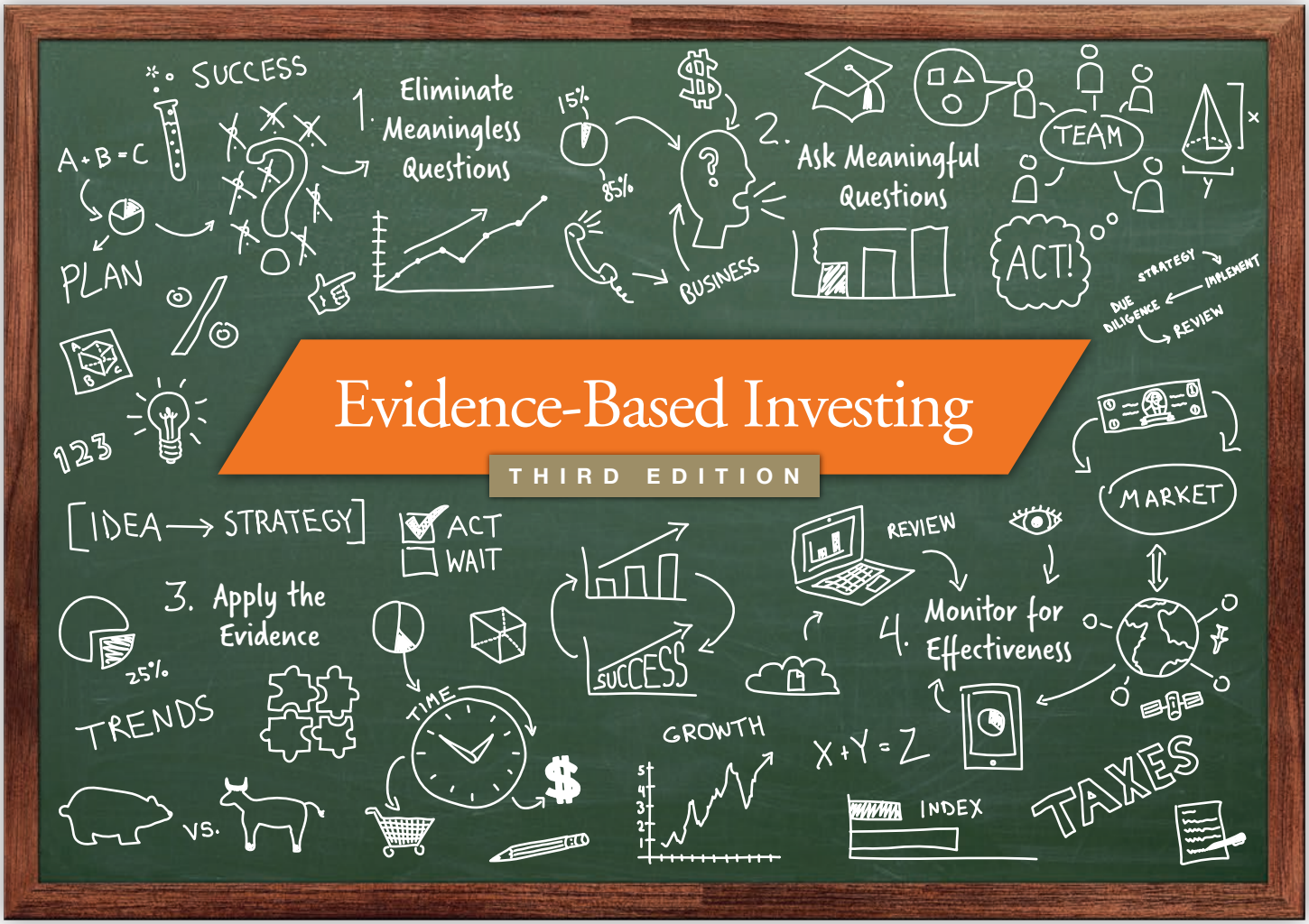


A Scientific Framework for the Art of Investing

Science has produced many tremendous advances, from lifesaving medical treatments to instantaneous communication. Historically, though, science has had little influence on investing. Instead of keeping pace with advancements in modern portfolio theory along with historical and statistical evidence, 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 return and minimize risk? This paper provides a framework called Evidence-Based Investing that can provide investors optimal outcomes based on compelling scientific evidence.

SAVANT®
BUILDING IDEAL FUTURES

Savant Capital Management

Who We Are

Savant Capital Management is an independent, fee-only wealth management firm. We do not sell products, and thus are able to deliver objective fiduciary advice and fully transparent service to you, our clients. Additionally, Savant does not receive benefits from brokerage services, commissions or finder's fees. This independence allows us to remain impartial and do what is in your best interest, giving you the peace of mind that comes from engaging in only the most trusting relationship.

What Drives Us

Our vision is to help build ideal futures for our clients, our team, and the communities we serve. Since 1986, we have focused on one key principal: all financial advice should be made strictly in the best interest of the client. But it goes beyond that…we are committed to helping our clients gain peace of mind through insight, wisdom, and perspective. At Savant we help people live the way they want when they retire. We start by working with you to determine what's important. Then, using a time-tested and evidence-based approach, we provide investors access to a personalized portfolio option and proactive, customized planning advice, all while considering the tax implications over a lifetime.

Experience and Recognition

Often our clients know where they want to be, but they need the collective wisdom and insight of a team of professionals to help them get there. That is why Savant is committed to providing you with the value and experience you deserve in wealth management. We have thoughtfully assembled a team of specialists, each of whom aspires to the highest professional and academic standards. Collectively, we offer each client our combined expertise, credentials, intelligence, work ethic, character, and reputation.

With hard work and a steadfast commitment to service, Savant has received significant local and national recognition:

- ***Accounting Today*** - Top CPA Financial Planners
- ***Barron's*** - Top 100 Financial Advisor
- ***BusinessWeek*** - Most Experienced RIA List
- ***Chicago* magazine** - #1 Independent Advisor
- ***Financial Advisor* magazine** - Top RIA Ranking and Fastest Growing Independent RIA
- ***Financial Planning* magazine** - Top 100 RIA Firm
- ***Forbes*** - Top 50 Registered Investment Advisor (RIA)
- ***InvestmentNews*** - One of the 50 Largest Wealth Management Firms in the Nation
- ***Schwab*** - Best-In-Business IMPACT Award Recipient
- ***Worth/Robb Report*** - Top 100 Wealth Advisor

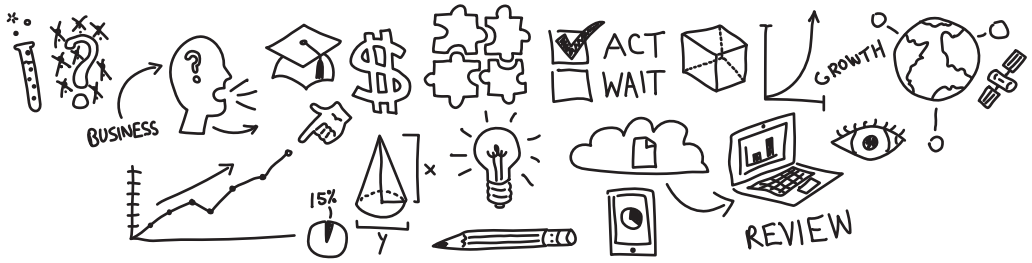
Among these honors is a certification from the **The Centre for Fiduciary Excellence (CEFEX)** which has recognized Savant as a CEFEX Certified Investment Steward and a CEFEX Certified Investment Advisor. These designations confirm that Savant's fiduciary practices have been audited by an independent global assessment and certification organization to be in conformity with global practices.

Confidence, Simplicity, and Peace of Mind

Your total wealth extends beyond financial issues. It is also made up of human capital, intellectual capital, and your ability to positively influence society. Our process and team help you leverage your financial assets in a manner that aligns your personal goals, values, and vision of your ideal future. Our goal is to bring clarity, focus, simplicity, and efficiency to your financial situation. To do this, our team functions as your personal CFO and continually reviews, monitors, and measures your progress to ensure that your plan is in alignment.

As your personal CFO, we integrate your financial planning, investments, and tax decisions. We help assure that your plan considers all opportunities and risks and help you navigate to avoid mistakes that otherwise impede you from getting to where you want to be. An effective financial plan will point you in the right direction. Your investment strategy will focus on preserving and growing your wealth, and tax management assures you do not pay too much tax along the way. With Savant as your personal CFO providing proactive advice, helping you implement that advice, and coordinating with other key professionals, you will have a much higher likelihood of achieving your ideal future.

The Clash of Conventional Wisdom and Science



Introduction

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 manner in which 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 return 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 pick individual stocks, trade in and out of them, and fare as well as the market. Likewise, the notion that there is a system by which one can consistently profit by timing the purchase and/or sale of securities has been proven false. The data, compiled by a conglomerate of Nobel laureates and other highly-acclaimed thinkers over two 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 provide 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 maximize after-tax returns for the individual investor while minimizing risk and protecting portfolios from market downturns.

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

The Evidence-Based Method

From Medicine to Investment Management to Building Ideal Futures

The first purpose of EBI is to provide a template that, laid across the spectrum of topics confronting today's investor, provides clear and simple principles that make it possible to better evaluate the wisdom of investment advice. EBI offers a way to answer investment questions in a systematic, analytical, and scientific manner as described below.

Step One: Eliminate Meaningless Questions

In Evidence-Based Investing, the only good question is one that can be verified. For example, consider the following question:

> *"Did the market decline today out of concern over Iranian oil production?"*

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. 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 advisor 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 manner in which they are able to maintain objectivity.

Data obtained 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 risk and maximize after-tax return.

EBI is also an important part of the *The Building Ideal Futures Process*[SM]. 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. Review Current Plan & Portfolio
3. Develop Plan
4. Implement & Coordinate Plan
5. Conduct Review Sessions

The EBI method is part of step four of *The Building Ideal Futures Process*[SM] 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 end result is a time-tested and common sense approach. We provide investors access to an evidence-based portfolio option along with proactive and customized planning advice.

EBI Step One:

Eliminate Meaningless Questions

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 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 four broad areas including: asset allocation, active management, market timing, and costs and taxes. These conclusions form the pillars of our investment philosophy.

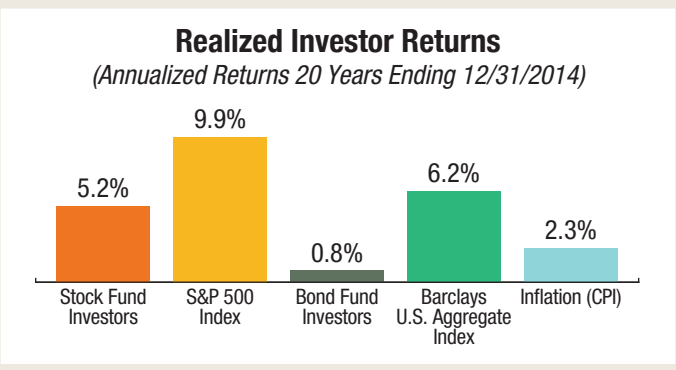
Asset Allocation

Evidence Contradicts the Conventional Approach

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

Most brokers 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, however, 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 simply overwhelming.

Figure 1a



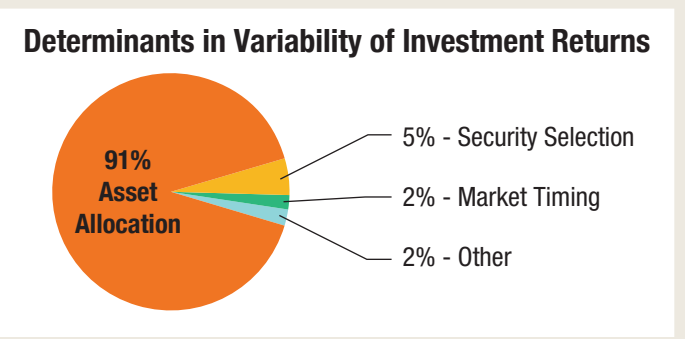
Data Source: Dalbar. Quantitative Analysis of Investor Behavior, 2015. 2015 results not yet available.

Wall Street tells conventional 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 actually harm investors. The conventional approach of active management not only fails to deliver returns that exceed the market, but it actually underperforms the market.

A study by *Dalbar* **(Figure 1a)** shows that conventional active money management techniques actually resulted in substantially lower returns for investors. The average stock fund investor earned returns of only 5.2% per year over the 20-year period ending in 2014, while a simple buy-and-hold strategy in the *S&P 500* returned 9.9%. The comparison is similar for bond investors. Remarkably, the average stock investor was barely able to realize returns above the level of inflation. The average bond investor was unable to accomplish even this feat.

The significant long-term growth of capital markets raises the question: How can individual investors capture this growth while minimizing costs? 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, 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 91% of the total return variations across portfolios was the result of asset allocation differences. Other decisions such as security selection and market timing account for only 5% and 2%, respectively. Disciplined asset allocation enhances returns, whereas security selection and market timing are likely to actually detract from performance more frequently than not. Typically, conventional investors focus on stock

Figure 1b



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

selection and market timing while ignoring the primary driver of future return – 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 historically, free markets have provided a long-term return that has offset inflation. With an optimal asset allocation, investors can let markets work for them. Stock markets have a long and illustrious history of consistent growth. 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 time period. A dollar invested in small cap stocks in 1926 would be worth more than $26,000 in 2015, compared to about $5,400 for large cap stocks.

Active Management

The Poor Performance of Active Money Managers

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

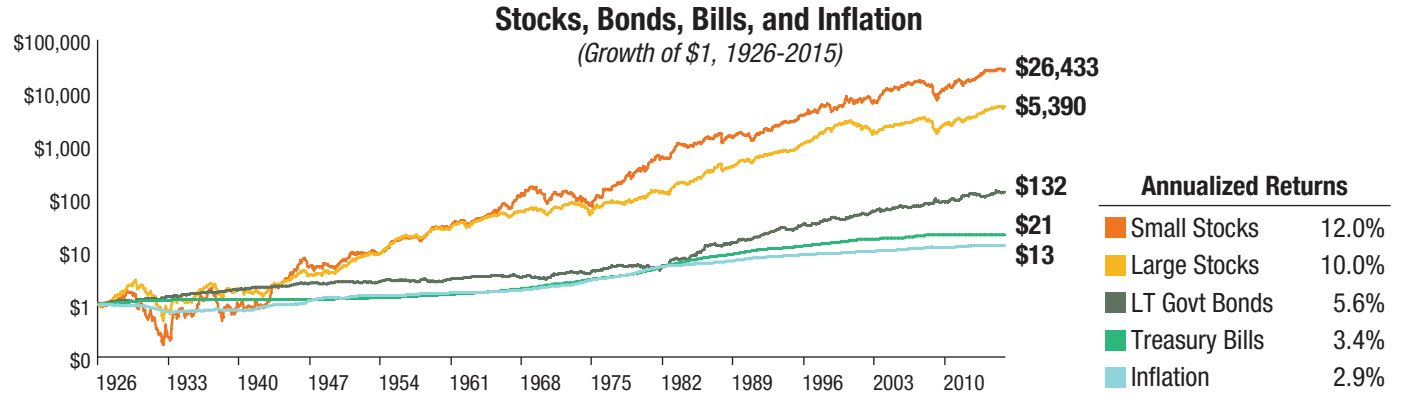
Money managers can be hyperactive traders. They execute a variety of trading techniques in an effort to achieve short-term returns that are higher than the return of the stock market as a whole. With the finest information, technology, and research at their disposal, money managers no longer have to be content with simply trading in and out of the market. They can also trade from sector to sector and company to company simultaneously.

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, or admitted, costs include:

- Local broker commissions (loads).
- Expense ratios which include management fees, administrative fees, legal fees, custody costs, and 12b-1 fees.
- Wall Street brokerage commissions (inside the fund).
- Capital gains tax 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).

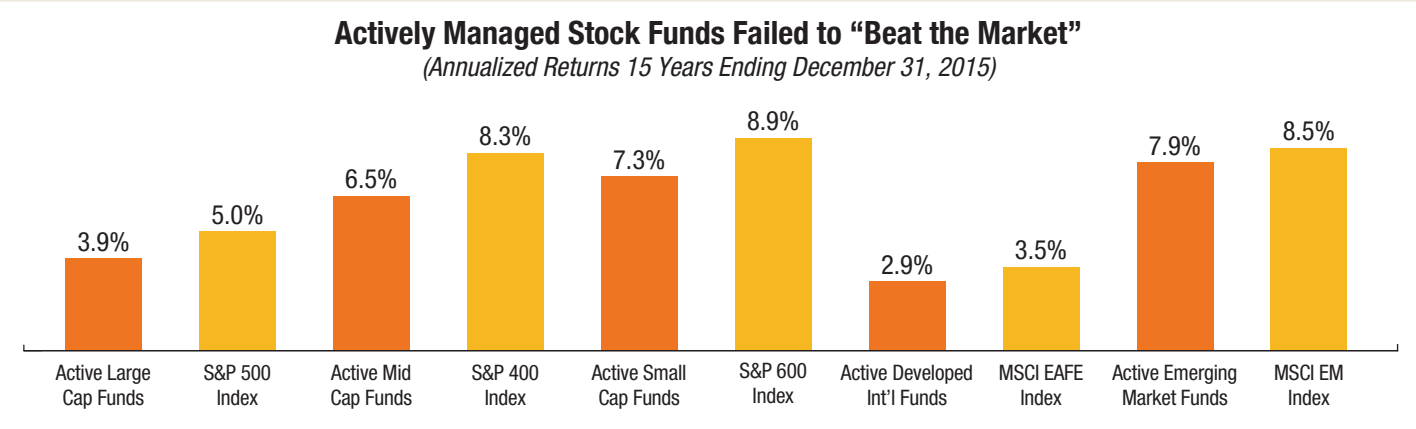
All of these added costs make it very difficult for active managers to outperform their benchmarks. **Figure 2a** shows how the average actively managed fund compared to its relevant passive index for

Figure 1c



Data Source: Morningstar Direct.

Figure 2a



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

the 15-year period ending December 31, 2015. Active large cap funds underperformed the S&P 500 by an average of 1.1% per year. The results are even more pronounced for active small cap funds which trailed their index by 1.6% annually. The same holds true even for funds that invest overseas. Developed international and emerging markets stock funds trailed their benchmarks by 0.6% per year each.

The Allure of Hunting for the Great Money Manager

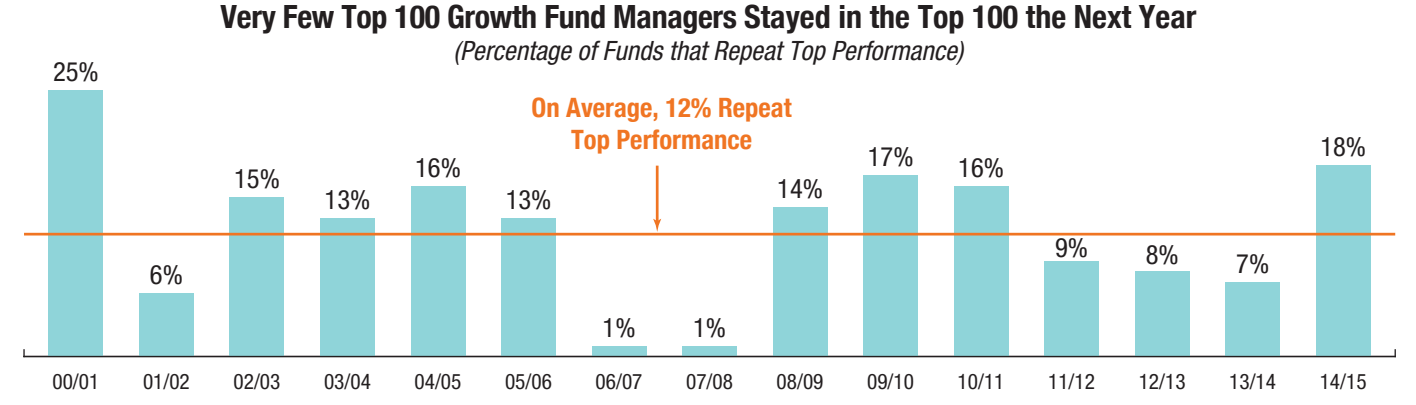
Question: *Can you beat the market by identifying great money managers?*

The previous section, *The Poor Performance of Active Money Managers*, established that the average actively managed fund lags behind its benchmark index. Many advisors acknowledge this is true. However, they do not see it as a reason to abandon their quest to beat the market by picking the right mutual 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 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."

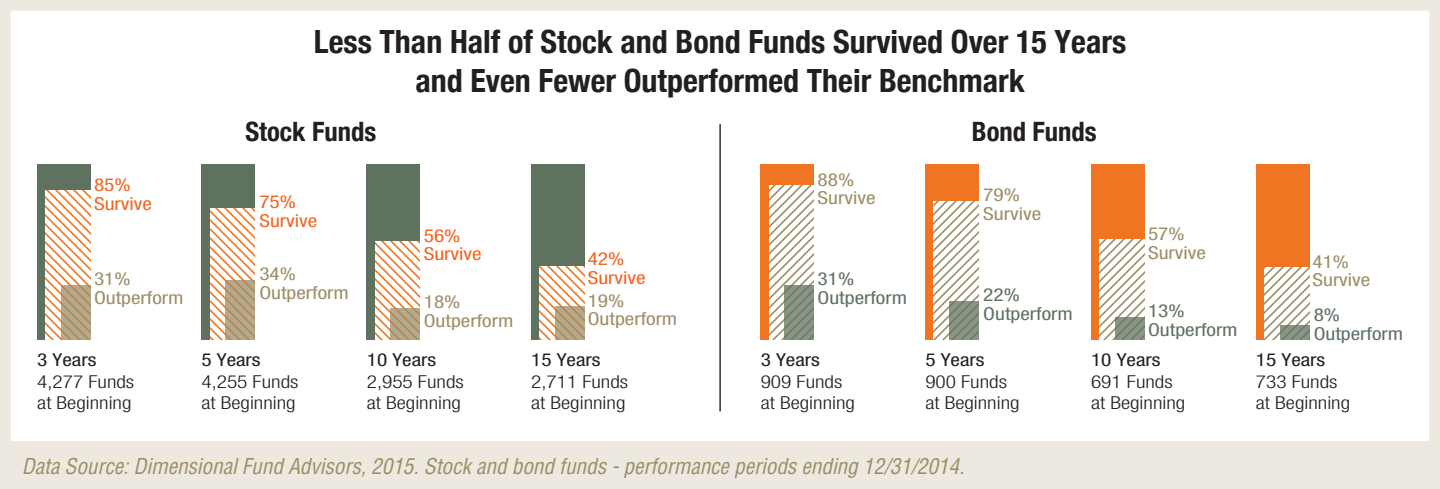
Ironically, good track records attract an influx of new capital that, in turn, often consigns the fund to lower future returns. **Figure 2b** shows how few top 100 growth fund managers were able to maintain a top 100 ranking in the following year. On average, only 12% of the managers were able to remain in the Top 100 from year to year. Notice the range of money managers'

Figure 2b



Data Source: Morningstar Direct. Domestic large growth funds ranked by calendar year performance.

Figure 2c



Data Source: Dimensional Fund Advisors, 2015. Stock and bond funds - performance periods ending 12/31/2014.

annual repeat successes – from 1% to 25%. Such a broad range points to the random nature of a money manager's success and to 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 42% surviving that long going back to 2000. Beyond that, only 19% of those stock funds that survived actually outperformed their benchmark over the past 15 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.

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 two decades strongly supports the hypothesis that markets are more or less efficient. This hypothesis states that at any given time, the market has already taken into account all available information as it sets security prices. There is consensus on this concept. Both evidence and experience suggest that those events that really do move the markets are notable precisely because of their unpredictability. For instance, the tragic events of 9/11 and the implosion of Lehman Brothers truly devastated markets, yet neither of these events could have been included in any list of predictable economic factors before they occurred.

The randomness of capital markets is illustrated in **Figure 3a**. This graph has no pattern, showing that the behavior and ranking of asset classes defies 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 clearly were burned.

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 10.3% since 1988. 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 just the best five days cost 1.6% in average annual return.

Clearly, market timing adds risk and can be extremely costly. The evidence proves that market timing is exceedingly difficult to do 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 3a

Can You Pick the Next Winner?

(Asset Class Returns 2001-2015)

Best Return

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
U.S. Large Cap	13.0	25.9	55.8	33.8	34.0	38.8	39.4	23.0	78.5	27.8	14.1	23.7	39.1	22.8	9.0
U.S. Small Cap	9.0	17.0	52.9	28.8	22.1	32.1	16.2	8.0	41.5	23.4	5.8	20.4	32.4	15.8	3.6
Int'l Large Cap	8.0	11.2	47.4	25.6	21.4	30.3	11.6	5.1	36.1	19.4	4.5	18.2	28.4	13.7	1.7
Int'l Small Cap	7.0	9.8	39.0	20.2	13.5	26.3	11.2	4.8	33.7	18.9	2.1	18.2	22.8	9.9	1.4
Emerging Markets	6.6	7.9	38.6	20.0	10.4	18.8	9.5	-1.1	31.8	16.8	1.7	17.3	7.5	6.1	1.1
Short-Term Bonds	6.0	7.0	28.7	10.9	7.5	15.8	7.4	-35.6	26.5	15.1	0.4	16.0	2.8	4.5	0.6
Interm-Term Bonds	3.2	2.8	23.9	9.1	6.3	15.8	6.2	-36.2	18.9	7.8	-2.8	7.3	1.4	3.1	-0.1
TIPS	-2.6	-6.2	21.3	8.5	5.6	4.4	6.1	-37.0	10.0	6.3	-4.8	5.3	0.2	0.0	-0.8
Foreign Bonds	-11.9	-7.7	8.3	5.2	4.9	4.1	5.5	-43.4	5.2	5.9	-12.1	3.9	-0.9	-2.2	-1.7
REITS	-16.4	-15.9	4.3	4.2	2.8	3.1	5.1	-45.0	2.3	5.0	-13.3	0.1	-2.6	-3.1	-4.1
Commodities	-19.5	-18.4	2.0	3.0	2.1	2.1	1.2	-46.6	0.9	3.4	-14.4	-1.1	-9.4	-4.9	-14.9
Managed Futures	-21.4	-22.1	1.3	0.5	1.6	0.5	-11.1	-53.3	0.4	0.5	-18.4	-8.0	-9.5	-17.0	-24.7

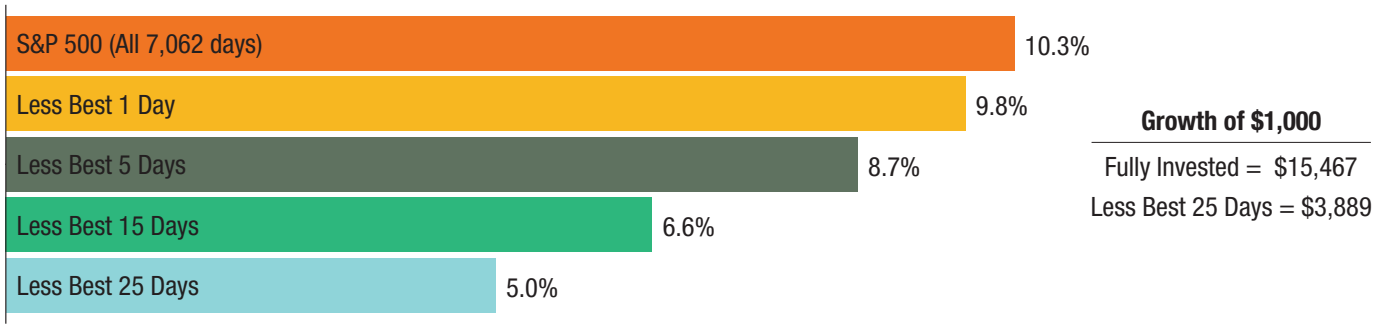
Worst Return

Data Source: Morningstar Direct.

Figure 3b

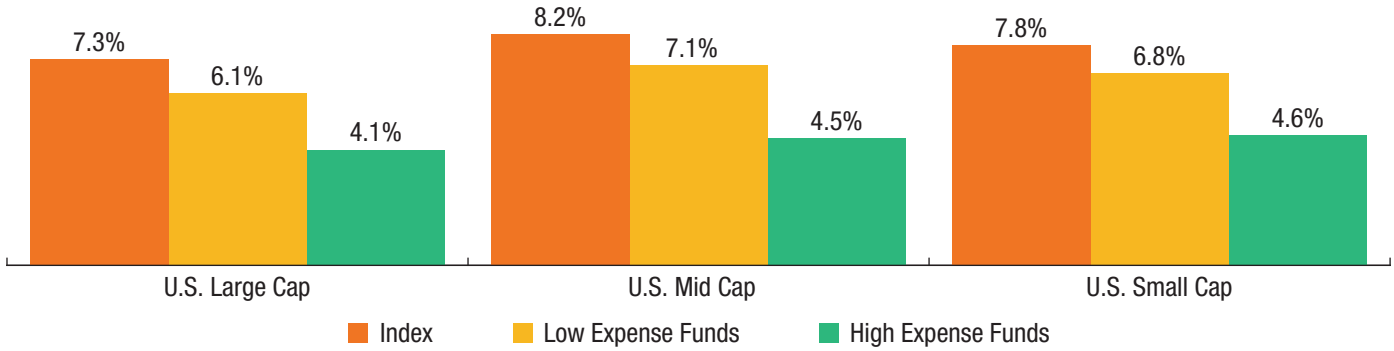
The Real Problem with Market Timing: Missing the Big Days

(S&P 500 1988-2015)



Data Source: Morningstar Direct. S&P 500 Index data since daily returns were available (1/1988-12/2015).

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	0.58%	1.98%	0.93%	2.17%	1.02%	2.35%

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 12/31/2015.

Costs and Taxes

The Costs of Trying to Beat the Market

Question: *Can investors overcome the fees charged and taxes 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:

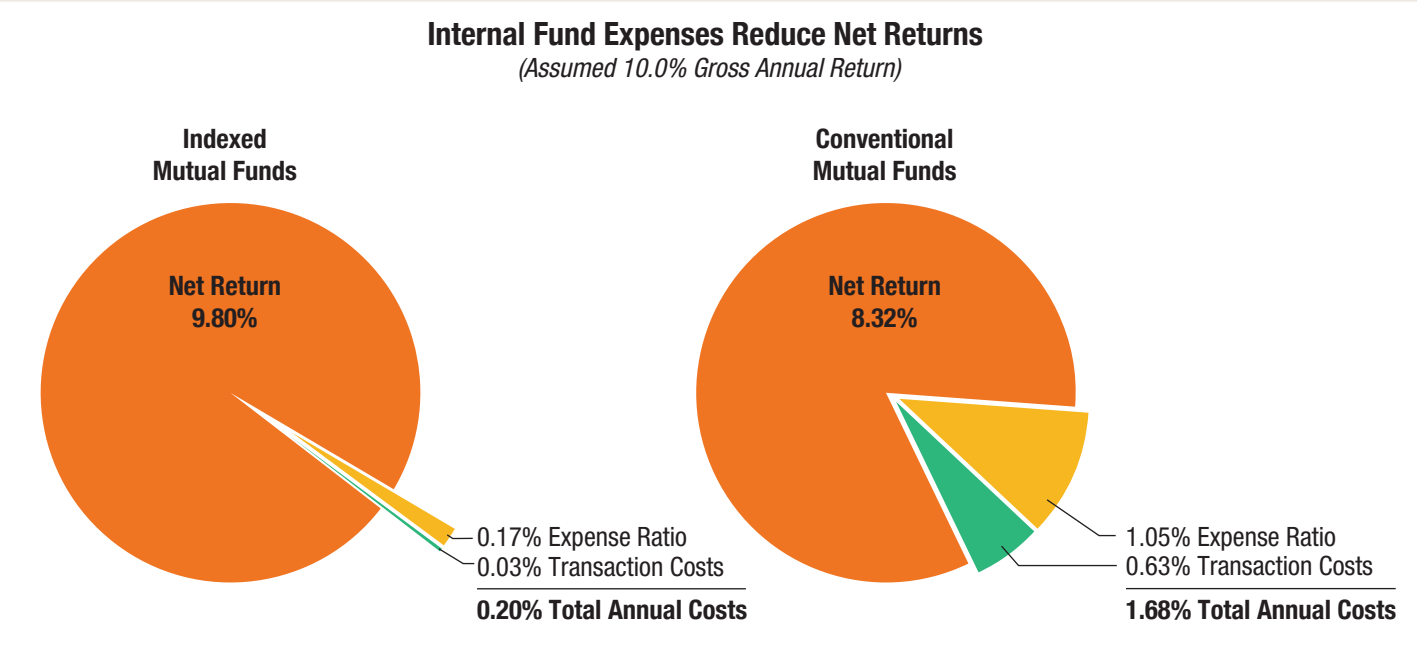
"If active and passive management styles are defined in sensible ways, it *must* be the case that (1) before costs, the return on the average actively managed dollar will equal the return on the average passively managed dollar, and (2) after costs, the return on the average actively managed dollar will 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 scientific expression for trying to beat the market is "pursuing alpha" and refers to the measure of returns above the market. A large alpha is required in order 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 require a very high alpha in order 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 1.7% 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. 8.3% annually. While attempting to outperform the market, active managers actually 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 more or less a thing of the past. Yet, the fund industry has turned to more sophisticated ways of extracting commissions. Wrap accounts, for example, typically charge between 1.5% and 2.5% of assets under management – plus other hidden trading costs. Variable

Figure 4b



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

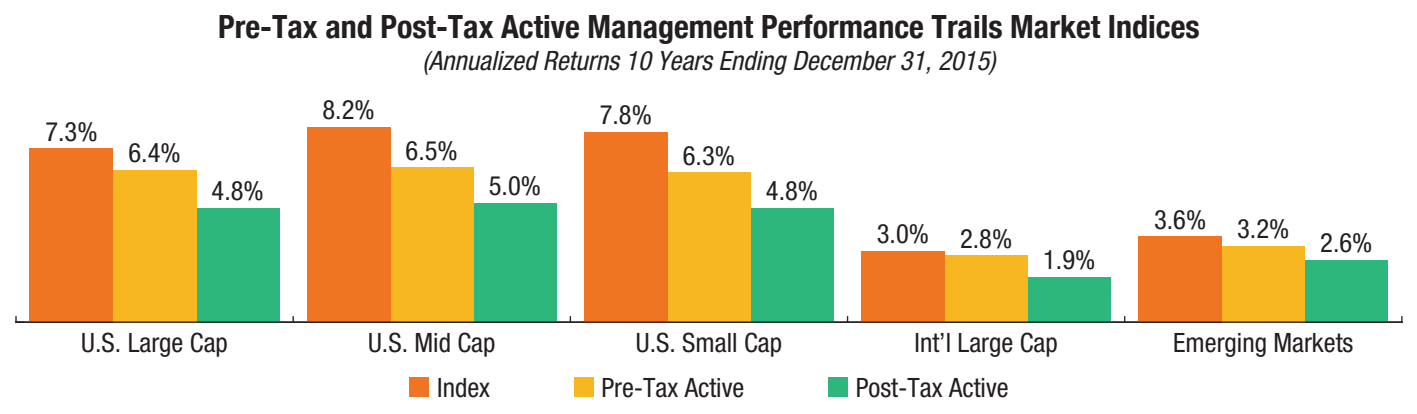
annuities, some with surrender charges up to 9%, have become popular. The 12b-1 fee, introduced in the 1970s as a fee for marketing costs, remains in most actively managed funds, scraping off an additional fee each year.

Transaction costs can also be a significant expense. A recent 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 of 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 4c



Data Source: Morningstar Direct.

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 framework for the portfolios we implement for individual investors.

1. Bonds Reduce Risk and Protect Income

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

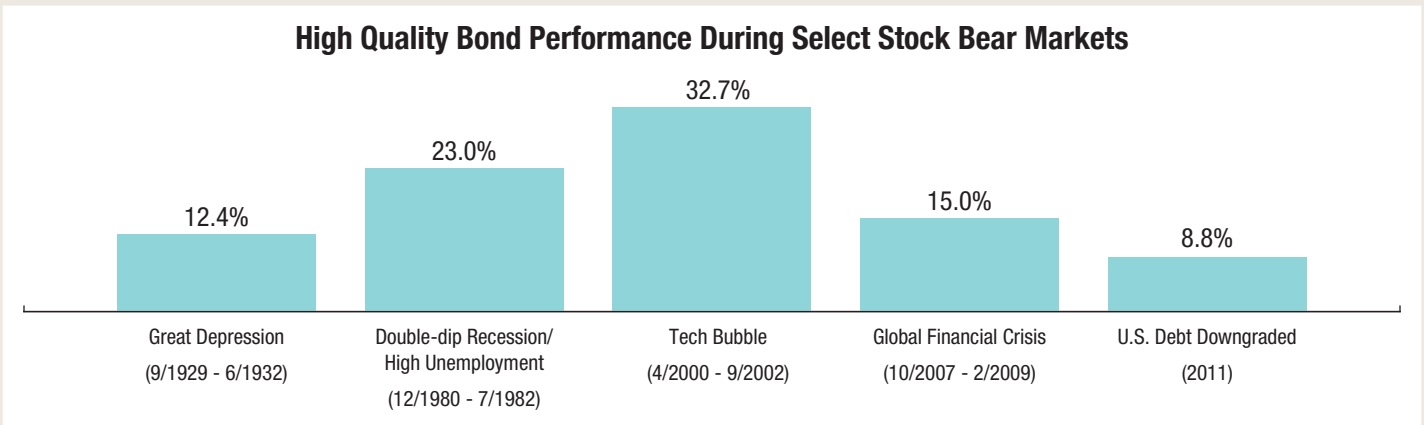
Bonds have always been a preferred means of protecting principal and providing income. Recent innovations have brought a wide array of new bond investment vehicles to market; consequently, the current function of bonds is far less straightforward than it was in the past.

In order to protect capital against discouraging 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 stock, and long-term bonds have historically failed to offer investors sufficient return for their higher levels of risk. Since the purpose of holding bonds is to protect the portfolio, it does not make sense to enter these risky areas of the market. **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, short and intermediate-term bonds are optimal because they maximize return for their level of risk.

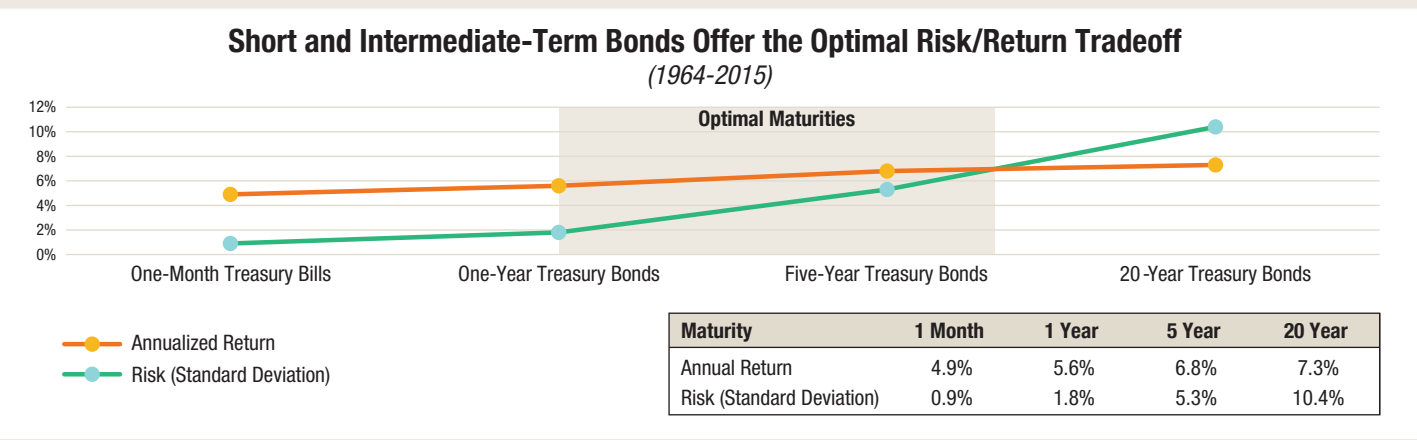
Treasury Inflation-Protected Securities (TIPS) offer additional diversification. They have a low correlation to other asset classes (including other types of bonds), particularly during periods of high inflation. TIPS have a fixed interest rate at the time they are issued; however, the bond's underlying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

Figure 5a



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

Figure 5b



Maturity	1 Month	1 Year	5 Year	20 Year
Annual Return	4.9%	5.6%	6.8%	7.3%
Risk (Standard Deviation)	0.9%	1.8%	5.3%	10.4%

Data Source: Morningstar Direct. See Endnote 5.

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

Foreign bonds make up the final piece of a truly diversified bond portfolio. Holding bonds issued by countries outside the U.S. expands the investment opportunity set, insulates the portfolio from interest rate risk and inflation in the U.S., and adds an asset class with a low correlation to U.S. stocks and bonds.

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

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 minimize risk and volatility in a similar way.

In order to create a strong bond allocation, intermediate and short-term bonds should be blended with TIPS and foreign bonds – the four parts that make up a defensive bond portfolio. This four-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 during challenging markets. Assuming that a diversified and defensive bond portfolio is partnered with a properly allocated stock portfolio, lower bond returns during periods of low inflation and high growth are more than offset by robust stock gains.

2. The Importance of International Investing

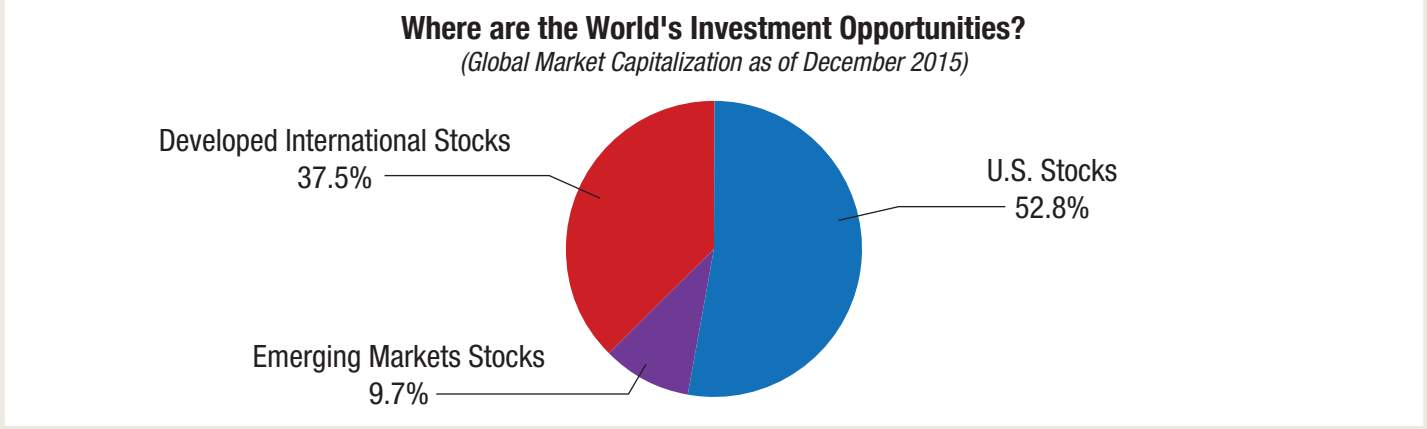
Question: *Is it advantageous to diversify overseas?*

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 of the 120 countries with stock markets have securities available to U.S. investors.[6] The companies listed on foreign stock exchanges number over 44,000[7] compared to roughly 6,449 in the U.S.[8]

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.[9] 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 industries including energy and textiles.

Figure 6a



Data Source: Dimensional Fund Advisors.

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 1970 to 2015, the correlation between international stocks and U.S. stocks was low, with even lower correlation between international stocks and U.S. small stocks.[10] In the 1980s, foreign markets provided the highest returns. In the 1990s the U.S. market dominated. Overseas markets again outperformed in the 2000s, with the U.S. market having performed better thus far in 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 their global consumption habits and invest in companies with whom they do business.

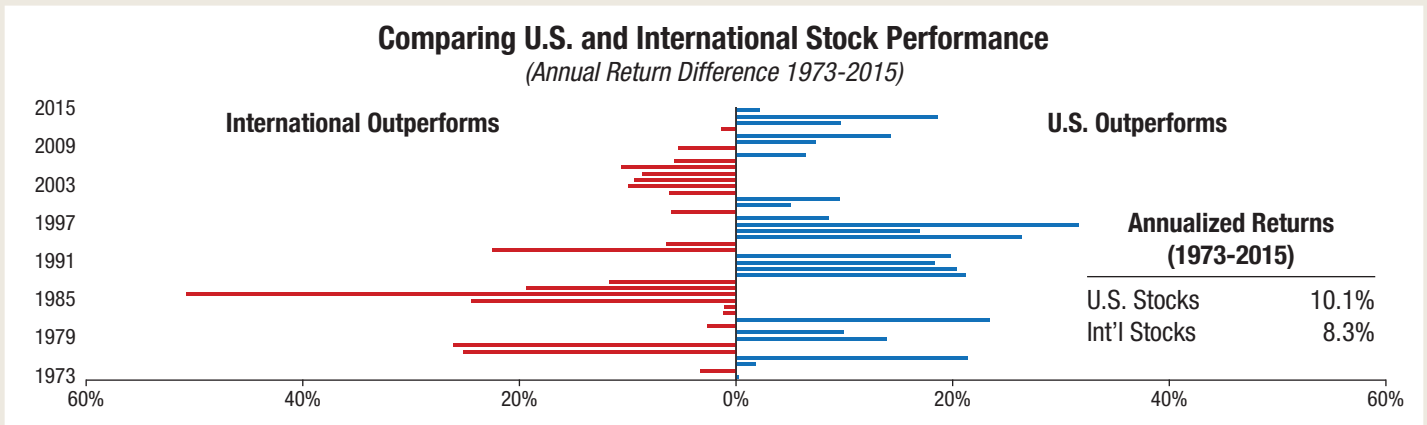
As illustrated in **Figure 6c**, a portfolio that includes both U.S. and international stocks (Global Blend) has experienced higher returns and lower risk than a portfolio composed solely of either U.S. or international stocks. The results speak for themselves; there is no more compelling evidence for the inclusion of international stocks in a diversified portfolio.

3. Small Companies Offer Higher Returns and Broader Diversification

Question: *Can small stocks be safely included in diversified portfolios?*

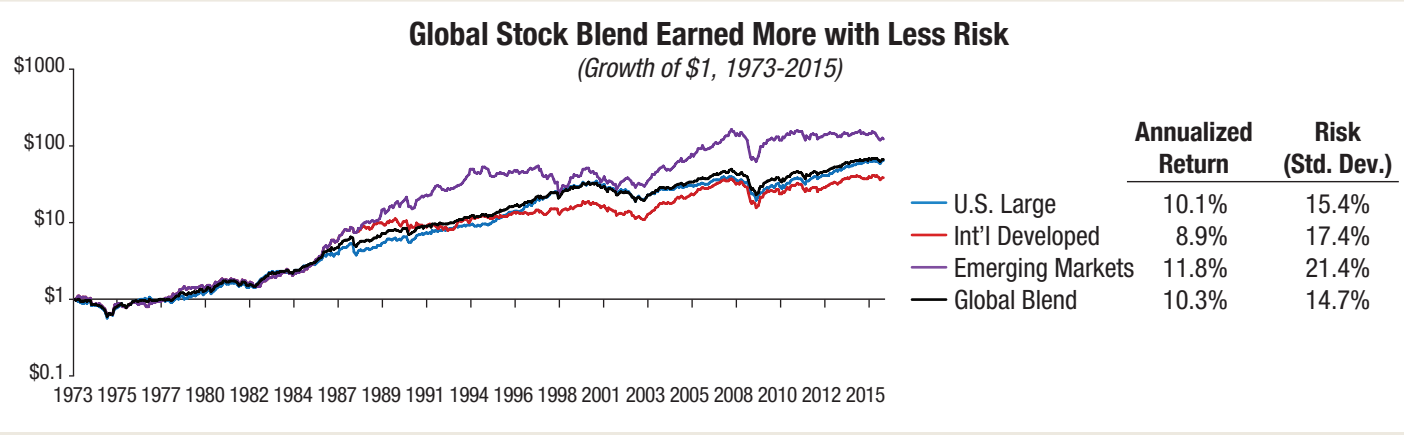
It is not uncommon for investors and advisors to believe that conservative investing for the long haul should exclude small company stocks. At first glance, this belief may appear sound. Yet the evidence strongly suggests otherwise. While it is true that

Figure 6b



Data Source: Morningstar Direct. International Stocks = MSCI EAFE NR Index; U.S. Stocks = S&P 500 Index.

Figure 6c



Data Source: Morningstar Direct. See Endnote 11.

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, there is no way to capture overall stock market returns without paying close attention to small stocks.

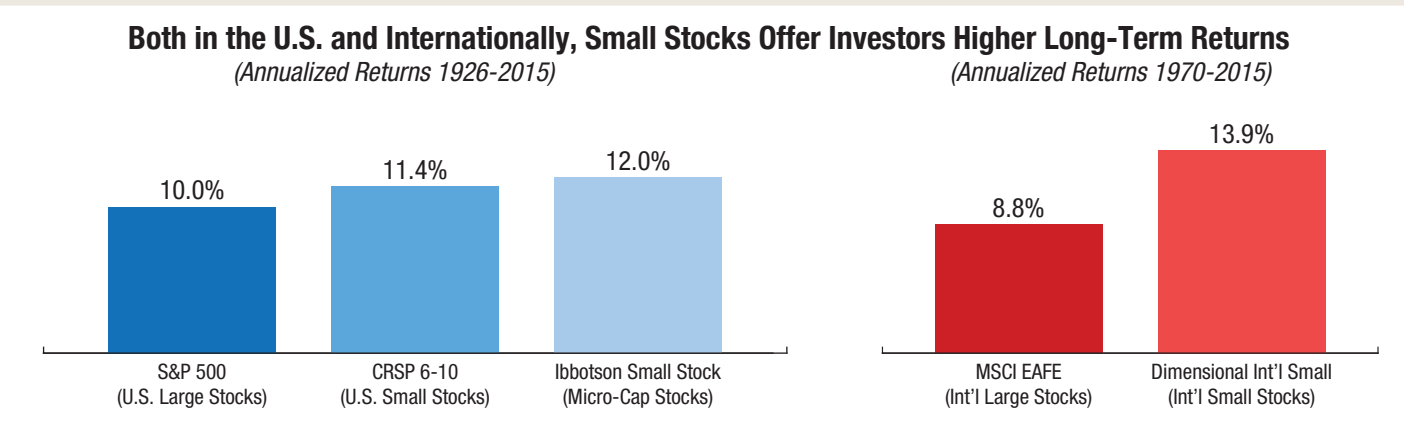
Small stocks offer higher expected returns. This additional return is often referred to as the small stock premium, depicted in **Figure 7a**. Note that the superior returns of small stocks hold true around the globe. From 1926 to 2015, U.S. micro-cap stocks (the very smallest companies) provided an average annual return of 12.0% compared with 10.0% for large cap stocks. Internationally, small stocks performed even better, returning an average of 13.9% compared to only 8.8% for international large stocks from 1970 to 2015.

To put these returns in perspective, consider the following scenario: An investor who put $1,000 in the largest stocks in 1926 would have $5,313,023 today. If the same $1,000 had been invested in the smallest stocks, the investor would have $26,891,934. 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 every one 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 7b 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 1926 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.

Figure 7a



Data Source: Morningstar Direct.

Figure 7b

Blending Large and Small Stocks Enhances Diversification

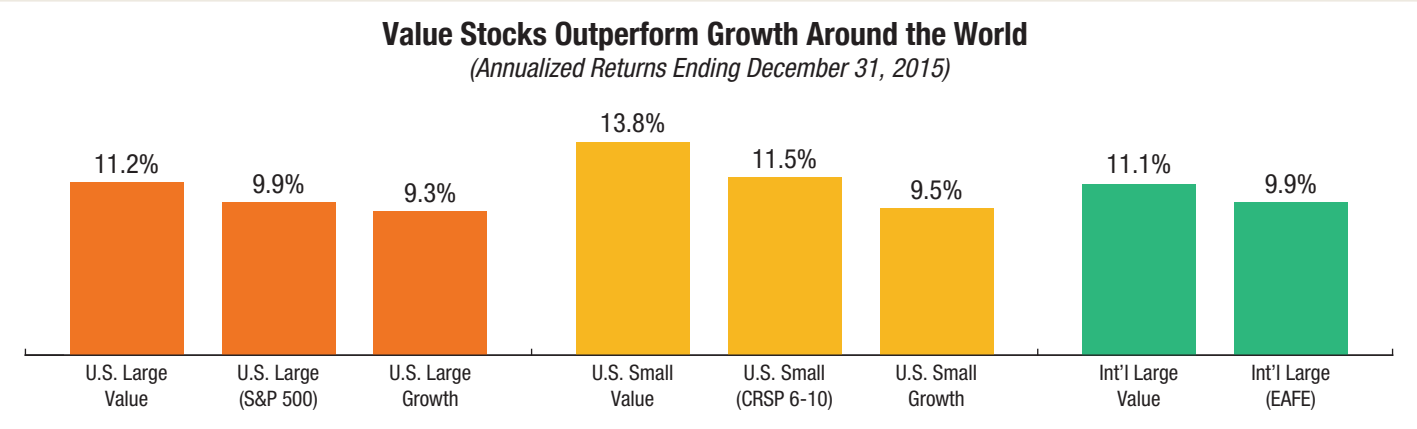
(Three-Year Rolling Returns – Highest and Lowest Returns Since 1926)

	Largest Decile									Smallest Decile
	CRSP 1	CRSP 2	CRSP 3	CRSP 4	CRSP 5	CRSP 6	CRSP 7	CRSP 8	CRSP 9	CRSP 10
1926-1928	28.6	24.0	22.9	24.1	26.7	18.9	21.4	14.6	17.3	26.4
1929-1931	-26.7	-34.5	-35.1	-38.7	-36.6	-43.2	-41.1	-46.5	-48.3	-50.2
1932-1934	9.9	24.1	28.0	30.0	22.5	37.4	27.2	54.1	49.0	81.7
1935-1937	7.8	9.8	2.6	3.1	8.3	6.3	9.2	5.3	12.4	13.8
1938-1940	6.8	5.5	6.1	9.2	14.9	12.3	10.3	8.8	6.4	-5.2
1941-1943	7.7	15.5	14.7	15.1	16.8	16.6	26.6	26.6	33.2	52.1
1944-1946	13.2	20.9	20.5	23.9	24.5	29.6	24.8	28.6	35.7	39.5
1947-1949	9.1	8.1	8.8	6.1	6.1	4.8	4.8	1.7	2.3	5.5
1950-1952	21.3	21.4	19.9	19.7	20.3	18.8	21.6	20.2	19.5	19.2
1953-1955	24.5	21.4	23.6	21.1	21.5	24.7	22.1	19.3	23.4	24.8
1956-1958	11.3	15.0	13.0	15.8	13.2	10.6	14.9	12.3	15.9	11.6
1959-1961	12.5	13.7	15.4	14.7	14.9	13.2	13.7	14.4	14.6	12.0
1962-1964	9.0	7.8	7.2	5.8	3.1	4.3	4.5	6.2	2.6	4.7
1965-1967	6.0	10.7	16.0	19.3	22.9	26.4	25.9	29.8	33.3	40.2
1968-1970	1.2	1.1	3.0	-2.8	-0.6	-0.1	-4.7	-3.9	-7.4	-3.8
1971-1973	7.0	-0.4	0.5	-0.2	-4.3	-3.8	-7.0	-8.2	-11.4	-11.9
1974-1976	4.6	12.8	17.0	17.5	21.6	19.2	22.2	25.4	22.8	25.7
1977-1979	3.8	8.3	13.5	15.5	19.1	25.5	25.0	27.8	26.8	30.7
1980-1982	13.3	16.7	18.2	19.5	21.8	22.0	20.6	19.9	23.5	22.2
1983-1985	19.7	20.1	18.8	17.3	17.2	19.1	17.3	20.1	16.1	11.5
1986-1988	12.5	12.4	13.6	13.4	10.4	8.4	8.4	7.1	4.3	1.1
1989-1991	19.8	17.0	17.1	16.0	16.5	14.8	12.9	11.6	7.9	2.4
1992-1994	4.6	8.8	8.2	8.8	13.2	11.8	11.4	9.0	12.2	17.7
1995-1997	32.5	28.1	25.6	25.8	20.5	24.2	27.4	23.8	26.8	23.2
1998-2000	13.4	10.2	10.1	7.9	5.2	6.9	3.6	6.9	3.3	-0.7
2001-2003	-6.2	1.1	2.7	5.7	4.4	8.4	9.4	15.2	21.6	35.3
2004-2006	9.0	15.9	15.0	13.7	14.3	13.1	15.1	15.6	11.1	14.6
2007-2009	-5.2	-4.9	-5.0	-1.6	0.3	-3.8	-3.3	-3.4	-4.0	-5.0
2010-2012	10.4	12.3	14.1	12.6	14.0	14.0	14.0	13.7	11.1	10.6
2013-2015	14.9	15.4	14.0	14.0	11.3	11.1	12.6	10.9	10.8	10.6
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

Highest Return Lowest Return

Data Source: Dimensional Fund Advisors.

Figure 8a



Data Source: Morningstar Direct. U.S. returns 7/1927-12/2015. International returns 1/1975-12/2015. See Endnote 12.

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.

4. Value Stocks Outperform Growth Stocks

Question: *Are value stocks preferable to growth stocks?*

As their name suggests, value stocks are generally thought to be a bargain: the price is low relative to company assets, sales, and earnings potential. Value stocks often tend to be older companies that, for one reason or another, have fallen out of favor with the financial media. 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.

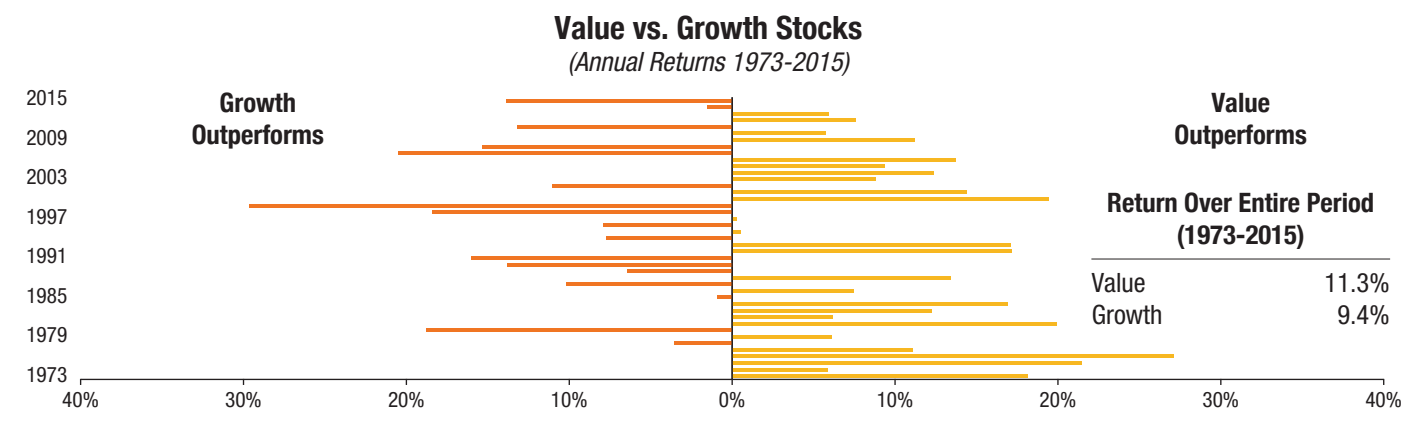
Both history and evidence vindicate the value investor over the growth investor. Since 1927, value stocks have outperformed growth stocks. This holds true in large, small, and international categories. The margins are sizeable across the board. U.S. large value stocks beat large growth stocks by 1.9%, and U.S. small value stocks beat small growth by 4.3% (**Figure 8a**).

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.[13] 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, when growth stocks outperformed value stocks by a wide margin (**Figure 8b**). The graph illustrates the variation in value and growth trends over an extended period of time. While value stocks are preferable, an asset mix that includes both value and growth provides the diversification necessary to reduce risk.

Of course, investing in value stocks does not require the selection of individual stocks any more than investing in small stocks.

Figure 8b



Data Source: Morningstar Direct. Growth - Fama-French Large Growth Index. Value - Fama-French Large Value Index.

Value stocks, like small stocks, are a distinct class of securities that can be quantifiably defined, captured using a specialized index fund, and added to a portfolio to maximize return for an investor's appropriate level of risk.

5. 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, liquid, and have low correlations to other major asset classes. REITs (real estate investment trusts), commodities, and managed futures are three examples of asset classes that demonstrate these traits and are the logical completion of a broadly diversified portfolio designed to maximize returns and minimize risk.

REITs, commodities, and managed futures add a dimension of portfolio protection 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, correlation describes this relationship in terms of the rise or fall of different investments or, more precisely, different asset classes.

REITs are publicly traded stocks that invest in various real estate projects. Historically, equity REITs have outperformed both traditional U.S. large stocks and bonds.[14] The correlation scale in **Figure 9a** illustrates the relationship between REITs and various other asset classes since 1973. REITs have a low to moderate correlation with small stocks, large stocks, and bonds. They also have a very low correlation with commodities.

For most investors, REITs are superior to other alternative investments. Their availability, low costs, liquidity, and transparency make them a great addition to the portfolio.

Commodities, which include energy, precious and industrial metals, and agricultural assets, are another type of alternative investment offering diversification benefits. The vendor in the previous example is a shrewd businessman because his umbrellas and sunglasses have a negative correlation, which reduces risk. As depicted in **Figure 9b**, commodity returns are very different compared to stocks and bonds during a variety of market cycles. For example, commodities and U.S. large stocks have exhibited a very low correlation of 0.1 since 1970.[15] Commodities are also negatively correlated to bonds.

Managed futures are based on time-tested evidence that momentum exists in various asset classes - that is, assets increasing in value will

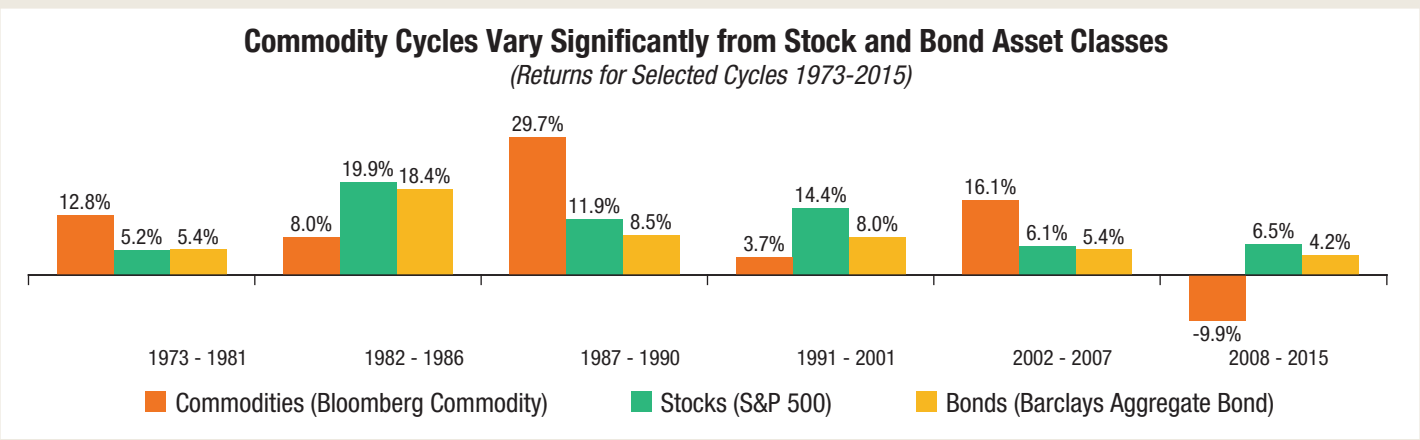
Figure 9a

REITs Offer Unique Diversification: Correlation of Global REITs vs. Other Asset Classes

Correlation with REITs (1973-2015)	
U.S. Large Stocks	0.6
International Large Stocks	0.5
Short-Term Bonds	0.1
Intermediate-Term Bonds	0.2
Commodities	0.1

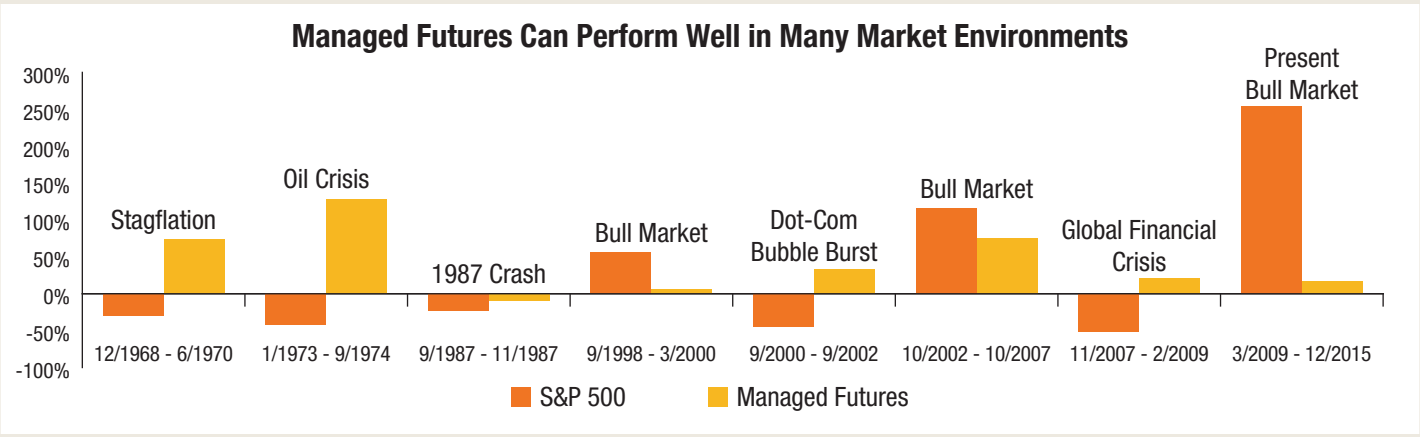
Data Source: Morningstar Direct.

Figure 9b



Data Source: Morningstar Direct. Returns are cumulative for date ranges shown. Prior to 1991, the S&P GSCI Index was used for commodities.

Figure 9c



Data Source: Morningstar Direct. AQR equal weighted Trend Following Strategy quantitative back tests (1/73 - 1/98), Credit Suisse Managed Futures Liquid Index (after 1/98).

continue to rise, and assets decreasing in value will continue to fall. Trend following involves the use of futures contracts to go long markets that are exhibiting an "up" trend and short markets exhibiting a "down" trend. The long/short characteristics of the asset class can provide downside protection during bear markets while still allowing it to participate in bull markets. **Figure 9c** compares the returns of trend following to stocks over various bull and bear market periods. **Figure 9d** illustrates the low correlation that trend following has with various asset classes. Trend following returns since 1973 were almost completely uncorrelated to the returns of stocks, bonds, REITs, and commodities. It is this negative correlation that allows managed futures to enhance the risk/return characteristics of an already well diversified portfolio.

Although managed futures have been employed by hedge fund managers for some time, in the last decade managed futures have become more prominent in the transparent and cost efficient mutual fund space. Institutional and retail investors can now access this asset class at low relative cost and reap its diversification benefits.

The evidence shows that adding REITs, commodities, and managed futures to a basic portfolio results in a clear diversification benefit. Measured allocations of these three alternative asset classes

Figure 9d

Managed Futures Have Low Correlations with Traditional Asset Classes

(1973-2015)

Correlation with Managed Futures (1973-2015)	
U.S. Large Stocks	-0.1
International Large Stocks	0.0
Aggregate Bond	0.0
REITs	0.0
Commodities	0.1

Data Source: Morningstar Direct.

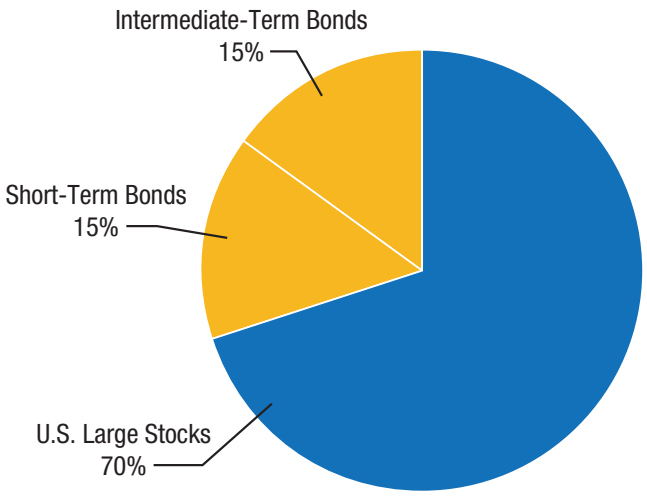
Figure 10a

Broad Global Diversification Increases Return and Reduces Risk

(1973-2015)

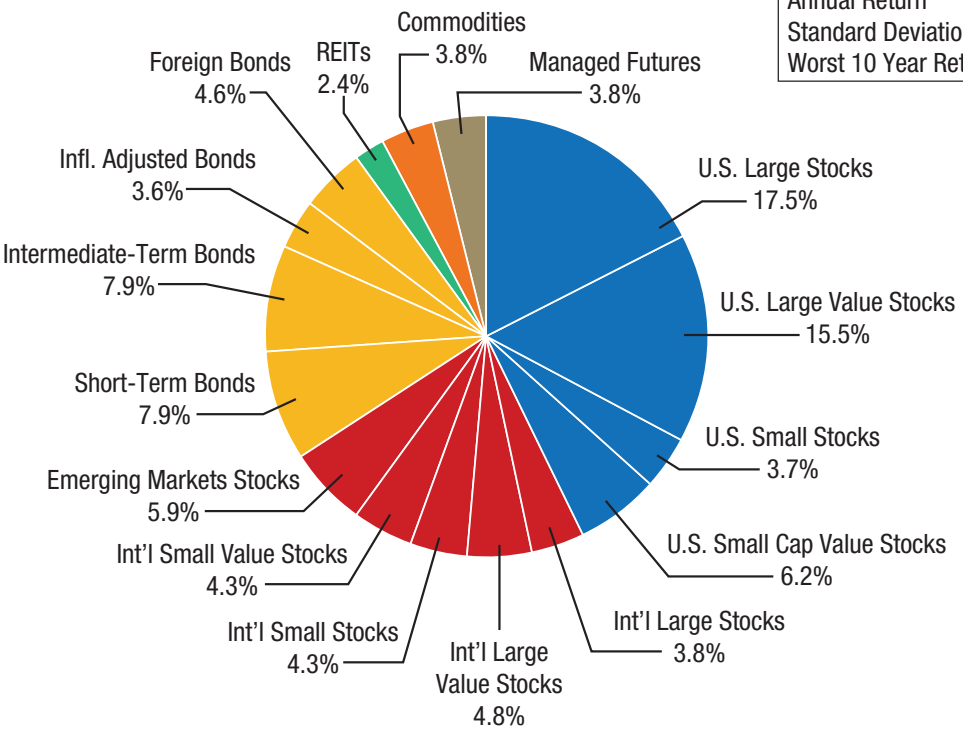
Simple 70/30 Index Portfolio

Simple 70/30 Index Portfolio	
Annual Return	9.3%
Standard Deviation	11.0%
Worst 10 Year Return	-0.7%



Broadly Diversified 70/30 Index Portfolio

Broadly Diversified 70/30 Index Portfolio	
Annual Return	11.4%
Standard Deviation	10.2%
Worst 10 Year Return	3.2%



Data Source: Morningstar Direct.

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.

6. Broadly Diversified Global Portfolios Help Achieve Better Returns

Question: *Can globally diversified index 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, passive 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.

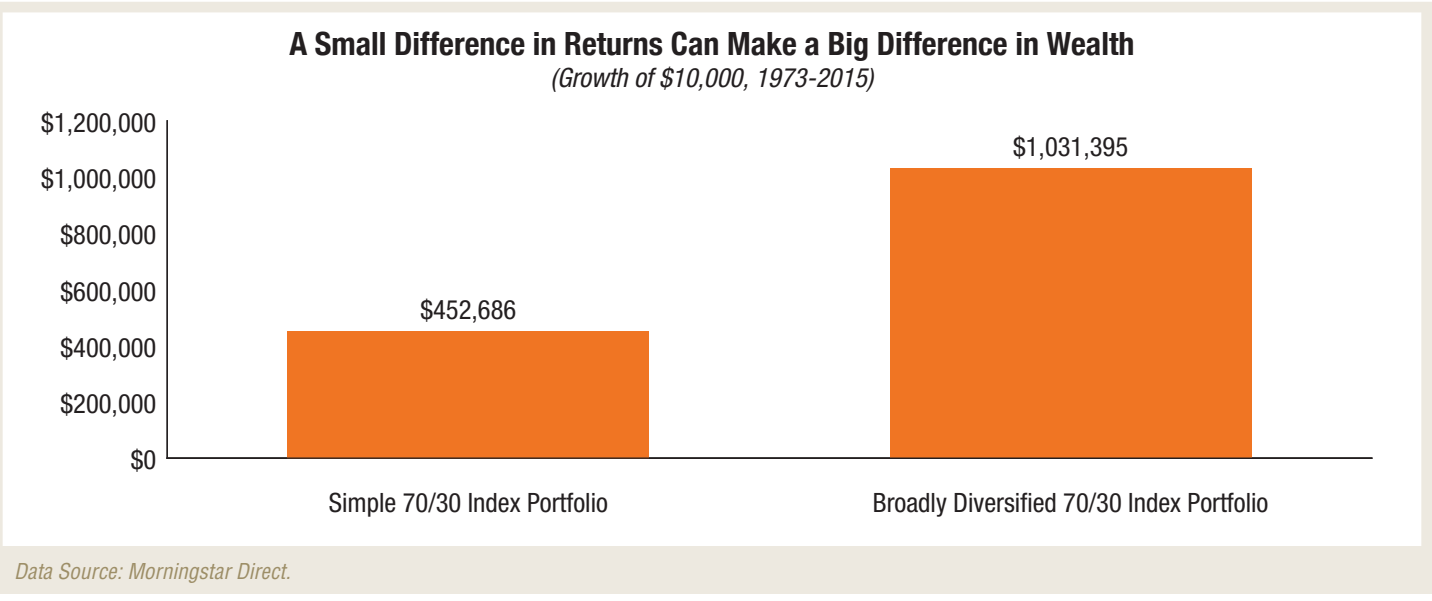
Evidence shows that basic index funds outperform actively managed funds. This is true for the classic S&P 500 index as well as simple stock/fund combinations such as the simple balanced index portfolio shown in **Figure 10a**.

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 option is substantial. As **Figure 10b** 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, 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 10b



Data Source: Morningstar Direct.

EBI Step Three:

Apply the Evidence

Once the evidence has been gathered, it is time to implement the portfolio. 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.

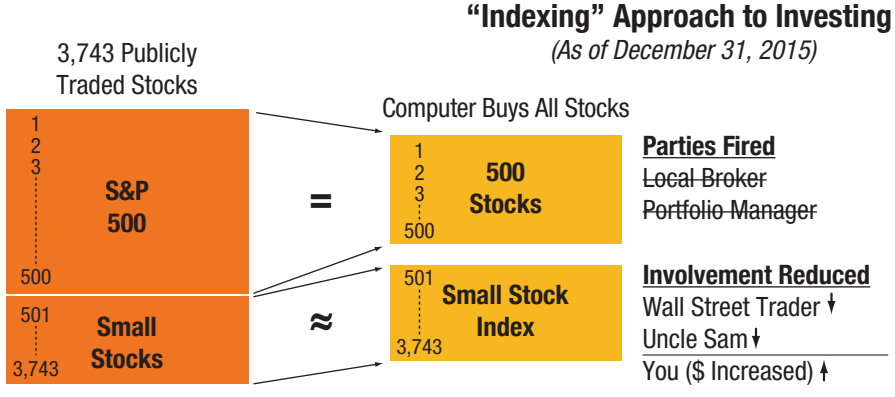
Indexed and broad-based market strategies recognize that financial markets discover and distribute financial information so quickly that it is difficult or impossible for active managers to consistently outperform the market over the long run. The goal of a basic index fund is to provide a return which 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.

Of course, index funds are now available for nearly all asset classes. In addition to the S&P 500, index funds now track small stocks, foreign stocks, bonds, and various alternative asset classes. To gain perspective on the cost savings, **Figure 11a** further illustrates the cost difference between the average U.S. active fund and the largest U.S. total market index fund.

Whereas index funds seek to replicate an index as closely as possible, other index-like investment vehicles are more flexible and do not perfectly emulate a particular index. Whether it is a passive fund or a broad-based market 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 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 11a



U.S. Active (Average) Funds[16]	
Average Expense Ratio	1.05%
Turnover	63%
Other Hidden Trading Costs	Very High
Tax Cost	High

Largest Total Market Index Fund[17]	
Expense Ratio	0.17%
Turnover	3%
Other Hidden Trading Costs	Very Low
Tax Cost	Very Low

Data Source: Morningstar Direct. CRSP U.S. Total Market Index has 3,743 holdings.

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.

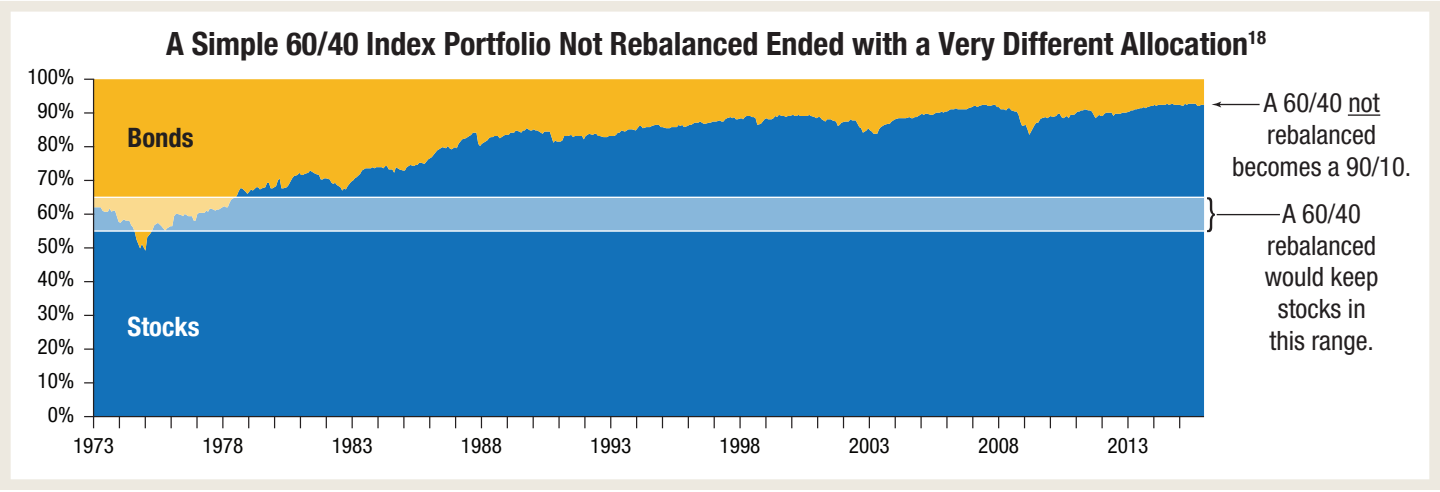
Rebalancing is the disciplined process of selling assets that have increased in value and then buying other assets that have underperformed on a relative basis. Rebalancing maintains the target allocation to reduce tracking error (the difference in return between the actual portfolio and target allocation). 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:

1. **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 12a**).
2. **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.[19] 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.
3. **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.
4. **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.

Figure 12a



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 trigger-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 fairly 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!

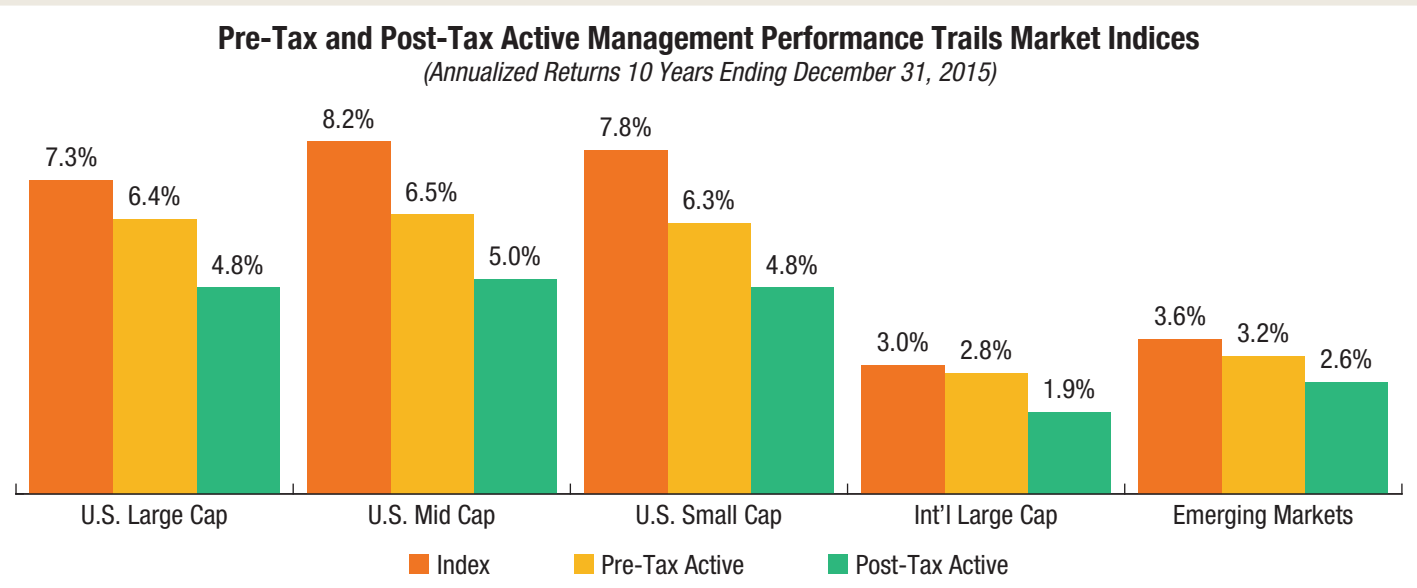
Fortunately, there are numerous strategies that can be utilized to maximize total portfolio return after taxes:

1. Indexed / low turnover funds
2. Tax-managed funds
3. Municipal (tax-free) bonds
4. Tax-loss harvesting
5. 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 as **Figure 4c** illustrated in an earlier section, repeated below.

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

Figure 4c (repeated from Step 1, page 9)



Data Source: Morningstar Direct.

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.

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.

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 before or 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

Figure 13a

The Arithmetic of Tax Loss Harvesting

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

	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	$1,980	$5,000	$-5,000	$1,980
Realized Long-Term Gain	5,000	1,000	5,000	-5,000	1,000
Earned Income	3,000	1,188	3,000	-3,000	1,188
Loss Carry Forward				**$12,000**	
Year Two					
Realized Short-Term Gain	3,000	1,188	3,000	-3,000	1,188
Earned Income	3,000	1,188	3,000	-3,000	1,188
Loss Carry Forward				**$6,000**	
Year Three					
Realized Short-Term Gain	1,000	396	1,000	-1,000	396
Realized Long-Term Gain	2,000	400	2,000	-2,000	400
Earned Income	3,000	1,188	3,000	-3,000	1,188
Totals	**$25,000**	**$8,528**		**Total Tax Savings**	**$8,528**

Note: Assumed short-term tax rate of 39.6%, long-term gains tax rate of 20%, and earned income tax rate of 39.6%. Tax code allows for up to $3,000 of earned income to be offset annually with capital losses.

Figure 13b

Optimal Placement of Assets in Proper Accounts Can Reduce Taxes

Roth IRA	Traditional IRA	Taxable
Assets Grow Tax-Free with No Tax at Withdrawal	Assets Grow Tax-Deferred with Withdrawals Taxed at Ordinary Income Rates	Both Income and Capital Gains Taxed
Ideal Asset Characteristics: • High Ordinary Income • Highest Expected Growth • High Distributions • High Turnover	**Ideal Asset Characteristics:** • High Ordinary Income • Lowest Expected Growth • High Distributions • High Turnover	**Ideal Asset Characteristics:** • Low Ordinary Income • High Growth OK (Taxed at Capital Gains Rates) • Low Turnover
		

future gains. The process is counterintuitive because it requires investors to admit their losses and sell losers. **Figure 13a** shows the general process and potential tax savings of tax-loss harvesting over three years resulting in a $8,528 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 13b**, 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 (Asset Location for Taxable Investors, Jaconetti 2007) 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.

EBI Step Four:

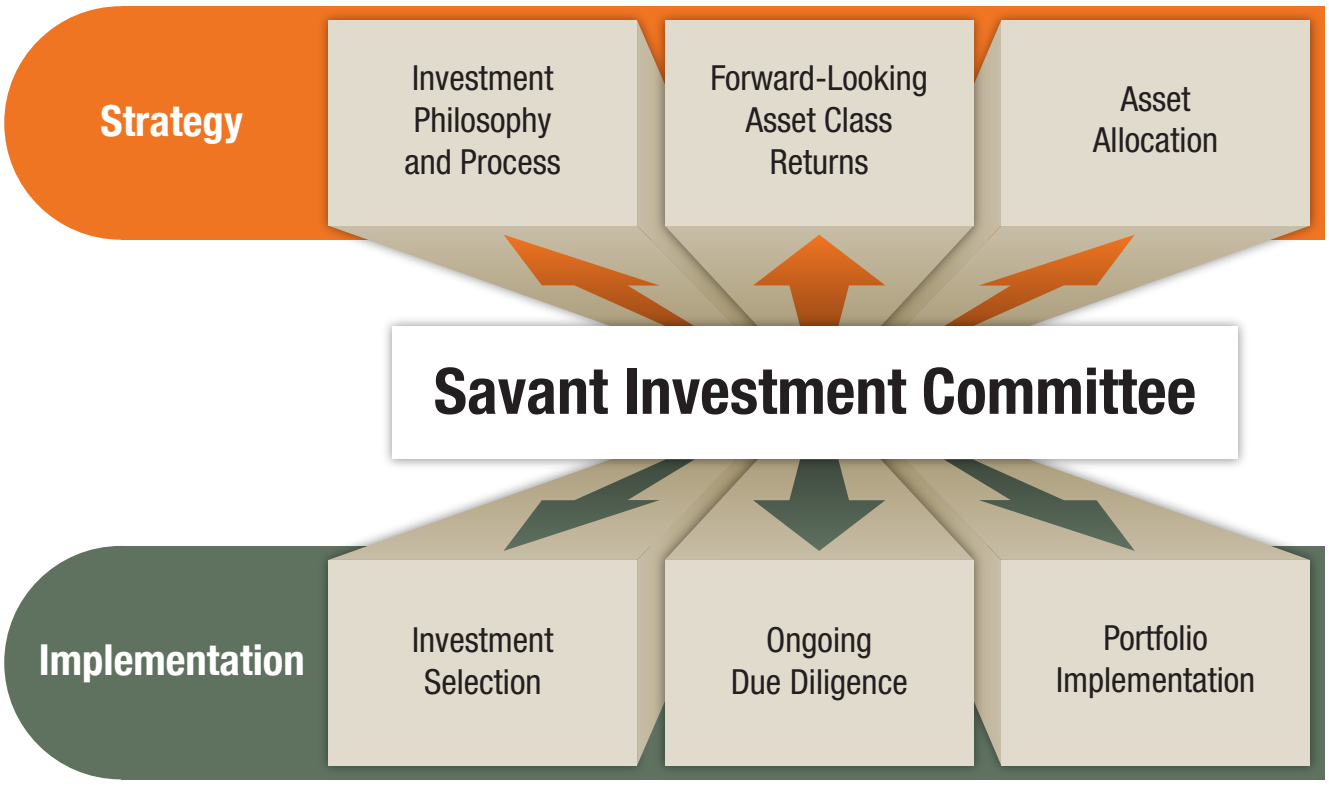
Monitor for Effectiveness

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 14a**. 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 14a

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[20] 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.

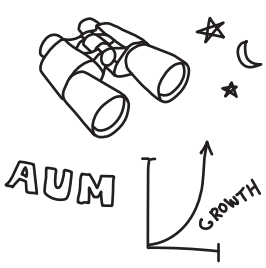
Asset Allocation

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.

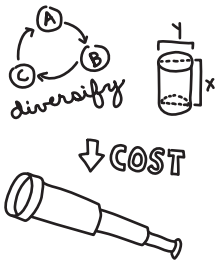
Investment Selection and Ongoing Due Diligence

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, highly liquid, 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.

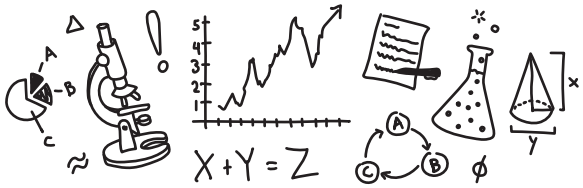
Selected funds are continuously monitored via a quarterly review process. The Investment Research Team assembles quarterly qualitative and quantitative information/data from which certain criteria may trigger a fund to be flagged based on the set thresholds. This might require simply digging deeper into 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.



"We screen the universe of available funds which must meet criteria including, but not limited to: low cost, low turnover, highly liquid, transparent structure, pure representation of the asset class, reputable firm, and sufficient track record and assets under management."



The Evidence is Clear



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.

Negative Findings

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 fails.
- Active money management fails.
- High costs cause money managers to fail.
- High taxes negate much of the return generated by active money management, causing even many "winners" to fail.
- Using past performance to pick money managers fails.

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 pertinent 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 goal of increasing investor return while reducing risk.

Evidence-Based Investing –The Positive Results

The broad application of Evidence-Based Investing in the preceding overview has yielded six investment theses:

1. An effective and defensive bond strategy reduces risk. Short, intermediate, inflation-protected, and foreign bonds protect against most adverse economic scenarios.
2. Investing overseas enhances diversification and return.
3. Small stocks add return and provide diversification benefits.
4. Value stocks offer a return premium globally.
5. Alternative investments, namely REITs, commodities, and managed futures, protect investors from inflation and challenging stock and bond markets.
6. Broad global diversification increases return and reduces risk.

Finally, broad market investing–typically indexed or structured–optimally delivers market returns. In spite of 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."[21]

For us, the evidence is clear. This evidence presents a scientific framework investors can use 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."[22]

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."[23] 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.[24] 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.[25]

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.[26]

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.[27]

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.[28]

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.[29]

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.[30]

Example 1: Corticosteroids for Preterm Birth[31]

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[32]

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 as a result 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 actually 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.

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 – Barclays U.S. Aggregate Bond Index

Intermediate-Term Bonds – Barclays Intermediate Government/ Credit Bond Index

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

Inflation-Protected Bonds (TIPS) – 50% Barclays Intermediate Government/Credit Bond Index and 50% Ibbotson U.S. 1-Year Treasury Constant Maturity Appreciation Index (1/1973 – 2/1997), BofA Merrill Lynch U.S. Treasury Inflation-Linked Securities Index (after 2/1997)

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

U.S. Large Stocks – Standard & Poor's 500 Total Return Index

U.S. Large Value Stocks – Fama-French Large Value Index

U.S. Mid Stocks – Standard & Poor's 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 – DFA International Small Company Index (1/1973 – 8/1989), S&P EPAC Small Cap Index (after 8/1989)

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

Emerging Markets Stocks – 50% MSCI EAFE and 50% DFA International Small Company Index (1/1973 – 12/1984), IFC EM Composite Index (1/1985 – 12/1988), MSCI Emerging Markets Index (after 12/1988)

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

Commodities – S&P GSCI Commodity Index (1/1973 – 1/1991), Bloomberg Commodity Index (after 1/1991)

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

[1] Centre for Evidence-Based Medicine. (n.d.) What is EBM? Retrieved August 4, 2008, from www.cebm.net.

[2] Sharpe, William F. (1991, January/February). The Arithmetic of Active Management. Financial Analysts Journal.

[3] Expense ratio of 0.17% reflects the cost of the Vanguard Total Stock Market Index (Investor Class). Transaction costs are estimated as 1.0% per annum per 100% portfolio turnover, with turnover of 3% for index funds (based on the Vanguard Total Stock Market Index) and 63% for conventional funds (based on the U.S. Large cap category average). Data from Morningstar Direct as of 12/31/2015.

[4] Edelen, Roger M., Evans, Richard B. and Kadlec, Gregory B. (2007, March). Scale Effects in Mutual Fund Performance: The Role of Trading Costs.

[5] One-Month Treasury Bills = Ibbotson U.S. 30-Day T-Bill Index; One-Year Treasury Bonds = Ibbotson U.S. 1-Year Treasury Constant Maturity Appreciation Index; Five-Year Treasury Bonds = Ibbotson U.S. Intermediate-Term Government Index; 20-Year Treasury Bonds = Ibbotson U.S. Long-Term Government Index.

[6] Central Intelligence Agency. Rank Order – Market Value of Publicly Traded Shares. The World Fact Book. Data as of 12/31/2015.

[7] The World Federation of Exchanges. Data as of 10/31/2015.

[8] BigCharts.com, data as of 1/28/2016. Includes NYSE, NASDAQ, and Bulletin Board Exchanges.

[9] IMF World Economic Outlook, October 2015.

[10] From 1970-2015, the correlation between the MSCI EAFE Index and the S&P 500 Index was 0.63. The correlation between the MSCI EAFE Index and the Ibbotson Small Stock Index was 0.52. Source: Morningstar Direct.

[11] International Stock: A blend of the MSCI EAFE, and International Small (DFA International Small Company Index from 1/1973 - 9/1996, then S&P Citigroup EPAC after 9/1996). Emerging: MSCI EM after 1/1988 and MSCI EAFE prior to 1/1988. Global Portfolio: 67% U.S. Large Stocks, 24% MSCI EAFE and International Small Blend, 9% Emerging Markets Stocks.

[12] U.S. Large Value = Fama-French Large Value Index; U.S. Large = Standard & Poor's 500 Total Return Index; U.S. Large Growth = Fama-French Large Growth Index; U.S. Small Value = Fama-French Small Value Index; U.S. Small = CRSP Deciles 6-10 Index; U.S. Small Growth = Fama-French Small Growth Index; Int'l Large Value = MSCI EAFE Value Index; Int'l Large = MSCI EAFE Index.

[13] Fama, Eugene F. & French, Kenneth R., (1998, December). Value Versus Growth: The International Evidence. The Journal of Finance.

[14] From 1973-2015 the annualized total return of the S&P Global REIT Index (prior to 1/1995, FTSE NAREIT U.S. Equity REIT Index data used) was 11.7% compared to 10.1% for the S&P 500 Index and 7.4% for the Barclays Government/Credit Index. Source: Morningstar Direct.

[15] Morningstar Direct.

[16] U.S. active funds turnover and expense ratio reflects average of all U.S. stock funds in Morningstar Direct as of 12/31/2015 (excluding index funds, exchange-traded funds, funds of funds, and balanced funds).

[17] Largest Total Market Index reflects Vanguard Total Stock Market Index (Investor Class) from Morningstar Direct as of 12/31/2015.

[18] Source: Morningstar Direct. 60/40 index portfolio not rebalanced from 1/1/1973 – 12/31/2015. Bonds = Blend of Short-Term Bonds, Intermediate-Term Bonds, Inflation-Protected Bonds, International Bonds; Stocks = Blend of U.S. Large Stocks, U.S. Large Value 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 Market Stocks.

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[31] Glasiziou et al.

[32] Glasiziou et al.

NOTES

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