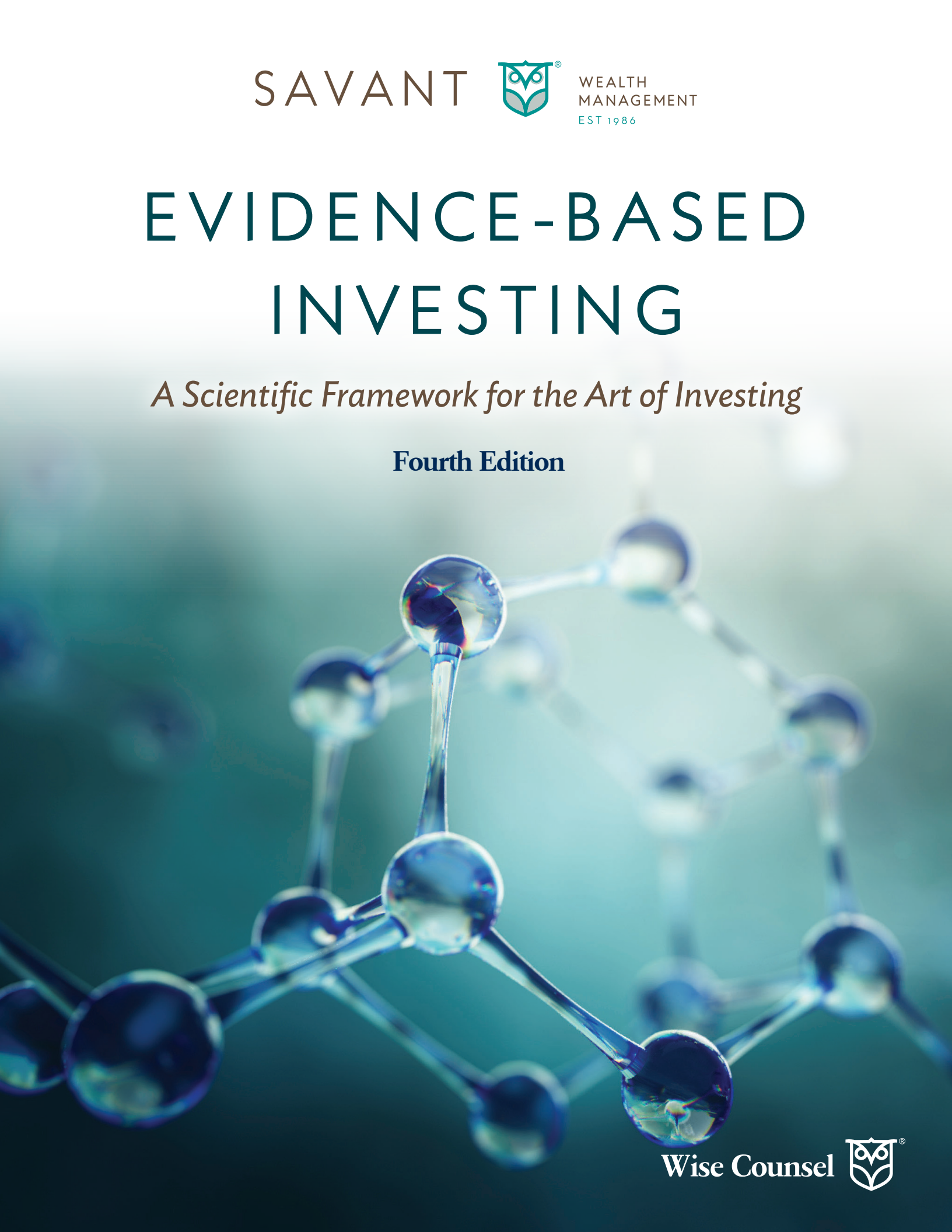
SAVANT WEALTH MANAGEMENT
EST 1986

EVIDENCE-BASED INVESTING

A Scientific Framework for the Art of Investing

Fourth Edition



Wise Counsel

The Clash of Conventional Wisdom and Financial Science

Introduction

Science has produced many tremendous advances, from lifesaving medical treatments to instantaneous communication. Historically, though, science has had little influence on how we invest. Rather than adapting to empirical results and financial innovations, investors and money managers often rely on conventional wisdom and flawed assumptions. How can investors sort through the vast amount of available data to maximize after-tax returns and minimize risk? This paper provides a framework called Evidence-Based Investing, grounded in logic and supported by compelling data, that help put investors on a path towards building their ideal futures.

Scientific progress is evident in virtually every aspect of our lives. From the moment we get up in the morning, the impact of modern science is everywhere. The magnitude of change over the last few decades is overwhelming in every way except one—the way most people make their investment decisions.

Over the last five decades there has been a quantum leap forward in understanding how capital markets work and what specific factors drive investment performance over time. Research clearly demonstrates which investment approaches are most likely to succeed as well as those involving unnecessary risk that are more likely to fail.

Even though this research exists and is virtually irrefutable, most investors do not make their investment decisions based on the evidence. On the contrary, fear and greed drive most investor decisions. It is astonishing how few investors are even aware of the overwhelming body of evidence that exists regarding optimal investing.

There is substantial evidence demonstrating how difficult it is to "beat the market" by trading in and out of individual stocks. Likewise, the notion that there is a system by which one can consistently profit by timing the market has been proven false. The data, compiled by a conglomerate of Nobel laureates and other highly-acclaimed thinkers over several decades, is crystal clear.

Nevertheless, many brokers and some investment advisors ignore the evidence. They typically follow speculative and unproven approaches. While doing so, they claim that they alone have special knowledge that can be used to produce returns in excess of the market, somehow justifying their higher expenses. To expose the many shortcomings of this approach and what we believe is a road map to investing success, this paper introduces the concept of Evidence-Based Investing (EBI).

EBI involves the judicious use of current best evidence to make informed investment decisions. The concept is built around the evidence-based method that has produced such great success in the field of medicine. Evidence-Based Medicine (EBM) is defined as "the attempt to apply standards of evidence gained from the scientific method to aspects of medical practice in a uniform manner."[1] (An overview of Evidence-Based Medicine can be found in the appendix.)

In the same way, EBI applies the available evidence to each investor's specific questions and challenges to formulate optimal investing solutions. The goal of EBI is to leverage our collective knowledge of risk and return to maximize the likelihood of achieving desired outcomes, while minimizing risk and reducing frictions such as taxes and unnecessary costs that can act as a drag on results.

This paper introduces the methods and conclusions of EBI and relates how an investor can best capture market gains while avoiding the pitfalls of conventional approaches. In doing so, this paper will help demonstrate the potential benefits of a scientific approach for the individual investor.

The Evidence-Based Method

From Medicine to Investment Management to Building Ideal Futures®

1	2	3	4
CHALLENGE CONVENTIONAL WISDOM	**ASK MEANINGFUL QUESTIONS**	**APPLY THE EVIDENCE**	**MONITOR FOR EFFECTIVENESS**

The first purpose of EBI is to provide a decision-making framework that makes it possible to better evaluate the spectrum of topics confronting today's investor and challenge the wisdom of conventional investment advice. EBI offers a way to answer investment questions in a systematic, analytical, and scientific manner as described below.

Step One: Challenge Conventional Wisdom

Conventional investment wisdom often attempts to answer questions that cannot be verified. For example, consider the following question:

> *"Did the market decline today due to trade tensions between the U.S. and China?"*

There would be no way to irrefutably verify either a positive or a negative answer to this question. There are countless unverifiable questions and statements that dominate investment news on a daily basis. This brings to light the importance of the next step in EBI—the need to develop the right questions.

Step Two: Ask Meaningful Questions

Meaningful questions need to be formulated. That means asking questions that can be proven or disproven with reference to evidence. The questions must also have significance for the individual investor. We believe this requires the experience and knowledge of an objective financial advisory team.

Step Three: Apply the Evidence

Once the right questions have been asked, evidence can be applied to solve problems and integrate both the advisor's expertise and the individual investor's values and goals.

Step Four: Monitor for Effectiveness

The final step in EBI is evaluating the effectiveness and efficiency of the process. This involves closely analyzing portfolio performance (after all costs) and revisiting the investor's goals and values. Effective monitoring presumes that the advisor is compensated in a way they can maintain objectivity.

Data must be applied in the context of an individual's goals, needs, and circumstances. In this way, empirical research becomes more relevant to practical investing, and practical investing is backed by solid theory and economic knowledge. As a result, our EBI investment philosophy is designed to engineer broad, globally diversified portfolios that minimize unrewarded risks and maximize after-tax return.

EBI is also an important part of the Building Ideal Futures® Process. The process is Savant's proprietary five-step method that was developed to help clients maintain a well-structured plan and investment portfolio aligned with their vision and goals. The five steps of the process include:

1. Determine What's Important
2. Perform Default Plan & Portfolio Assessment
3. Develop Ideal Futures® Plan
4. Implement & Coordinate Ideal Futures® Plan & Portfolio
5. Ideal Futures® Review Sessions

The EBI method is part of step four of The Building Ideal Futures® Process where an effective investment strategy needs to be implemented to assure clients earn an appropriate return for the level of risk they can afford. The result is a time-tested and common-sense approach. We provide investors access to evidence-based portfolios along with proactive and customized planning advice.

EBI Step One:

Challenge Conventional Wisdom

This section exposes the tenets of the conventional approach as resting on spurious assumptions and false hopes. Whether one seeks investing success by picking stocks, timing the market, or by picking skilled money managers, the costs of these speculative techniques are often greater than any gains derived by their practice. Through an informal application of the evidence-based method described in the introduction, we've arrived at conclusions about broad areas including asset allocation, active management, market timing, costs, and taxes. These conclusions form the pillars of our investment philosophy.

ASSET ALLOCATION

Evidence Contradicts the Conventional Approach

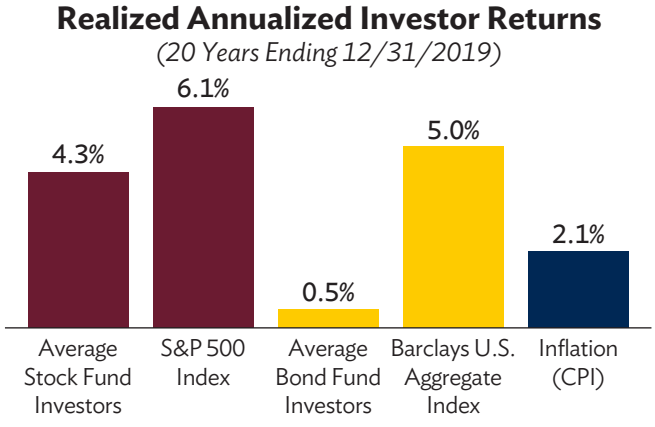
Question: *What is the best way to capture market returns?*

Most salespeople on Wall Street believe that successful investing involves beating the market and that the best way to achieve this is through actively managed investment strategies. Evidence demonstrates that this assumption is without foundation. Both the method (the continuous trading of securities for short-term gains) and the goal (beating the market) add risk and expense while delivering a lower overall return compared to investing strategies that neither actively trade nor seek returns greater than the market. This may be counter-intuitive for many people, but the evidence is overwhelming.

Wall Street tells investors that money managers add value by providing expertise in stock selection and market timing. In fact, there is a great quantity of evidence that demonstrates how professional market timing and stock selection harms investors. In aggregate, the conventional approach of active management has failed to deliver the market-beating returns that it promises.

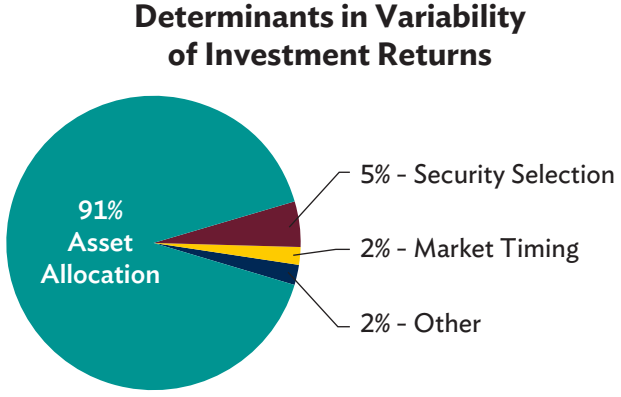
A study by Dalbar (**Figure 1a**) shows that conventional active money management techniques resulted in substantially lower returns for investors. The average stock fund investor earned returns of only 4.3% per year over the 20-year period ending in 2019, while a simple buy-and-hold strategy in the S&P 500 returned 6.1%. The comparison is similar for bond

Figure 1a



Data Source: Dalbar. Quantitative Analysis of Investor Behavior, 2020.

Figure 1b



Data Source: Brinson, G., Singer, B., & Beebower, G. (1991, May/June). The Determinants of Portfolio Performance II, An Update, Financial Analysts Journal.

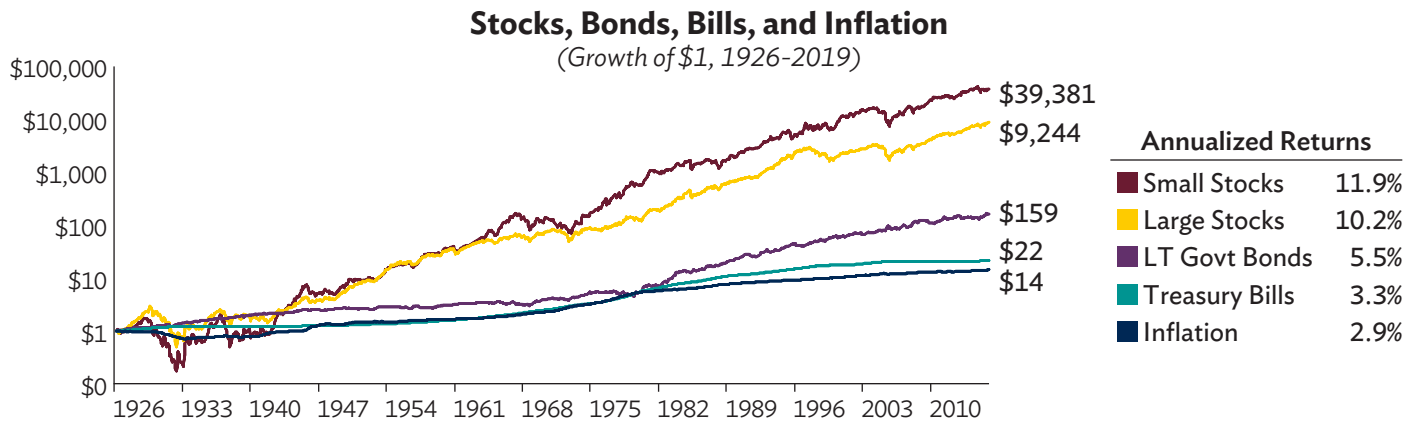
investors. Remarkably, the average bond investor wasn't able to realize returns above the level of inflation.

The significant long-term growth of capital markets raises the question: How can individual investors capture this growth while minimizing costs? We believe asset allocation is by far the most effective means of capturing market returns. Asset allocation is the strategic mixture of asset classes (e.g. stocks, bonds, alternatives, and cash) in a portfolio to reap the highest returns over the long term given an investor's acceptable level of risk. As **Figure 1b** shows, research conducted in 1986 and then confirmed in 1991 demonstrates that over 90% of the total return variations across portfolios were the result of asset allocation differences. Other decisions such as security selection and market timing accounted for only 5% and 2%, respectively. Disciplined asset allocation can help enhance returns, whereas security selection and market timing are likely to detract from performance more frequently than not. Typically, conventional investors focus on stock selection and market timing while ignoring the primary driver of future returns—optimal allocation between different asset classes.

Throughout history, capital markets have rewarded long-term investors. The markets represent capitalism at work in the economy, and free markets have provided a long-term return that has substantially outpaced inflation. With an optimal asset allocation, investors can let markets work for them. Stock markets have a long and illustrious history of growth and appreciation. This history is depicted in the graph, "Stocks, Bonds, Bills, and Inflation" (**Figure 1c**). The data illustrates the beneficial role of stocks in creating real wealth over time. T-bills have barely covered inflation, while longer-term bonds have provided higher returns over inflation. U.S. stock returns have far exceeded inflation and significantly outperformed bonds.

Another key point is that not all stocks or bonds are the same. For example, consider the performance of U.S. small cap stocks versus large cap stocks over this period. A dollar invested in small cap stocks in 1926 would be worth more than $39,400 in 2019, compared to about $9,200 for large cap stocks.

Figure 1c



Data Source: Morningstar Direct.

Small Stocks: IA SBBI U.S. Small Stock Index, Large Stocks: IA SBBI U.S. Large Stock Index, LT Govt Bonds: IA SBBI U.S. LT Govt Index, Treasury Bills: 30 Day U.S. TBill Index, Inflation: IA SBBI U.S. Inflation. Historical performance results for investment indices have been provided for general informational/comparison purposes only, and do not reflect the deduction of investment management fees or other expenses.

ACTIVE MANAGEMENT

The Poor Performance of Active Money Managers

Question: *Do professional money managers perform better than market indexes?*

Money managers are notorious for overtrading, executing a variety of strategies and techniques in the pursuit of market-beating returns. Armed with the finest information, technology and research, these managers compete with thousands of other similarly equipped peers. Unfortunately for them—but fortunately for patient, disciplined investors—the evidence demonstrates that activity does not necessarily equate with results.

Their actions are best measured in terms of cost, both explicit (published in the prospectus) and implicit (hidden and not disclosed). These hidden costs are rarely discussed. They include the cost of market impact, bid/ask spreads, and direct trading costs that only appear in the net cost of a stock position after the trade has settled. Truly visible, and more easily measurable, costs include:

- Brokerage commissions and sales loads.
- Expense ratios, which include management fees, administrative fees, legal fees, custody costs, and 12b-1 fees.
- Capital gains distributions from excessive trading within the fund (few people understand the added cost of taxes, although it may be the single most important expense to overcome).

All these added costs make it very difficult for active managers to outperform their benchmarks. **Figure 2a** shows how the average actively managed stock fund compared to its relevant passive index for the 15-year period ending December 31, 2019. Active large cap funds underperformed the S&P 500 by an average of 1.3% per year. The results are even more pronounced for active small cap funds which trailed their index by 2.1% annually. The same holds true even for funds that invest overseas. Developed international and emerging markets stock funds trailed their benchmarks by 0.2% and 0.9% per year respectively.

The Allure of Hunting for the Great Money Manager

Question: *Can you beat the market by identifying great money managers?*

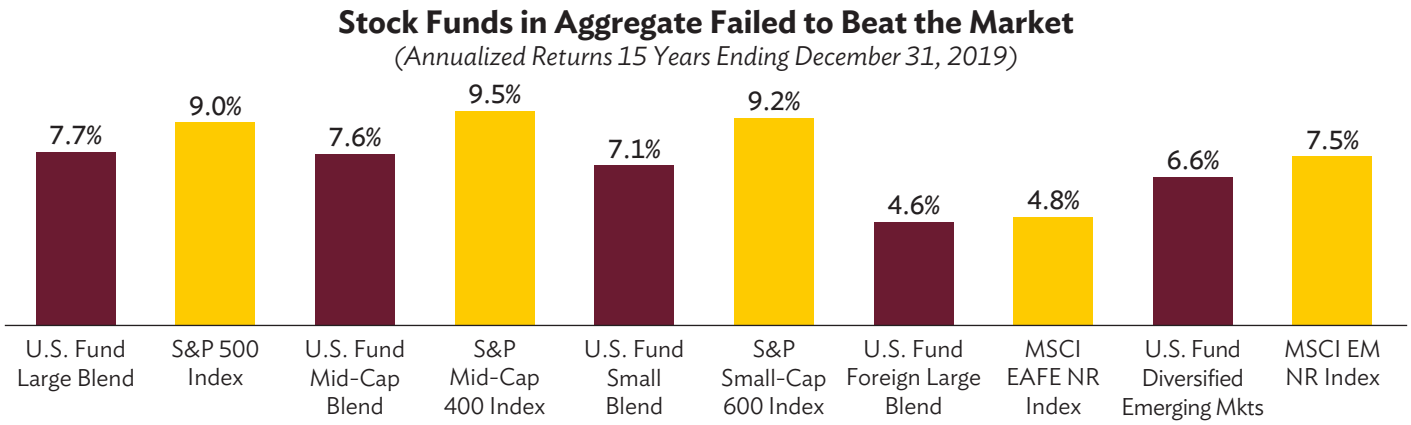
The previous section, The Poor Performance of Active Money Managers, established that the average actively managed stock fund lags its benchmark index. Many advisors acknowledge this is true, yet do not see it as a reason to abandon their quest to beat the market by picking the right funds. After all, they argue, they plan to select only the best money managers—the average money manager need not apply.

The idea is that the advisor recommends only managers with top track records—those with stellar five-year or ten-year return histories. Find only the top performing money managers and leave the less successful managers to other, less attentive advisors. The Securities and Exchange Commission (SEC) has highlighted the first problem with this convention: They mandate that every mutual fund prospectus disclose that "past performance is not indicative of future returns."

Ironically, good track records attract an influx of new capital that, in turn, often consigns the fund to lower future relative returns. **Figure 2b** shows how few top-quartile stock funds were able to maintain a top-quartile ranking over the following five years. On average, only 21% of the managers were able to remain in the top quartile in consecutive five-year periods. Notice the range of money managers' annual repeat successes—from 14% to 26%. Such a broad range points to the random nature of a money manager's success and the difficulty of consistently beating the market.

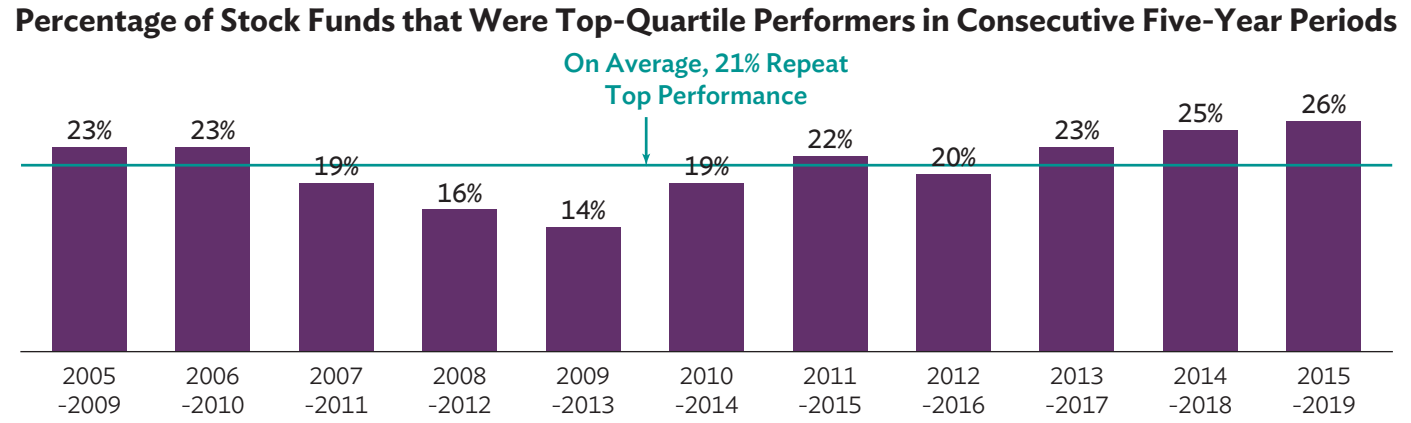
Figure 2c shows that if one attempts to actively select stock funds, there is a good possibility that the fund will not even exist in 15 years, with only 52% surviving that long going back to 2005. Beyond that, only 22% of those stock funds that survived ended up outperforming their benchmark over the past 20 years. Even over shorter periods, many funds attempting to market time and pick stocks will inevitably underperform and potentially not survive. No evidence supports the notion of a positive correlation between superior past performance and future returns. If anything, evidence suggests that the correlation is negative. To summarize, chasing performance is like driving a car while only looking in the rear-view mirror.

Figure 2a



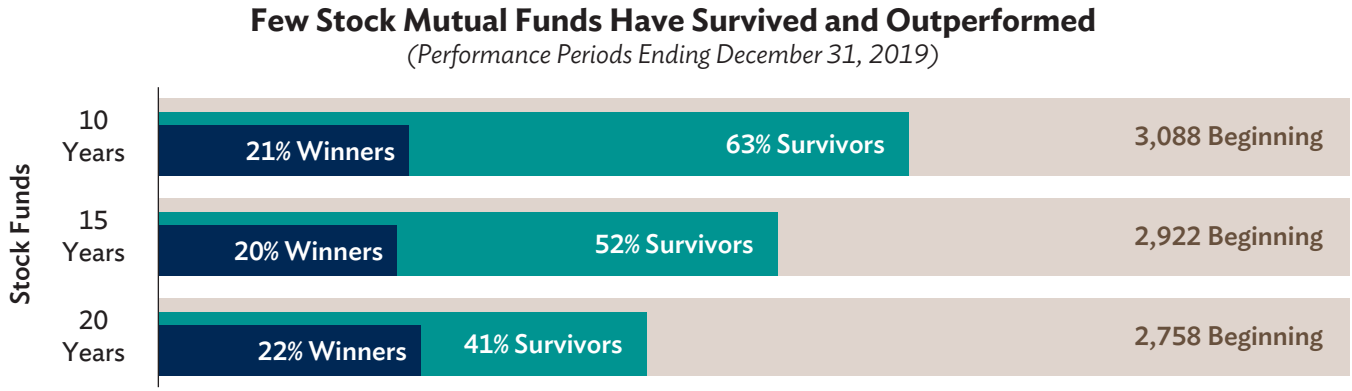
Data Source: Morningstar Direct. Fund returns are Morningstar open-end fund category average returns.

Figure 2b



Data Source: Dimensional Fund Advisors, US-domiciled, USD-denominated, non-Dimensional open-end mutual funds.

Figure 2c



Data Source: Dimensional Fund Advisors, US-domiciled, USD-denominated, non-Dimensional open-end mutual funds.

Figure 3a

Can You Pick the Next Winner?

(Asset Class Returns 2005-2019)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
U.S. Large Stocks	34.0	38.8	39.4	23.0	78.5	27.8	14.1	23.7	39.1	22.8	9.0	20.4	37.3	3.6	31.5
U.S. Small Stocks	22.1	32.1	17.1	8.0	41.5	23.4	11.6	20.4	32.4	15.8	4.3	12.0	34.0	2.8	25.9
Int'l Large Stocks	21.5	30.3	15.4	5.1	36.1	19.4	5.8	18.2	28.4	13.7	3.6	11.2	25.0	2.4	24.5
Int'l Small Stocks	13.5	26.3	11.6	4.8	33.7	18.9	4.5	18.2	22.8	13.1	3.4	7.8	21.8	1.5	24.3
Emerging Markets	13.3	22.3	11.2	2.1	31.8	15.1	3.7	17.3	14.7	9.9	1.7	6.9	15.2	0.9	22.0
Global REITS	10.4	18.8	9.5	-1.1	26.5	11.4	2.1	16.0	10.8	6.2	1.4	6.6	8.6	-1.5	18.4
Short-Term Bonds	7.5	16.5	7.4	-5.8	22.2	9.2	1.7	13.6	8.7	6.1	1.1	5.5	8.3	-4.4	10.2
Interm-Term Bonds	6.3	15.8	6.4	-18.2	13.5	7.8	0.4	10.3	7.5	5.9	0.6	4.8	5.5	-4.4	9.2
TIPS	5.6	15.8	6.2	-36.2	10.0	6.3	-0.2	7.3	2.8	4.5	-0.1	4.2	3.3	-4.8	8.8
Int'l Bonds	4.9	12.0	6.1	-37.0	5.2	5.9	-2.8	5.3	1.4	3.1	-0.8	2.8	2.1	-5.4	8.0
Trend Following	2.8	4.4	5.5	-43.4	3.8	5.0	-4.8	3.9	0.2	0.0	-1.3	2.1	2.0	-11.0	6.8
Event Driven	2.1	4.1	5.1	-45.0	2.3	3.4	-12.1	2.5	-0.9	-2.2	-1.7	1.7	0.5	-13.8	4.4
Reinsurance	1.6	3.1	1.2	-46.6	0.9	1.0	-14.4	0.1	-2.6	-3.1	-4.1	1.0	0.3	-14.6	3.1
Real Assets	1.6	0.5	-11.1	-53.3	0.4	0.5	-18.4	-8.0	-9.4	-4.9	-14.9	0.4	-2.3	-18.3	-4.6

Best Return

Data Source: Morningstar Direct. See References, Notes, Sources of Data and Methodology section for asset class indices referenced.

MARKET TIMING

The Allure of Market Timing—Hope Springs Eternal

Question: *Can market timing improve returns?*

Investors perennially wish to foresee the next big trend, invest accordingly, and then watch the investment shoot to the sky as the economic climate unfolds as predicted. Yet research over the last several decades strongly supports the hypothesis that markets are extremely efficient, though admittedly not perfectly so. This hypothesis states that at any given time, the market has already factored in all publicly available information as it sets security prices. There is consensus on this concept. Both evidence and experience suggest that the events that really do move markets are notable precisely because of their unpredictability. For instance, the implosion of Lehman Brothers in 2008 and the most recent global pandemic of 2020 severely disrupted financial markets, yet neither of these events could have been predicted ahead of time.

The randomness of capital markets is illustrated in **Figure 3a**. This graph has no pattern, showing that the behavior and ranking of asset classes defy prediction from year to year. In fact, even patterns that seem to appear can often reverse quickly and backfire on investors who chase returns. For example, international stocks were one of the top performing asset classes from 2005 to 2007. However, the bear market and Global Financial Crisis in 2008 affected international stocks the most. Investors who attempted to time the market based on a few years of performance suffered as a result.

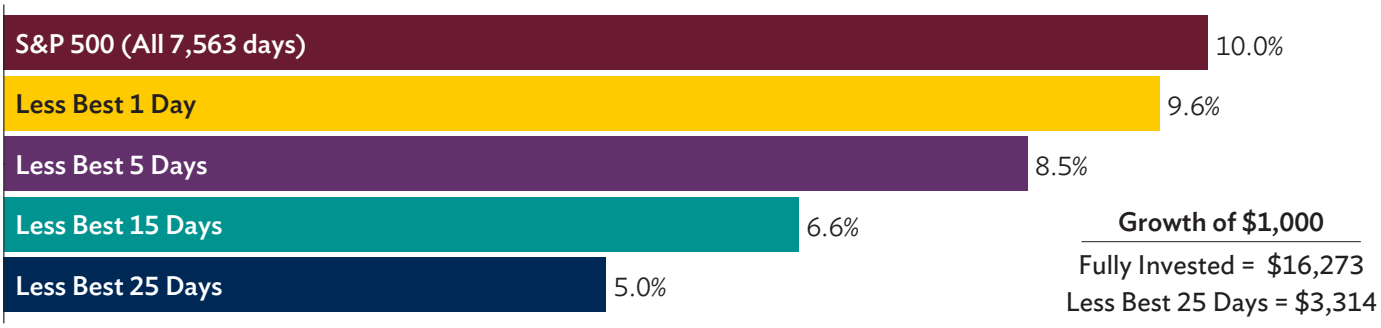
The evidence-based investor looks skeptically at any obsession over what the future holds. The fact is, substantial market growth and loss occur in relatively short periods throughout the year. As **Figure 3b** shows, stock returns come in concentrated pockets of time. The S&P 500 Index has had an annual average return of 10.0% since 1990. However, by missing the best 25 trading days over that period, the return drops to only 5.0%—bad timing would have cost more than half the return. Even missing the best five days cost 1.5% in average annual return.

Clearly, market timing adds risk and can be extremely costly. The evidence proves that market timing is exceedingly difficult and exposes investors to higher levels of risk with no accompanying probability of higher return. The good news is that this search for the holy grail of predictive power is as unnecessary as it is unrealistic.

Figure 3b

The Real Problem with Market Timing: Missing the Big Days

(S&P 500 1990-2019)



Data Source: Morningstar Direct. S&P 500 Index data from 1/1/1990 – 12/31/2019.

COSTS AND TAXES

The Costs of Trying to Beat the Market

Question: *Can investors overcome the fees charged and tax liabilities generated by money managers?*

There is an inverse relationship between fund expenses and returns. In short, costs matter. Nobel Laureate Dr. William Sharpe points to this in his landmark article, "The Arithmetic of Active Management."[2] He asserts:

"If active and passive management styles are defined in sensible ways, it must be the case that (1) before costs, the return on the average actively managed dollar will equal the return on the average passively managed dollar, and (2) after costs, the return on the average actively managed dollar will be less than the return on the average passively managed dollar. These assertions will hold for any time period. Moreover, they depend only on the laws of addition, subtraction, multiplication and division. Nothing else is required."

Even though it is hard to overcome the high costs of active management, many managers try. The academic term "alpha" refers to excess returns that cannot be explained by the market or other common risk factors. In other words, the returns that come from a manager's "secret sauce." A large alpha is required for an active manager to match the performance of a similar indexed or passive strategy. This is due to the many additional costs that active managers must overcome. High turnover also results in higher transaction costs. Thus, actively managed funds need to generate very high alpha to simply break even. In fact, a fund's expenses can be a good indicator of its performance. **Figure 4a** shows that funds with the highest expense ratios trailed their passive benchmarks much more than funds with lower costs.

To put this in perspective, **Figure 4b** illustrates that the average money manager with a typical turnover of over 60% per year needs to beat the market by 1.1% annually just to match the return of the index—a nearly impossible long-term feat. Assuming 10.0% gross annual return, the difference in net return between conventional active mutual funds and a low-cost index fund is 9.8% vs. 8.8% annually. While attempting to outperform the market, active managers underperform by a significant margin.

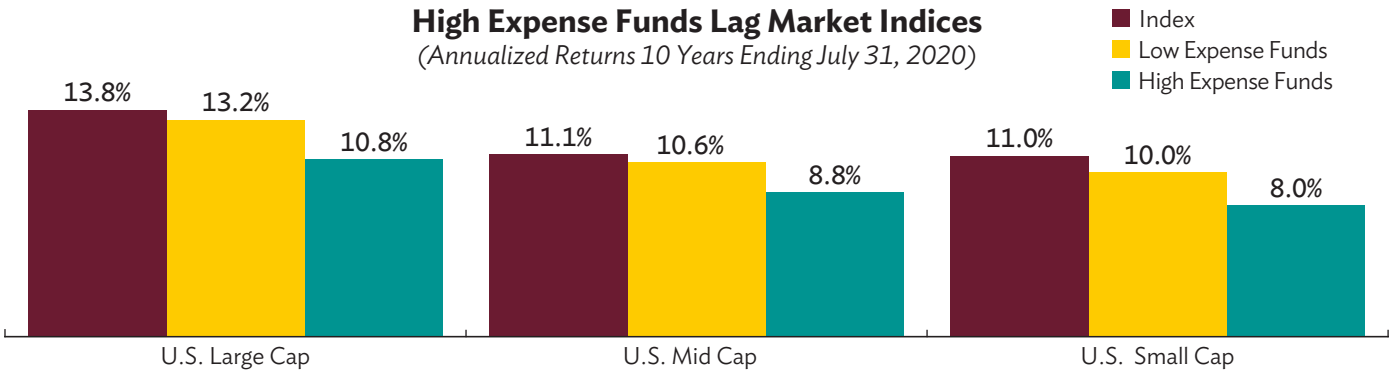
The cost of active management is considerable, and there are many different layers of costs to consider. For most investors, mutual funds with upfront loads are a thing of the past. Yet, the fund industry has turned to more sophisticated ways of charging fees. Wrap accounts, for example, typically charge between 1.5% and 2.5% of assets under management—plus other hidden trading costs. Variable annuities, some with surrender charges up to 9%, have become popular. The 12b-1 fee, introduced in the 1970s as a fee for marketing costs, remains in most actively managed funds, scraping off an additional fee each year.

Trading costs can also be a significant expense. A study, "The Role of Trading Costs," found that trading costs pulled more capital from portfolios than commissions or expense ratios. The study also found that the bigger the mutual fund, the higher the trading costs. "Trading costs," say the authors, "have an increasingly detrimental impact on performance as the fund's relative trade size increases."[4]

In addition to the higher expense of trying to beat the market, the high turnover generated by active management also results in higher taxes. **Figure 4c** shows how taxes can be a significant additional drag on performance. The average fund trailed its benchmark index across multiple categories even before taxes. After taxes are considered, the picture is even worse.

Once all the hidden costs (transaction costs and taxes) are added to the disclosed sales expenses and commissions, total costs not only negate any gains made by achieving alpha, but they usually result in returns that lag the market.

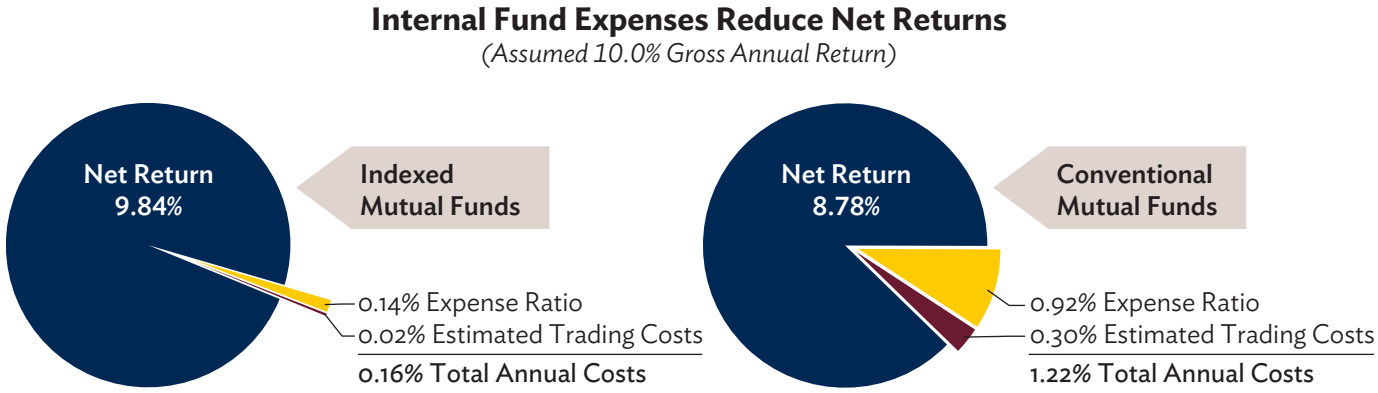
Figure 4a



	U.S. Large Cap		U.S. Mid Cap		U.S. Small Cap	
	Low Expense	High Expense	Low Expense	High Expense	Low Expense	High Expense
Median Expense Ratio	0.38%	1.62%	0.52%	1.83%	0.64%	1.89%

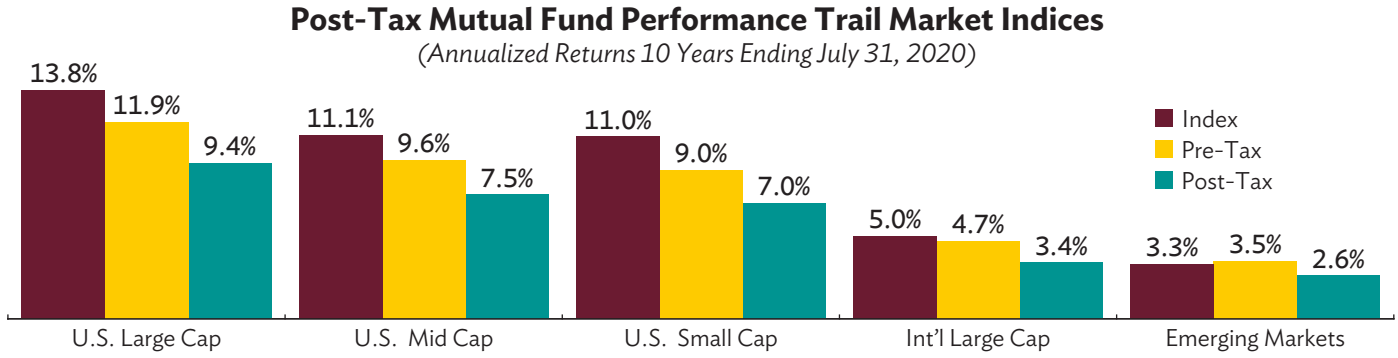
Data Source: Morningstar Direct. Low expense funds are defined as funds in the first quartile of expense ratios in their category. High expense funds are defined as funds in the fourth quartile of expense ratios in their category. Data as of 7/31/2020. Funds examined include all U.S. Large Blend, U.S. Mid-Cap Blend, and U.S. Small-Cap Blend as defined by Morningstar Direct. U.S. Large Cap = S&P 500, U.S. Mid Cap = S&P 400, U.S. Small Cap = S&P 600.

Figure 4b



Data Source: Morningstar Direct. Sum may not appear to add due to rounding. See endnote 3.

Figure 4c



Data Source: Morningstar Direct. Funds examined include all U.S. Funds in the following Morningstar Categories: Large Blend, Mid-Cap Blend, Small-Cap Blend, Foreign Large Blend, Diversified Emerging Markets. U.S. Large Cap = S&P 500, U.S. Mid Cap = S&P 400, U.S. Small Cap = S&P 600, Int'l Large Cap = MSCI EAFE, Emerging Markets = MSCI Emerging Markets.

EBI Step Two:

Ask Meaningful Questions

Asking questions that can be answered with proven evidence illustrates our investment strategy and results in better building blocks for the portfolio. These five questions and answers provide the foundation for the portfolios we implement for individual investors.

1. BONDS REDUCE RISK AND PROVIDE INCOME

Question: *What is the role of bonds and what types of bonds are most appropriate?*

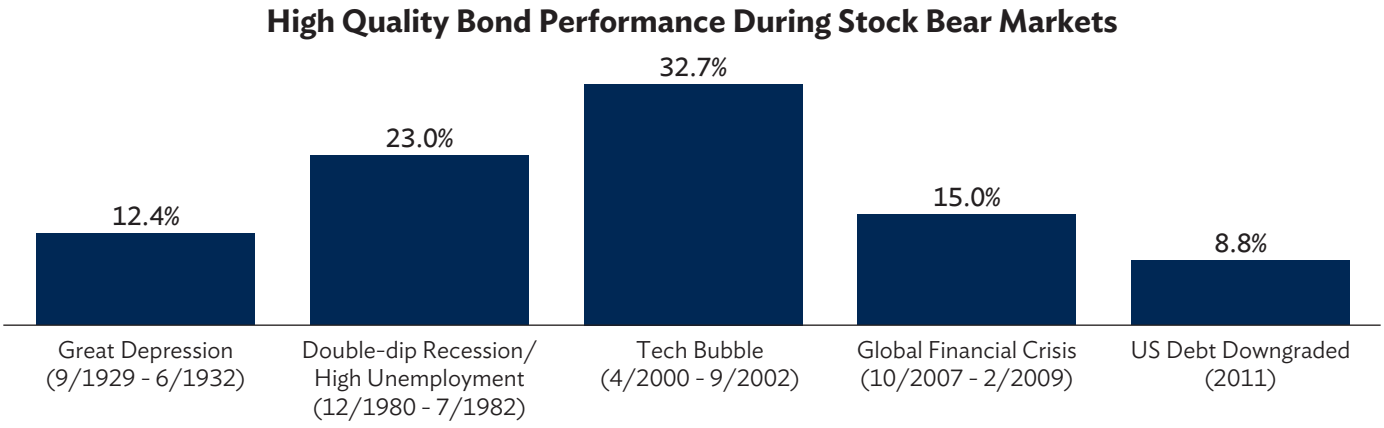
Bonds have always been a preferred means of protecting principal, generating income, and serving as a source of portfolio liquidity. Recent innovations have brought a wider array of bond investment choices to the marketplace. At the same time, interest rates are at or near historic lows across the globe. Consequently, the current function of bonds is far less straightforward than it was in years past.

To protect capital against dislocations in equity markets, it is not enough to simply invest in bonds. It is imperative to understand exactly what types of bonds should be considered. For instance, junk bonds, preferred stock, convertible bonds, and leveraged-loans have historically failed to offer investors sufficient return for their higher levels of risk. These income asset classes also fail to provide diversification when it is needed most—as stocks are suffering. Since the purpose of holding bonds is to protect the portfolio, allocations to these categories are best used in moderation, or within diversified funds run by managers with tight risk controls. **Figure 5a** shows how high-quality bonds can be an effective hedge against stock bear markets. High-quality bonds have historically enjoyed positive returns during volatile markets and helped to ease the pain felt in the stock portfolio.

Similarly, long-term bonds should be avoided. While long-term bonds are riskier than intermediate (e.g. five-year) bonds, they have historically earned a similar return (**Figure 5b**). Simply put, long-term bonds do not compensate investors for extending maturities and taking more risk. Holding cash will not solve the problem; one-month bonds (cash) earned far less than one-year bonds, even though they incurred similar risk. Historically, we believe short- and intermediate-term bonds are optimal because they help maximize return for their level of risk.

Treasury Inflation-Protected Securities (TIPS) offer additional diversification. They have a low correlation to other asset classes (including other types of bonds), particularly during periods of high inflation. TIPS have a fixed interest rate at the time they are issued; however, the bond's underlying principal rises and falls with changes in inflation. As a result, TIPS will increase in value during periods of unexpected inflation. In the

Figure 5a



Data Source: Morningstar Direct, Reflects Ibbotson Intermediate-Term Government Bond Index.

event of a deflationary environment, these bonds can still add safety. Even if total payments are lower than anticipated, the investor will still receive the full face value at maturity.

Another diversifying strategy in bonds is to invest globally. International bonds are the largest asset class in the world, yet they are often underrepresented—if represented at all—in many investors' portfolios. Holding bonds issued by countries outside the U.S. expands the investment opportunity set, insulates the portfolio from interest rate risk and inflation linked to the U.S., and adds an asset class with a low correlation to U.S. stocks and bonds.

Multi-sector bond strategies make up the final piece of a truly diversified bond portfolio. Today's low-yield environment creates challenges for fixed income investors who are unwilling or unable to take advantage of the full opportunity set in bonds. Modest allocations to a diversified mix of credit-oriented sectors that can add an element of total return potential may improve the odds of bond allocations, providing reasonable returns while still retaining their primary diversification benefits.

Multi-sector bond strategies provide access to many "non-indexed" areas of the fixed income universe. The primary reference index for bonds is the Bloomberg Barclays U.S. Aggregate Bond Index, which represents roughly $20 trillion in value. While that is a remarkably large number, an even greater value of bond securities—$23 trillion—exists outside of the securities in that index. Certain non-indexed sectors can provide lower duration, higher yields, or potential relative values.

Effective asset allocation and diversification within a bond portfolio require a deep understanding and focus on the correlation of various bond strategies.

What is correlation? To fully appreciate the power of this statistical term, it is helpful to see it at work in the everyday world. Street vendors often sell seemingly unrelated products such as umbrellas and sunglasses. Initially, that may seem odd. After all, when would a person buy both items at the same time? They probably never would. Umbrellas and sunglasses have a very low correlation. By diversifying the product line, the vendor can reduce the risk of losing money on any given day. Rain or shine, the street vendor prospers. Incorporating asset classes with low correlations allows investors to reduce risk and volatility in a similar way.

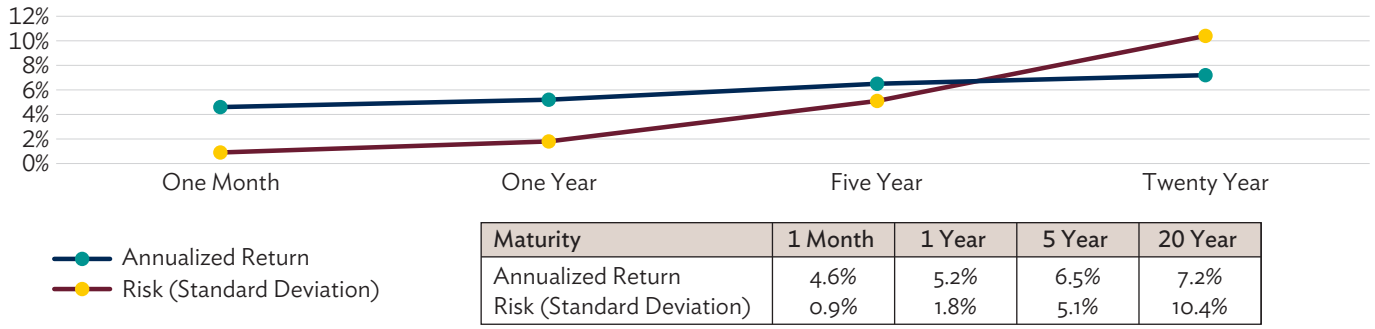
To strengthen a fixed income allocation, we believe intermediate- and short-term bonds should be blended with TIPS, international bonds, and multi-sector credit—the five components of a diversified bond portfolio. This five-part bond mix protects against a variety of adverse market conditions, from a weak economy to inflation and deflation.

The decision to include bonds in a portfolio means investing less money in stocks. While the implication is a lower return, there is an accompanying reduction of risk that protects portfolios during challenging markets. If a diversified and defensive bond portfolio is partnered with a properly allocated stock portfolio, lower bond returns during good economic times should be more than offset by robust stock gains.

Figure 5b

Short and Intermediate-Term Bonds Offer the Optimal Risk/Return Tradeoff

(1964-2019)



Maturity	1 Month	1 Year	5 Year	20 Year
Annualized Return	4.6%	5.2%	6.5%	7.2%
Risk (Standard Deviation)	0.9%	1.8%	5.1%	10.4%

Data Source: Morningstar Direct. Bonds used in exhibit are U.S. Treasuries. See Endnote 5.

Historical performance results for investment indices, benchmarks, and/or categories have been provided for general informational/comparison purposes only, and generally do not reflect the deduction of transaction and/or custodial charges, the deduction of an investment management fee, nor the impact of taxes.

2. THE IMPORTANCE OF INTERNATIONAL INVESTING

Question: *Is it advantageous to diversify overseas?*

Given the immense size of the U.S. capital markets and the unpredictability of many foreign economies, some investment professionals limit their clients' portfolios to domestic securities. In the past, it was indeed possible to invest only in the domestic stock market and be well diversified. With changes in the global economy, following this approach today results in the loss of return and diversification opportunities.

As **Figure 6a** illustrates, the U.S. market makes up just over half of the world's market capitalization. It is important to note that some countries lack stability and represent significant risk to investors. Therefore, not all the 49 countries with stock markets should be considered by U.S. investors. The companies listed on foreign stock exchanges number over 14,018 compared to roughly 3,366 in the U.S.[6]

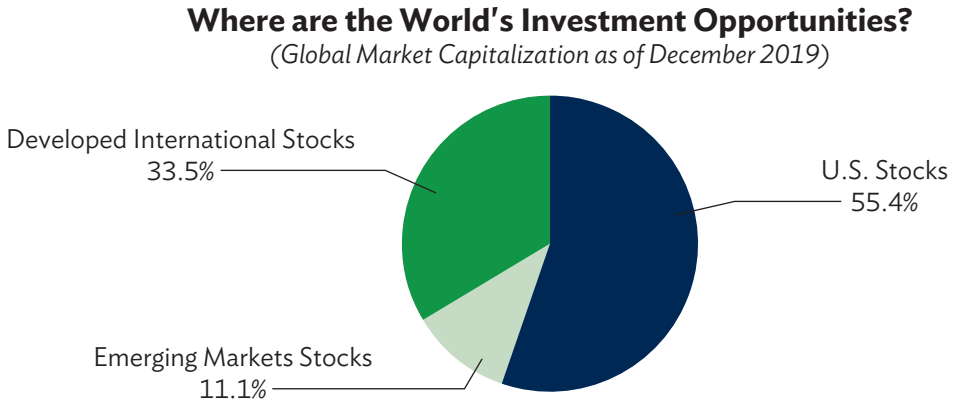
The global economy is now substantially larger than that of the U.S., with 76% of world's gross domestic product presently generated outside the United States.[7] Recently, China and India have experienced economic growth that has been much more rapid than in the U.S. Foreign companies now dominate several global sectors including energy, consumer staples and industrials.

It should come as no surprise that foreign stocks behave differently than U.S. stocks, making them an excellent source of diversification. Research shows that from 1975 to 2019, the correlation between international stocks and U.S. stocks was modest, with even lower correlation between international stocks and U.S. small stocks.[8] In the 1980s, foreign markets provided the highest returns. In the 1990s the U.S. market dominated. Overseas markets again outperformed in the 2000s, while the U.S. market outperformed during the 2010s (**Figure 6b**).

There are significant advantages to a global investment strategy that includes Europe, the Pacific, the Americas, and Emerging Markets. International investing broadens exposure to opportunities, allowing the investor to diversify over a much larger number of stocks. It is sensible for U.S. investors to make investment choices that mirror global consumption habits and invest in companies with whom they do business.

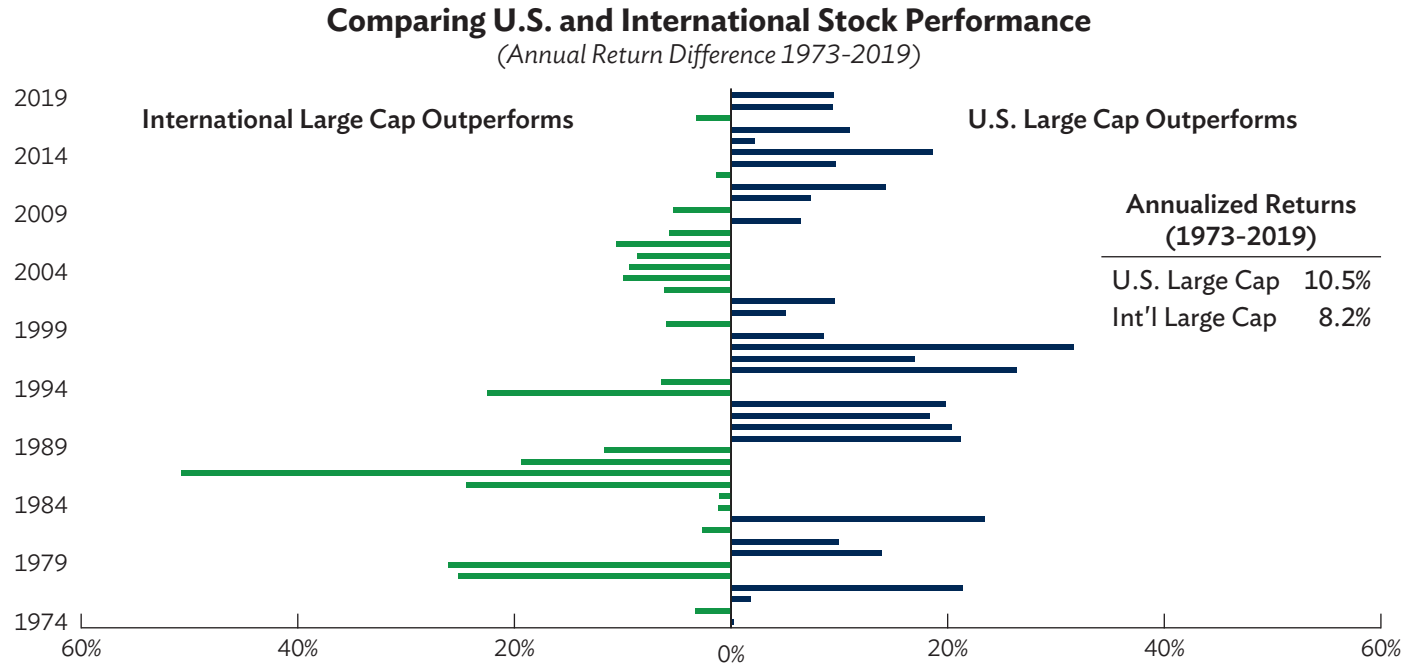
As illustrated in **Figure 6c**, a portfolio that includes both U.S. and international stocks (Global Blend) has experienced similar returns and lower risk than a portfolio composed solely of either U.S. or international stocks. The results speak for themselves; we believe there is compelling evidence for the inclusion of international stocks in a diversified portfolio.

Figure 6a



Data Source: DFA Global Market Breakdown

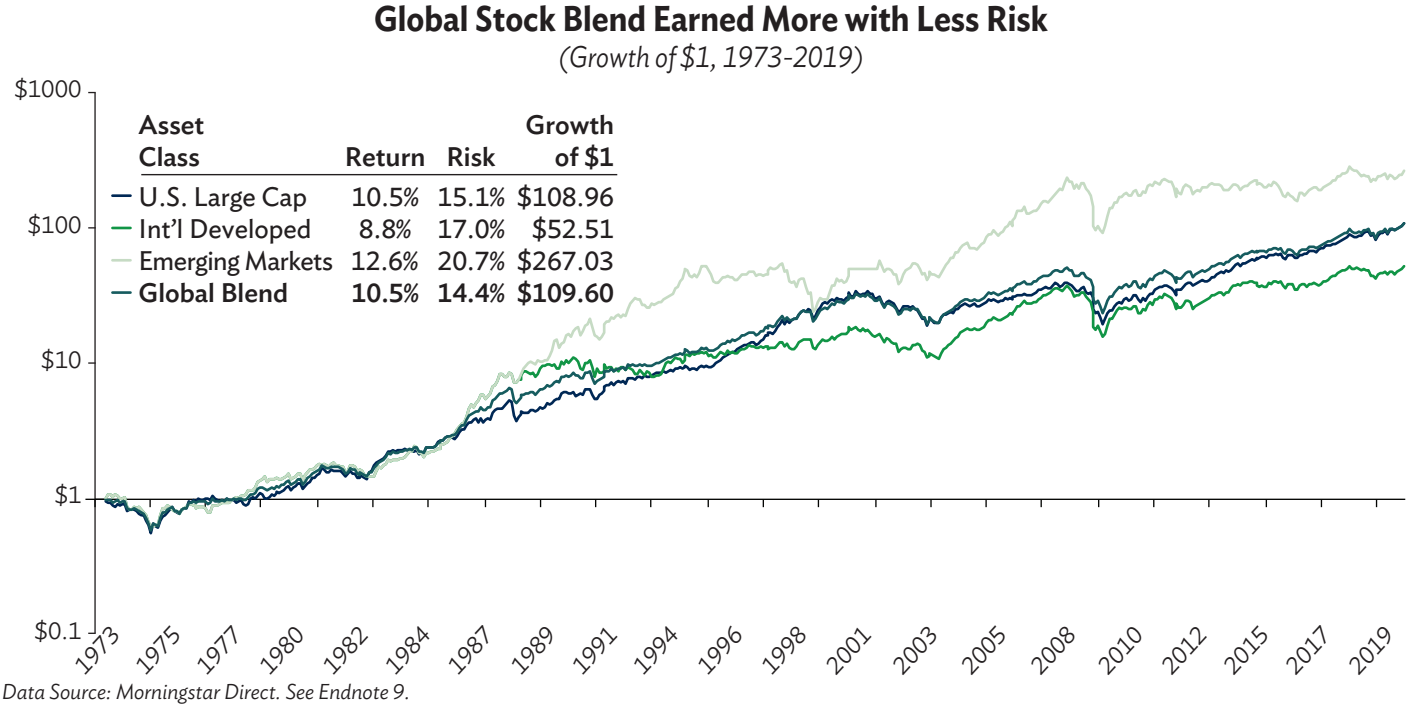
Figure 6b



Data Source: Morningstar Direct.

Historical performance results for investment indices, benchmarks, and/or categories have been provided for general informational/comparison purposes only, and generally do not reflect the deduction of transaction and/or custodial charges, the deduction of an investment management fee, nor the impact of taxes.

Figure 6c



Data Source: Morningstar Direct. See Endnote 9.

Historical performance results for investment indices, benchmarks, and/or categories have been provided for general informational/comparison purposes only, and generally do not reflect the deduction of transaction and/or custodial charges, the deduction of an investment management fee, nor the impact of taxes.

3. FACTOR INVESTING MAY OFFER HIGHER EXPECTED RETURNS AND BROADER DIVERSIFICATION

Question: *Should investors overweight stocks with attributes associated with higher expected returns?*

We have seen academics and professionals alike develop theories about 525 "factors" since 1964. While researchers may uncover some factors through data mining, we require the evidence behind factors we favor to be pervasive, persistent, and robust throughout time and across geographies, as returns to these factors are more likely to persist into the future. Only four factors pass our test and merit inclusion in our portfolios. While even these pervasive, persistent, and robust factors do not guarantee higher returns at all times, we believe having a positive exposure to value (stocks inexpensive relative to their fundamentals), size (smaller companies), quality (companies with healthy balance sheets), and momentum (stocks with strong recent performance) should help increase an investor's return over longer time horizons.

While all four of these factors have outperformed the market over the long run, each individual factor can and will suffer periodic bouts of underperformance and challenge investors' conviction. In the late 1990s, small stocks drastically underperformed large stocks and as of late, disappointing returns from the value factor have left investors wondering if fundamentals even matter. **Figure 7a** demonstrates that each of the factors have rewarded long-term investors with returns greater than the broad market. Of course, we also must take into consideration some traits that may inflate index returns beyond what investors should expect in the real world. For example, the momentum factor requires more frequent trading, and these higher trading costs likely bring the realized premium down to be more in line with the rewards offered by value, size, and quality.

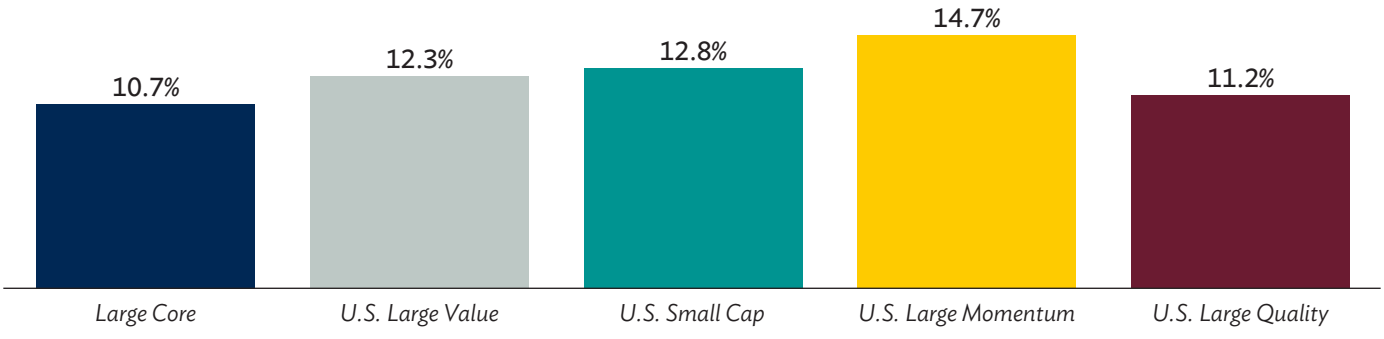
Figure 7b demonstrates that each factor on average has also outperformed the broad U.S. market on a rolling 12-month basis. But when we diversify across these factors, building a multi-factor portfolio, the consistency of that outperformance improves.

Because these factors underperform and outperform at different times, diversification can help smooth the ride for investors. Neither factors nor diversification are silver bullets, meaning even multi-factor stock allocations will underperform a broad-based index at times. And even though the peaks of outperformance may not be as high as with a single factor, a multi-factor allocation mitigates the magnitude of underperformance as well. We believe that the evidence is robust, persistent, and pervasive in demonstrating the long-term rewards available to investors who tilt towards the value, size, quality, and momentum factors.

Figure 7a

Annualized Returns of U.S. Broad Market vs Individual U.S. Factors

(1/1/1973-12/31/2019)

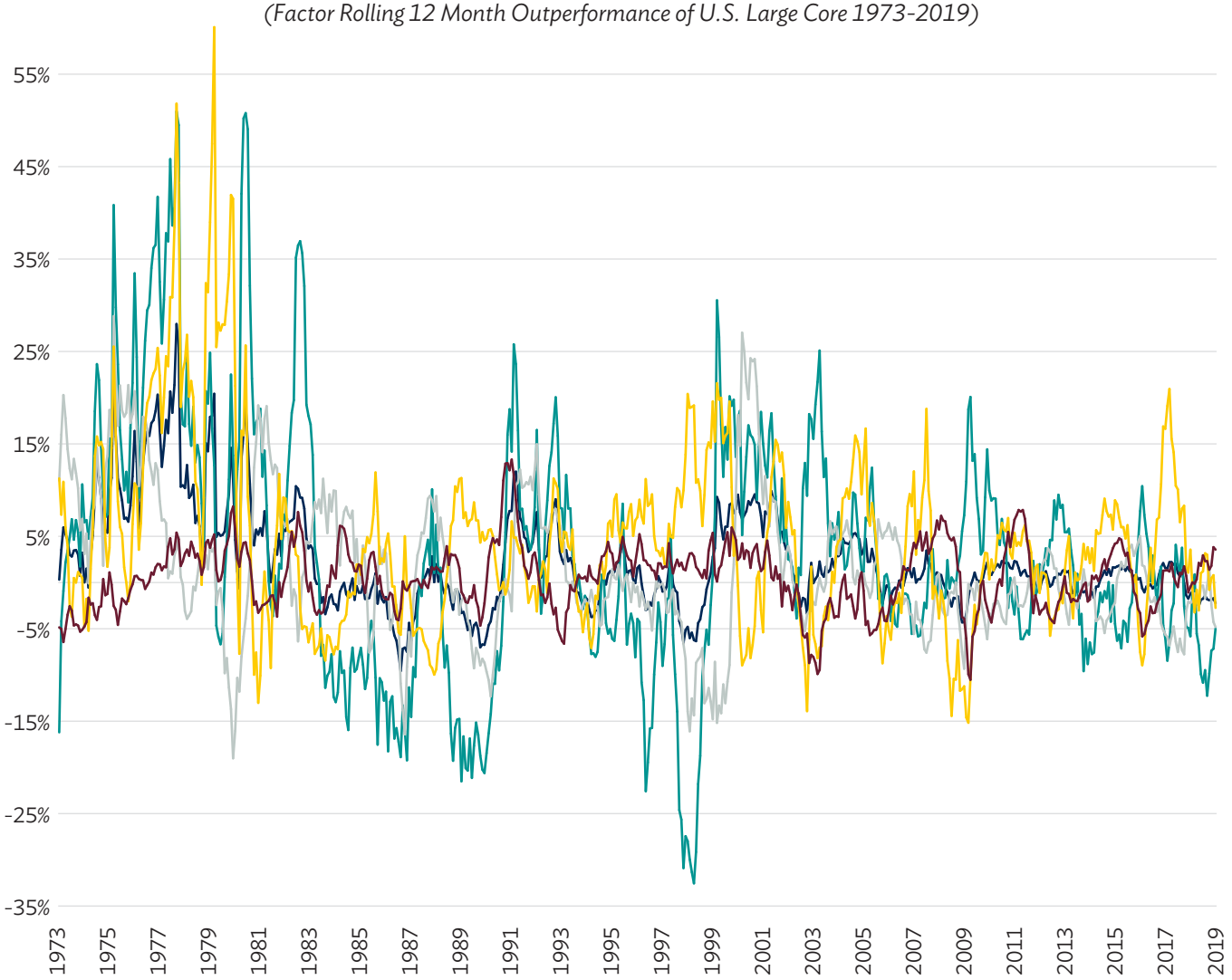


Data Source: Morningstar Direct. See References, Notes, Sources of Data and Methodology for relevant indices.

Figure 7b

Exposure to Multiple Factors Can Improve Consistency of Outcomes

(Factor Rolling 12 Month Outperformance of U.S. Large Core 1973-2019)



Quality Excess Return | Momentum Excess Return | Value Excess Return | Small Excess Return | Equal Weight Factor Excess Return

	Equal Weight Factors	Value	Small	Momentum	Quality
Total Periods	553	553	553	553	553
Average Period Excess Return vs. U.S. Large Core	2.5%	1.5%	3.1%	4.7%	0.6%
% Periods Outperforming U.S. Large Core	64.0%	48.6%	56.4%	67.8%	58.8%
Worst 12 Month Period of Underperformance	-9.6%	-19.0%	-32.6%	-15.2%	-10.5%

Data Source: Morningstar Direct.

The Size Factor

It is not uncommon for investors and advisors to believe that conservative investing for the long haul should exclude small company stocks. At first glance, this belief may appear sound. Yet the evidence strongly suggests otherwise. While it is true that small stocks are more volatile than large stocks, i.e. S&P 500, they make up the largest numbers of U.S. stocks. As a result, omitting small cap stocks leaves a good portion of the available opportunity set on the table.

Small stocks have historically offered higher expected returns. This additional return is often referred to as the size premium, depicted in **Figure 8a**. Note that the superior returns of small stocks hold true around the globe. Internationally, small stocks performed even better, returning an average of 13.5% compared to only 8.7% for international large stocks from 1970 to 2019.

To put these returns in perspective, consider the following scenario: An investor who put $1,000 in the largest stocks in 1926 would have $9,243,896 today. If the same $1,000 had been invested in the smallest stocks, the investor would have $39,380,904. That is a truly stunning difference. The strength of small stocks is consistent over long periods. To take an analogy from nature, small stocks are the acorns in the forest. While not all will grow into a mature tree, if no acorns matured at all, there would be no forest. Likewise, no tree grows forever. So, it is sensible to see comparative limits to the future growth of mid-cap and large stocks.

Figure 8b illustrates the benefit of diversifying into small stocks. Large company stocks make up deciles 1 and 2, mid cap stocks make up deciles 3 through 5, and small stocks make up deciles 6 through 10.

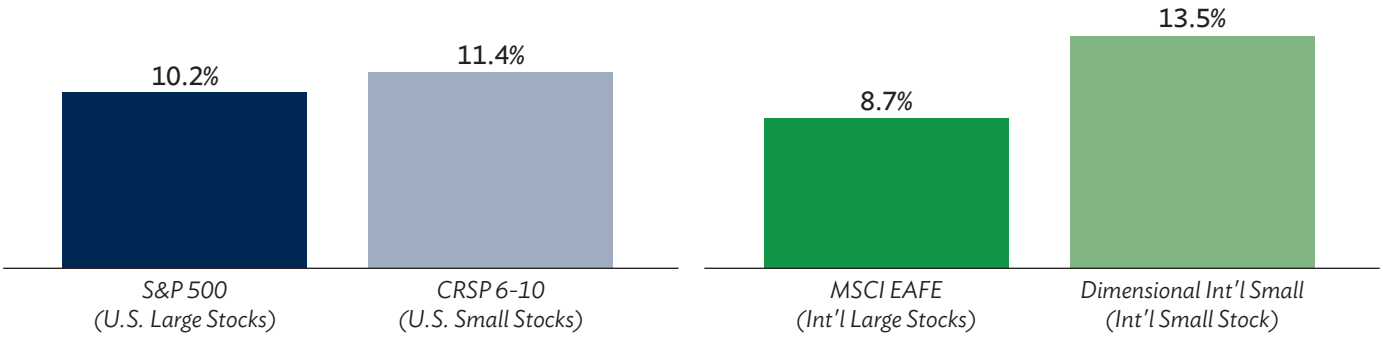
The average annual return is listed for each three-year period from 1927 to the present for each decile. The largest and smallest stocks tend to act very differently each period. Small stocks provide a key to capturing higher returns while diversifying to diminish risk. The table shows that the vast majority of activity is at the two end points of the continuum—very large and very small.

While reviewing the correlation values at the bottom of the table, keep in mind that it is on a scale from 1 to -1. A value of 1 indicates perfect correlation (no diversification benefit). A positive correlation means that the two investments tend to rise and fall together over time. A low or negative correlation indicates that the investments act differently, and when one investment is rising, the other may fall or go sideways.

It is noteworthy that mid cap stocks act more like large stocks. This is evidenced by their high correlations ranging from 0.92 to 0.95. Thus, they provide comparatively little diversification benefit. In contrast, small stocks act quite differently, which is to say their correlation is lower. Their correlation to the S&P 500 falls as low as 0.73. The benefit of diversification occurs at the size extremes, not in the middle.

Figure 8a

Both in the U.S. and Internationally, Small Stock Offered Investors Higher Long-Term Returns



Data Source: Morningstar Direct. Annualized returns shown are for period 1970-2019.

Figure 8b

Blending Large and Small Stocks Enhances Diversification

(Three-Year Rolling Returns – Highest and Lowest Returns Since 1926)

	CRSP 1	CRSP 2	CRSP 3	CRSP 4	CRSP 5	CRSP 6	CRSP 7	CRSP 8	CRSP 9	CRSP 10
1927-1929	18.60	18.20	12.29	7.10	15.99	-1.63	4.45	0.32	-4.07	0.27
1930-1932	-26.72	-32.10	-30.43	-32.57	-33.53	-30.95	-34.62	-35.91	-35.16	-28.51
1933-1935	28.30	42.86	44.02	51.26	52.14	53.99	58.92	80.49	74.28	98.57
1936-1938	3.42	4.30	1.92	2.52	5.00	4.16	1.99	0.59	6.22	-5.23
1939-1941	-4.52	-6.86	-5.71	-4.58	-3.91	-3.46	-3.45	-6.50	-7.63	-12.81
1942-1944	17.95	28.00	25.42	31.03	36.30	36.38	45.47	49.04	61.72	93.83
1945-1947	9.31	12.44	12.43	13.41	12.51	13.46	11.21	11.44	15.49	16.54
1948-1950	16.57	17.36	17.84	15.43	16.58	16.80	17.53	15.06	16.16	22.47
1951-1953	11.96	12.16	10.89	8.78	7.25	7.44	8.36	4.58	4.70	0.12
1954-1956	27.17	25.06	26.41	25.19	25.85	27.51	26.38	24.59	27.85	27.69
1957-1959	12.77	14.47	15.12	17.96	17.21	13.75	18.82	16.67	20.87	17.69
1960-1962	4.95	6.62	5.99	4.47	1.87	1.09	0.87	2.66	1.32	1.28
1963-1965	15.67	18.28	20.37	19.15	20.09	23.96	22.26	22.84	19.73	24.39
1966-1968	5.58	9.89	14.41	17.34	21.49	24.10	23.60	32.52	34.99	45.92
1969-1971	3.43	0.13	3.08	-1.10	-2.90	-2.17	-6.42	-9.51	-12.27	-13.22
1972-1974	-8.47	-12.96	-13.96	-17.05	-16.74	-18.97	-20.72	-20.63	-23.99	-25.12
1975-1977	13.17	22.35	28.96	32.95	36.65	38.35	42.31	47.20	44.59	49.74
1978-1980	17.60	20.96	24.05	24.60	26.09	31.55	31.33	31.10	32.78	33.35
1981-1983	9.76	11.36	16.63	18.20	20.07	20.26	17.87	21.36	21.38	24.09
1984-1986	18.89	20.56	15.46	14.44	13.69	13.43	12.59	9.48	7.96	0.56
1987-1989	17.06	16.09	16.75	15.27	13.19	12.35	10.11	11.68	5.88	2.80
1990-1992	10.62	12.55	13.10	12.53	17.08	14.06	13.33	10.01	12.39	10.88
1993-1995	15.03	14.58	14.61	14.96	15.27	14.31	15.52	14.05	15.11	16.71
1996-1998	31.15	20.64	16.25	17.20	9.70	15.10	15.60	13.95	12.78	8.23
1999-2001	-2.98	2.58	6.09	5.11	4.36	9.80	7.96	13.53	15.04	14.74
2002-2004	1.73	10.78	10.07	12.11	10.88	12.49	11.36	15.61	16.26	29.24
2005-2007	8.72	11.61	10.16	8.92	11.05	7.57	8.21	6.21	3.80	4.45
2008-2010	-3.37	-0.71	2.32	3.43	6.64	2.65	6.44	8.23	6.79	7.30
2011-2013	16.28	16.88	16.12	18.52	17.34	18.26	16.95	17.14	16.79	15.82
2014-2016	8.47	9.38	8.14	5.79	4.50	4.49	7.96	4.44	5.95	3.49
2017-2019	16.10	12.66	12.24	11.00	7.13	7.92	9.85	5.75	6.50	4.63
Monthly Correlation with S&P 500	0.99	0.97	0.95	0.93	0.92	0.89	0.87	0.84	0.81	0.73

Data Source: Dimensional Fund Advisors.

The Value Factor

As their name suggests, value stocks are generally thought to be a bargain: a company's stock price is low relative to its assets, sales, and earnings potential. Value stocks often tend to be mature companies that, for one reason or another, have fallen out of favor with the financial media and/or investing public. They no longer generate buzz.

Value stocks can be described as on sale or even beat up. Growth stocks, sometimes called glamour stocks, are splashed across the headlines of magazines and newspapers. Typically, these have had very good runs and thus attract a lot of attention. Naturally, there are plenty of investors willing to buy them. However, as the evidence suggests, there is a catch. The high expectations generated by heavy media coverage often cause growth stocks to be overpriced.

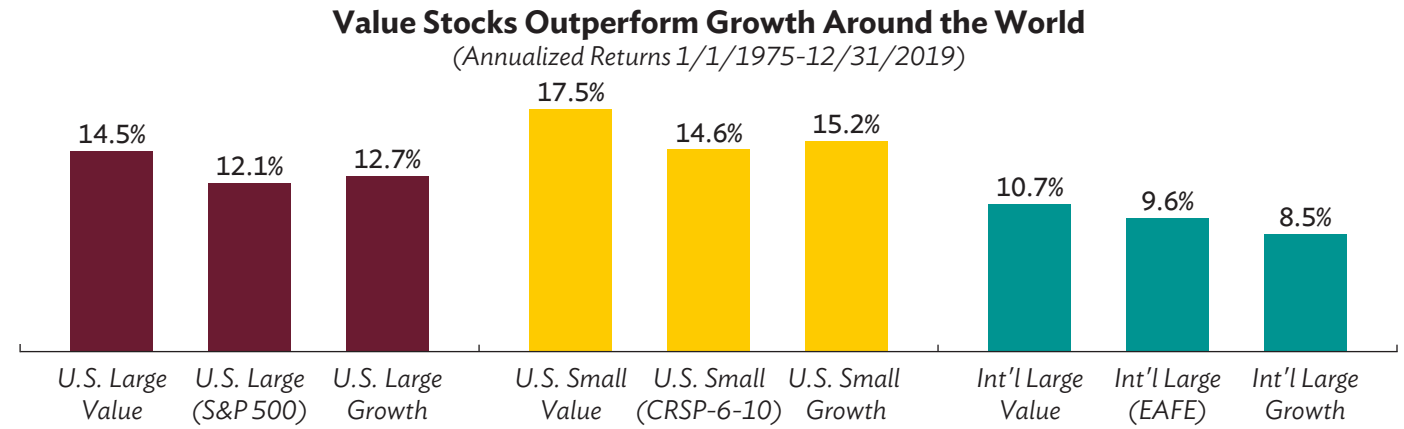
Both history and evidence vindicate the value investor over the growth investor. Since 1975, value stocks have outperformed growth stocks. This holds true in large, small, and international categories. The margins are sizeable across the board. U.S. large value stocks beat large growth stocks by 1.8%, and U.S. small value stocks beat small growth by 2.3% (**Figure 9a**).

In their breakthrough study, "Value versus Growth: The International Evidence," Eugene Fama and Kenneth R. French demonstrated that value stocks have higher returns than growth stocks outside the U.S.[10] For the 20-year period covered by their study, "the difference between the average returns on global portfolios of growth and value stocks is 7.7% per year. Furthermore, value stocks outperformed growth stocks in 12 of 13 major markets." Value stocks only lagged in Italy, a market notorious for its poor accounting data.

Faced with the historical superiority of value over growth stocks, it can be tempting to consider investing exclusively in value. But once again the evidence warns against too much concentration in one area of the market. In fact, there are some periods, such as the late 1990s and the late 2010s, when growth stocks outperformed value stocks by a wide margin (**Figure 9b**). The graph illustrates the variation in value and growth trends over time. While value stocks are preferable to growth long-term, an asset mix that includes both provides valuable diversification and will likely be easier to stick with over time.

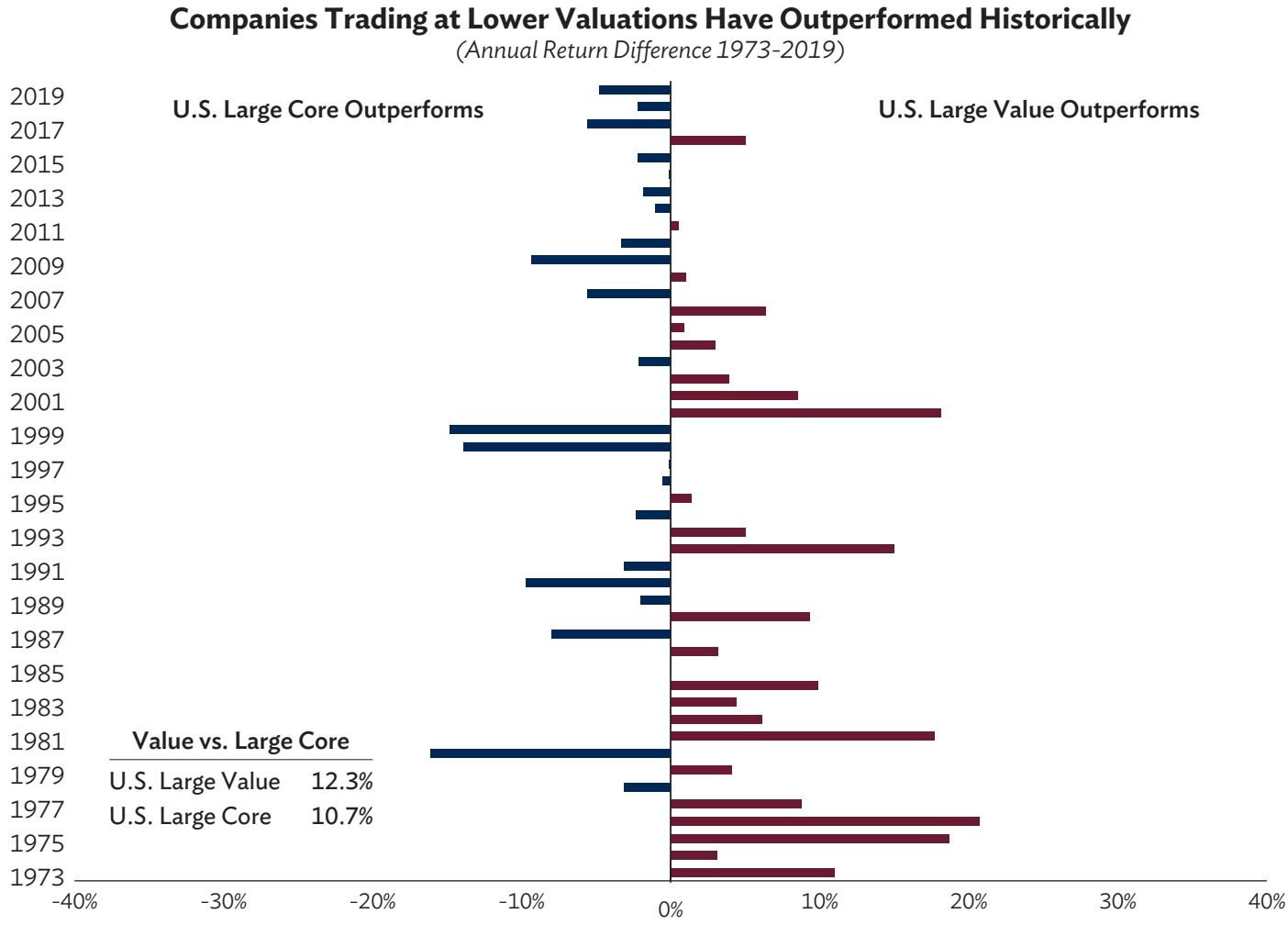
Of course, investing in value stocks does not require the selection of individual stocks any more than investing in small stocks. Value stocks, like small stocks, are a distinct class of securities that can be quantifiably defined, captured using a specialized asset class fund, and added to a portfolio to maximize return for an investor's appropriate level of risk.

Figure 9a



Data Source: Morningstar Direct. See endnote 11.

Figure 9b



Data Source: Morningstar Direct.

The Quality Factor

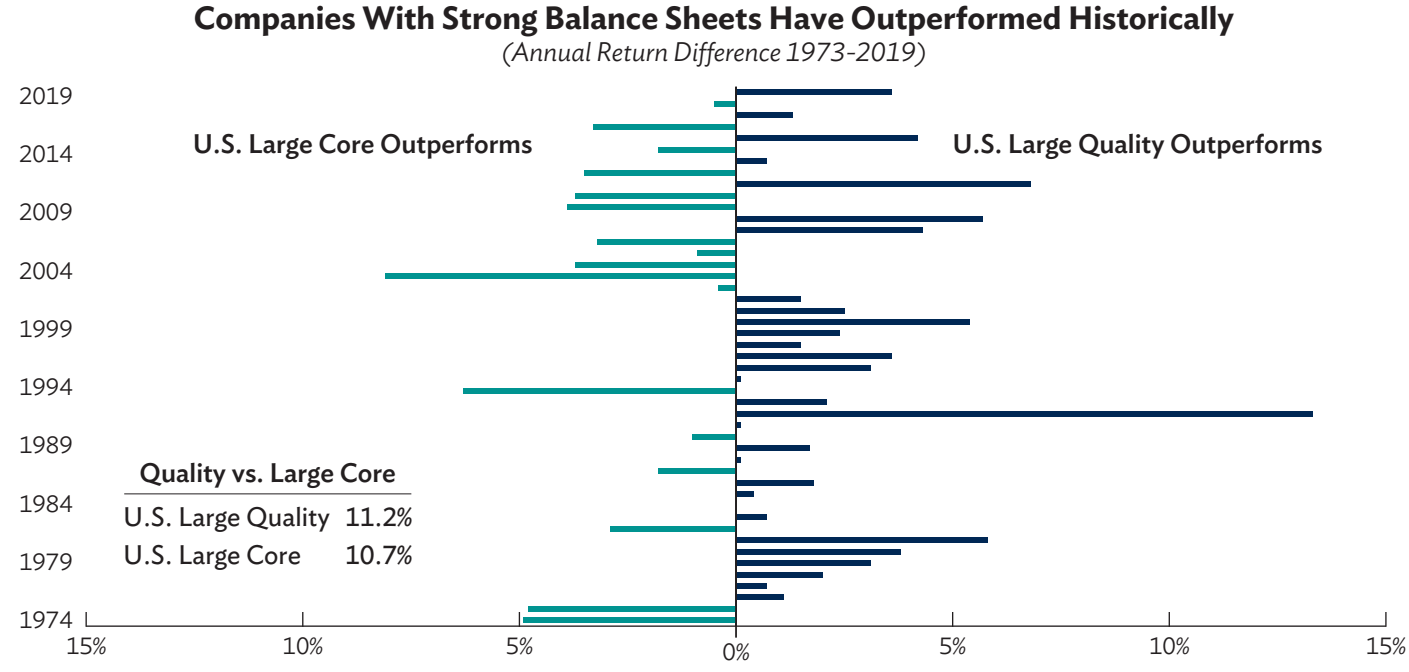
Charlie Munger, Warren Buffett's longtime business partner, is noted for saying, "A great business at a fair price is superior to a fair business at a great price." That quote is an apt summation of their approach to investing in quality companies. In fact, a 2013 paper from AQR titled "Buffett's Alpha" analyzed the performance of Berkshire Hathaway and found that much of Berkshire Hathaway's performance could be explained by consistent exposure a handful of factors, with quality being foremost.

To Warren and Charlie's credit, they were investing with a quality bias before the academic literature had identified it. But investors don't need to be stock pickers like Warren and Charlie to invest in quality. Today, there exist rules-based, systematic ways to invest in diversified baskets of quality stocks.

Relative to other factors, quality is a bit "fuzzy," as there is a decent amount of variation between index providers. While there is no standard definition of quality, some examples of metrics used to quantify the factor include high return on equity, stable year-over-year earnings growth, and low financial leverage. As shown in **Figure 10a** quality stocks in the U.S. have generated a modest return premium over time relative to large cap stocks broadly.

What you don't own can be just as meaningful as what you do own when it comes to quality. There is a substantial body of research supporting the poor stock performance of companies with low (or no) profitability and/or high asset growth. This effect has been particularly pronounced in small cap growth stocks. The underweighting or exclusion of the subset of securities with these characteristics can lead to modest improvement in performance over time.

Figure 10a



Source: Morningstar Direct.

The Momentum Factor

Momentum is probably the least intuitive of all factors, as it goes against the first lesson most investors are taught: buy low, sell high. Momentum strategies, by contrast, buy more of what has recently done relatively well and sell (or avoid) what has recently done relatively poorly.

So why does the momentum factor work and exist? First discovered academically in 1993, there is now a long history of momentum working in a "research-only" environment (1927-1993) as well as in the real world (actual funds using the strategy post-1993). On average and over time, stocks with the strongest recent performance have tended to continue their strong performance, and stocks with the weakest recent performance have tended to continue their poor relative performance.

The momentum factor can be explained by both risk-based and behavioral reasoning. From a risk-based perspective, high momentum stocks tend to have higher volatility and can be at risk for a momentum reversal. Reversals can be characterized as sudden, sharp downturns in a subset of momentum stocks or broadly across the factor.

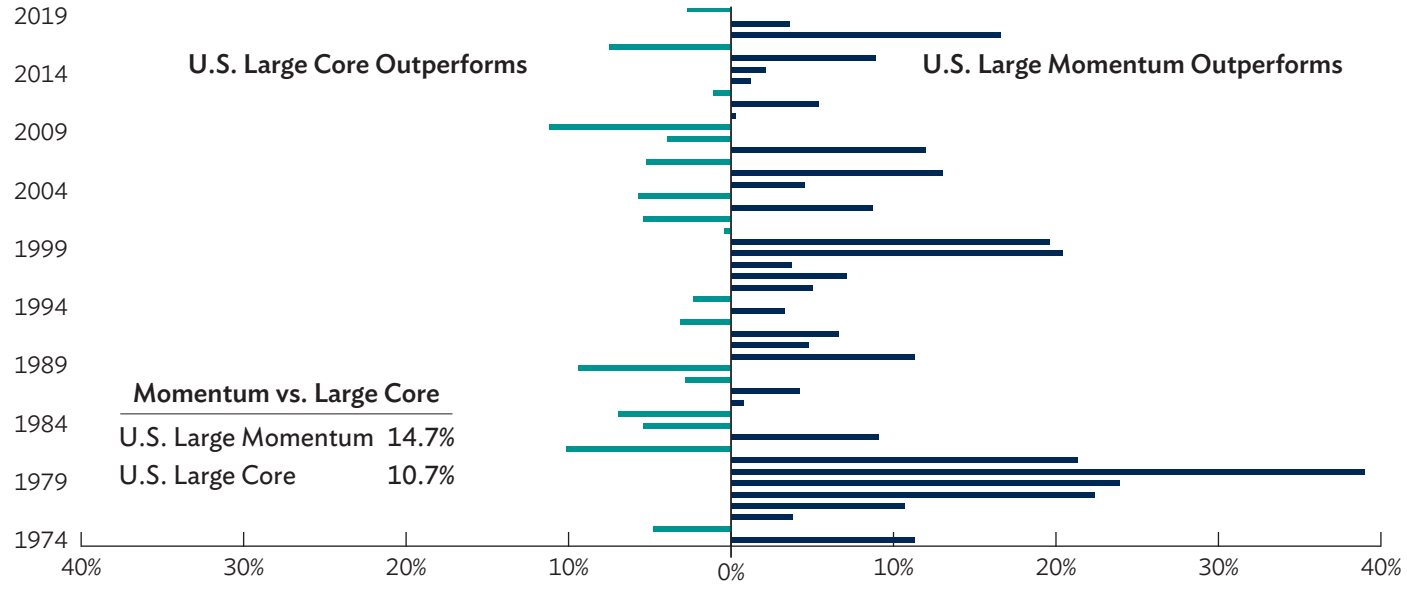
Behaviorally, momentum can be explained by the herding effect. There is a tendency of many investors to see what's working and follow the pack. As a result, this can increase flows into stocks with strong recent performance—pushing the price up even further. Even with these supporting reasons for strong historical performance and expected persistence in the future, momentum strategies will underperform the market at times. They do tend to outperform most of the time, however, resulting in a return premium for long-term investors who stay the course, as shown in **Figure 11a**.

A secondary benefit of the momentum factor is that it has been negatively correlated to the value factor, making them great complements to one another. Each will have their day in the sun, and each will go through periodic struggles. Yet these factors are stronger together than they are individually.

Figure 11a

Stocks Experiencing Recent Positive Price Momentum Have Outperformed the Broad Market

(Annual Return Difference 1973-2019)



Data Source: Morningstar Direct.

4. REINFORCING DIVERSIFIED PORTFOLIOS WITH ALTERNATIVE INVESTMENTS

Question: *Should diversified portfolios invest in assets other than stocks and bonds?*

Portfolios can benefit from alternative investments when they are transparent, reasonably liquid, and have low correlations to major asset classes. Trend Following, Event Driven, Reinsurance, and Real Assets are four examples of alternative asset classes that demonstrate these traits and are the logical completion of a broadly diversified portfolio designed to maximize returns and minimize risk.

These alternatives add a dimension of portfolio resiliency by virtue of their low correlation with stocks and bonds. The section about bonds illustrated the impact of diversification with an example of a vendor selling umbrellas and sunglasses. His two wares had very low correlation to one another. The vendor reduced the risk of losing money on any given day. In portfolio design, the combination of assets with low correlation to one another allows for overall risk reduction that cannot be obtained otherwise.

Described below are the four core alternative strategies Savant currently utilizes in client portfolios:

- **Trend Following:** Takes advantage of price trends across stocks, bonds, currencies, and commodities. Follows trends by buying assets that have been rising in price and selling assets that have been falling in price. This strategy can take both long and short positions, allowing it to potentially benefit in stock market declines.
- **Reinsurance:** Natural disasters are independent of financial market activity. Investors are rewarded for bearing diversified exposure to catastrophe risk by purchasing Insurance-Linked Securities (ILS). The two main forms of ILS are quota shares and catastrophe (cat) bonds.
- **Event Driven:** Seeks uncorrelated returns and a liquidity risk premium created by market dislocations and corporate events. Examples of event driven strategies include merger arbitrage, convertible arbitrage, spin-offs and special purpose acquisition companies, or "SPACs."
- **Real Assets:** A blend of infrastructure, farmland, and timberland asset classes that benefit from contractual cash flows generated by tangible assets. It can consist of both private and public investments and can be either equity or debt. This strategy aims to deliver positive real, or inflation adjusted, returns that have low correlation to stocks and bonds.

Figure 12a shows how each of these alternatives have performed across a variety of economic and market environments. While they should be expected to lag during major bull markets in stocks, they should also be able to provide varying levels of downside protection during challenged markets. **Figure 12b** illustrates the low correlation these assets have not just to stocks and bonds, but also each other. This structural diversification allows for more robust portfolios that can withstand a wider range of possible future outcomes.

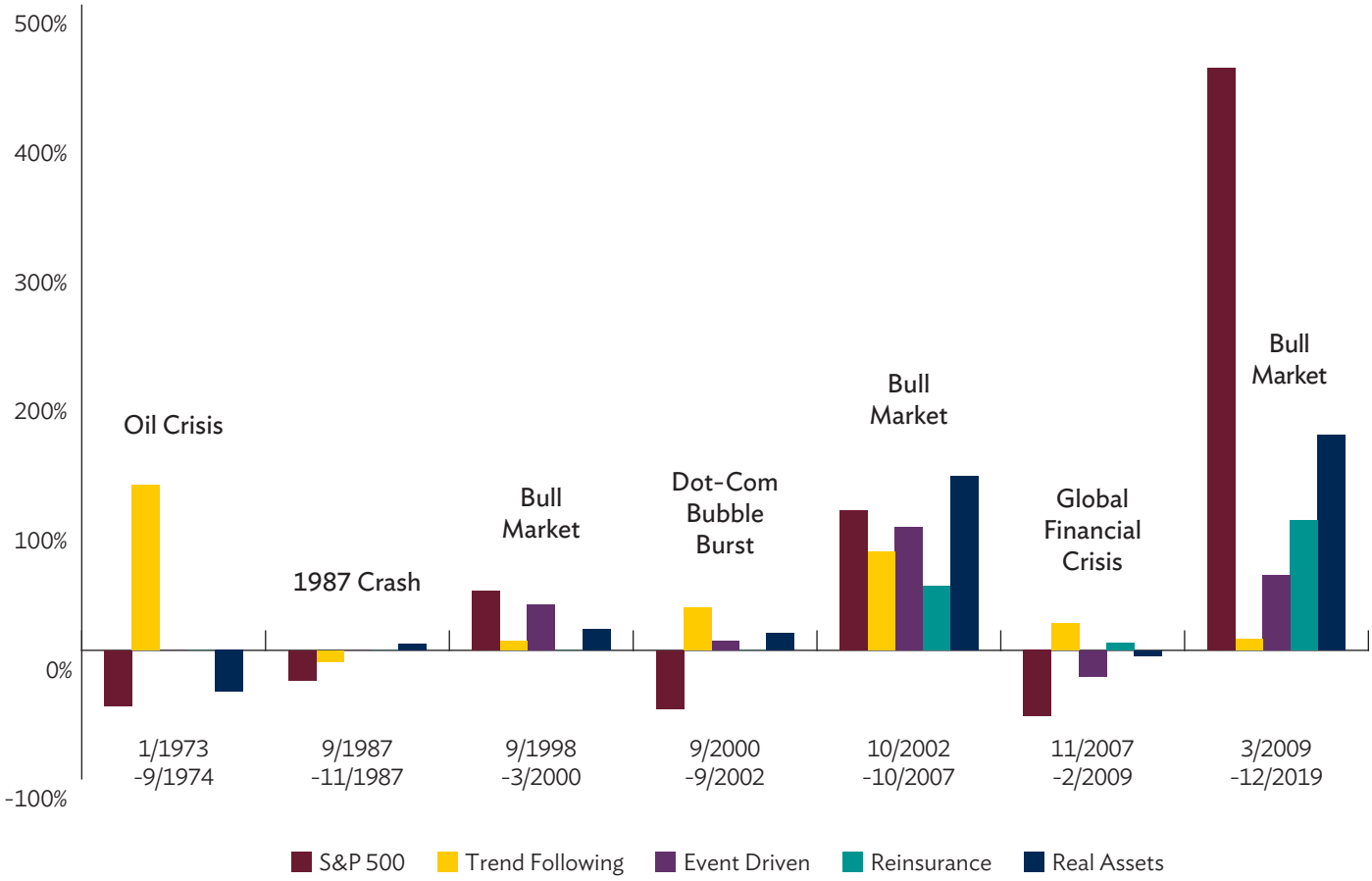
The evidence shows that adding trend following, event driven, reinsurance, and real assets to a basic portfolio results in a clear diversification benefit. Measured allocations of these four alternative asset classes enhance diversification and limit risk by exposing the portfolio to asset classes that behave differently than regular stocks and bonds.

In recent years, many more alternative investments have become available to individual investors in transparent, liquid, and accessible funds. It is likely that there will be other investments to consider for the alternatives allocation in the future.

Figure 12a

Alternatives Can Perform Well in Many Market Environments

(Historical Annualized Returns 1973-2019)



Data Source: Morningstar Direct.

Figure 12b

Alternative Asset Class Correlation Matrix

(2002 - 2019)

	U.S. Large Stock	Int'l Large Stock	U.S. Bond	Trend Following	Reinsurance	Event Driven	Real Assets
U.S. Large Stocks	1.00	0.87	-0.11	-0.13	0.15	0.68	0.30
Int'l Large Stocks	0.87	1.00	0.02	-0.07	0.15	0.67	0.40
U.S. Bond	-0.11	0.02	1.00	0.24	0.14	0.08	0.06
Trend Following	-0.13	-0.07	0.24	1.00	0.04	-0.06	0.10
Reinsurance	0.15	0.15	0.14	0.04	1.00	0.22	0.07
Event Driven	0.68	0.67	0.08	-0.06	0.22	1.00	0.25
Real Assets	0.30	0.40	0.06	0.10	0.07	0.25	1.00

Data Source: Morningstar Direct.

5. BROADLY DIVERSIFIED GLOBAL PORTFOLIOS HELP ACHIEVE BETTER RETURNS

Question: *Can globally diversified portfolios improve long-term returns and reduce risk?*

This paper draws on a wide array of evidence to demonstrate the failure of traditional active money management and build a case against speculating using stock selection, money manager selection, and market timing.

While repudiating the conventional approach to investing, this paper provides evidence in support of indexed investing, rules-based management, and broad global diversification guided by scientific methods. The findings include the following:

- Indexed investment strategies work.
- Asset allocation has a strong impact on returns.
- Owning a multitude of asset classes offers the dual benefit of increasing return while decreasing overall portfolio risk.
- Costs, which include published costs, hidden fees, and tax consequences, have a substantial impact on return.

Evidence shows that basic index funds outperform actively-managed funds. This is true for the classic S&P 500 Index as well as simple stock/bond combinations such as the balanced index portfolio shown in **Figure 13a**.

An index portfolio using broad global diversification performed even better. The addition of a much wider range of asset classes increased returns and reduced risk.

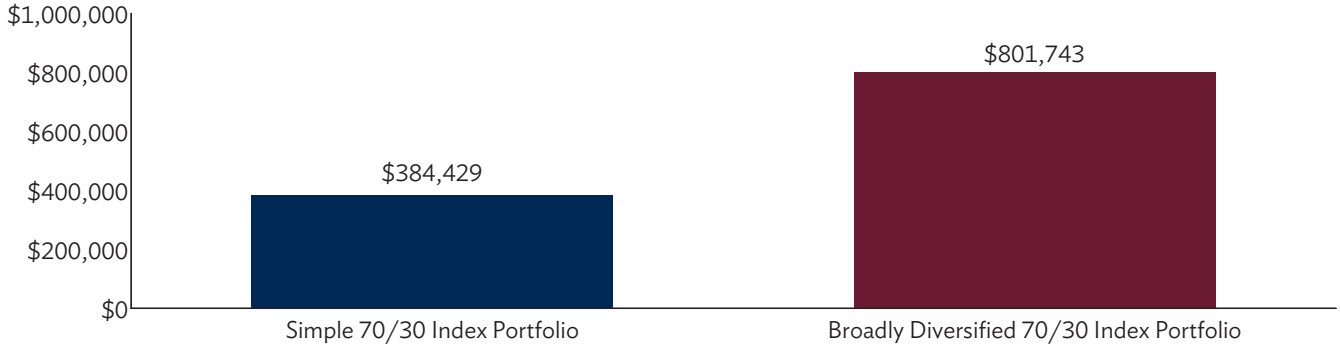
Evidence clearly shows that the added wealth generated by the broad, globally diversified index portfolio is substantial. As **Figure 13b** illustrates, since 1973, investors who saved $10,000 in the broadly diversified global index portfolio accumulated more than twice the wealth of investors owning a simple index portfolio. It paid to defy conventional wisdom and follow the evidence.

Simply put, we believe the broadly diversified global index portfolio is a better investment solution. This approach can be used to create broadly diversified global portfolios ranging from 100% stocks to 100% bonds, depending on the goals and risk tolerance of the individual investor. Broad global diversification reduces risk and generates better risk-adjusted returns. True diversification requires allocation among every viable asset class the market makes available to investors. Asset mixes without a broad and global reach close the door to effective diversification in today's global economy.

Figure 13b

A Small Difference In Returns Can Make a Big Difference In Wealth

(Growth of $10,000, 1973-2019)



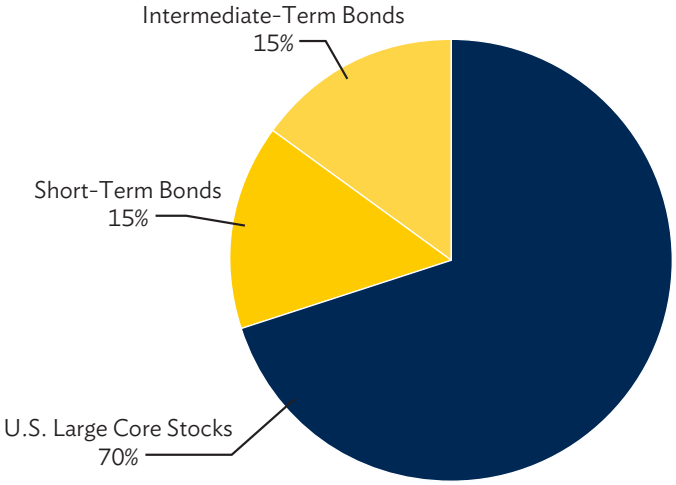
Data Source: Morningstar Direct. See following page for allocation details on simple and broadly diversified portfolios. Returns are net of annual 1.00% estimated management fee, 0.30% estimated fund expenses, and 0.05% estimated custodial expenses. See Important Limitations disclosures.

Figure 13a

Broad Global Diversification Increases Return and Reduces Risk

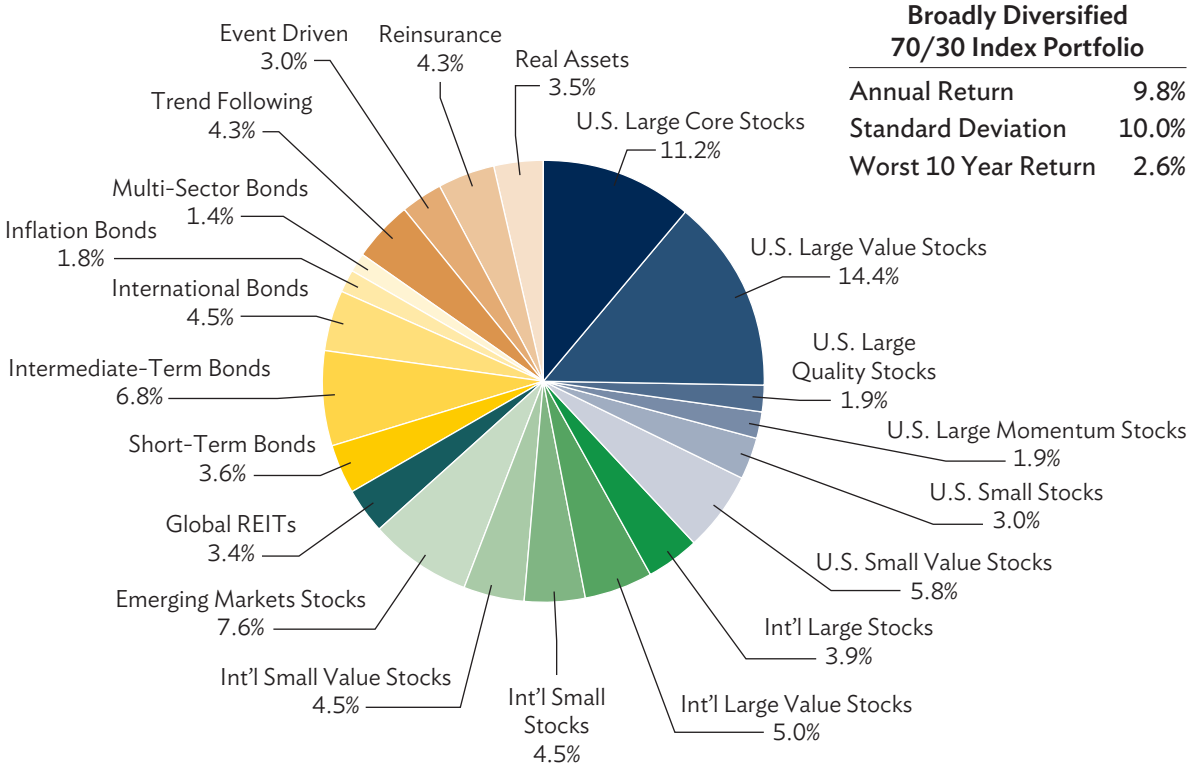
(1973-2019)

Simple 70/30 Index Portfolio



Simple 70/30 Index Portfolio	
Annual Return	8.1%
Standard Deviation	10.8%
Worst 10 Year Return	-1.6%

Broadly Diversified 70/30 Index Portfolio



Broadly Diversified 70/30 Index Portfolio	
Annual Return	9.8%
Standard Deviation	10.0%
Worst 10 Year Return	2.6%

Data Source: Morningstar Direct. See References, Notes, Sources of Data and Methodology section for asset class indices referenced. Returns are net of annual 1.00% estimated management fee, 0.30% estimated fund expenses, and 0.05% estimated custodial expenses. See Important Limitations disclosures.

EBI Step Three:

Apply the Evidence

Once the evidence has been gathered, the focus turns to implementation. This includes several key areas: investment selection, rebalancing, and managing taxes.

INVESTMENT SELECTION

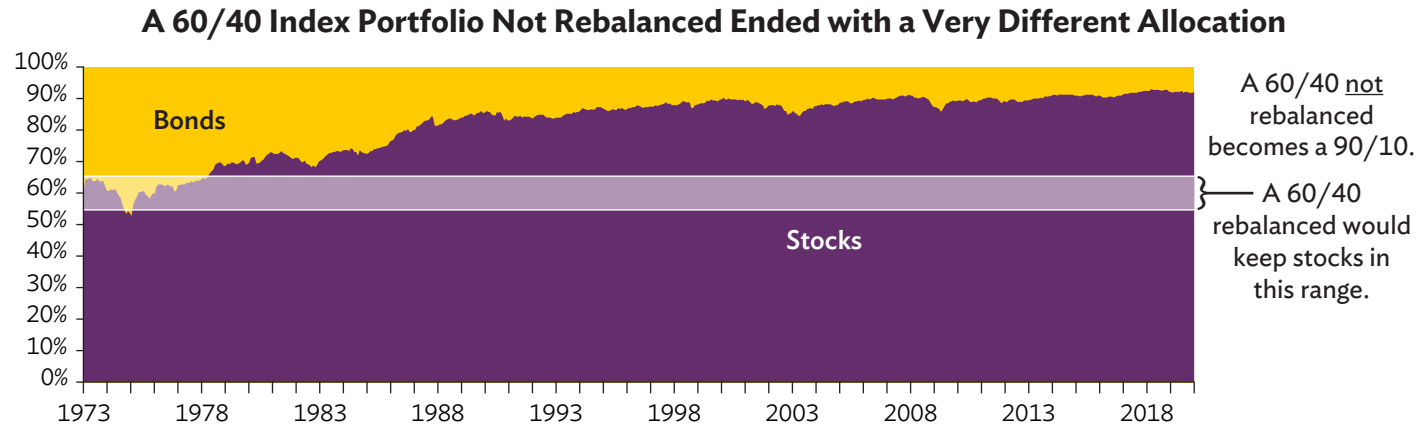
The conventional approach to investing is anchored in the basic belief that active managers can effectively outperform the market. However, the evidence clearly shows that active management is inefficient, costly, and counter-productive. It is very difficult, if not impossible, to consistently beat the market over time. There is an abundance of logical, mathematical, and empirical evidence to support this fact.

Indexed and broad-based market strategies recognize that financial markets discover and distribute financial information so quickly that it is difficult or impossible for active managers to consistently outperform the market over the long run. The goal of a basic index fund is to provide a return which matches the performance of a given market index, minus very modest expenses. The strategies are called "indexed" because the intention is to buy and hold all or most of the stocks in a target index. Index funds are now available for nearly all asset classes. In addition to the S&P 500, index funds now track small stocks, international stocks, bonds, and various alternative asset classes.

Whereas index funds seek to replicate a benchmark as closely as possible, other index-like investment vehicles have more flexibility and do not aim to perfectly emulate an index. Whether it is a truly passive fund or a broad-based asset class fund, the essential characteristics of all structured index-like investment vehicles are low cost, long-term investments that are tax-efficient and transparent.

It is nearly impossible for active managers to consistently exploit market inefficiencies in such a way as to justify their higher management costs and taxes over time. As previously discussed, there is an overwhelming body of academic and industry evidence that documents the routine failure of active management. Index and other similar funds offer the ideal path to broadly diversified and tax-efficient global portfolios of stocks, bonds, and alternative investments.

Figure 14a



Data Source: Morningstar Direct. See endnote 12.

REBALANCING

It is critical to implement an investment strategy that will deliver the level of risk and expected return that is needed for success. Some investors might just stop there and leave the portfolio to do what it will. However, it is vital that the investment process does not end there. It is important to carefully monitor the portfolio over time to make sure it continues to track the allocation that has been carefully selected. This is where the proactive oversight of rebalancing comes in.

Rebalancing is the disciplined process of selling assets that have increased in value and then buying other assets that have underperformed on a relative basis. Rebalancing maintains the target allocation to reduce tracking error (the difference in return between the actual portfolio and target allocation). Volatile markets cause a portfolio's value to gyrate up and down. Left unchecked, during good markets, investors can end up with too much stock exposure (relative to bonds) which increases risk. With disciplined rebalancing, investors can capitalize on stock market movements to enhance the portfolio's return and control risk. The expression "buy low, sell high" can be used to describe rebalancing. The rebalancing process systematically buys asset classes that fall (buy low) relative to others and sells assets that have grown (sell high).

Rebalancing can offer numerous benefits:

- Rebalancing ensures a commitment to long-term risk control. Risk continually changes in non-rebalanced portfolios. If the portfolio was never rebalanced, it would materially stray from its original risk profile (see **Figure 14a**).
- Research demonstrates that judicious rebalancing can enhance return. In a portfolio with multiple asset classes, in the short-term, some assets zig while others zag. Rebalancing capitalizes on this phenomenon by selling assets that zag higher (selling high to capture excess gains) and can potentially add 0.5% to 0.8% in return each year.[13] How does rebalancing add return? Simply put, rebalancing allows you to systematically purchase investments that have declined in price and sell investments that have increased in price.
- Rebalancing instills discipline. We inherently know it makes sense to rebalance when an asset class appreciates versus other asset classes. Of course, that means "selling your winners." This is easier said than done since people have a hard time selling winners. Unemotional rebalancing buys temporarily out-of-favor investments – asset classes that have underperformed but offer more upside potential. Rebalancing does not rely on forecasts or predictions for excess return. Rather, it applies a consistent discipline.
- Rebalancing simplifies life. Investors are often too busy to worry about details like rebalancing. Complacency causes them to miss the opportunity that rebalancing presents.

Of course, there is no such thing as a free lunch. One of the potential costs of rebalancing is realizing capital gains in taxable accounts after selling what is overweighted. That is why it is critical to fully consider all tax ramifications and trading costs before rebalancing. In taxable accounts, it may make sense to do only a partial rebalance.

Determining the appropriate frequency of rebalancing is critical for success. Calendar-based rebalancing is popular, but it is inefficient and creates needless tax and excessive trading. A better method is to simply rebalance whenever needed. This is called drift-based rebalancing. This is an opportunistic approach and is based on market volatility, portfolio distributions, fund distributions, and client cash flows. Research and experience lead to look frequently but rebalance infrequently. A change in relative market values is not the only reason to rebalance. Cash flow in or out of the portfolio also trigger rebalancing. New money goes to underweighted asset classes and withdrawals from asset classes that are over-weighted. In effect, each cash flow event causes a mini-rebalance.

While the concept is simple, it is complex in real life. This is because each asset class has unique properties requiring adjustments to the process. Taxes, multiple accounts, cash flow needs, trading costs, and trading restrictions further complicate execution of the buy-low, sell-high discipline. Executed properly, rebalancing controls risk, increases returns, instills discipline, and simplifies life.

MANAGING TAXES

While risk and return are critical to investment management, so too is tax. As legendary investor Sir John Templeton said, "For all long-term investors, there is only one objective: maximum total return after taxes." We couldn't agree more!

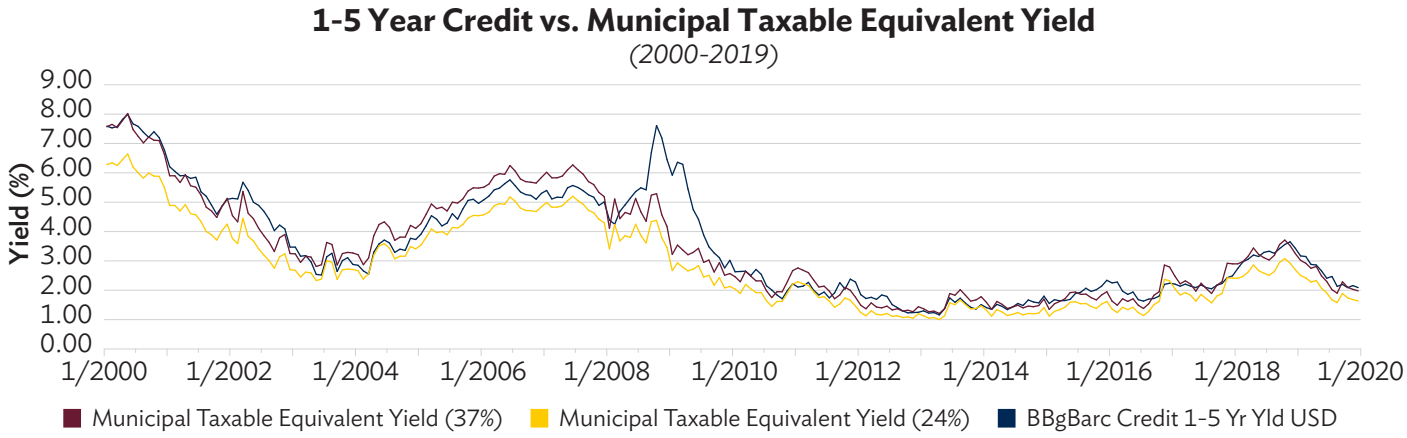
Fortunately, there are numerous strategies that can be utilized to maximize total portfolio return after taxes:

- Indexed / low turnover funds
- Tax-managed funds
- Municipal (tax-free) bonds
- Tax-loss harvesting
- Asset location (tax engineering)

Perhaps the easiest strategy to implement is low turnover funds which tend to track an index or attempt to capture the returns of an asset class. Actively managed funds, on the other hand, tend to trade more, and thus have a higher tax burden. High turnover means more buying and selling of securities which means higher tax cost because it causes the realization of short-term capital gains which get passed on to investors. Fortunately, these tax costs can be nullified by avoiding actively managed funds and focusing on low turnover funds.

Another popular strategy that incorporates low turnover is tax-managed funds. Tax-managed funds attempt to approximate a benchmark while taking advantage of several tax mitigation strategies. Instead of steadfastly tracking the index, tax-managed funds hold a security until it becomes a long-term capital gain which qualifies the sale for long-term rates instead of much higher short-term rates. In addition, tax-managed funds aggressively sell stocks at a loss to help offset gains. These types of funds use an accounting method known as "highest cost" accounting which sells securities with the highest cost basis. The final strategy employed is using penalties and/or transaction fees to discourage investors from short-term trading.

Figure 15a



Fund	Hypothetical Yield	Taxable Equivalent Yield (Tax Bracket)			
		24%	32%	35%	37%
Intermediate Term Municipal Bond Fund	1.00%	1.32%	1.47%	1.54%	1.59%
Intermediate Term Taxable Bond Fund	1.50%	1.50%	1.50%	1.50%	1.50%
Taxable - Municipal Differential		-0.18%	-0.03%	0.04%	0.09%
Use Municipal Fund?		No	No	Yes	Yes

Data Source: Morningstar Direct. Intermedite Term Corporate Yield = Bloomberg Barclays Credit 1-5 Yr Yld USD. Municipal Yield = Bloomberg Barclays Muni 1-5 Yr Blend(1-6) Yld USD.

While tax-managed funds can help reduce or eliminate capital gains, purchasing municipal bonds can reduce federal tax liabilities altogether. Municipal bonds are issued by state and local governments, and the interest payments are exempt from federal taxation. Since there are income tax benefits, they typically offer lower interest rates than taxable bonds. This means that municipal bonds generally make sense for investors in high tax brackets. While municipal bonds offer opportunity, they need to be handled with caution. They require continual monitoring of tax brackets, yield curves, and personal tax circumstances. **Figure 15a** shows a hypothetical example of an intermediate-term taxable bond fund and an intermediate-term municipal bond fund and their respective yields. By analyzing both on a taxable equivalent yield basis, we can better make the determination as to which is most appropriate at various marginal tax brackets at a given point in time.

Realizing losses on the portfolio is never fun. Fortunately, the investment world does offer investors a consolation prize known as tax-loss harvesting. Tax-loss harvesting works by selling a security at a loss and concurrently buying back a similar but not identical investment. To avoid "wash sale" rules, the original security can't be repurchased 30 days after the sale. Nothing really changes aside from realizing a valuable tax benefit. The realized losses can be used to offset capital gains or, if there are no capital gains, to offset up to $3,000 of ordinary income each year. It is important to harvest losses in a disciplined and systematic manner that continuously captures tax benefits and preserves them for current and future use. Any unused losses can be carried forward indefinitely to offset future gains. The process is counterintuitive because it requires investors to admit their losses and sell losers. **Figure 15b** shows the general process and potential tax savings of tax-loss harvesting over three years resulting in a $8,060 tax reduction.

When selling securities, many investors err in their selection of an accounting method for tax purposes. The IRS offers multiple methods to determine the cost basis in the shares sold such as selling the lowest cost shares (thus realizing more capital gains) or averaging the price over multiple purchase methods. The preferred method for portfolio accounting is known as tax-loss optimization. When selling securities, this method selects short-term capital losses first and then long-term capital losses. If all the positions have appreciated, it looks for long-term capital gains before realizing costly short-term capital gains. In nearly every instance, the tax-loss optimization method results in much lower taxes. Importantly, there is no additional cost in choosing this method; it is merely an accounting election.

Another strategy we use in the quest for maximum tax-efficiency is asset location, also known as tax-engineering, which is nearly as important as the actual investments selected. As shown in **Figure 15c**, different types of accounts are taxed in very different manners, and the tax characteristics can be bucketed into three general types: 1) tax-deferred accounts (e.g. traditional IRA), 2) taxable accounts, and 3) tax-free accounts (e.g. Roth IRAs). Conventional wisdom is often wrong with respect to tax bucket management. Many investors put long-term investments such as stocks in tax-deferred accounts. This eliminates the opportunity to benefit from preferential treatment of long-term capital gains and qualified dividends in taxable accounts. Plus, as the value of the tax-deferred account grows, so too does the amount of potential tax owed to the federal government. Though effective tax bucket management is complex, the benefit of getting it right is significant. A Vanguard study[14] showed that proper asset location can add up to 0.75% in value each year, depending on the investor's asset allocation and "bucket" sizes. Optimal asset location does not increase gross returns but reduces how much tax is paid.

In addition to the five strategies detailed here, there are other strategies that can be utilized depending on the individual's circumstances. Some of those strategies include Roth conversions, charitable donor advised funds, estate engineering, and distribution planning.

Figure 15b

The Arithmetic of Tax Loss Harvesting

(3-Year Tax Savings from Harvesting a $25,000 Loss)

Activity	Without Loss Harvesting		With Loss Harvesting		
	Gains and Income	Taxes Paid	Gains and Income	Use of $25,000 Harvested Loss	Taxes Saved
Year One					
Realized Short-Term Gain	$5,000	$1,850	$5,000	-5000	$1,850
Realized Long-Term Gain	5,000	1000	5,000	(5,000)	1000
Earned Income	3,000	1110	3,000	(3,000)	1110
Loss Carry Forward				12,000	
Year Two					
Realized Short-Term Gain	3,000	1110	3,000	(3,000)	1110
Earned Income	3,000	1110	3,000	(3,000)	1110
Loss Carry Forward				6,000	
Year Three					
Realized Short-Term Gain	1,000	370	1,000	(1,000)	370
Realized Long-Term Gain	2,000	400	2,000	(2,000)	400
Earned Income	3,000	1110	3,000	(3,000)	1110
Totals	$25,000	$8,060		Total Tax Savings	$8,060

Note: Assumed short-term gains tax rate of 39.6%, long-term gains tax rate of 20%, and earned income tax rate of 37%.

Tax code allows for up to $3,000 of earned income to be offset annually with capital losses.

This is intended for illustrative purposes only and is not representative of actual results.

Figure 15c

Optimal Placement of Assets in Proper Accounts Can Reduce Taxes

Roth IRA

Assets Grow Tax-Free with No Tax at Withdrawal

Ideal Asset Characteristics:
- High Ordinary Income
- Highest Expected Growth
- High Distributions
- High Turnover

Traditional IRA

Assets Grow Tax-Deferred with Withdrawals Taxed at Ordinary Income Rates

Ideal Asset Characteristics:
- High Ordinary Income
- Lowest Expected Growth
- High Distributions
- High Turnover

Taxable

Both Income and Capital Gains Taxed

Ideal Asset Characteristics:
- Low Ordinary Income
- High Growth OK (Taxed at Capital Gains Rates)
- Low Turnover

EBI Step Four:

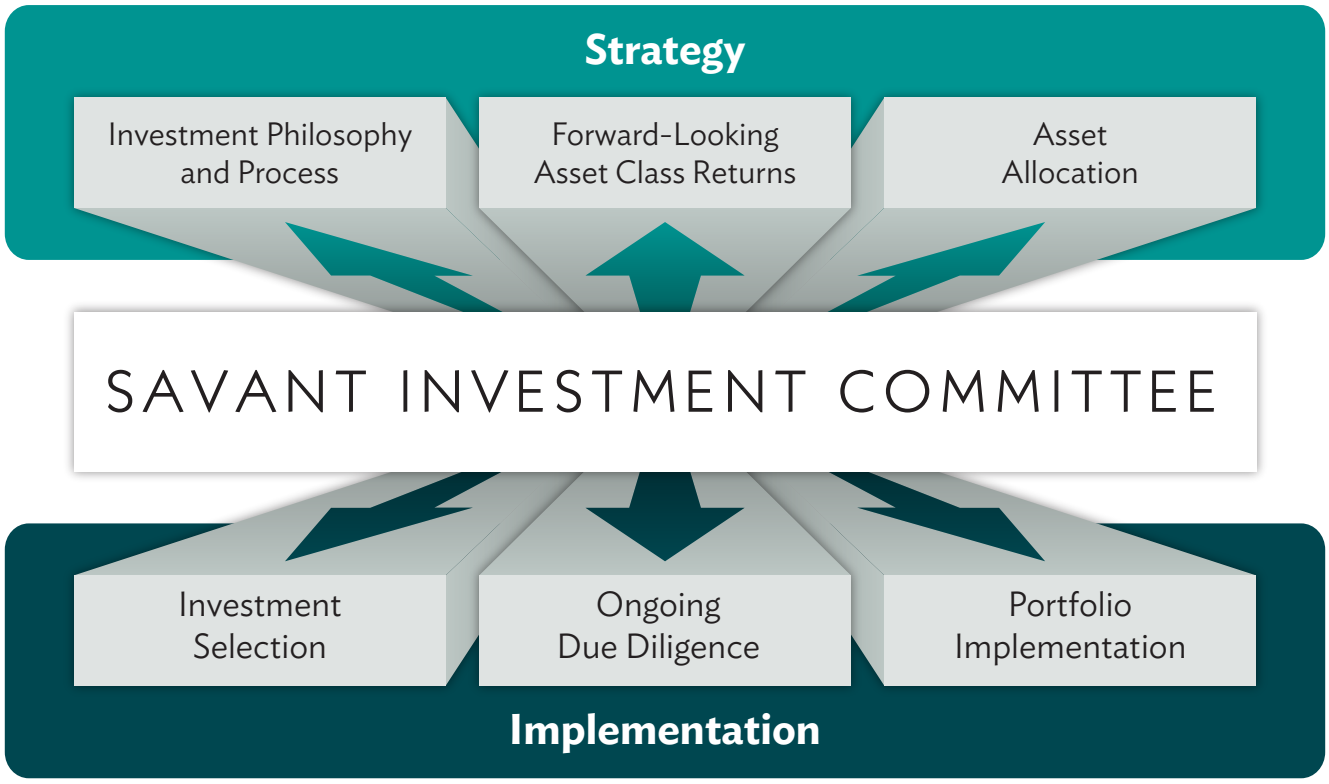
Monitor for Effectiveness

The last step, monitoring for effectiveness, is a very important part of the process. We refer to it as "robust investment oversight" which we believe significantly enhances investment results by eliminating needless risk.

The Investment Committee (Committee) is at the helm of Savant's investment management and is responsible for overseeing all investment-related activities as illustrated in **Figure 16a**. The Committee is governed by a formal charter and bylaws, and members consist of Savant's executive team members, senior investment research analysts, and senior advisors. This group provides the depth of experience needed to navigate numerous facets of investment oversight. The investment environment is constantly changing (capital markets, tax code, investment universe), and leveraging a formal committee and process is more important than ever. The Committee meets regularly throughout the year and is supported by the Investment Research Team. The Committee also exchanges ideas with Zero Alpha Group, a network of independent investment advisory firms. For additional reading on how we monitor the investment process, please read the following page.

Figure 16a

A Formal Approach to Oversee All Investment-Related Activities



Investment Philosophy and Process

The Committee continually tests and challenges the validity of our investment philosophy described in this paper. While our philosophy is time-tested and does not change dramatically from year to year, the Investment Committee regularly refines our processes and updates the way we implement our strategy.

Forward-Looking Asset Class Returns

Before setting allocations, we determine risk and return expectations for each asset class. Savant developed a robust methodology[15] for estimating long-term, forward-looking returns. This allows us to not solely rely on historical returns, but to also incorporate current valuations and other economic circumstances into expected returns. As with any forward-looking estimate, it is only an estimate—we do not have a crystal ball. In addition to helping build efficient portfolios, Savant's expected returns are used in our financial planning models to assist clients with portfolio forecasting (Monte Carlo analysis). Lastly, expected returns are used to evaluate the tax efficiency of different asset classes to help determine in what type of accounts to locate each asset.

Asset Allocation

Our asset allocation process follows the three general principles of Modern Portfolio Theory: 1) The only way to earn higher returns is to take additional risk; 2) Diversification can help reduce volatility (or risk); and 3) All things being equal, investors should construct efficient portfolios that maximize return and minimize risk. Savant utilizes our forward-looking return estimates and statistical analysis to build optimal portfolios. We estimate the expected outcome of many asset mixes under various market environments. The Committee then determines the asset allocation for each portfolio.

Investment Selection and Ongoing Due Diligence

Once portfolio allocations are determined, the Committee is responsible for determining which investments to use. Savant's Investment Research Team performs an in-depth annual review to ensure we utilize the best investment(s) for each asset class. The constant proliferation of new funds makes for a continually changing universe of investments. We screen the universe of available funds which must meet criteria, including but not limited to: low cost, low turnover, reasonable liquidity, transparent structure, pure representation of the asset class, reputable firm, and sufficient track record and assets under management. These criteria help narrow the field. Remaining investments are then evaluated and must undergo an interview process. Funds that pass this rigorous process are eligible to be added to the portfolio.

Selected funds are continuously monitored via a quarterly review process. The Investment Research Team assembles quarterly qualitative and quantitative information/data from which certain criteria may trigger a fund to be flagged based on the set thresholds. This might require simply digging deeper into fund data, or it may trigger a meeting with the fund manager. Funds that receive enough flags are put on watch. All due diligence is brought to the Committee to discuss and determine any necessary action.

Conclusion

Summary

The purpose of this evidence-based approach to investing is to benefit the investor, whether individual or institutional. This paper demonstrates that the correct use and analysis of evidence can benefit the field of investing in much the same way as it has benefited the field of medicine. Approaching a problem or a set of questions from an evidence-based point of view has profoundly affected the field of medicine, and now investing.

What Doesn't Work

This paper has reviewed and analyzed the arguments supporting the conventional approach to investing. The best empirical data available has been analyzed to determine that:

- Market timing is a recipe for disappointment.
- Active stock-picking, in aggregate, is unlikely to deliver value.
- Frictions such as high costs and unnecessary taxes can erode returns over time, causing even many "winners" to fail.
- There is no evidence in the persistence of past performance as an indicator when selecting money managers.

Evidence-Based Investing—Its Impact on the Relationship Between Client and Advisor

Investing resembles the field of medicine in another aspect – there is an art to the practice. There cannot be one "textbook" answer for each individual investor. Rather, an advisor should work to tailor an investment approach to each investor's individual circumstances.

EBI processes are ongoing. Analysis of relevant data should have a direct impact on current investment options and approaches. Changes in investment recommendations should be based on the most recent empirical data with the simple goals of either increasing expected returns at a given level of risk or reducing risk without having to sacrifice expected returns.

The Positive Results

The broad application of Evidence-Based Investing in the preceding overview has yielded four key diversification strategies:

- Enhanced bond diversification provides protection from stock risk without leaning too heavily on interest-rate risk or credit risk and taking full advantage of the full universe of bonds.
- Harnessing the global opportunity set in stocks offers improved risk-adjusted returns without having to bet on any one country's stock market.
- Tilting towards persistent and robust factors such as size, value, quality and momentum allows investors to target excess returns in stocks in an efficient and systematic fashion.
- Allocating to select alternative investments—namely trend following, event driven, reinsurance and real assets—can mitigate portfolio risk through the inclusion of uncorrelated return streams that can benefit in environments when stocks or bonds struggle.

Finally, broad market investing—typically indexed or structured—optimally delivers market returns. Despite the growing consensus and clear evidence against active management and speculation, the conventional active approach to investing is here to stay. Hopefully, armed with evidence and logic, the number of individual investors who get caught up in this unscientific approach will decrease. Why does the conventional view have such strong staying power? This question was asked by Nobel laureate William Sharpe in his piece, "The Arithmetic of Active Management." His answer follows:

"More often, the conclusions (in support of active management) can only be justified by assuming that the laws of arithmetic have been suspended for the convenience of those who choose to pursue careers as active managers."[16]

For us, the evidence is clear. Investors can use a scientific framework to enhance the art of investing.

Appendix: Evidence-Based Medicine

History and Methodology

The term Evidence-Based Medicine, or EBM, was first used in the early 1990s. It is an attempt to apply the standards of evidence gained from the scientific method to certain aspects of medical practice in a uniform manner. EBM also seeks to judge the quality of specific evidence as it is applied to the assessment of the potential risks and benefits of a given treatment. According to the Centre for Evidence-Based Medicine at the University of Oxford, "Evidence-Based Medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients."[17]

Historically, testing the efficacy of medical interventions has existed for centuries. Alexandre Louis, a French physician, introduced an initiative called "medecine d'observation" in 1830. Louis stated to his colleagues that "physicians should not rely on speculation and theory about causes of disease, nor on single experiences, but they should make large series of observations and derive numerical summaries from which real truth about the actual treatment of patients will emerge."[18] Unfortunately, Louis met with strong resistance from his fellow physicians, who practiced in an era of medicine that lacked the solid basic science and experimental background of modern medicine. "Medecine d'observation" failed shortly after its appearance.

A Scottish epidemiologist, Archie Cochrane, set forth much of the groundwork for EBM in his 1972 book, Effectiveness and Efficiency: Random Reflections on Health Services. His work has been honored through the naming of centers of evidence-based medical research – Cochrane Centers. Cochrane's efforts also led to the establishment of the Cochrane Collaboration, an international organization dedicated to tracking down, evaluating, and synthesizing randomized controlled trials in all areas of medicine.[19] The concept and terminology of EBM originated with David Sackett and his colleagues at McMaster University, with the term first appearing in medical literature in 1992 in a Journal of the American Medical Association article.[20]

In the 1980s there were several studies examining the utilization of various operations in the healthcare system in the northeastern United States. There were large variations noted in the amount and type of care provided to similar populations. Nearby counties with similar populations were found to have variations in the rates of prostate surgeries and hysterectomies of up to 300%. Variation in the rate of cataract surgeries was noted to be up to 2000%. Researchers concluded that physicians must use very different standards to determine the need for surgery in a given patient. With the same body of information and medical research available to all practitioners, wouldn't one expect more uniformity in medical practice? On a daily basis, clinicians are asked questions regarding the interpretation of a diagnostic test, the potential harm of a given medicine, the effectiveness of a preventive measure, the prognosis for a specific patient, and the cost effectiveness and consequences of a course of action. EBM gives physicians the ability to find a proven therapy for a patient.[21]

The Methodology of EBM

EBM is an evolving methodology. There is a series of steps by which the method is used:

1. Formulation of a question that is to be answered.
2. Finding the best evidence of outcomes available.
3. Critical appraisal of the evidence.
4. Application of the evidence, including integration with clinical expertise and patient values.
5. Evaluation of the effectiveness and efficiency of the process.[22]

Once evidence has been gathered, it is stratified according to the quality of the evidence. A commonly used system is the one developed by the U.S. Preventive Services Task Force:

Level I: Evidence obtained from at least one properly designed randomized controlled trial.

Level II-1: Evidence obtained from well-designed controlled trials without randomization.

Level II-2: Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.

Level II-3: Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled trials might also be regarded as this type of evidence.

Level III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.[23]

There are other alternative systems to categorize levels of evidence, such as the Oxford CEBM system:

Level A: Consistent Randomized Controlled Clinical Trial, Cohort Study, All or None, Clinical Decision Rule validated in different populations.

Level B: Consistent Retrospective Cohort, Exploratory Cohort, Ecological Study, Outcomes Research, Case-Control Study; or extrapolations from level A studies.

Level C: Case-series Study or extrapolations from level B studies.

Level D: Expert opinion without explicit critical appraisal, or based on physiology, bench research, or first principles.[24]

After evidence has been obtained, analyzed, and categorized, a recommendation can be given. A taxonomy has been developed to rate a recommendation, based on both the balance of the risk vs. benefit as well as the level of evidence upon which this recommendation is based. The U.S. Preventive Services Task Force uses the following system:

Level A: Good scientific evidence suggests that the benefits of the clinical service substantially outweigh the potential risks. Clinicians should discuss the service with eligible patients.

Level B: At least fair scientific evidence suggests that the benefits of the clinical service outweigh the potential risks. Clinicians should discuss the service with eligible patients.

Level C: At least fair scientific evidence suggests that there are benefits provided by the clinical service, but the balance between benefits and risks are too close for making general recommendations. Clinicians need not offer it unless there are individual considerations.

Level D: At least fair scientific evidence suggests that the risks of the clinical service outweigh potential benefits. Clinicians should not routinely offer the service to asymptomatic patients.

Level I: Scientific evidence is lacking, of poor quality, or conflicting, such that the risk versus benefit balance cannot be assessed. Clinicians should help patients understand the uncertainty surrounding the clinical service.[25]

Example 1: Corticosteroids for Preterm Birth[26]

The need for EBM, including the dissemination and use of the latest medical information, is illustrated by the case of corticosteroid use in the treatment of preterm birth. In 1972, a randomized controlled trial (RCT) was reported showing the improved outcomes for preterm infants whose mothers received corticosteroid treatment just prior to birth. From 1972 to 1989, six more RCTs were done on this subject, and all confirmed the findings of the 1972 study. During this time, most obstetricians were unaware of these studies, and corticosteroid treatment for mothers about to give birth to preterm infants did not become the accepted practice or standard of care. The first systematic review of the issue was published in 1989, and seven new studies were reported in the following two years. This treatment has been found to reduce the odds of a preterm baby dying from complications of immaturity by 30 to 50%, but thousands of babies did not benefit from this treatment because doctors did not know about the effectiveness of the treatment.

Example 2: Flecainide for the Treatment of Arrhythmias[27]

The use of the drug flecainide in the treatment of heart patients during the 1980s demonstrates another instance of the dangers of the gap between research and clinical practice. At an address to the American College of Cardiology in 1979, Bernard Lown, the inventor of the defibrillator, pointed out that one of the most common causes of death in young and middle-aged men (20 to 64 years old) was heart attack. Moreover, he pointed out that arrhythmias, which often appeared because of a heart attack, were often the cause of death. He suggested that a safe and effective antiarrhythmic drug that protects against ventricular fibrillation could save millions of lives.

In response to this challenge, a paper was published in the New England Journal of Medicine regarding a new antiarrhythmic drug, flecainide. In a well-designed randomized placebo-controlled cross-over trial, this local anesthetic was found to decrease the number of premature ventricular contractions (PVCs). The conclusions were quite straightforward: flecainide reduces arrhythmias, arrhythmias in heart attack patients cause death, therefore people who have had a recent heart attack should be given flecainide. Flecainide was approved shortly by the U. S. Food and Drug Administration, and this treatment soon became standard treatment for heart attack in the United States.

As flecainide became the standard of care, information about its use was published in medical textbooks. At the same time, researchers started gathering information on the survival of patients instead of the rate of PVCs. In other words, they started to actually measure the outcome as opposed to the mechanism. These subsequent studies showed that in the 18 months following a heart attack, more than 10% of the patients treated with flecainide died, which was about twice the number of deaths in the placebo group. Despite a useful mechanism of action – reducing cardiac arrhythmias – the drug was clearly toxic and overall did much more harm than good. Unfortunately, these subsequent studies received much less publicity than the original studies regarding the benefits of flecainide.

The widespread use of flecainide continued and expanded, and by 1989, about 200,000 people were being treated with the drug. Although good medical evidence to the contrary was available, the inappropriate use of flecainide continued due to the poor dissemination of the good quality outcome-based research studies.

The flecainide story demonstrates the importance of the dissemination of quality medical research. The initial information may have been more widely and readily accepted because it offered a "cure." The follow-up studies were counterintuitive in their conclusions and negative with respect to a potential treatment. Doctors continued to prescribe flecainide because they believed it worked. They did not know that there was contrary information available. It is especially difficult to obtain information when one is unaware of its existence.

References, Notes, Sources of Data and Methodology

Indexes used except where otherwise noted. Historical performance results for investment indices, benchmarks, and/or categories have been provided for general informational/comparison purposes only, and generally do not reflect the deduction of transaction and/or custodial charges, the deduction of an investment management fee, nor the impact of taxes.

U.S. Inflation – Consumer Price Index – Bureau of Labor Statistics

Treasury Bills – Ibbotson U.S. 30 Day T-Bill Index

Short-Term Bonds – Ibbotson U.S. 1-Year Treasury Index

Aggregate Bond – Bloomberg Barclays U.S. Aggregate Bond Index

Intermediate-Term Bonds – Bloomberg Barclays U.S. Aggregate Bond Index

Long-term Bonds – Ibbotson U.S. Long-Term Government Index

Inflation-Protected Bonds (TIPS) – Bloomberg Barclays U.S. Govt/Credit Intermediate TR (1/1973 - 2/1997), ICE BofA U.S. Inflation-Linked Treasury after 2/1997

International Bonds – Bloomberg Barclays Intermediate Government/Credit Bond Index (1/1973 – 4/1993), JPM Global GBI ex U.S. Hedged Index (after 4/1993)

Multisector Bonds – Bloomberg Barclays Intermediate Government/Credit Bond Index (1/1973 – 1/1986), 50% Bloomberg Barclays U.S. Corporate High Yield TR, 50% Bloomberg Barclays U.S. MBS TR (1/1986 – 8/1999), 33.4% Bloomberg Barclays U.S. Corporate High Yield TR, 33.3% Bloomberg Barclays U.S. MBS TR, 33.3%, JPM EMBI Global Diversified after 8/1999

U.S. Large Core Stocks – S&P 500 (1/1973 - 6/2001), CRSP U.S. Total Market (After 6/2001)

U.S. Large Stocks – S&P 500 Total Return Index

U.S. Large Momentum Stocks – Fama-French High Prior Return (1/1927 – 11/1981), MSCI USA Momentum GR USD (after 11/1981)

U.S. Large Quality Stocks – Fama-French U.S. High Profitability Index (1/1/1973 – 11/1988), MSCI USA Sector Neutral Quality GR (after 11/1988)

U.S. Large Value Stocks – Fama-French Large Value (1/1973 - 6/1992), MSCI U.S. Prime Market Value (After 6/1992)

U.S. Mid Stocks – S&P 400 Total Return Index

U.S. Small Stocks – Ibbotson U.S. Small Stock Index (1/1973 – 6/1992), MSCI U.S. Small Cap 1750 Index (after 6/1992)

U.S. Small Value Stocks – Fama-French Small Value Index (1/1973 – 6/1992), MSCI U.S. Small Cap Value Index (after 6/1992)

Int'l Large Stocks – MSCI EAFE Index

Int'l Large Value Stocks – MSCI EAFE Index (1/1973-12/1974), MSCI EAFE Value Index (after 12/1974)

Int'l Small Stocks – Dimensional International Small Cap Index (1/1973 - 8/1989), S&P EPAC Small Index (after 8/1989)

Int'l Small Value Stocks – Dimensional International Small Cap Index (1/1973 - 8/1989), S&P EPAC Small Value Index (after 8/1989)

Emerging Markets Stocks – MSCI EAFE Index (1/1973 - 1/1988), MSCI EM GR Index (1/1988 - 1/2000), MSCI EM NR Index After (1/2000)

REITs – FTSE NAREIT U.S. Equity REIT Index (1/1973 – 1/1995), S&P Global REIT Index (after 1/1995)

Trend Following – AQR equal weighted Trend Following Strategy quantitative backtests (1/1973 – 1/1998), Credit Suisse Managed Futures Liquid Index (after 1/1998)

Reinsurance – 59.5% IA SBBI IT Govt TR USD, 40.5% IA SBBI U.S. 1 Yr Trsy Const Mat TR USD (1/1973 – 12/2001), SwissRe Global Cat Bond TR USD after 1/2002

Real Assets – FTSE Nareit All Equity REITs TR USA (1/1/1973 – 1/1978), NCREIF Property (1/1978 – 1/1987), 75% NCREIF Property, 25% NCRIEF Timberland (1/1987 – 4/1991), 25% NCREIF Farmland, 50% NCREIF Property, 25% NCREIF Timberland (4/1991 – 3/2003), 25% Dow Jones Brookfield Global Infrastructure TR USD, 25% NCREIF Farmland, 25% NCREIF Property, 25%, NCREIF Timberland (3/2003 – 6/2020), Dow Jones Brookfield Global Infrastructure Comp TR USD after 6/2020

Event Driven – Bloomberg Barclays Intermediate Government/Credit Bond Index (1/1973 – 1/1997), Credit Suisse Event Driven Liquid TR USD (1/1997 – 11/2007), IQ Hedge Merger Arbitrage TR USD (11/2007 – 1/2015), IQ Event-Driven TR USD after 1/2015

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[8] From 1975-2019, the correlation between the MSCI EAFE Index and the S&P 500 Index was 0.65. The correlation between the MSCI EAFE Index and the Ibbotson Small Stock Index was 0.53. Source: Morningstar Direct.

[9] International Developed: MSCI EAFE Index (1/1973 - 8/1989), blend of MSCI EAFE Index and S&P EPAC Small Index after 8/1989. Emerging Markets: MSCI EAFE Index (1/1973 - 1/1988), MSCI EM GR Index (1/1988 - 1/2000), MSCI EM NR Index After (1/2000). Global Blend: 62.5% U.S. Large Cap, International Developed 27.8%, Emerging Markets 9.7%.

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[12] Source: Morningstar Direct. 60/40 index portfolio not rebalanced from 1/1/1973 – 12/31/2019. Bonds = Blend of Short-Term Bonds, Intermediate Term Bonds, Multisector Bonds, Inflation-Adjusted Bonds, International Bonds; Stocks = Blend of U.S. Large Core Stocks, U.S. Large Value Stocks, U.S. Large Quality Stocks, U.S. Large Momentum Stocks, U.S. Small Stocks, U.S. Small Value Stocks, International Large Stocks, International Large Value Stocks, International Small Stocks, International Small Value Stocks, Emerging Markets Stocks, Global REITs.

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Please Note: Limitations of Index discussion. Savant has provided the Index presentation solely to demonstrate the benefit of rebalancing. Different types of investments and/or investment strategies or allocations involve varying degrees of risk and volatility, and at any specific point in time, or over any specific time-period, any investment or investment strategy can and will suffer losses, at times substantial losses. Therefore, it should not be assumed that the future performance of any specific investment or investment strategy, including the investments and/or investment strategies or allocations recommended and/or undertaken by Savant, will be profitable, equal any historical performance level(s), or prove successful. **Please Also Note: The referenced graphs at 13a, 13b, and 14a do not reflect the rebalancing, composition or performance of any current Savant investment strategy.**

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