

## Volatility Rises, But Stay the Course

The U.S. stock market was able to squeak out a positive gain in 2015, with the Russell 3000 returning 0.48% despite a mid-year correction. Although broader U.S. market measures showed slight positive returns for the year, exposure to the size and value effect was negative and detracted from domestic portfolio returns.

Global stocks, as measured by the MSCI All Country World ex-U.S. Index, continued to lag with a -5.66% return. Interestingly, most global stock returns were positive in their own local currencies, but a strengthening U.S. dollar pushed foreign stock returns into negative territory. Despite several years of lagging performance and question marks in several major economies, we still believe global stock diversification makes sense (see page 2).

Fixed income provided the desired diversification and low volatility benefits despite the Federal Reserve raising interest rates for the first time in nearly a decade, with the Barclays U.S. Aggregate Bond Index returning 0.55% for the year. The relative lack of volatility is the primary reason for fixed income exposure in a portfolio (see page 4), but they also provide ammunition for buying equities on the cheap through the process of rebalancing.

At the time of publication, U.S. markets were off to the worst start in over a decade. Market turmoil in China gets most of the blame, but part of the volatility can also be attributed to relatively high stock market valuations. We've frequently repeated throughout the past year that current valuations suggest that stock prices are vulnerable to unexpected shocks and long-term returns have an increased probability of trailing historical average returns.

We still expect market exposure to continue delivering higher long-term returns than fixed income, cash, or alternatives. The cost of these higher expected returns in stocks is higher expected volatility.

When it comes to stock investing, there is always something to worry about. It is this uncertainty that allows stocks to provide higher returns in the first place. The wonderful thing about volatility is that it works in favor of long-term investors. High volatility in the short-run provides rebalancing opportunities that allow you to buy low and sell high. Meanwhile, stock market returns over longer time horizons tend to be less volatile.

Media headlines are focused solely on stock market losses, but it's likely your portfolio also holds bonds. As part of a balanced portfolio, bonds provide diversification and capital preservation benefits, while stocks are the main source of risk and return over the long run. As we would expect, bonds are doing their job quite well and are reducing portfolio volatility and losses.

5-10% corrections happen all the time, usually on an annual basis. The S&P 500 averages a 20% drop roughly every three and a half years. 30-50% drops happen less frequently, but they are going to happen. We believe in building a portfolio that accepts these declines, but doesn't try to predict when they will start and end.

Our portfolios are designed to lose value in down markets, but our discipline allows us to recover and then some. Stay invested during the down markets and time will reward you for your patience. 

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## Assessing an Allocation to Global Stocks

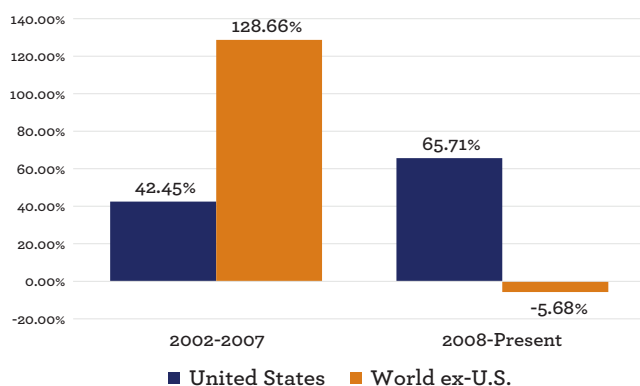
You know your portfolio is properly diversified when there is always a portion of it you hate. Right now, that hated piece of the equity allocation is global stocks.

The performance has been particularly frustrating for investors who compare performance with a domestic benchmark, such as the S&P 500 Index. It's tempting to criticize a strategy based on recent performance, but using global equities as part of a diversified portfolio still makes sense.

### How Fast We Forget

It wasn't that long ago when everyone seemed to hate U.S. stocks and wanted to increase their allocation of global equities (particularly emerging markets). Investors who chased performance and made significant shifts in their allocations following the global equity outperformance were burned.

Cumulative Total Return



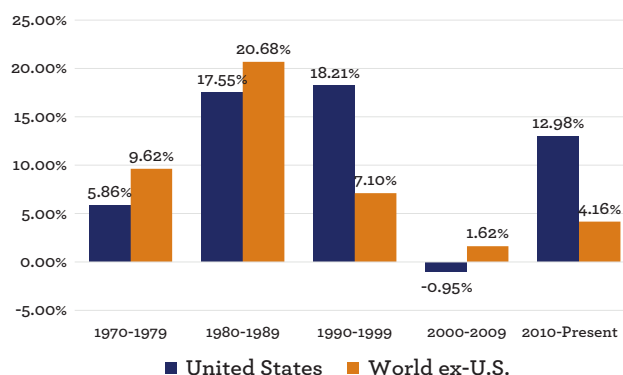
Diversification doesn't work when you deviate from your long-term investment plan. That makes it all the more important to recognize that periods of over- and underperformance are the norm when investing in a globally diversified portfolio.

*"You know your portfolio is properly diversified when there is always a portion of it you hate."*

### Different Decade, Different Winners

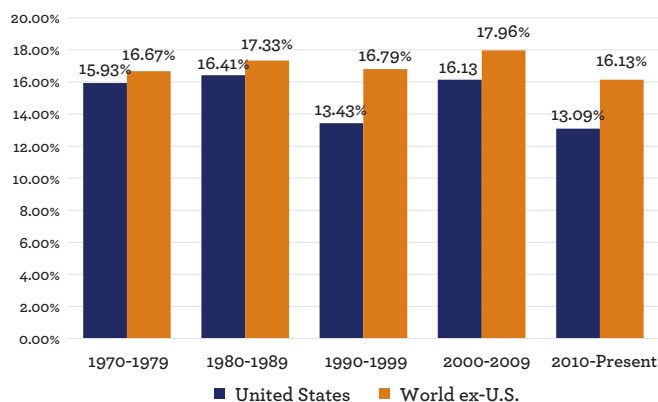
The dataset for the MSCI World ex-U.S. Index goes back to 1970. If you break out annualized returns by decade, you can see that periods of outperformance and underperformance for global equities have always been part of the deal.

Annualized Total Return by Decade



Equally important from a diversification standpoint is that these two asset classes experience different levels of volatility, which you can see in the chart below, which breaks out annualized standard deviation by decade.

Annualized Standard Deviation



Because the point of diversification is to combine assets with different levels of return and volatility, we would argue that global equity exposure has been working for long-term investors. ➤

## Measuring Historical Success

Building an investment portfolio to meet your long-term goals is all about trying to earn the highest return for a given level of risk. That requires combining investments that zig with others that zag in order to achieve the desired levels of risk and return in your client's portfolio.

One way to measure the risk-return trade-off is with the Sharpe ratio. The following table compares U.S. and global stocks as well as a diversified portfolio of 70% U.S. stocks and 30% global stocks.<sup>1</sup>

**Annualized Total Return  
and Standard Deviation (1970-Present)**

	United States	World ex-U.S.	Diversified Portfolio
Annualized Return	10.27%	8.77%	10.04%
Standard Deviation	15.31%	17.09%	14.57%
Sharpe Ratio	0.35	0.22	0.35

The first thing to notice is that the Diversified Portfolio has the lower standard deviation than either U.S. stocks or global stocks alone, which means the Diversified Portfolio is the least volatile option. The lower level volatility allows it to match the U.S. risk-adjusted return, as measured by the Sharpe ratio.

In an ideal world, we would like to show that the Diversified Portfolio has a higher Sharpe ratio than U.S. stocks, but the sample period being used pits global equities against an extremely impressive period of U.S. equity returns.

Reliable data on U.S. stock returns go back to 1926, but we are capturing only the past 45 years because the global equity data doesn't begin until 1970. Within these past 45 years are six of the seven longest bull markets in U.S. history.

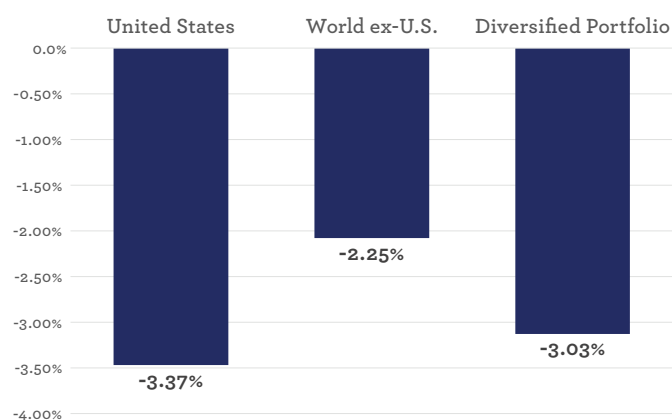
If we compare the sample period with the entire dataset for U.S. markets, we find that the average return is lower and average volatility is higher than in the 1970-present dataset.

### U.S. Annualized Total Return and Standard Deviation

	1926 to Present	1970 to Present	Difference
Annualized Return	10.02%	10.27%	-.25%
Standard Deviation	18.85%	15.31%	3.54%

We couldn't speculate on how the historical performance comparison may have differed if we hadn't picked up such a positive period for U.S. stocks. We can, however, measure the diversification benefit of global equities by looking at periods in which U.S. stocks had a negative monthly return.

### Average Monthly Return During U.S. Down Market



Since 1970, there were 207 months in which U.S. stocks were down. Although global stocks also tended to fall, they only had a correlation of 0.62 and provided higher average returns than the U.S. stocks. Again, this is what diversification is all about: combining assets that don't move in lockstep in order to have a less volatile portfolio.

## Conclusion

Although recent performance may suggest otherwise, investing in global equities as part of a diversified portfolio has historically provided some modest benefit to long-term investors via a reduction in overall volatility and superior performance during down markets in the United States.

Investors considering reducing their allocation to global equities because of recent underperformance may want to consider the perils of chasing performance. It is extremely improbable that someone could accurately predict the best-performing asset class year in and year out.

There are many uncertainties facing global equity investors, but it is those uncertainties that provide for higher expected returns. Over time, global investing has improved diversification for disciplined investors, and we believe allocations should be maintained despite recent underperformance and the uncertain outlook.

## Four Reasons to Buy Bonds in 2016

The Federal Reserve announced at their December 2015 meeting that they will raise interest rates for the first time in nearly a decade. The move signals that the U.S. economy is no longer in a state of emergency and healthy enough to continue growing with modestly tighter monetary policy.

For more than three decades, we've experienced an incredible bull market in bonds. The probability of bond returns matching those of the previous three decades is very low, but bonds will remain an important piece of a well-diversified portfolio even if bond returns are lower or even negative.

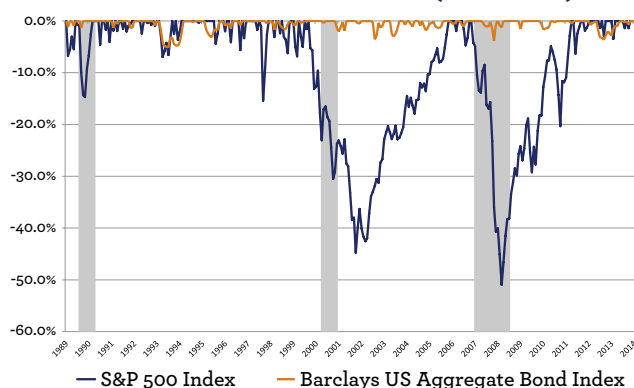
Low returns in any asset class have a funny way of leading to bad investment decisions. Although bonds have historically been considered the "boring" part of a portfolio, we view this as an area of high risk when it comes to bad investor behavior. As a result, we've identified four reasons investors should love their bond exposure, regardless of the things you hear in the media or from financial prognosticators.

### 1. *Returns may be low or even negative, but low volatility and diversification benefits remain.*

The primary purpose of your bond allocation is to decrease the volatility of a portfolio. Even as interest rates rise, we believe that bonds will fulfill their duty of volatility anchor.

Even if bonds experience temporary losses as interest rates rise, the worst bond market losses are not as severe as the worst stock markets losses. The graphic below illustrates this point by comparing downturns on the S&P 500 and the Barclays U.S. Aggregate Bond Index since 1990. The orange line represents bonds and the blue line represents stocks.

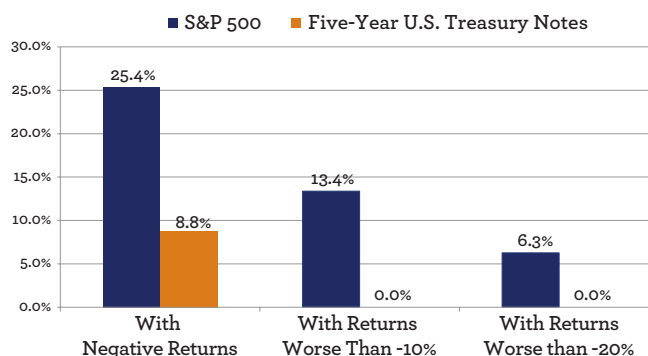
U.S. Stock and Bond Downturns (1990-2014)



*"Low returns in any asset class have a funny way of leading to bad investment decisions."*

In order to take the data back even further, we compared returns of the S&P 500 (blue bars) and Five-Year Treasury Notes (orange bars) below.

Percentage of 12-month Periods with Negative Losses (1926-2015)



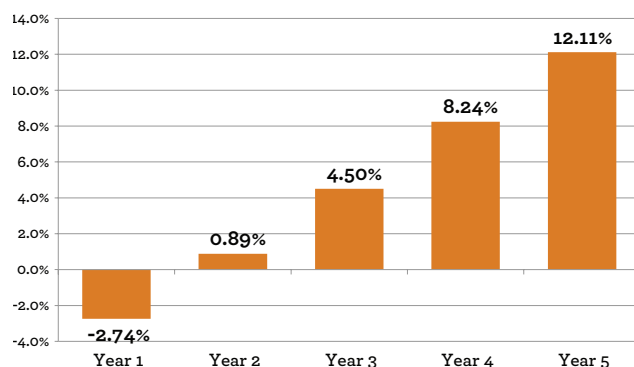
Since 1926, bonds (orange bars) had a negative return in only 8.8% of 12-month periods, and not once had a 12-month period with returns worse than -10% or -20%. Compare those numbers to stocks (blue bars) and you can quickly understand the dramatic difference in volatility between bonds and stocks.

When stock markets experience a sharp fall, bonds act as a diversifier and reduce the overall volatility of the portfolio. The relative lack of volatility is the primary reason investors have fixed income exposure in their portfolios. We don't expect that to change and neither should you.

**2. Rising interest rates are good for long-term investors.** Although increasing interest rates result in immediate bond price declines, long-term returns are actually enhanced due to the ability to reinvest at higher rates. ➤

Consider the scenario below that depicts the impact of a one percentage point increase in yield on the total return of a bond.

### Cumulative Bond Returns Following One Percentage Point Increase in Interest Rates



As you can see, the one percentage point increase in interest rates results in a loss for Year 1, but by Year 2 the cumulative return turns positive because interest and principal are being reinvested at higher rates. Over time, the cumulative return grows even more as the benefit of higher rates compounds.

The above example uses the Barclays Aggregate Bond Index, which has a yield of 2.58% and duration of 5.68 as of December 31, 2015. For ease of presentation, this analysis assumes a one-time parallel shift in yields and then no further fluctuation in interest rates.

In addition, we assume that all income received is reinvested, which is extremely important because reinvesting income at higher rates helps offset the losses in the initial hike year and increases the total return of the bond portfolio over time. This benefit of reinvesting higher interest income applies to both individual bonds and bond funds.

**3. Global diversification offers diversifying opportunities.** Investors shouldn't limit themselves to just the U.S. bond market. Global bonds are the largest investable asset class, yet the area where most investors are underexposed.

Using global bonds with hedged currency exposure has historically provided a dramatic reduction in volatility, which can be seen in the next table that compares monthly return data for the Citigroup U.S. Government Bond Index (1-5 years) to the currency hedged Citigroup World Government Bond Index (1-5 years).

### Diversification Benefits of Global Bonds(1985-2015)

	U.S. Bonds	Global Bonds
Average Return	0.47%	0.46%
Standard Deviation	0.71%	0.53%
Reduction in Volatility		35.00%


As you can see, returns are very similar but there is a 35% reduction in volatility when using a global bond portfolio.

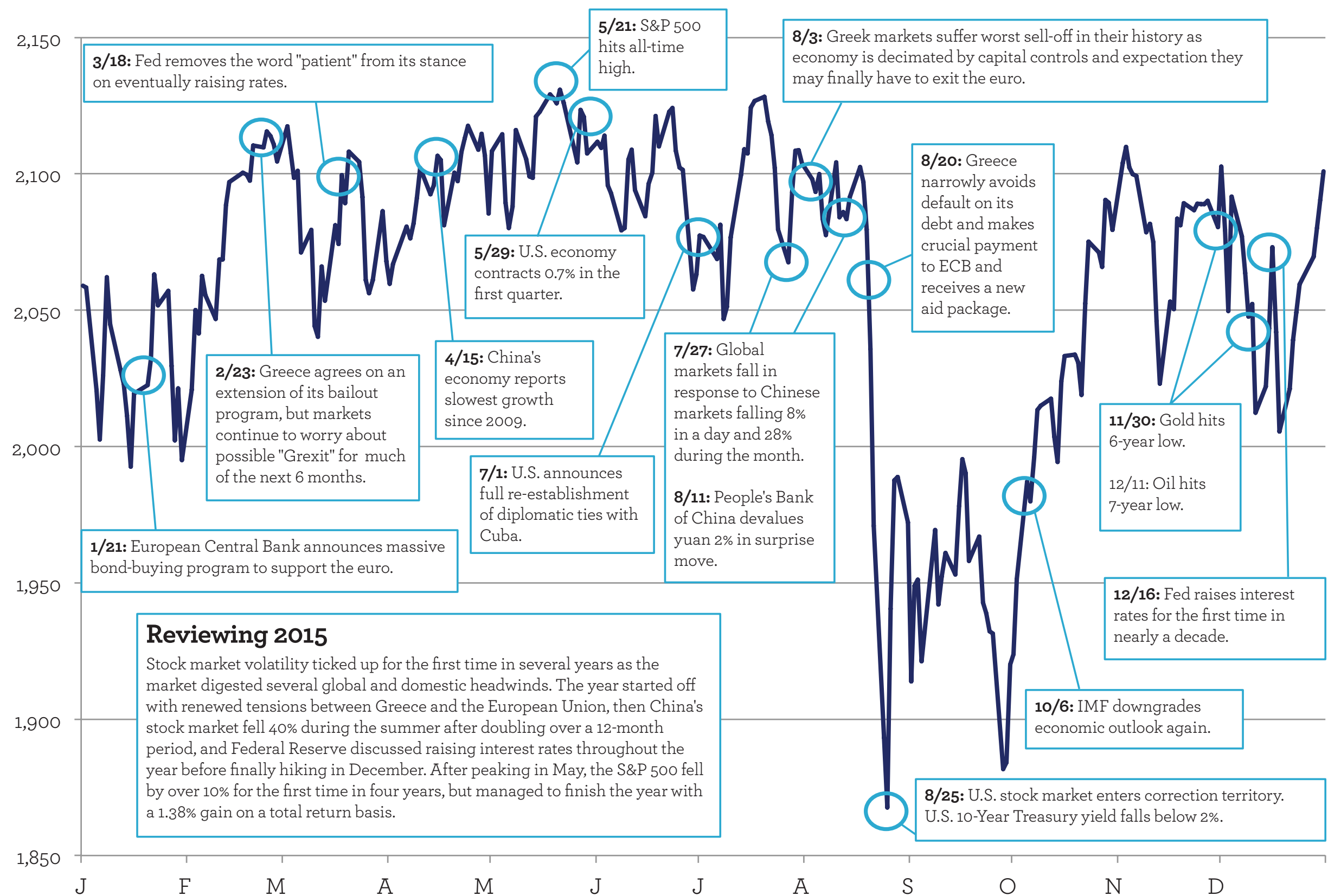
The biggest reason for the reduction in volatility is that each country's yield curve is shaped differently and the factors that impact changes in yields are lowly correlated across countries. Additionally, global bonds add to the number of issuers in a portfolio and, thus, diversifies among different credit risks.

Making the safest part of your portfolio even less volatile is a no-brainer to us. As a result, the opportunity to have global bond exposure is always a great reason to buy bonds.

**4. Bonds are an important part of a disciplined rebalancing strategy.** When stock prices are down, the low volatility of your bond portfolio provides some dry powder to rebalance and buy stocks more cheaply. When stock prices are up, buying fixed income helps bring the portfolio risk levels back in line with your financial plan.

The beauty of rebalancing is that it removes our biases and emotions from investment decisions. Investors that don't rebalance periodically may end up with risk exposures that don't match their willingness and/or ability to tolerate portfolio fluctuations.

As a result, we always recommend owning bonds as part of a rebalancing strategy. 



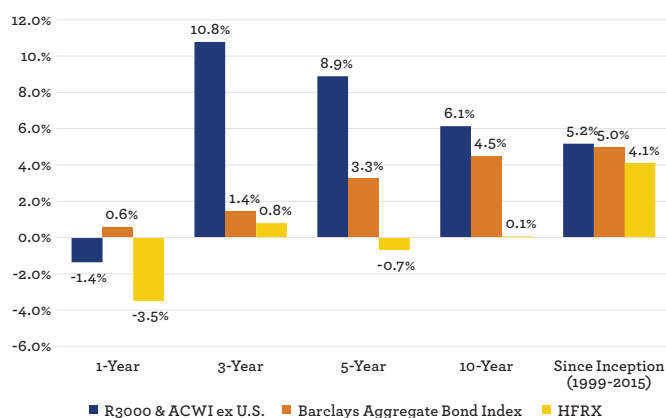


## Hedge Funds: Better to Run One Than Own One

Hedge funds provided another year of disappointing returns in 2015, losing 3.5% and trailing broad equity and fixed income indices.

The chart below compares returns for the HFRX Global Hedge Fund Index (yellow bars) over different periods versus broadly diversified stocks (blue bars) and bonds (orange bars).

**Asset Class Performance Comparison**



As you can see, hedge funds have been losing relative to stocks and bonds for years, which is pretty amazing considering the survivorship and backfill biases in the index data that each skew hedge fund returns upwards by three to five percent per year<sup>1</sup>. Both biases stem from the fact that hedge funds aren't required to report their performance – all reporting is entirely voluntary.

The survivorship bias refers to the fact that hedge fund indices only show the returns earned by funds that are currently in the index. That means the index doesn't include funds that previously reported returns, but stopped reporting due to poor performance. The implication is that hedge funds only report when they are successful and stop reporting once they have a string of bad results. Consequently, all hedge fund indices are missing some really bad performance and, thus, hedge fund index returns are artificially high.

Backfill bias also has dramatic impact on various hedge fund indices, including the HFRX Index in the analysis above. Backfill bias occurs when an index provider adds a new fund to their index and "fills in" prior returns of that fund, which are presumably good. For hedge fund managers, this typically means

establishing a fund with seed money and then waiting to report results until returns are sufficiently high to start marketing the fund and raise money using the allure of strong past performance. The end result is a process that overstates returns.

Whether you look at an aggregate index such as the HFRX Global Hedge Fund Index or at the performance of a specific strategy, the way hedge funds report data results in the index showing higher performance than was actually realized.

There are number of reasons that hedge fund exposure fails for investors including high competition, failure of active management, misunderstanding of hedge funds, and high fees.

The collective knowledge of financial markets (see page 10) and the failure of active management (see page 11) are a big part of why hedge fund strategies don't work. When the industry experienced its best performance in the late 1990's and early 2000's, there were only 1,000 funds competing against each other. Today there are about 12,000 firms competing against each other, and we would argue that there is less alpha (excess return over a passive benchmark) available to capture in the first place.

*"Running a hedge fund has been a good business in good and bad markets. For investors, however, hedge fund exposure fails to fulfill the promise of better returns with lower risk."*

Combine the impact of less excess return available, significantly more firms trying to capture this smaller amount of profits, and the high fee levels, and you have a simple recipe for failure. Even if some financial advisers and consultants accept this premise, the common rebuttal is that they only invest in the top firms and have a proven due diligence process that will allow them to pick winners. But it's mathematically impossible for everyone to pick the best managers. ➤

This isn't to say that there aren't good managers out there, but there are only a select few investors that are able to pick good hedge funds with any success. Sadly, most of the consultants putting their clients (individuals and institutions) into hedge fund investments don't understand how great of a disadvantage they are at compared to a select few investors.

So if hedge fund investing has been so unsuccessful for investors, how has the industry managed to grow from \$50 billion in assets during the 1990s to \$2.7 trillion in assets today?

The allure of hedge funds revolves around an ever-changing narrative that plays off investors' emotions and fears, but always centers on uncorrelated profits with minimal downside risk. Plus, it's always easier to blame someone else when using a complex investment strategy as opposed to being the only one to blame in years a passive portfolio doesn't work out.


Another big reason for the vast expansion of the hedge fund industry is that it's biggest promoters focus on past performance more than anyone else. In particular, they focus on simple, long-term average returns promoted by the hedge fund industry – these returns are much higher than those realized by investors because the averages are boosted by a four-year period

during the dot com bubble as well as the survivorship and backfill biases we discussed earlier.

Suppose, however, if we looked at real investor profits versus the fees generated by hedge funds and fund-of-funds. The graphic below does just that.

This profit and fee analysis was originally conducted by Simon Lack, author of *The Hedge Fund Mirage*<sup>2</sup>. We were able to recreate the analysis using his methodology and publicly available data from BarclayHedge and Hedge Fund Research.

The methodology understates hedge fund profits for a variety of reasons, but you can still see that running a hedge fund has been a good business in good and bad markets. In fact, Simon Lack's most recent data shows that hedge funds captured 84% of the profits and fees from 1998 through 2014 versus investors that only captured 5% (fund of funds captured the remaining share of industry profits).

The purpose of hedge funds from the perspective of the manager, parent-company, consultants, and brokerages is to collect fees. In that sense, hedge funds have been a huge success each and every year. For investors, however, hedge fund exposure fails to fulfill the promise of better returns with lower risk. 

**Investors' Real Profits vs. Estimated Hedge Fund and Fund-of-Fund Fees in Billions of \$ (1998-2015)**





## The Collective Knowledge of Financial Markets



Meet Penelope the cow. NPR's Planet Money<sup>1</sup> asked the internet how much Penelope weighed and received 17,205 responses.

The average of all the responses was 1,287 pounds and the actual weight was 1,355 pounds. The average was off by only five percent. This experiment, which was originally conducted in 1906 by Francis Galton, is a perfect example of the power of collective knowledge – together we know more than we do individually.

Every person's guess reflects their unique knowledge and life experiences. Perhaps some participants knew the average weight of a cow is 1,500 pounds and considered that a female should weigh less. Others may have looked at the man near the cow and determined that the cow was at least 10 times his weight. Every person's estimate is a bit flawed, but each person's guess also has a bit of information in it.

James Surowiecki explains this further in his book *The Wisdom of Crowds*:

*"If you ask a large enough group of diverse, independent people to make a prediction or estimate a probability, and then average those estimates, the errors each of them makes in coming up with an answer will cancel themselves out. Each person's guess, you might say, has two components: information and error. Subtract the error, and you're left with information."*

Another related experiment involves individuals guessing the number of jelly beans in a jar. In a September 2012 study, participants independently provided estimates that ranged from 498 to 9,999. The average guess was 2,716 and the actual amount was 2,650 – meaning the crowd was only a little more than 2% off the correct value.

This jelly bean experiment is frequently repeated with the crowd's aggregate average usually being within 3-5% of the actual number. The larger the number of guesses, the more likely the average will be closer to the actual number.

### The Collective Knowledge of Financial Markets

Millions of market participants buy and sell securities around the world. The new information each buyer and seller brings to the markets help set prices. The errors in judgment from "dumb" money opinions offset each other as do the errors made by "smart" money. What you're left with is information, and prices adjust according to each bit of new information.

*"The wisdom of crowds supports the notion that most active managers won't consistently outperform the crowd, and it is nearly impossible to predict who will be the winner."*

Because the future is uncertain, we can't know the next bit of new information, but we believe it is reasonable to accept current prices as fair. If you believe the market is significantly mispriced – dramatically overvalued or undervalued – then you are pitting your knowledge or hunches against the combined knowledge of millions of other market participants.

### What about bubbles, panics and manias?

It is important to point out that in order for collective decision making to be useful, independence and diversity of opinions are crucial. Usually independence ➤

and diversity of opinion are missing from bubbles, panics, and manias – today’s market environment is a far cry from those conditions.

## The Randomness of Beating the Market

The wisdom of crowds also supports the notion that most active managers won’t consistently outperform the crowd, and it is nearly impossible to predict who will be the winner.

Let’s go back to the jelly bean experiment for a brief moment. When this experiment is run with the same group ten times, each time there are one or two people that have better guesses than the rest of the

group. However, the one or two people with the best guesses are different each time and there is very little ability to predict which one or two people will have the best guess. There are a lot of implications to draw from this example, but the biggest is that outsmarting the group has a lot to do with luck, particularly when participants are highly skilled.

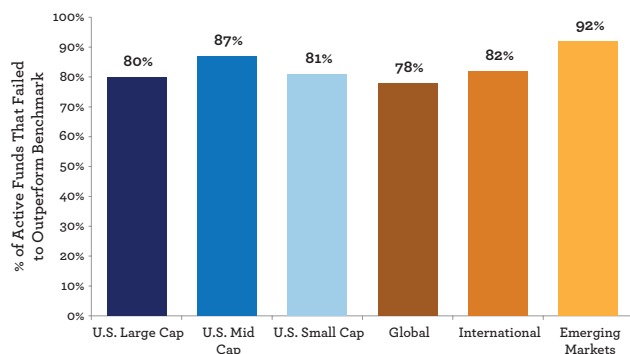
Rather than compete against the vast knowledge of the world’s market participants, a superior investment process involves harnessing the knowledge of markets and focusing on things that can be controlled such as risk exposure, costs, taxes, and investment behavior. 

# The Failure of Active Management

## Active versus Passive Management

For the past 11 years, the S&P Indices Versus Active (SPIVA) Scorecard<sup>1</sup> has been the de facto scorekeeper of the active versus passive debate. Below is a graphic of active funds that failed to beat their respective index according to the most recent SPIVA Scorecard. As you can see, the results are pretty lopsided.

**Percentage of Active Public Equity Funds that Failed to Beat the Index (10 Years as of 6/30/2015)<sup>2</sup>**



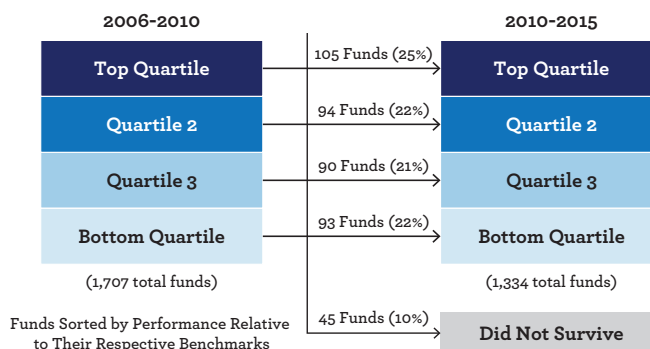
In addition to ten-year results, the SPIVA Scorecard also provides results for one, three, and five-year time periods. The results are the same regardless of time period: most active managers fail to beat their respective index.

## The Winners Don’t Keep Winning

Not only do the vast majority of managers fail to beat the index, managers that outperform in the most recent period are unlikely to have persistent outperformance in the future. The annual S&P Persistence Scorecard<sup>3</sup> measures


this across the mutual fund industry and the graphic below uses data from latest report on June 2015.

**Subsequent Performance of Top 25% of U.S. Equity Funds (as of 03/31/2015)<sup>4</sup>**



The left column breaks equity fund performance over a five-year period into quartiles. The right column then shows how funds from the top quartile during the previous five-year period performed in the next five-year period.

As you can see, only 25% of the top performing funds remained in the top quartile over the next five-year period. Meanwhile over half of the top performers from the previous period finished in the bottom half of performers in the next period, including 10% of past winners that failed and closed.

These most recent updates to the SPIVA Scorecard and S&P Persistence Scorecard aren’t a fluke. The failure of active management is evident throughout the history of these reports, regardless of the year the report is released. 

## Active Management in Down Markets

A common rebuttal to this type of analysis is that active managers outperform in down markets and are a good tool for protecting against downside volatility. This is simply not true.


The 2008 SPIVA Scorecard<sup>5</sup> shows quite clearly in the active management didn't prevail during the last bear market. In addition, Vanguard did a more extensive study<sup>6</sup> of bear markets dating back to 1973 and found no evidence that active management leads to outperformance in down markets.

Even if the myth of active management's outperformance in down markets were true – and it's very clearly not – protecting against the downside is a poor reason for choosing an active management strategy since bull markets last longer and provide disproportionately higher returns than bear markets.<sup>7</sup> In other words, you would have to be willing to accept long-term underperformance in return for short-term outperformance.

## Conclusion

Active managers play a crucial role in setting prices in the market. The extremely high level of skill and competition among active managers strengthens our belief in the collective knowledge of financial markets, but it also means that luck plays a larger role in the relative performance of active managers.

There will always be active managers that outperform the overall market, but it is extremely unlikely that you (or anyone else) will identify outperformers in advance and consistently pick the best active manager for any given asset class. Moreover, the odds of your portfolio outperforming get progressively smaller as the number of funds in the portfolio increase.<sup>8</sup>

Most people with a portfolio filled with active managers are simply paying for the illusion of control and dream of market beating performance. We believe a better investment strategy follows a systematic, disciplined, low turnover, and low cost approach. 

### SOURCES AND DISCLOSURES:

**S&P 500 Index®** is widely regarded as the best single gauge of the U.S. equities market, this market-capitalization-weighted index includes a representative sample of 500 leading companies in the foremost industries of the U.S. economy and provides over 80% coverage of U.S. equities.

**S&P MidCap 400 Index®** consists of 400 mid-sized companies and covers approximately 7% of the U.S. equities market.

**S&P SmallCap 600 Index®** consists of 600 small-cap stocks and covers approximately 3% of the U.S. equities market.

**S&P Global 1200 Index** captures approximately 70% of the world's capital markets. The index is a composite of seven headline indices, many of which are accepted leaders in their regions, covering U.S., Europe, Japan, Canada, Australia, Asia ex-Japan, and Latin America.

**S&P 700 Index** measures the non-U.S. component of the global equity markets, covering all the regions included in the S&P Global 1200, excluding the U.S. (S&P 500).

**S&P/IFCI Composite Index** is widely recognized as a comprehensive and reliable measure of the world's emerging markets. It measures the returns of stocks that are legally and practically available to foreign investors.

**Russell 3000 Index®** measures the performance of 3,000 publicly held U.S. companies based on total market capitalization, which represents approximately 98% of the investable U.S. market.

**MSCI All Country World ex-U.S. Index®** captures large, mid and small cap representation across 22 of 23 Developed Markets countries (excluding the United States) and 23 Emerging Markets countries. With 6,161 constituents, the index covers approximately 99% of the global equity opportunity set outside the U.S.

**The Barclays U.S. Aggregate Bond Index®** covers the USD denominated, investment-grade, fixed-rate, and taxable areas of the bond market. This is the broadest measure of the taxable U.S. bond market, including most Treasury, agency, corporate, mortgage-backed, asset-backed, and international dollar-denominated issues, all with maturities of 1 year or more.

**MSCI World ex-U.S. Index®** captures large and mid cap representation across 22 of 23 Developed Markets (DM) countries\*—excluding the United States. With 1,020 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

**Citigroup U.S. Government Bond Index (1-5 years)** measures the performance of the U.S. government bond market with maturities of one to five years.

**Citigroup World Government Bond Index (1-5 years) (hedged)** measures the performance of the global government bond market. It is a widely used benchmark that currently comprises sovereign debt from over 20 countries, denominated in a variety of currencies, and has more than 25 years of history available. The WGBI provides a broad benchmark for the global sovereign fixed income market.

**HFRI Global Hedge Fund Index** is designed to be representative of the overall composition of the hedge fund universe. It is comprised of all eligible hedge fund strategies; including but not limited to convertible arbitrage, distressed securities, equity hedge, equity market neutral, event driven, macro, merger arbitrage, and relative value arbitrage. The strategies are asset weighted based on the distribution of assets in the hedge fund industry.

Index performance returns do not reflect any management fees, transaction costs or expenses. Indexes are unmanaged and one cannot invest directly in an index.

PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS. Investing involves risk. It should not be assumed that recommendations made in the future will be profitable or will equal the performance shown. Investment returns and principal value of an investment will fluctuate and losses may occur. Diversification does not ensure a profit or guarantee against a loss.

### Assessing an Allocation to Global Stocks

Diversified portfolio in page 3 analysis defines 70% U.S. stocks using the S&P 500 Index® and 30% global stocks using the MSCI World ex-U.S. Index®.

### Hedge Funds: Better to Run One Than Own One

1. Malkiel, Burton and Atanu Saha. "Hedge Funds: Risk and Return," *Financial Analysts Journal*, Volume 61, Number 6.

Fung, William and David A. Hsieh. "Measurement Biases in Hedge Fund Performance Data: An Update," *Financial Analysts Journal*, Volume 65, Number 3.

2. Lack, Simon. *The Hedge Fund Mirage: The Illusion of Big Money and Why It's Too Good to Be True*, Pages 59-70.

### The Collective Knowledge of Financial Markets

1. <http://www.npr.org/sections/money/2015/08/07/430372183/episode-644-how-much-does-this-cow-weigh>

### The Failure of Active Management

1. <http://www.spindices.com/documents/spiva/spiva-us-midyear-2015.pdf>

2. Standard & Poor's Indices Versus Active Funds Scorecard, June 2015. Index used for comparison: US Large Cap—S&P 500 Index; US Mid Cap—S&P MidCap 400 Index; US Small Cap—S&P Small-Cap 600 Index; Global Funds—S&P Global 1200 Index; International—S&P 700 Index; Emerging Markets—S&P IFCI Composite. Data for the SPIVA study is from the CRSP Survivor-Bias-Free US Mutual Fund Database.

3. See "Persistence Scorecard" at <https://us.spindices.com/search/?ContentType=SPIVA>

4. The left column represents all US equity funds in the CRSP Mutual Fund Database with a complete return history for 2006-2010. The funds are sorted by performance relative to their benchmarks. Funds in the top quartile are then tracked and directed to their subsequent performance quartiles in the following 5-year period (2010-2015), or to the "Did Not Survive" category. Quartiles in the following period reflect all funds with a complete return history. Percentages may not total 100% due to rounding. Source: CRSP Survivor-Bias-Free US Mutual Fund Database.

5. <http://www.spindices.com/documents/spiva/spiva-us-year-end-2008.pdf>

6. Vanguard Investment Perspectives, Volume 5, Spring/Summer 2009, Pages 11-15.

7. <https://www.linkedin.com/pulse/20140625141712-55524203-quotes-from-iconic-investors-that-apply-to-your-portfolio-today>

8. Ferri, Richard A. and Alex C. Benke. *A Case for Index Fund Portfolios*, June 2013.