36 months following a Morningstar rating



Cash flows for Morningstar-rated stock funds in periods after the ratings were posted



Notes: Morningstar ratings are designed to bring returns, risks, and adjustments for sales loads together into one evaluation. To determine a fund's star rating for a given time period (three, five, or ten years), the fund's risk-adjusted return is plotted on a bell curve. If the fund scores in the top 10% of its category, it receives five stars; in the next 22.5%, four stars; in the middle 35%, three stars; in the next 22.5%, two stars; and in the bottom 10%, one star. The overall rating is a weighted average of the available three-, five-, and ten-year ratings.

To calculate the median performance versus style benchmarks, Vanguard first assigned each fund to a representative benchmark according to both size and style (growth versus value). We then compared the performance of each fund to the performance of its style benchmark for each 36-month period since June 1992. Funds were grouped according to their star ratings, and we then computed the median relative return versus the style benchmark for the subsequent 36-month period. Data are through December 2013.

Sources: Data on cash flows, fund returns, and ratings were provided by Morningstar. Index data to compute relative excess returns were provided by Thomson Reuters Datastream. More information is available in the Vanguard research paper *Mutual Fund Ratings and Future Performance* (Philips and Kinniry, 2010).

Many investors—both individuals and institutions—are moved to action by the performance of the broad stock market, increasing stock exposure during bull markets and reducing it during bear markets. Such "buy high, sell low" behavior is evident in mutual fund cash flows that mirror what appears to be an emotional response—fear or greed—rather than a rational one. **Figure 3** shows that not only do investors in aggregate allow their portfolios to drift with the markets, but they also tend to move cash between stock and bond investments in patterns that coincide with recent performance of the equity market. Over the four periods we identified, these cash flows, together with a failure to rebalance, amounted to buying high and selling low.

For example, from 1993 to the market peak in March 2000, investors' allocation to stock funds nearly doubled, and in the two years preceding that peak, as the market climbed 41%, investors poured nearly $400 billion into stock funds. Unfortunately, the stock market then reversed rather dramatically and returned –23% over the next two years.

Figure 3. Mutual fund cash flows often follow performance

			Investor cash flows over the prior two years (in millions)		Stock market performance (cumulative)	
	Date	Equity weighting	Stock funds	Bond funds	Prior two years	Subsequent two years
Early in '90s bull market	1/31/1993	34%	—	—	—	—
Bull market peak	3/31/2000	62	$393,225	$5,100	41%	–23%
Bear market bottom	2/28/2003	40	71,815	221,475	–29	53
Bull market peak	10/31/2007	62	424,193	173,907	34	–29
Bear market bottom	2/28/2009	37	–49,942*	83,921*	–51*	94

* Reflects cash flows starting in November 2007, when the bear market began, rather than for the full 24 months.

Notes: Equity allocations reflect the cumulative assets under management for all U.S.-domiciled open-ended mutual funds and ETFs. Cash flows represent net cash moving in or out of stock and bond funds. Market returns are based on the MSCI USA Index through May 1994 and the MSCI USA Investable Market Index thereafter.

Sources: Morningstar for equity allocations and cash-flow data; Thomson Reuters Datastream for market returns.

A sound investment plan can help the investor to avoid such behavior, because it demonstrates the purpose and value of asset allocation, diversification, and rebalancing. It also helps the investor to stay focused on intended contribution and spending rates.

We believe investors should employ their time and effort up front, on the plan, rather than in ongoing evaluation of each new idea that hits the headlines. This simple step can pay off tremendously in helping them stay on the path toward their financial goals.

The key take-away

The best way to work toward an investment goal is to start by defining it clearly, take a level-headed look at the means of getting there, and then create a detailed, specific plan. Being realistic is essential to this process: Investors need to recognize their constraints and understand the level of risk they are able to accept.

They also need to be clear-eyed about the markets, because research has shown that pinning one's hopes on outsize market returns—or on finding some investment that will outperform the markets—is not the most likely road to success.

Balance

Develop a suitable asset allocation using broadly diversified funds.

A sound investment strategy starts with an asset allocation suitable for the portfolio's objective. The allocation should be built upon reasonable expectations for risk and returns, and should use diversified investments to avoid exposure to unnecessary risks.

Both asset allocation and diversification are rooted in the idea of balance. Because all investments involve risk, investors must manage the balance between risk and potential reward through the choice of portfolio holdings. Here we provide evidence that:

- A diversified portfolio's proportions of stocks, bonds, and other investment types determine most of its return as well as its volatility.
- Attempting to escape volatility and near-term losses by minimizing stock investments can expose investors to other types of risk, including the risks of failing to outpace inflation or falling short of an objective.
- Realistic return assumptions—not hopes—are essential in choosing an allocation.
- Leadership among market segments changes constantly and rapidly, so investors must diversify both to mitigate losses and to participate in gains.

The importance of asset allocation

When building a portfolio to meet a specific objective, it is critical to select a combination of assets that offers the best chance for meeting that objective, subject to the investor's constraints.[2] Assuming that the investor uses broadly diversified holdings, the mixture of those assets will determine both the returns and the variability of returns for the aggregate portfolio.

This has been well documented in theory and in practice. For example, in a paper confirming the seminal 1986 study by Brinson, Hood, and Beebower, Wallick et al. (2012) showed that the asset allocation decision was responsible for 88% of a diversified portfolio's return patterns over time (**Figure 4**).

Figure 4. Investment outcomes are largely determined by the long-term mixture of assets in a portfolio

Note: Calculations are based on monthly returns for 518 U.S. balanced funds from January 1962 through December 2011. For details of the methodology, see the Vanguard research paper *The Global Case for Strategic Asset Allocation* (Wallick et al., 2012).

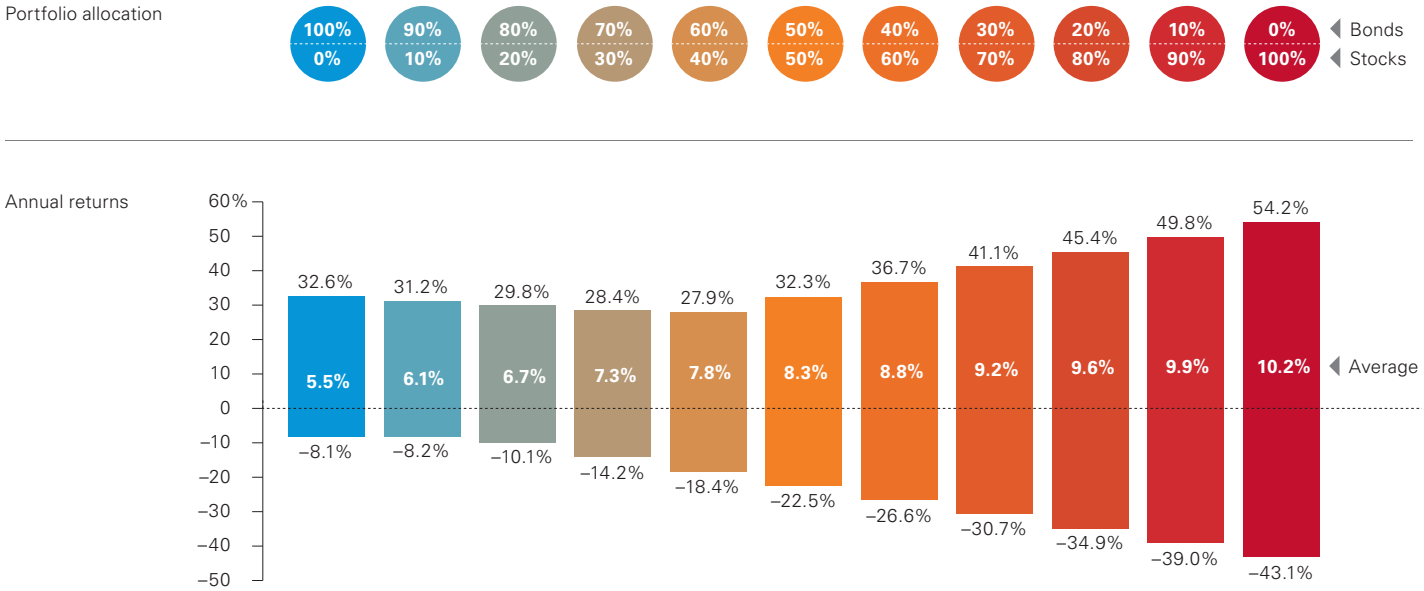
Source: Vanguard calculations using data from Morningstar.

2 For asset allocation to be a driving force of an outcome, one must implement the allocation using vehicles that approximate the return of market indexes. This is because market indexes are commonly used in identifying the risk and return characteristics of asset classes and portfolios. Using a vehicle other than one that attempts to replicate a market index will deliver a result that may differ from the index result, potentially leading to outcomes different from those assumed in the asset allocation process. To make the point with an extreme example: Using a single stock to represent the equity allocation in a portfolio would likely lead to very different outcomes from either a diversified basket of stocks or any other single stock.

In **Figure 5** we show a simple example of this relationship using two asset classes—U.S. stocks and U.S. bonds—to demonstrate the impact of asset allocation on both returns and the variability of returns. The middle numbers in the chart show the average yearly return since 1926 for various combinations of stocks and bonds. The bars represent the best and worst one-year returns. Although this example covers an unusually extended holding period, it shows why an investor whose portfolio is 20% allocated to U.S. stocks might expect a very different outcome from an investor with 80% allocated to U.S. stocks.

Figure 5. The mixture of assets defines the spectrum of returns

Best, worst, and average returns for various stock/bond allocations, 1926–2013



Note: Stocks are represented by the Standard & Poor's 90 Index from 1926 to March 3, 1957; the S&P 500 Index from March 4, 1957, through 1974; the Wilshire 5000 Index from 1975 through April 22, 2005; and the MSCI US Broad Market Index thereafter. Bonds are represented by the S&P High Grade Corporate Index from 1926 to 1968; the Citigroup High Grade Index from 1969 to 1972; the Barclays U.S. Long Credit AA Index from 1973 to 1975; and the Barclays U.S. Aggregate Bond Index thereafter. Data are through December 31, 2013.

Source: Vanguard.

Stocks are risky—and so is avoiding them

Stocks are inherently more volatile than investments such as bonds or cash instruments. This is because equity owners are the first to realize losses stemming from business risk, while bond owners are the last. In addition, whereas bond holders are contractually promised a stated payment, equity holders own a claim on future earnings. But the level of those earnings, and how the company will use them, are beyond the investor's control. Investors thus must be enticed to participate in a company's uncertain future, and the "carrot" that entices them is higher expected or potential return over time.

Figure 5 also demonstrates the short-term risk of owning stocks: Even a portfolio with only half its assets in stocks would have lost more than 20% of its overall value in at least one year. Why not simply minimize the possibility of loss and finance all goals using low-risk investments? Because the attempt to escape market volatility associated with stock investments by investing in more stable, but lower-returning, assets such as Treasury bills can expose a portfolio to other, longer-term risks.

One such risk is "opportunity cost," more commonly known as shortfall risk: Because the portfolio lacks investments that carry higher potential return, it may not achieve growth sufficient to finance ambitious goals over the long term. Or it may require a level of saving that is unrealistic, given more immediate demands on the investor's income or cash flow (in the case of an endowment or pension fund, for example). Another risk is inflation: The portfolio may not grow as fast as prices rise, so that the investor loses purchasing power over time. For longer-term goals, inflation can be particularly damaging, as its effects compound over long time horizons. For example, Bennyhoff (2009) showed that over a 30-year horizon, an average inflation rate of 3% would reduce a portfolio's purchasing power by more than 50%.

For investors with longer time horizons, inflation risks may actually outweigh market risks, often necessitating a sizable allocation to investments such as stocks.

Use reasonable assumptions in choosing an allocation

Just as important as the combination of assets that are used to construct a portfolio are the assumptions that are used to arrive at the asset allocation decision. By this we mean using realistic expectations for both returns and volatility of returns. Using long-term historical data may serve as a guide, but investors must keep in mind that markets are cyclical and it is unrealistic to use static return assumptions. History does not repeat, and the market conditions at a particular point in time can have an important influence on an investor's returns.

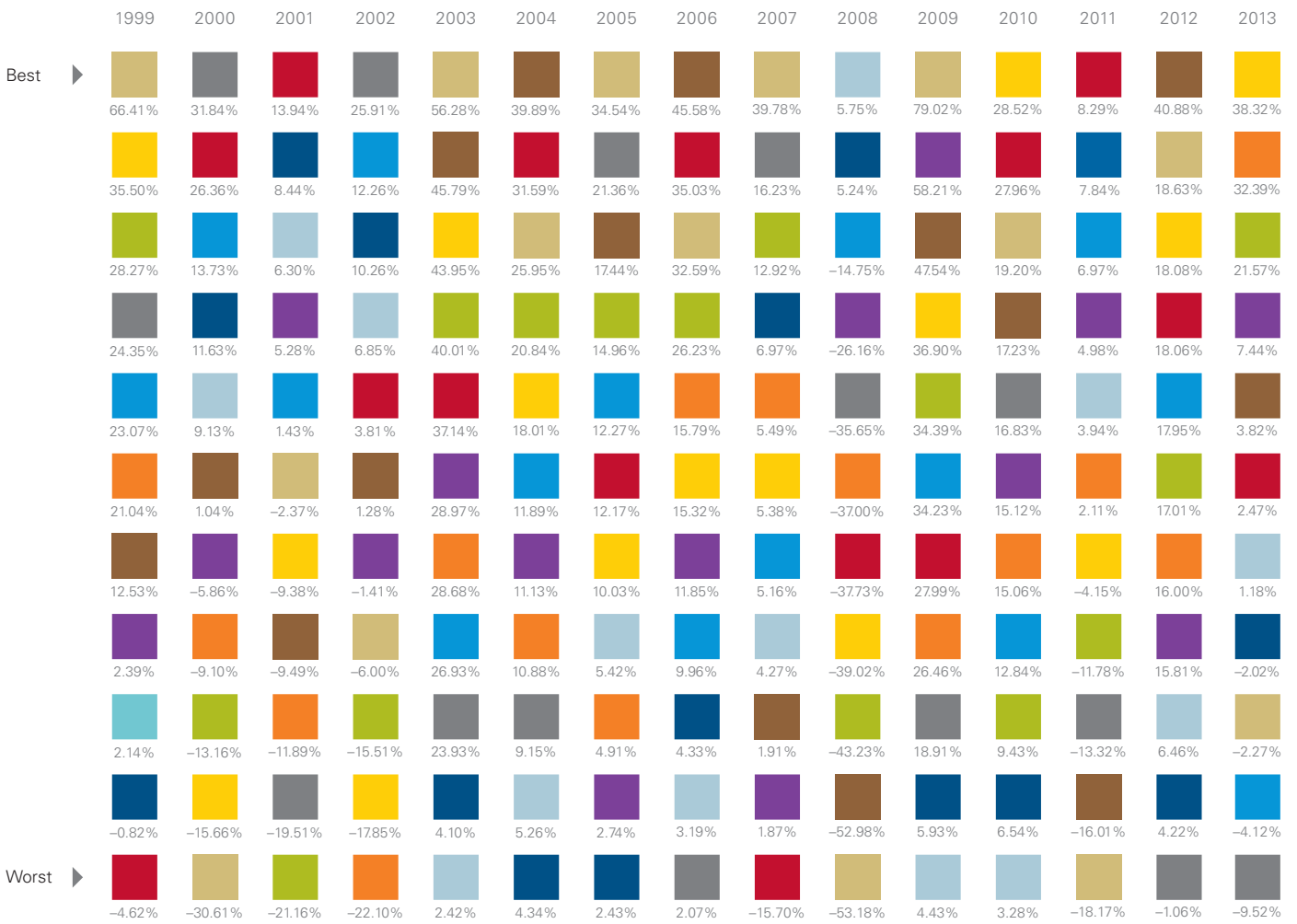
For example, over the history of the capital markets since 1926, U.S. stocks returned an average of 10.2% annually and U.S. bonds 5.5% (based on the same market benchmarks used in Figure 5). For this 87-year period, a half-stock, half-bond portfolio would have returned 8.3% a year on average if it matched the markets' return.

But look at a shorter span, and the picture changes. For example, from 1980 through 2013, U.S. stocks returned an average of 11.7% a year, while bonds returned 8.2%. A portfolio split evenly between the two asset classes and rebalanced periodically would have generated an average annual return of 10.3%. As you can see, anyone with such a portfolio over this particular period could have earned 2 percentage points a year more than the long-term historical average. Contrast that with the period from 2000 through 2013, when U.S. stocks provided a 4.3% average return and U.S. bonds 5.7%; then the same balanced portfolio would have averaged 5.6% a year.

In practice, investors will always need to decide how to apply historical experiences to current market expectations. For example, as reported in *Vanguard's Economic and Investment Outlook* (2014), returns over the next decade may look very different from the examples above as a result of current market conditions. Particularly for bonds, the analysis provided in the paper suggests that returns may be lower than what many investors have grown accustomed to. The implication is that investors may need to adjust their asset allocation assumptions and contribution/spending plans to meet a future objective that could previously have seemed easily achievable based on historical values alone.

Figure 6. Market segments display seemingly random patterns of performance

Annual returns for various investment categories ranked by performance, best to worst: 1999–2013



Note: Benchmarks reflect the following asset classes—for large-capitalization U.S. stocks, the S&P 500 Index; for mid- and small-cap U.S. stocks, the Wilshire 4500 Completion Index; for developed international stock markets, the MSCI World ex USA Index; for emerging markets, the MSCI Emerging Markets Index; for commodities, the Dow Jones-UBS Commodity Total Return Index; for U.S. real estate, the FTSE NAREIT Equity REIT Index; for international real estate, the S&P Global Ex U.S. Property Index; for U.S. investment-grade bonds, the Barclays U.S. Aggregate Bond Index; for U.S. high-yield bonds, the Barclays U.S. High Yield Bond Index; for international bonds, the Barclays Global Aggregate Ex U.S. Index (Hedged); and for emerging market bonds, the Barclays Aggregate Emerging Market Bond Index.

Source: Vanguard.

Diversify to manage risk

Diversification is a powerful strategy for managing traditional risks.[3] Diversifying across asset classes reduces a portfolio's exposure to the risks common to an entire class. Diversifying within an asset class reduces exposure to risks associated with a particular company, sector, or segment.

In practice, diversification is a rigorously tested application of common sense: Markets will often behave differently from each other—sometimes marginally, sometimes greatly—at any given time. Owning a portfolio with at least some exposure to many or all key market components ensures the investor of some participation in stronger areas while also mitigating the impact of weaker areas. See for example **Figure 6**, on page 13, where we show annual returns for a variety of asset and sub-asset classes. The details of Figure 6 don't matter so much as its colorful patchwork, which shows how randomly leadership can shift among markets and market segments.

Performance leadership is quick to change, and a portfolio that diversifies across markets is less vulnerable to the impact of significant swings in performance by any one segment. Investments that are concentrated or specialized, such as REITs, commodities, or emerging markets, also tend to be the most volatile. This is why we believe that most investors are best served by significant allocations to investments that represent broad markets such as U.S. stocks, U.S. bonds, international stocks, and international bonds.[4]

3 Diversification carries no guarantees, of course, and it specifically may not mitigate the kinds of risks associated with illiquid assets, counterparty exposure, leverage, or fraud.

4 We believe that if international bonds are to play an enduring role in a diversified portfolio, the currency exposure should be hedged. For additional perspective, including an analysis of the impact of currency on the return characteristics of foreign bonds, see Philips et al. (2014).

Although broad-market diversification cannot insure an investor against loss, it can help to guard against unnecessarily large losses. One example: In 2008, the Standard & Poor's 500 Index returned –37%. However, more than a third of the stocks in the index that year had individual returns worse than –50%.[5] Some of the worst performers in the index would probably have been viewed as "blue chip" companies not long before. They were concentrated in the financial sector, considered a staple in many dividend-focused portfolios (**Figure 7**).[6]

Although this example comes from the stock market, other asset classes and sub-classes can provide many of their own. It's worth saying again that, while diversification cannot insure against loss, undiversified portfolios have greater potential to suffer catastrophic losses.

Figure 7. The ten worst and best stocks in the S&P 500 Index in 2008

Worst performers	Return
Lehman Brothers Holdings Inc.	–99.67%
Washington Mutual, Inc.	–99.39
American International Group, Inc.	–97.25
General Growth Properties, Inc.	–96.49
Fannie Mae	–96.06
Freddie Mac	–94.87
Ambac Financial Group, Inc.	–94.75
XL Capital Ltd. (Class A)	–92.15
American Capital, Ltd.	–89.05
National City Corp.	–88.75

Best performers	Return
Family Dollar Stores, Inc.	38.62%
UST Inc.	31.96
H&R Block, Inc.	25.77
Amgen Inc.	24.35
Barr Pharmaceuticals, Inc.	23.92
Synovus Financial Corp.	23.40
Wal-Mart Stores, Inc.	20.00
Celgene Corp.	19.63
Rohm and Haas Co.	19.44
Hasbro, Inc.	16.82

Sources: FactSet and Vanguard.

5 A 50% loss requires a 100% return to break even, while a 37% loss requires a 59% return to break even.

6 For further discussion, see *Did Diversification Let Us Down?* (Bennyhoff, 2009).

The key take-away

Asset allocation and diversification are powerful tools for achieving an investment goal. A portfolio's allocation among asset classes will determine a large proportion of its return—and also the majority of its volatility risk. Broad diversification reduces a portfolio's exposure to specific risks while providing opportunity to benefit from the markets' current leaders.

Cost

Minimize cost.

Markets are unpredictable. Costs are forever. The lower your costs, the greater your share of an investment's return. And research suggests that lower-cost investments have tended to outperform higher-cost alternatives. To hold onto even more of your return, manage for tax efficiency. You can't control the markets, but you can control the bite of costs and taxes.

To show why it is essential to consider cost when choosing investments, we provide evidence that:

- Higher costs can significantly depress a portfolio's growth over long periods.
- Costs create an inevitable gap between what the markets return and what investors actually earn—but keeping expenses down can help to narrow that gap.
- Lower-cost mutual funds have tended to perform better than higher-cost funds over time.
- Indexed investments can be a useful tool for cost control.

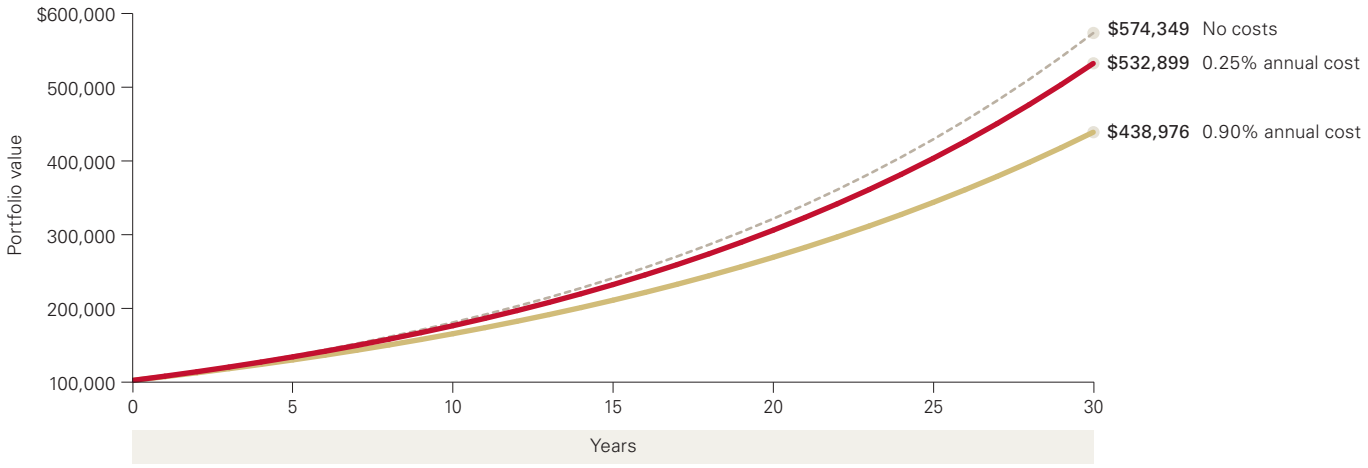
Why cost matters

Minimizing cost is a critical part of every investor's toolkit. This is because in investing, there is no reason to assume that you get more if you pay more. Instead, every dollar paid for management fees or trading commissions is simply a dollar less earning potential return. The key point is that—unlike the markets—costs are largely controllable.

Figure 8 illustrates how strongly costs can affect long-term portfolio growth. It depicts the impact of expenses over a 30-year horizon in which a hypothetical portfolio with a starting value of $100,000 grows an average of 6% annually. In the low-cost scenario, the investor pays 0.25% of assets every year, whereas in the high-cost scenario, the investor pays 0.90%, or the approximate asset-weighted average expense ratio for U.S. stock funds as of December 31, 2013.[7] The potential impact on the portfolio balances over three decades is striking—a difference of almost $100,000 (coincidentally, the portfolio's starting value) between the low-cost and high-cost scenarios.

Figure 8. The long-term impact of investment costs on portfolio balances

Assuming a starting balance of $100,000 and a yearly return of 6%, which is reinvested



Note: The portfolio balances shown are hypothetical and do not reflect any particular investment. The final account balances do not reflect any taxes or penalties that might be due upon distribution.

Source: Vanguard.

7 The asset-weighted expense ratio for all U.S. stock funds was 0.86% at year-end 2013, according to Morningstar.

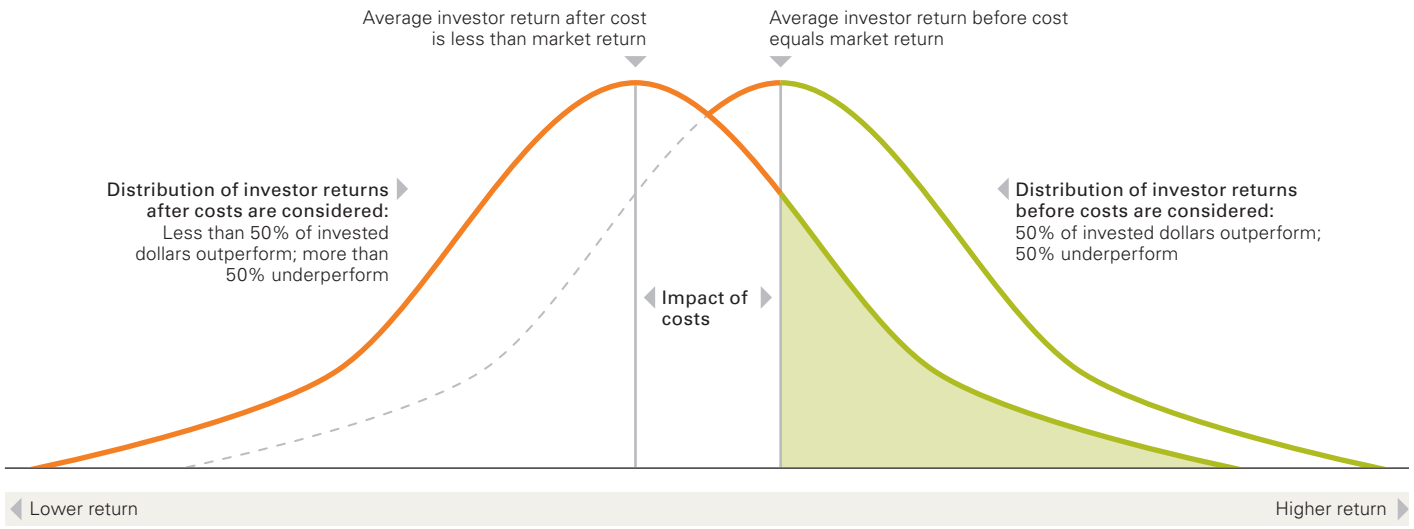
Figure 9 looks at the impact of costs in another way—by illustrating how they cause the return of investors in aggregate to trail the overall market return. It shows a bell-shaped distribution of returns, from lowest to highest, with the average return marked by a vertical line. In any market, the average return for all investors before costs is, by definition, equal to the market return. Once various costs are accounted for, however, the distribution of returns realized by investors moves to the left, because their aggregate return is now less than the market's. The actual return for all investors combined is thus the market return reduced by all costs paid. One important implication of this is that, after costs, fewer investors are able to outperform the markets (occupying the green area in Figure 9).

Reduce cost to help improve return

There are two ways to shift an investor's after-cost return to the right, toward the green region. The first is to earn higher returns than the average investor by finding a winning manager or a winning investment strategy (an "alpha" or "skill-based" approach).

Figure 9. The impact of costs on overall investor returns

Hypothetical distributions of market returns before and after costs



Note: These distributions are theoretical and do not reflect any set of actual returns.

Source: Vanguard.

Unfortunately, research shows that this is easier said than done (Philips, 2012). The second way is to minimize expenses. **Figure 10** highlights five studies evaluating the impact of costs on performance. The common thread among them is that higher costs lead to worse performance for the investor.

Figure 11 compares the ten-year records of the median funds in two groups: the 25% of funds that had the lowest expense ratios as of year-end 2013 and the 25% that had the highest, based on Morningstar data. In every category we evaluated, the low-cost fund outperformed the high-cost fund.

Indexing can help minimize costs

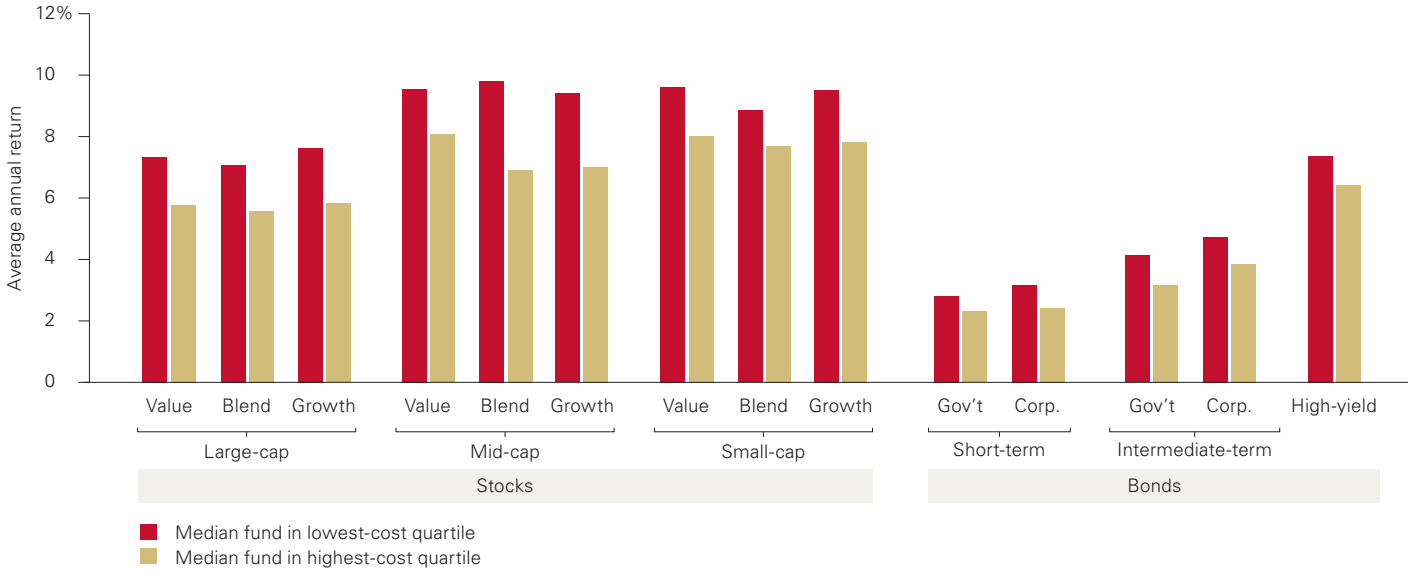
If—all things being equal—low costs are associated with better performance, then costs should play a large role in the choice of investments. As **Figure 12** shows, index funds and indexed exchange-traded funds (ETFs) tend to have costs among the lowest in the mutual

Figure 10. Higher costs make for unhappy news: Studies document effects on performance

1996	Martin J. Gruber, in a study on growth in the mutual fund industry, found that high fees were associated with inferior performance, and also that better-performing managers tended not to raise fees to reflect their success. After ranking funds by their after-expense returns, Gruber reported that the worst performers had the highest average expense ratio and that the return differences between the worst and best funds exceeded the fee differences.
1997	Mark Carhart followed with a seminal study on performance persistence in which he examined all of the diversified equity mutual funds in existence between 1962 and 1993. Carhart showed that expenses proportionally reduce fund performance.
2002	Financial Research Corporation evaluated the predictive value of various fund metrics, including past performance, Morningstar rating, alpha, and beta, as well as expenses. The study found that a fund's expense ratio was the most reliable predictor of its future performance, with low-cost funds delivering above-average performance in all of the periods examined.
2010	Christopher B. Philips and Francis M. Kinniry Jr. showed that using a fund's Morningstar rating as a guide to future performance was less reliable than using the fund's expense ratio. Practically speaking, a fund's expense ratio is a valuable guide (although of course not a certain one), because the expense ratio is one of the few characteristics that are known in advance.
2011	Daniel W. Wallick and colleagues evaluated the associations between a fund's performance and its size, age, turnover, and expense ratio. They found that the expense ratio was a significant factor associated with future alpha (return above that of a market index).

Figure 11. Lower costs can support higher returns

Average annual returns over the ten years through 2013



Notes: All mutual funds in each Morningstar category were ranked by their expense ratios as of December 31, 2013. They were then divided into four equal groups, from the lowest-cost to the highest-cost funds. The chart shows the ten-year annualized returns for the median funds in the lowest-cost and highest-cost quartiles. Returns are net of expenses, excluding loads and taxes. Both actively managed and indexed funds are included, as are all share classes with at least ten years of returns.

Source: Vanguard calculations, using data from Morningstar.

Figure 12. Asset-weighted expense ratios of active and indexed investments

		Average expense ratio as of December 31, 2013		
	Investment type	Actively managed funds	Index funds	ETFs
U.S. stocks	Large-cap	0.80%	0.11%	0.14%
	Mid-cap	0.97	0.18	0.25
	Small-cap	1.04	0.19	0.23
U.S. sectors	Industry sectors	0.94	0.44	0.37
	Real estate	0.92	0.13	0.20
International stocks	Developed market	0.91	0.17	0.29
	Emerging market	1.16	0.21	0.42
U.S. bonds	Corporate	0.58	0.11	0.13
	Government	0.47	0.12	0.15

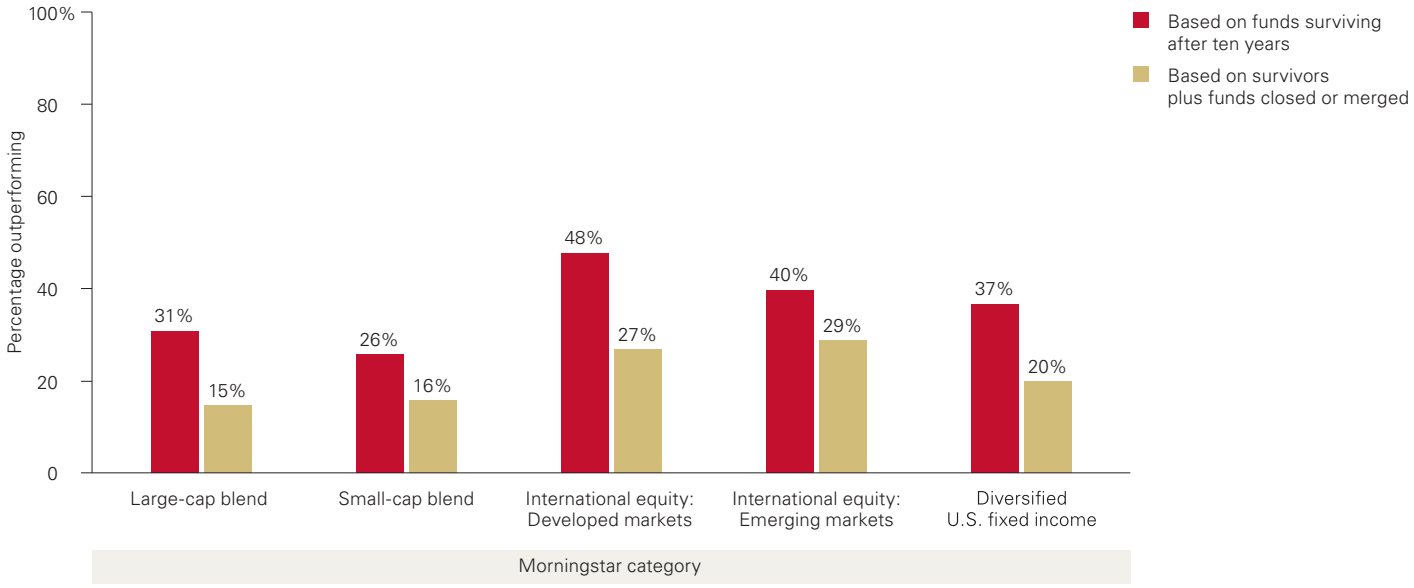
Notes: "Asset-weighted" means that the averages are based on the expenses incurred by each invested dollar. Thus, a fund with sizable assets will have a greater impact on the average than a smaller fund. ETF expenses reflect indexed ETFs only. We excluded "active ETFs" because they have a different investment objective from indexed ETFs.

Source: Vanguard calculations, using data from Morningstar.

fund industry. As a result, indexed investment strategies can actually give investors the opportunity to outperform higher-cost active managers—even though an index fund simply seeks to track a market benchmark, not to exceed it. Although some actively managed funds have low costs, as a group they tend to have higher expenses. This is because of the research required to select securities for purchase and the generally higher portfolio turnover associated with trying to beat a benchmark.[8]

There is much data to support the outperformance of indexed strategies, especially over the long term, across various asset classes and sub-asset classes. **Figure 13** shows how low-cost index funds as a group bested actively managed funds within common asset categories over the ten years through 2013. It provides the results in two ways: first,

Figure 13. Percentage of active funds outperforming the average return of low-cost index funds over the ten years through 2013



Notes: Data cover the ten years ended December 31, 2013. The actively managed funds are those listed in the respective Morningstar categories. Index funds are represented by those funds with expense ratios of 20 basis points or less as of December 31, 2013. All returns used were for the Investor share class.

Sources: Morningstar and Vanguard.

8 Turnover, or the buying and selling of securities within a fund, results in transaction costs such as commissions, bid-ask spreads, and opportunity cost. These costs, which are incurred by every fund, are not spelled out for investors but do detract from net returns. For example, a mutual fund with abnormally high turnover would be likely to incur large trading costs. All else equal, the impact of these costs would reduce total returns realized by the investors in the fund.

measuring only those funds that survived for the entire decade; and second, including the funds that disappeared along the way.[9] The chart shows how difficult it can be for active managers to outperform indexed funds. The results are especially telling when they account for funds that were closed or merged during the ten-year period. Research has shown that low costs, inherent in passive investing, are a key driver in the long-term outperformance of indexed portfolios (Philips, 2012).

Tax-management strategies can enhance after-tax returns

Taxes are another potentially significant cost. For many investors, it may be possible to reduce the impact by allocating investments strategically among taxable and tax-advantaged accounts. The objective of this "asset location" approach is to hold relatively tax-efficient investments, such as broad-market stock index funds or ETFs, in taxable accounts while keeping tax-inefficient investments, such as taxable bonds, in retirement accounts. In the fixed income markets, tax-sensitive investors with higher incomes can consider tax-exempt municipal bonds in nonretirement accounts.[10]

The key take-away

Investors cannot control the markets, but they can often control what they pay to invest. And that can make an enormous difference over time. The lower your costs, the greater your share of an investment's return, and the greater the potential impact of compounding.

Further, as we have shown, research suggests that lower-cost investments have tended to outperform higher-cost alternatives.

9 For additional analysis regarding the performance of funds that have been closed, see Schlanger and Philips (2013).

10 See Jaconetti (2007) for an in-depth discussion of asset location, and Donaldson and Kinniry (2008) for a discussion of tax-efficient investing.

Discipline

Maintain perspective and long-term discipline.

Investing can provoke strong emotions. In the face of market turmoil, some investors may find themselves making impulsive decisions or, conversely, becoming paralyzed, unable to implement an investment strategy or to rebalance a portfolio as needed. Discipline and perspective are the qualities that can help investors remain committed to their long-term investment programs through periods of market uncertainty.

Here we show the benefits of a disciplined approach to investing and the cost of allowing emotional impulse to undermine it. We provide evidence that:

- Enforcing an asset allocation through periodic rebalancing can help manage a portfolio's risk.
- Spontaneous departures from such an allocation can be costly.
- Attempts to outguess the market rarely pay.
- Chasing winners often leads to a dead end.
- Simply contributing more money toward an investment goal can be a surprisingly powerful tool.

The case for discipline

Although the asset allocation decision is one of the cornerstones for achieving an objective, it only works if the allocation is adhered to over time and through varying market environments. Periodic rebalancing will be necessary to bring the portfolio back into line with the allocation designed for the objective. In a 2010 paper, Jaconetti, Kinniry, and Zilbering concluded that for most broadly diversified portfolios, the asset allocation should be checked annually or semiannually, and the portfolio should be rebalanced if it has deviated more than 5 percentage points from the target.

Of course, deviations resulting from market movements offer an opportunity to revalidate the targeted asset allocation. However, abandoning an investment policy simply because of these movements can harm progress toward an objective. **Figure 14** shows how an investor's risk exposure can grow unintentionally when a portfolio is left to drift during a bull market.

Figure 14. The importance of maintaining discipline: Failure to rebalance can increase an investor's exposure to risk

Changes in stock exposure for a rebalanced portfolio and a "drifting portfolio," February 2003–December 2013

Notes: The initial allocation for both portfolios is 42% U.S. stocks, 18% international stocks, and 40% U.S. bonds. The rebalanced portfolio is returned to this allocation at the end of each June and December. Returns for the U.S. stock allocation are based on the Dow Jones U.S. Total Stock Market Index through April 2005 and on the MSCI US Broad Market Index thereafter. Returns for the international stock allocation are based on the MSCI All Country World Index ex USA, and returns for the bond allocation are based on the Barclays U.S. Aggregate Bond Index.

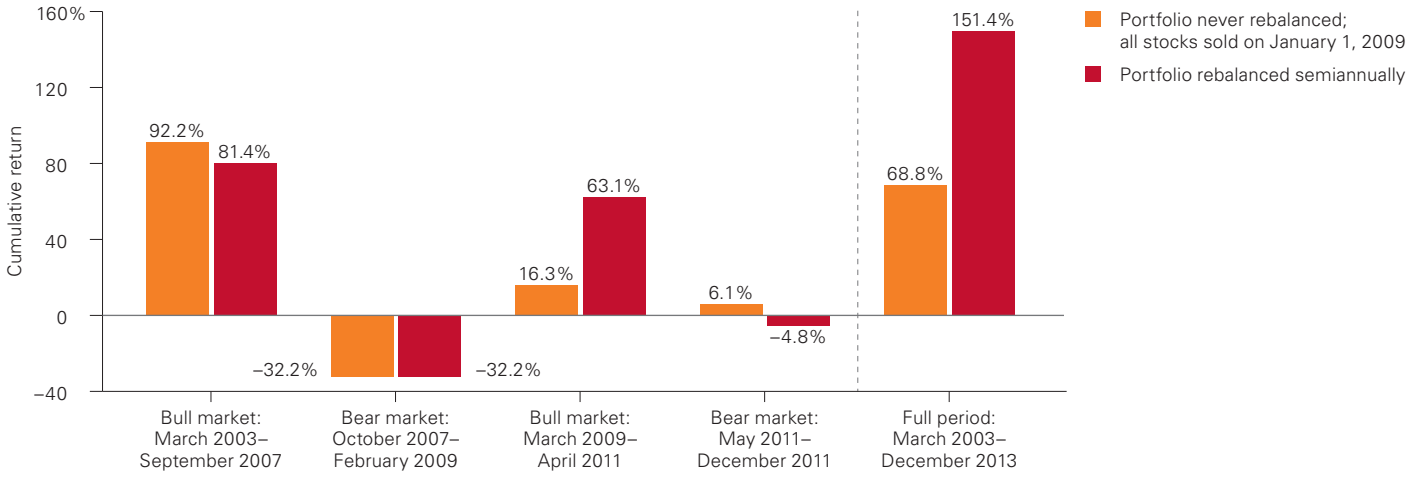
Source: Vanguard, using data provided by Thomson Reuters Datastream.

It compares the stock exposures of two portfolios—one that is never rebalanced and one that is rebalanced twice a year—over changing market environments since early 2003. Both of these hypothetical portfolios start at 60% stocks, 40% bonds, but four years later the "drifting" portfolio has moved to 75% stocks. That much equity exposure might seem appealing during a bull market, but by late 2007 the portfolio would have faced significantly greater downside risk as the financial crisis began.

Figure 15 shows the impact of fleeing an asset allocation during a bear market for stocks. In this example, the investor moves out of equities at the end of December 2008. The portfolio escapes the stock market's further declines in January and February 2009 (stocks dropped an additional 17% in those two months), but it also misses out on the significant bull market that started in March. Although this represents an extreme example, it also reflects a reality for many investors: After abandoning exposure to an asset class, such as stocks, inertia makes it all too easy to postpone the decision to "get back in."

Figure 15. The importance of maintaining discipline: Reacting to market volatility can jeopardize return

What if the "drifting" investor fled from stocks after the 2008 plunge?



Notes: The initial allocation for both portfolios is 42% U.S. stocks, 18% international stocks, and 40% U.S. bonds. The rebalanced portfolio is returned to this allocation at the end of each June and December. Returns for the U.S. stock allocation are based on the Dow Jones U.S. Total Stock Market Index through April 2005 and on the MSCI US Broad Market Index thereafter. Returns for the international stock allocation are based on the MSCI All Country World Index ex USA, and returns for the bond allocation are based on the Barclays U.S. Aggregate Bond Index.

Source: Vanguard, using data provided by Thomson Reuters Datastream.

It's understandable that during the losses and uncertainties of a bear market in stocks, many investors will find it counterintuitive to rebalance by selling their best-performing assets (typically bonds) and committing more capital to underperforming assets (such as stocks). But history shows that the worst market declines have led to some of the best opportunities for buying stocks. Investors who did not rebalance their portfolios by increasing their stock holdings at these difficult times not only may have missed out on subsequent equity returns but also may have hampered their progress toward long-term investment goals—the target for which their asset allocation was originally devised.

Ignore the temptation to alter allocations

In volatile markets, with very visible winners and losers, market-timing is another dangerous temptation. The appeal of market-timing—altering a portfolio's asset allocation in response to short-term market developments—is strong. This is because of hindsight: An analysis of past returns indicates that taking advantage of market shifts could result in substantial rewards. However, the opportunities that are clear in retrospect are rarely visible in prospect.

Indeed, Vanguard research has shown that while it is possible for a market-timing strategy to add value from time to time, on average these strategies have not consistently produced returns exceeding market benchmarks (Stockton and Shtekhman, 2010). Vanguard is not alone in this finding. Empirical research conducted in both academia and the financial industry has repeatedly shown that the average professional investor persistently fails to time the market successfully. Figure 16, on page 28, lists nine studies making this point, starting back in 1966 when J.L. Treynor and Kay Mazuy analyzed 57 mutual funds and found that only one showed significant market-timing ability.

Figure 17 looks at the record of market-timing mutual funds since 1997. Presumably most such funds are run by sophisticated investment managers with data, tools, time, and experience on their side. Generally speaking, their common objective is to outperform a benchmark in any market environment. To do this, the managers may be authorized to invest in any asset class or sub-asset class of their choosing, at any time. Figure 17 shows the record of these "flexible-allocation funds" since 1997 in five distinct periods—three bull markets and two bear markets. We compare them against a broad benchmark consisting of U.S. and non-U.S. stocks and U.S. bonds.

Two important conclusions can be drawn from this analysis: (1) in only one period did a majority of the flexible-allocation funds outperform the balanced benchmark; and (2) among those that did outperform in a particular period, less than half were able to carry that performance forward into the next period. The lesson? If market-timing is difficult for

Figure 16. Casualties of market-timing

These are groups found to have failed, on average, to successfully time the markets, along with the researchers responsible for the findings. (All the studies are listed in the References.)

Asset allocation funds	Becker et al.	1999
Investment clubs	Barber and Odean	2000
Pension funds	Coggin and Hunter	1983
Investment newsletters	Graham and Harvey	1996
Mutual funds	Chang and Lewellen	1984
	Henriksson and Merton	1981
	Kon	1983
	Treynor and Mazuy	1966
Professional market timers	Chance and Hemler	2001

professional managers with all their advantages, investors without such advantages should think twice before altering a thoughtfully designed portfolio.[11]

As Figures 16 and 17 have shown, the failure of market-timing strategies has not been limited to mutual funds. Investment newsletters, pension funds, investment clubs, and professional market-timers have also failed to demonstrate consistent success. Why is success so elusive? In a word—uncertainty. In reasonably efficient financial markets, the short-term direction of asset prices is close to random. In addition, prices can change abruptly, and the cost of mistiming a market move can be disastrous.

Figure 17. Market-timing versus a market benchmark: A spotty record

Performance of flexible-allocation funds compared with a 60% stock/40% bond benchmark, January 1997–December 2013

	Bull market	Bear market	Bull market	Bear market	Bull market
Date range	1/1/1997–8/31/2000	9/1/2000–2/28/2003	3/1/2003–10/31/2007	11/1/2007–2/28/2009	3/1/2009–12/31/2013
Benchmark returns	14.0%	–8.2%	14.0%	–26.8%	15.7%
Number of flexible-allocation funds	232	273	309	529	459
Number of flexible-allocation funds that outperformed benchmark	74	181	108	239	195
Percentage of flexible-allocation funds that outperformed benchmark	32%	66%	35%	45%	42%
Annualized performance of median fund relative to benchmark return	–2.3%	+3.5%	–1.4%	–1.8%	–0.6%
Number that outperformed benchmark in consecutive periods	37 of 74	73 of 181	29 of 108	42 of 239	—

Notes: The balanced benchmark consists of the MSCI US Broad Market Index (42%), the MSCI All Country World Index ex USA (18%), and the Barclays U.S. Aggregate Bond Index (40%). Flexible-allocation funds are those defined by Morningstar as having "a largely unconstrained mandate to invest in a range of asset types."

Source: Vanguard, using data from Morningstar.

11 For more on the performance of flexible-allocation funds, see Shtekhman et al. (2014).

Ignore the temptation to chase last year's winner

Another component of performance-chasing has to do with investment managers themselves. For years, academics have studied whether past performance has any predictive power regarding future performance. Researchers dating back to Sharpe (1966) and Jensen (1968) have found little or no evidence that it does. Carhart (1997) reported no evidence of persistence in fund outperformance after adjusting for the common Fama-French risk factors (size and style) as well as for momentum. More recently, in 2010, Fama's and French's 22-year study suggested that it is extremely difficult for an actively managed investment fund to regularly outperform its benchmark.

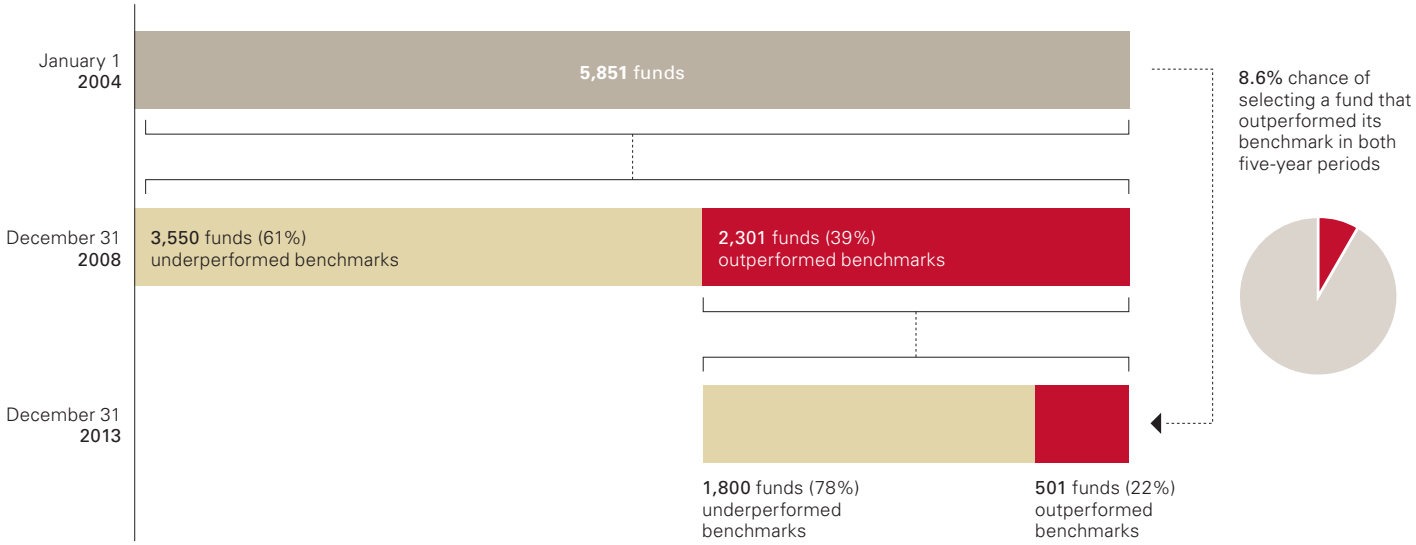
Figure 18 demonstrates the challenge of using past success as a predictor of future success. The ten years through December 2013 were split into two five-year periods, and the available funds were grouped based on whether they outperformed or underperformed their targeted benchmark indexes. Notably, only 39% of funds (2,301 of the original 5,851) managed to beat the benchmarks in the first period.

Even more telling is what happened to those outperformers in the second five years. Investors who selected one of them at the start of 2009 stood a significant chance of disappointment, as only 501 funds (22%) were able to top their benchmarks for a second five-year period.

This inconsistency among winners is also a reason why abandoning managers simply because their results have lagged can lead to further disappointment. For example, in a well-reported study, authors Amit Goyal and Sunil Wahal (2008) looked at U.S. institutional pension plans that replaced underperforming managers with outperforming managers. The results were far different than expected. The authors found that, following termination, the fired managers actually outperformed the managers hired to replace them over the next three years.

Figure 18. Fund leadership is quick to change

How the top-performing stock funds of 2008 fared in the rankings five years later



Note: The chart is based on a ranking of all actively managed U.S. equity funds covered by Morningstar's nine style categories according to their excess returns versus their stated benchmarks as reported by Morningstar during the five years through 2008.

Sources: Vanguard and Morningstar.

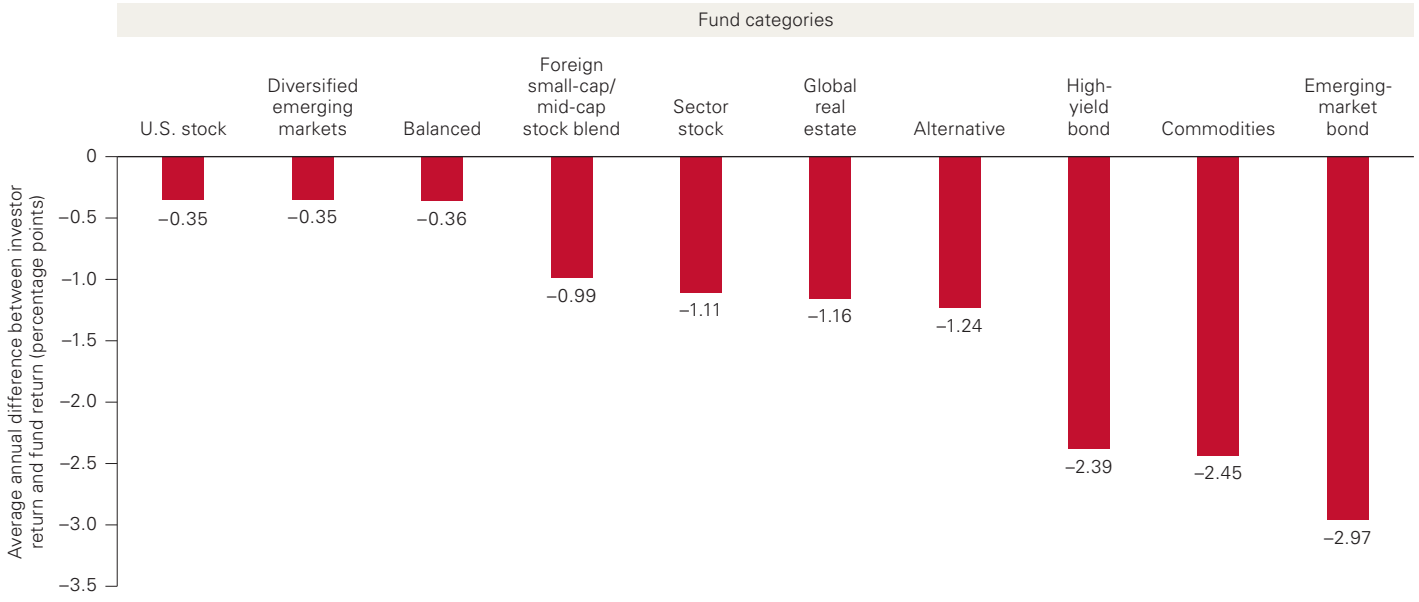
Market-timing and performance-chasing can be a drag on returns

A number of studies address the conceptual difficulties of market-timing. Some examine the records of professional market-timers. The results are discouraging for proponents of market-timing. But what about the experience of the typical investor? Has timing been a net positive or negative?

We can answer that question indirectly by looking at the difference between fund returns and investor returns. **Figure 19** examines the annual impact of investors' buy/sell decisions on the returns they earn (investor return) relative to the returns reported by the funds they are invested in (fund return) across ten different fund categories since January 1, 1999. There are two key implications to be drawn from this data. First, investors generally trail the funds they are invested in as a result of the timing of cash flows.[12] Second, the difference between balanced funds (to the left) and specialized, volatile funds (to the right) has been significant. Investors in these niche vehicles have often earned significantly less than the funds themselves—in part because many invest only after a fund starts looking "hot," and thus never see the gains that got it that reputation. The data suggest that, on average, market-timing is hazardous to long-term investing success.

Figure 19. How investors' returns lagged their funds' returns, 1999–2013

When investors chase performance, they often get there late



Notes: The average difference is calculated based on Morningstar data for investor returns and fund returns. Morningstar Investor Return™ assumes that the change in a fund's total net assets during a given period is driven by both market returns and investor cash flow. To calculate investor return, the change in net assets is discounted by the fund's investment return to isolate the amount of the change driven by cash flow; then a proprietary model is used to calculate the rate of return that links the beginning net assets and the cash flow to the ending net assets.

Sources: Morningstar and Vanguard calculations. Data cover the period from January 1, 1999, through December 31, 2013.

12 An investor's performance, of course, is influenced not only by the timing of cash flows but also by the return of the investments themselves.

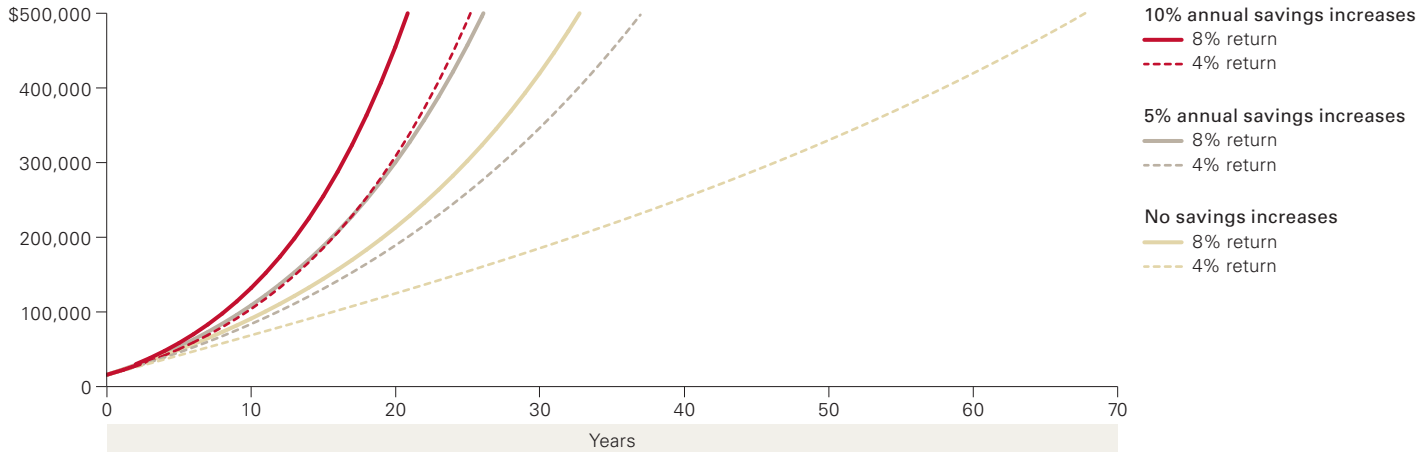
Saving/spending > Market performance

Increasing the savings rate can have a substantial impact on wealth accumulation (Bruno and Zilbering, 2011). To meet any objective, one must rely on the interaction of the portfolio's initial assets, the contribution or spending rate over time, the asset allocation, and the return environment over the duration of the objective. Because the future market return is unknowable and uncontrollable, investors should instead focus on the factors that are within their control—namely asset allocation and the amount contributed to or spent from the portfolio over time.[13]

Figure 20 shows a simple example of the power of increasing contribution rates to meet a given objective. For this example we have an investor who has a goal of $500,000 (in today's dollars

Figure 20. Increasing the savings rate can dramatically improve results

Years needed to reach a target using different contribution rates and market returns



Notes: This hypothetical example does not represent the return on any actual investment. The calculations assume a starting balance of $10,000, an objective of $500,000, a contribution of $5,000 in the first year, and an annual inflation rate of 2%. Contributions are not adjusted for inflation, but the portfolio balance and the portfolio objective are adjusted for inflation at each year-end.

Source: Vanguard.

13 It is also essential to control costs—another cornerstone of Vanguard's investment philosophy. The time horizon may or may not be within the investor's control.

adjusted for inflation), invests $10,000 to start, and—in the baseline case—contributes $5,000 each year (without adjusting for inflation). The example shows varying rates of market return.

The first set of two scenarios assumes that the contribution level is steady, with the investor relying more heavily on the markets to achieve the target. Simply increasing the contribution by 5% each year ($5,250 in year 2, $5,512 in year 3, etc.) or 10% per year significantly shortens the time needed to meet the $500,000 objective. Note that getting an 8% return while increasing savings by 5% a year produces almost the same result as getting a 4% return while boosting savings by 10% a year. In real-world terms, the big difference in those two scenarios is risk: An investor pursuing an 8% long-term return would most likely be forced to take on much more market risk than someone looking for 4%.

This reinforces the idea that a higher contribution rate can be a more powerful and reliable contributor to wealth accumulation than trying for higher returns by increasing the risk exposures in a portfolio.

The key take-away

Because investing evokes emotion, even sophisticated investors should arm themselves with a long-term perspective and a disciplined approach. Abandoning a planned investment strategy can be costly, and research has shown that some of the most significant derailers are behavioral: the failure to rebalance, the allure of market-timing, and the temptation to chase performance.

Far more dependable than the markets is a program of steady saving. Making regular contributions to a portfolio, and increasing them over time, can have a surprisingly powerful impact on long-term results.

References

Ambrosio, Frank J., 2007. *An Evaluation of Risk Metrics*. Valley Forge, Pa.: The Vanguard Group.

Barber, Brad M., and Terrance Odean, 2000. Too Many Cooks Spoil the Profits: Investment Club Performance. *Financial Analysts Journal* 56(1): 17–25.

Becker, Connie, Wayne Ferson, David Myers, and Michael Schill, 1999. Conditional Market Timing With Benchmark Investors. *Journal of Financial Economics* 52: 119–148.

Bennyhoff, Donald G., 2009. *Did Diversification Let Us Down?* Valley Forge, Pa.: The Vanguard Group.

Bennyhoff, Donald G., and Francis M. Kinniry Jr., 2010. *Advisor's Alpha*. Valley Forge, Pa.: The Vanguard Group.

Brinson, Gary P., L. Randolph Hood, and Gilbert L. Beebower, 1986. Determinants of Portfolio Performance. *Financial Analysts Journal* 42(4): 39–48. [Reprinted in: *Financial Analysts Journal* 51(1): 133–8. (50th Anniversary Issue.)]

Bruno, Maria A., and Yan Zilbering, 2011. *Penny Saved, Penny Earned*. Valley Forge, Pa.: The Vanguard Group.

Carhart, Mark, 1997. On Persistence in Mutual Fund Performance. *Journal of Finance* 52(1): 57–81.

Chance, Don M., and Michael L. Hemler, 2001. The Performance of Professional Market Timers: Daily Evidence From Executed Strategies. *Journal of Financial Economics* 62(2): 377–411.

Chang, E.C., and W.G. Lewellen, 1984. Market Timing and Mutual Fund Investment Performance. *Journal of Business* 57: 57–72.

Coggin, T.D., and J.E. Hunter, 1983. Problems in Measuring the Quality of Investment Information: The Perils of the Information Coefficient. *Financial Analysts Journal* 39: 25–33.

Davis, Joseph, Roger Aliaga-Díaz, Charles J. Thomas, and Andrew J. Patterson, 2014. *Vanguard's Economic and Investment Outlook*. Valley Forge, Pa.: The Vanguard Group.

Donaldson, Scott J., and Frank J. Ambrosio, 2007. *Portfolio Construction for Taxable Investors*. Valley Forge, Pa.: The Vanguard Group.

Donaldson, Scott J., and Maria A. Bruno, 2011. *Single-Fund Investment Options: Portfolio Construction Simplified for Investors*. Valley Forge, Pa.: The Vanguard Group.

Donaldson, Scott J., and Francis M. Kinniry Jr., 2008. *Tax-Efficient Equity Investing: Solutions for Maximizing After-Tax Returns*. Valley Forge, Pa.: The Vanguard Group.

Fama, Eugene F., and Kenneth R. French, 2010. Luck Versus Skill in the Cross-Section of Mutual Fund Returns. *Journal of Finance* 65(5): 1915–1947.

Financial Research Corporation, 2002. *Predicting Mutual Fund Performance II: After the Bear*. Boston: Financial Research Corporation.

Goyal, Amit, and Sunil Wahal, 2008. The Selection and Termination of Investment Management Firms by Plan Sponsors. *Journal of Finance* 63(4): 1841, Table 10.

Graham, John R., and Campbell R. Harvey, 1996. Market Timing Ability and Volatility Implied in Investment Newsletters' Asset Allocation Recommendations. *Journal of Financial Economics* 42(3): 397–421.

Gruber, Martin J., 1996. Another Puzzle: The Growth in Actively Managed Mutual Funds. *Journal of Finance* 51(3): 783–810.

Henriksson, Roy D., and Robert C. Merton, 1981. On Market Timing and Investment Performance II: Statistical Procedures for Evaluating Forecasting Skills. *Journal of Business* 54(4): 513–33.

Ibbotson, Roger G., and Paul D. Kaplan, 2000. Does Asset Allocation Policy Explain 40, 90, or 100 Percent of Performance? *Financial Analysts Journal* 56(1): 26–33.

Jaconetti, Colleen M., 2007. *Asset Location for Taxable Investors*. Valley Forge, Pa.: The Vanguard Group.

Jaconetti, Colleen M., Francis M. Kinniry Jr., and Yan Zilbering, 2010. *Best Practices for Portfolio Rebalancing*. Valley Forge, Pa.: The Vanguard Group.

Jahnke, William W., 1997. The Asset Allocation Hoax. *Journal of Financial Planning* 10(1): 109–13.

Jensen, Michael C., 1968. *The Performance of Mutual Funds in the Period 1945–1964*. Papers and Proceedings of the Twenty-Sixth Annual Meeting of the American Finance Association, Washington, D.C., December 28–30, 1967. Also *Journal of Finance* 23(2): 389–416.

Kinniry, Francis M., and Christopher B. Philips, 2012. *The Theory and Implications of Expanding Traditional Portfolios*. Valley Forge, Pa.: The Vanguard Group.

Kon, S.J., 1983. The Market Timing Performance of Mutual Fund Managers. *Journal of Business* 56: 323–348.

Philips, Christopher B., 2012. *The Case for Indexing*. Valley Forge, Pa.: The Vanguard Group.

Philips, Christopher B., Joseph Davis, Andrew J. Patterson, and Charles J. Thomas, 2014. *Global Fixed Income: Considerations for U.S. Investors*. Valley Forge, Pa.: The Vanguard Group.

Philips, Christopher B., and Francis M. Kinniry Jr., 2010. *Mutual Fund Ratings and Future Performance*. Valley Forge, Pa.: The Vanguard Group.

Schlanger, Todd, and Christopher B. Philips, 2013. *The Mutual Fund Graveyard: An Analysis of Dead Funds*. Valley Forge, Pa.: The Vanguard Group.

Sharpe, William F., 1966. Mutual Fund Performance. *Journal of Business* 39(1, Part 2: Supplement on Security Prices): 119–38.

Shtekhman, Anatoly, Kimberly A. Stockton, and Brian R. Wimmer, 2014. *Broader Opportunities, Same Limited Results: An Analysis of 'Go-Anywhere Funds.'* Valley Forge, Pa.: The Vanguard Group.

Stockton, Kimberly A., and Anatoly Shtekhman, 2010. *A Primer on Tactical Asset Allocation Strategy Evaluation*. Valley Forge, Pa.: The Vanguard Group.

Treynor, J.L., and Kay Mazuy, 1966. Can Mutual Funds Outguess the Market? *Harvard Business Review* 44: 131–36.

Wallick, Daniel W., Neeraj Bhatia, Andrew S. Clarke, and Raphael A. Stern, 2011. *Shopping for Alpha: You Get What You Don't Pay For*. Valley Forge, Pa.: The Vanguard Group.

Wallick, Daniel W., Julieann Shanahan, Christos Tasopoulos, and Joanne Yoon, 2012. *The Global Case for Strategic Asset Allocation*. Valley Forge, Pa.: The Vanguard Group.

P.O. Box 2600
Valley Forge, PA 19482-2600

Connect with Vanguard® > vanguard.com

For more information about Vanguard funds, visit vanguard.com or call 800-662-2739 to obtain a prospectus. Investment objectives, risks, charges, expenses, and other important information about a fund are contained in the prospectus; read and consider it carefully before investing.

Vanguard ETF Shares are not redeemable with the issuing fund other than in Creation Unit aggregations. Instead, investors must buy or sell Vanguard ETF Shares in the secondary market with the assistance of a stockbroker. In doing so, the investor may incur brokerage commissions and may pay more than net asset value when buying and receive less than net asset value when selling.

ICRPRINC 042014