This white paper was developed based on research by Invesco's Product Management, Product and Market Research and PowerShares by Invesco teams.

Why invest in average?

Five truths about benchmark investing

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Invesco's perspective on the active/passive debate

At Invesco, we believe the greatest opportunity for investors to achieve their unique objectives is through high-conviction portfolios that go beyond the limitations of traditional market benchmarks.

High-conviction portfolios can include actively managed funds, smart beta strategies and traditionally passive approaches that are all intentionally chosen and allocated with a client's goals in mind.

In this white paper series, we present the results of our research into two types of high-conviction strategies – truly active management and smart beta approaches – and discuss how they can help investors move beyond market-cap-weighted results. We also discuss the truth behind five myths that have clouded investors' understanding of active and passive investing.

Investing is often analyzed like a sport. Are US or international stocks winning right now? Did high yield or investment grade bonds outperform last quarter? And, the perennial question: Which is better, active or passive investing? Not surprisingly, this type of analysis can result in simplistic conclusions that don't cover the full story, and unnecessarily create an either/or mindset among investors. Over time, these conclusions may become accepted as conventional wisdom.

Today, many investors believe that they can't beat the market, and they point to the latest bull market, when benchmarks like the S&P 500 Index offered strong performance. Thus, these investors populate their portfolios with traditional passive strategies that simply offer exposure to the market average, rather than trying to achieve more through actively managed funds or smart beta strategies. But investor experiences during the bull market don't represent the whole story.
In this piece, we discuss five simplistic conclusions – or "investment myths" – about passive, broad-market, cap-weighted benchmark strategies, and we dig deeper to reveal the five truths that investors need to know when building portfolios. At Invesco, we believe that a wide variety of strategies can play a role in a well-constructed, high-conviction portfolio, but investors need to base their decisions on facts, not myths.

Myth 1: It's always a good time to invest in average.

Truth: Passive outperformance and underperformance have historically moved in cycles.

Historically, broad-market outperformance has changed hands frequently between active managers and passive, market-cap-weighted benchmarks. The table below shows how this performance has cycled over the past 25 years.

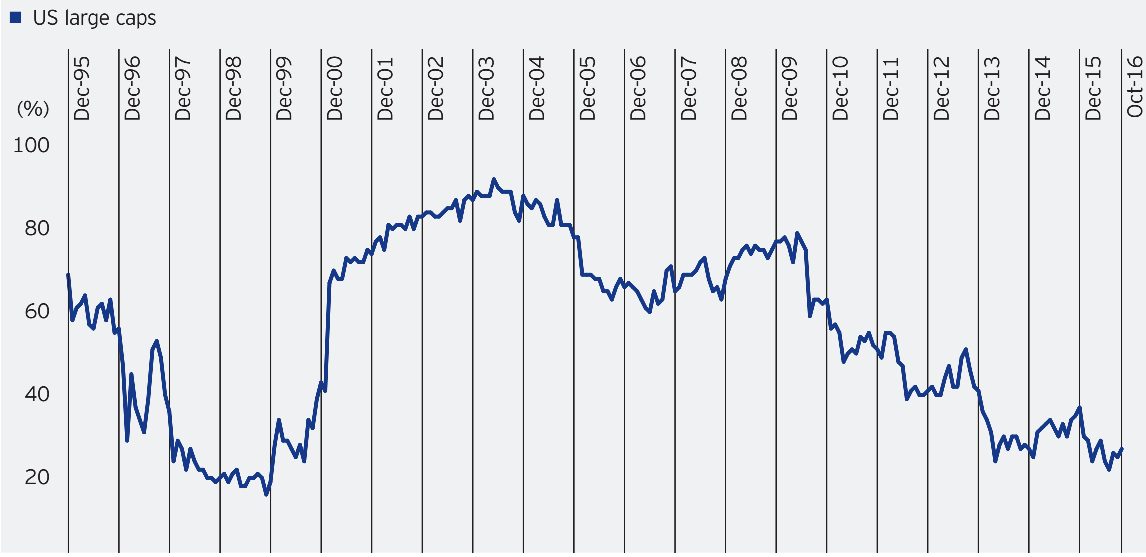
Active outperformance	Passive outperformance
4Q 1991 to 2Q 1994	1Q 1995 to 4Q 1999
2Q 2000 to 3Q 2002	4Q 2002 to 1Q 2004
4Q 2004 to 2Q 2006	3Q 2011 to 1Q 2013
2Q 2013 to 2Q 2014	4Q 2014 to present

Source: Callan, as quoted by Leuthold Group. Active is represented by Callan's active large-cap domestic managers. Passive is represented by the S&P 500 Index.

The chart below illustrates the same point, using five-year rolling data. This shows that active US large-cap equity funds have experienced distinct time periods in which most of them have outperformed their market-cap-weighted benchmarks, as well as time periods when most of them underperformed.

In fact, in the current cycle, just 35% of large-cap, active mutual fund assets outperformed their benchmarks, while nearly 60% of large-cap, passive mutual fund assets outperformed.[1]

Figure 1: US large-cap outperformance has cycled between active and passive strategies
% of active funds that delivered excess return over their market-cap-weighted benchmarks, over five-year rolling periods

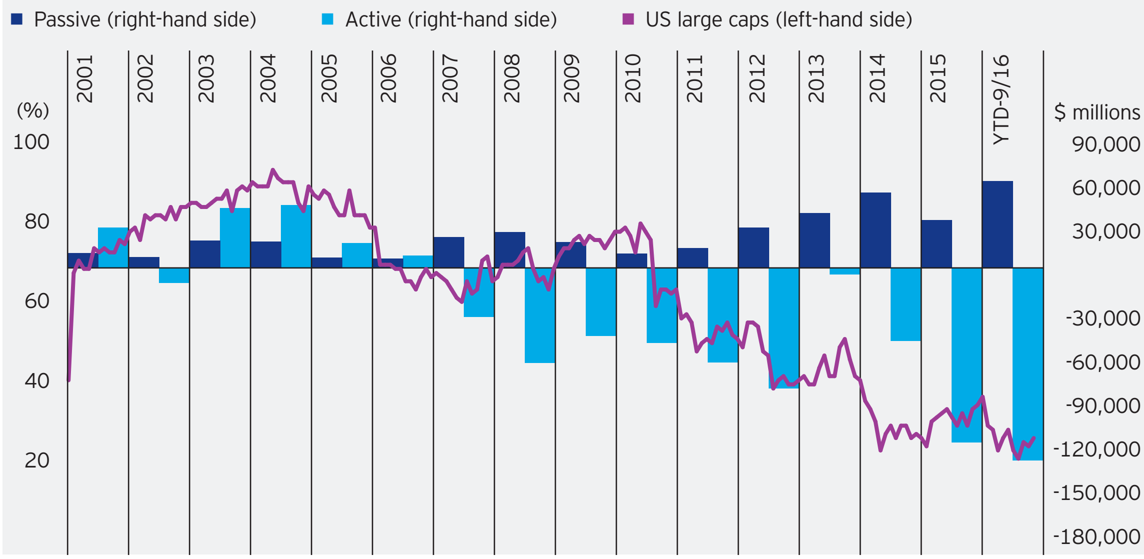


Sources: Invesco, FactSet and Morningstar Direct, used with permission. Chart illustrates funds with an active share score of 60% or greater within Morningstar's large blend, large growth and large value categories. The line measures the percentage of these funds that outperformed their market-cap-weighted benchmark. Active share measures the percentage of equity holdings in a fund that differ from the benchmark index. Higher active share indicates lower holdings similarity between a fund and a particular index.

What often happens in these types of performance cycles — whether it's US and international, growth and value, or active and passive — is that investors chase performance. It is interesting to look at flows alongside performance of active versus passive. What we have seen in recent years is that as passive has outperformed, flows into passive strategies have accelerated, while active managers have seen significant outflows.

1 Source: Morningstar Direct, used with permission. Mutual funds classified as an "Index Fund" by Morningstar were considered passive for this analysis — everything else is active. ETFs were excluded. Benchmarks used for this analysis were the Russell 1000 Growth Index for "Growth," the Russell 1000 Value Index for "Value" and the S&P 500 Index for "Core." "Large caps" used for this analysis is an aggregate of the assets beating benchmarks for large value, large blend and large growth for active and passive managers.

Figure 2: Investor flows have followed performance
% of active funds that delivered excess return over their market-cap-weighted benchmarks, over five-year rolling periods, and flows into and out of active and passive strategies



Source: Morningstar. Performance data as of Oct. 31, 2016. Flows data as of Sept. 30, 2016.

And since these cycles are impossible to time accurately, latecomers who pile into the outperforming asset may catch the wave just in time to see it fall — reaping the downside of the cycle and missing the upside of the underperforming asset's rebound.

Within the growth and value space, we've seen value outperform in the first two quarters of 2016 after a long stretch of underperformance versus growth. Might the same scenario be in store for active and passive? Evidence suggests that the tide is likely to turn, given that market leadership tends to drive these cycles of performance. A study by Leuthold Group[1] revealed that passive has tended to do better when a relatively small group of the largest stocks outperform, and also when growth is in favor. Conversely, when value is in favor and a broader range of large caps outperforms, active managers have also tended to outperform.

Leuthold found that from 1991 to 2016, passive tended to outperform when the 25 largest stocks in the S&P 500 Index beat the other 475 large-cap stocks that make up the index. Active tended to outperform when the 25 largest stocks underperformed.[1] The study found that the relative performance of these 25 "mega-cap" stocks was the strongest performance driver of the active/passive cycle.[1] This is what is typically referred to as a "narrow led rally." Conversely, when those stocks sell off, that is sometimes referred to a "market bubble" bursting. This happens when a smaller group of stocks or area of the market drives the performance of the broader market.

Investors who are chasing passive's current outperformance risk missing the boat. Rather than chasing any asset's or style's performance, we suggest investors consider diversifying their exposure to help minimize the potential downside of market cyclicality.

Diversification does not guarantee a profit or eliminate the risk of loss.

1 Source: "Active vs. Passive: A Three-Club Headwind," The Leuthold Group, July 26, 2016

Myth 2: Benchmarks follow sound investment strategies.

Truth: Traditional benchmarks buy high and sell low by valuing companies based on how large they are instead of by their fundamentals or investment factors.

Traditional benchmark indexes were created to help people measure the direction of the market — to define average. With the exception of the Dow Jones Industrial Average (which weights stocks on the basis of their share price only), most indexes are capitalization weighted, including the S&P 500 Index, the MSCI EAFE Index and the Russell 1000 Index. This means that companies with larger market caps make up a larger weight within the index, and smaller market-cap companies get a smaller weighting. Market-cap weighting makes sense when you're using benchmarks as a compass for market sentiment, but we believe it can have unintended consequences for investors who don't fully understand how it works.

The question is, do companies "deserve" higher portfolio weightings on the basis of market-cap alone? After all, market cap is simply the number of a company's outstanding shares multiplied by its per-share price. Is that the best measure of investment value? It's a critical question to answer, because companies with higher weightings have an outsized footprint on a strategy's performance.

We would answer that investment opportunity is not defined by market-cap size alone. Some companies may experience a rapid increase in stock price (and, therefore, their market cap) for reasons that are not related to the actual value or fundamentals of the company. Therefore, this methodology has a tendency to overweight overvalued stocks and underweight undervalued stocks, which can cause benchmark investors to buy high and sell low — the opposite of sound investment strategy. While proponents of benchmark indexing often say that these strategies remove the emotion from investing, that's not an accurate statement. To the contrary, these strategies don't offer investors any shelter from the collective emotions of market participants. Consider these historical examples:

- The "Nifty Fifty" was a group of the 50 most popular large-cap stocks on the New York Stock Exchange in the 1960s and 1970s, and were often referred to as "one-decision" stocks that investors could buy and hold for a lifetime.[1] These stocks were characterized by high price-to-earnings ratios and strong growth rates. Research has shown that these stocks didn't live up to their names, and that price appears to be a factor. One study[2] noted that, with few exceptions, "... the glamour stocks that were pushed to relatively high P/E ratios in the early 1970s did substantially worse than the market, in both the short and long run."
- Consider also the dot-com bubble of 1999 and 2000, when technology companies were all the rage — and notoriously overvalued. These stocks gained larger and larger influence within market-cap-weighted benchmarks simply because their stock prices were soaring, not because they were fundamentally sound (in some cases, certain tech companies didn't even have real assets — only unproven ideas). In other eras, the market has experienced real estate bubbles and commodity bubbles as investors flocked to these sectors and pushed up their prices.
- More recently, just a handful of stocks, Facebook, Amazon, Netflix and Google, or "FANG" as they are known, have been responsible for driving much of the S&P 500 Index's return. For example, the S&P 500 returned (including reinvested dividends) 1.4% in 2015, but without the help of the "FANG" stocks, the S&P 500 would have lost almost 3%.[3] This works during the upside, but also can be a detriment when those stocks sell off, like we saw during the first part of 2016.

1 Source: Investopedia
2 Source: "The Nifty-Fifty Re-Revisited," Jeff Fesenmaier and Gary Smith, The Journal of Investing, Fall 2002 http://www.iijournals.com/doi/abs/10.3905/joi.2002.319515?journalCode=joi
3 Source: FactSet Research Systems, data from Jan. 2, 2015, through Dec. 31, 2015. Please note that Google is now known as Alphabet.

Even in less dramatic times, benchmarks can require passive investors to make moves that they might not otherwise want to make. In 2013, Facebook was added to the S&P 500 Index — and to the portfolios of investors who track that index. When the news was announced, shares of Facebook jumped 4%.[1] That meant passive investors were set to pay a higher price for the stock, even though nothing had changed about its underlying business from one day to the next. Certainly, many active managers have bought Facebook stock over the years, and some may have bought technology stocks during the bubble, but they choose their own price targets and decide how much weight they want to give the stock in their strategy. Similarly, smart beta strategies — which select and weight stocks using methodologies other than market-cap weighting — would have bought and weighted Facebook on the basis of valuation, quality, volatility or other factors.

Myth 3: Benchmarks offer steady performance and less risk.

Truth: Benchmarks have tended to underperform on the downside, and they can't actively avoid risk.

As detailed previously in Myth 1, passive strategies have historically cycled through times of over- and underperformance. What's particularly notable is that benchmarks have tended to outperform in bull markets, but underperformed on the downside. As noted by Leuthold Group in its analysis of the active-passive cycle: "Periods of modest returns do not thrill investors, but they clearly favor active management styles."[2]

Taking a consistent approach in seeking to mitigate downside risk is important for three reasons:

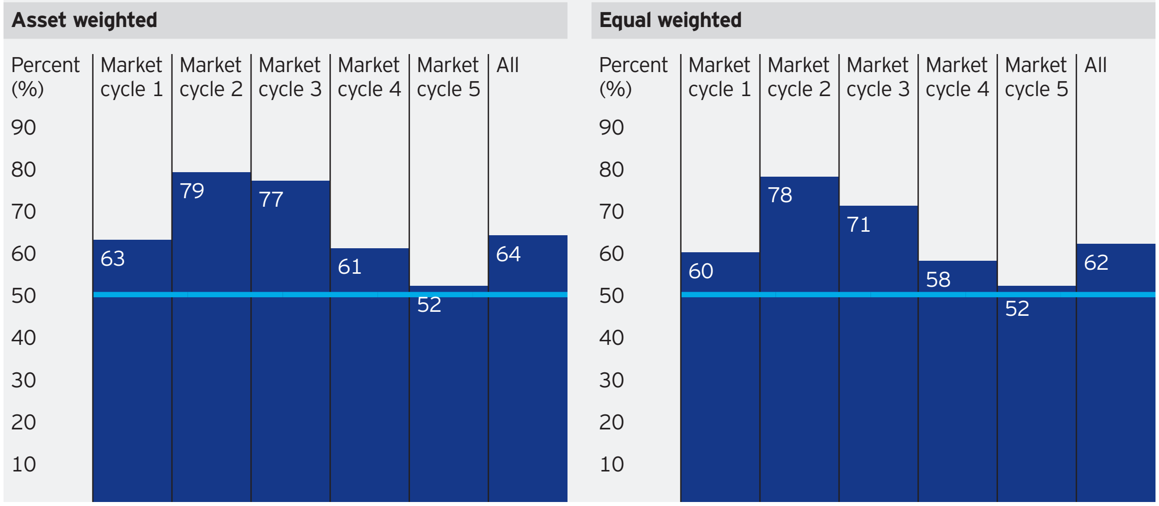
- **The numbers.** The impact of losses on a portfolio isn't easy to erase — a 50% loss requires a 100% gain just to get back to even. On the other hand, a 25% loss requires a 33% gain to get back to even. There's clearly a benefit to limiting loss.
- **The emotion.** Many risk-averse investors find it difficult to remain invested during times of volatility, and they may choose to sell their investments at precisely the wrong time when the market is undergoing dramatic swings. Relative downside protection may help these investors stay focused on their long-term time horizon as they pursue their financial goals.
- **The timing.** Some investors may look at the historical trends and try to buy passive strategies during bull markets and active strategies during bear markets. But inflection points are notoriously difficult to time accurately. The start of a bull or bear market may best be seen in the rearview mirror — and investors may find themselves chasing performance rather than benefiting at the start of a new cycle.

Recently, Invesco conducted a study[3] of about 3,000 equity mutual funds over the past 20 years, covering five distinct market cycles. We compared funds with active share[4] scores of 60% or greater with their passive benchmarks in a variety of performance measures — including downside capture. We found that 64% of high active share fund assets had a better downside capture than their benchmarks across all market cycles studied (62% on an equal-weighted basis).

1 Source: CNN Money, "Facebook to be added to S&P 500," Dec. 12, 2013
2 Source: "Active vs. Passive: A Three-Club Headwind," The Leuthold Group, July 26, 2016
3 Source: Invesco, "Think active can't outperform? Think again," August 2016. We analyzed 17 US open-end mutual fund Morningstar categories, which encompass all of the major US and foreign equity capitalization styles defined by Morningstar. About 3,300 total funds resulted from this primary screen. Funds were studied from July 1998 through December 2015. Equal-weighted figures represent the number of funds that outperformed a specified benchmark/value in each period relative to the total number of funds with calculable data in that period. Asset-weighted figures represent the percentage of assets of funds that outperformed a specific benchmark/value in each period relative to the total assets of funds with calculable data in that period. For market cycles and trailing periods, assets were averaged using beginning- and end-of-period data.
4 Active share measures the percentage of equity holdings in a fund that differ from the benchmark index. Higher active share indicates lower holdings similarity between a fund and a particular index. A fund and an index that have no commonality would yield an active share of 100%. Funds that hold derivatives may actually generate an active share score above 100% due to financial leverage.

Figure 3: % of high active share assets and funds that captured less of the downside than their benchmarks
Asset-weighted and equal-weighted results by market cycle

■ = >50% success rate for high active share



Market cycle 1: Peak to peak (7/98-3/00)
Market cycle 2: Trough to trough (10/98-9/02)
Market cycle 3: Peak to peak (4/00-10/07)
Market cycle 4: Trough to trough (10/02-2/09)
Market cycle 5: Peak to present (11/07-12/15)
All: Aggregate of all five market cycles (7/98-12/15)

Source: FactSet Research Systems, Inc.

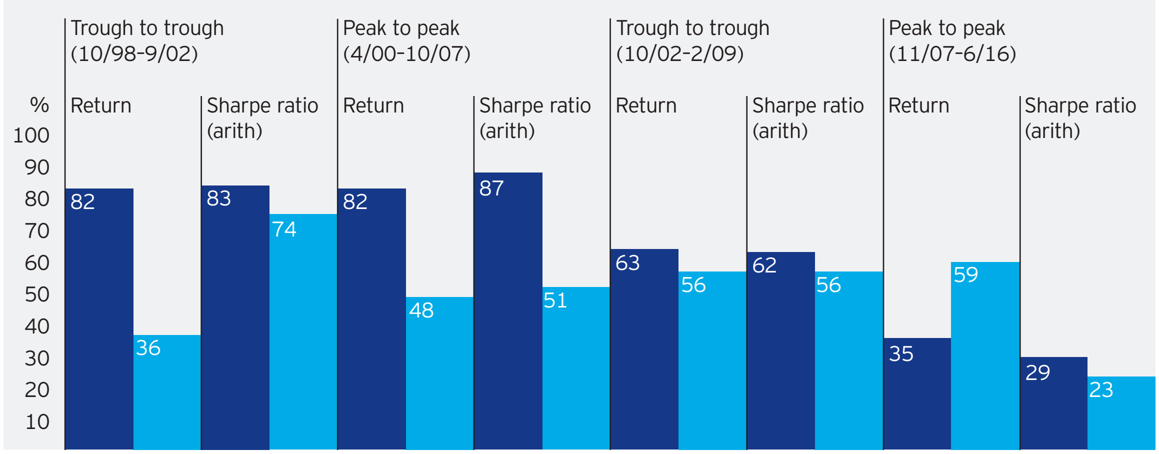
When we look inside these market cycles, we see that active managers have historically provided less risk than their passive, broad-market benchmarks during notable market crises.

Data also suggests that active managers, on average, have had better risk-adjusted returns and risk statistics than purely passive strategies.

As we noted earlier, in the current cycle, not only are large-cap, passive mutual fund managers outperforming on a relative basis, they are also outperforming on a risk-adjusted basis. However, in past cycles going back almost 20 years, we have seen active managers outperform passive on a relative and risk-adjusted basis, as defined by the Sharpe ratio.

Figure 4: Before the current cycle, active funds have had a history of outperforming on a risk-adjusted basis
Percent of assets beating their benchmark index

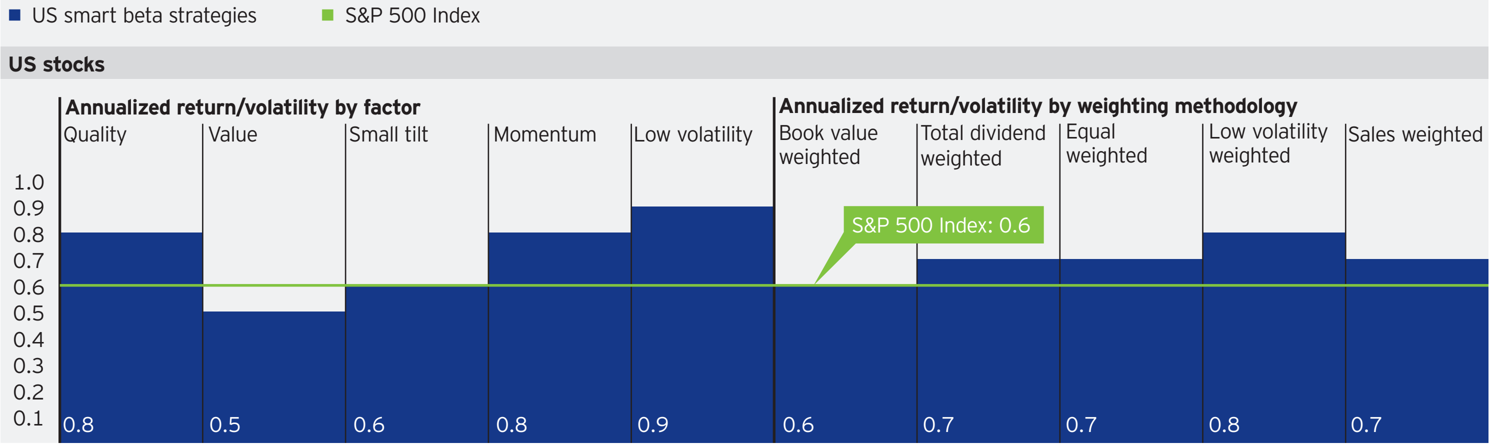
■ Active ■ Passive



Source: Morningstar Direct, used with permission.

In addition, smart beta strategies have a history of delivering higher risk-adjusted returns than passive benchmarks. In an Invesco study examining 10 common smart beta methodologies from December 1991 through December 2015, we see that nine out of the 10 US smart beta methodologies had the same or higher risk-adjusted returns than the S&P 500 Index.[1]

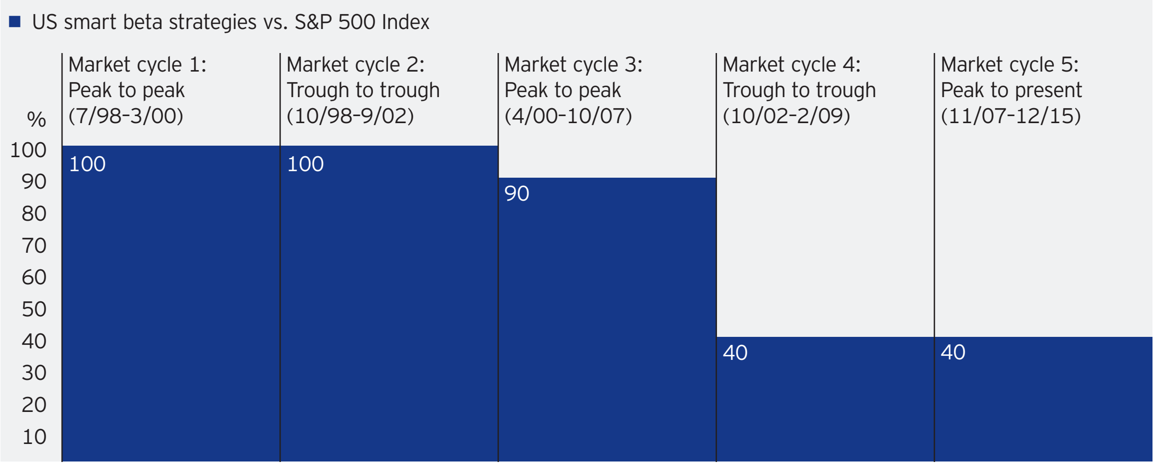
Figure 5: Most US smart beta strategies delivered higher risk-adjusted returns than the S&P 500 Index
Risk-adjusted returns from December 1991 through December 2015 for S&P 500 Index



Source: FactSet Research Systems as of Dec. 31, 2015. Past performance does not guarantee future results. An investment cannot be made directly into an index. Index returns do not reflect any fees, expenses or sales charges.

Additionally, our smart beta study showed that most to all of the US smart beta strategies studied exhibited lower downside capture ratios than the S&P 500 Index in three of the five market cycles studied.

Figure 6: Most US smart beta strategies outperformed during down periods in three of five market cycles
% of strategies with lower downside capture ratios, by market cycle



Source: FactSet Research Systems as of Dec. 31, 2015. Past performance does not guarantee future results. An investment cannot be made directly into an index. Index returns do not reflect any fees, expenses or sales charges.

1 Source: Invesco, "Getting smart about beta," September 2016. The study examined simple and transparent versions of well-established factor and weighting methodologies that are both widely recognized and commonly implemented. We tested these methodologies based on the earliest date for which we could obtain reliable factor data. The testing period for US smart beta strategies was December 1991 through December 2015, which included five full market cycles.

Myth 4: Benchmarks are effective substitutes for high-conviction strategies.

Truth: Benchmarks simply provide market exposure, while high-conviction strategies can pursue a variety of goals.

Benchmarks provide market exposure, which includes the market's full risks as well as its returns. But investors have a wide variety of needs beyond market exposure — such as capital preservation, capital appreciation, income, or a combination of these. Different high-conviction strategies emphasize different goals, allowing investors to choose the strategy that's best designed to help meet their unique needs.

For example, one of the goals that many investors are interested in is reducing risk. And many active managers and smart beta strategies target lower risk as an objective. Yet some of these investors believe that high-conviction approaches carry more risk than benchmark strategies: What if an active manager is "wrong" about a stock? Or what if a smart beta strategy is weighted by the "wrong" factor? Certainly, high-conviction managers vary in skill, and it's important to examine their process, philosophy, track record and outlook. But here's an important point that these investors overlook: By definition, broad-market benchmark strategies are fully exposed to the risks of the market at all times — they don't even try to be "right."

Another goal many investors have is income. But broad-market benchmarks don't distinguish between stocks that pay dividends and stocks that don't.

Investors today may remember Enron and WorldCom, two once-formidable companies that spiraled into bankruptcy. Many passive investors remained exposed to both stocks until they were removed from the S&P 500 Index and the portfolios that tracked it. That occurred shortly before they were delisted from the New York Stock Exchange and the NASDAQ Stock Market, respectively — which is a very low bar. (For instance, NYSE rules allow a company to be delisted after trading for less than $1 for 30 consecutive trading days.[1])

Active managers, on the other hand, had the choice to not invest in these stocks if they didn't meet their criteria for income generation, valuation or other metrics. And those active managers who did invest in these stocks had the choice to exit them whenever they saw fit. These managers have the flexibility to pick and choose which investments are best suited to their goals, based on company fundamentals, industry outlook, stock valuations and the strategy of corporate executives. Similarly, smart beta strategies are designed to screen out or underweight securities that don't meet certain criteria, such as quality, valuations or volatility.

1 Source: Investopedia

Myth 5: Benchmark strategies always outperform active strategies.

Truth: By their very nature, benchmarks cannot deliver alpha. They are simply a reflection of all market activity.

Myth 2 noted that market-cap-weighted benchmarks serve as a barometer of the market. To explore that point further, consider that benchmarks are simply a representation of all trading activity by investors – it's the daily decisions of all market participants that drive the ultimate direction of the benchmark. However, there is an important distinction that typically gets overlooked: Purely passive managers don't make their own decisions, they simply follow the market's ups and downs. So really, it's the collective choices of active managers that define the benchmark.

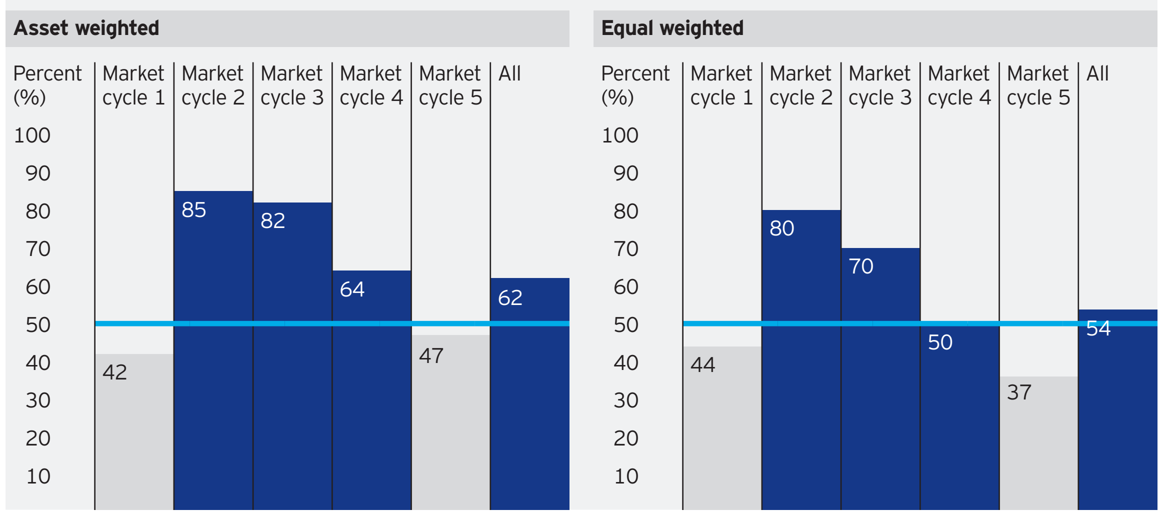
Because of that fact, we believe it's inaccurate to say – as some investors do – that "the average active manager" can't outperform the benchmark. Why? Because in essence, active managers are what drive the benchmark.

That may seem like an academic point to investors who are simply concerned about their own portfolio results. But some of these investors use broad generalizations about "the average active manager" as a reason to avoid active management altogether. These investors miss an important point: Some active managers do outperform the benchmark, but no market-cap-weighted strategies can – they simply deliver benchmark returns minus fees. They can never deliver more.

In the Invesco study of high active share funds, we found that over the study's time period, active management outperformed passive benchmarks over multiple market cycles.[1] On an asset-weighted basis, 62% of high active share fund assets beat their benchmarks. On an equal-weighted basis, 54% of high active share funds beat their benchmarks (after fees) across all market cycles.

Figure 7: % of high active share assets and funds that outperformed their benchmarks
Asset-weighted and equal-weighted results by market cycle

■ = at least a 50% success rate for high active share



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Source: FactSet Research Systems, Inc.

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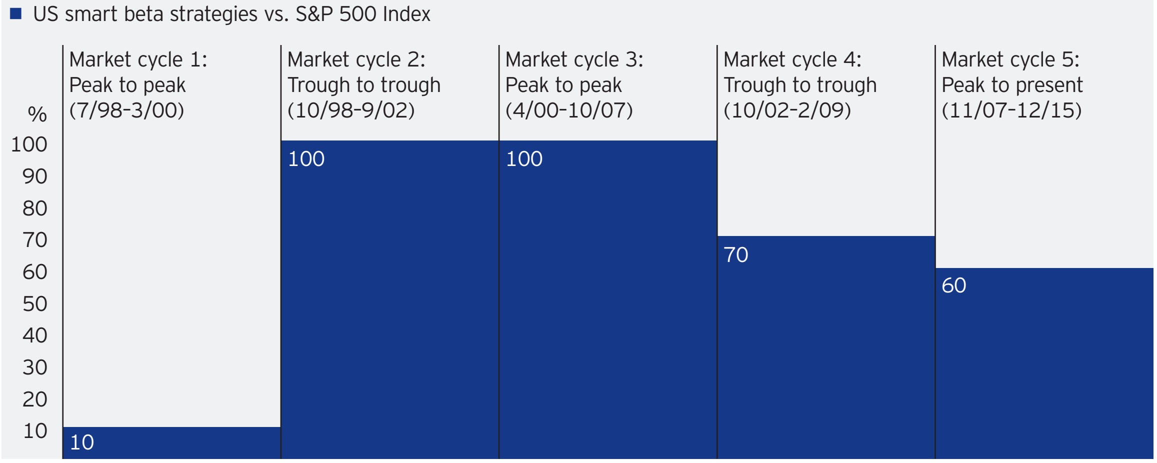
In the Invesco study of smart beta strategies, we found that in four of the five market cycles studied, a large majority of the smart beta strategies delivered excess returns over the S&P 500 Index.[1]

Figure 8: Most smart beta strategies delivered excess returns during four of five market cycles
% of strategies that delivered excess returns by market cycle



Source: FactSet Research Systems as of Dec. 31, 2015. Past performance does not guarantee future results. An investment cannot be made directly into an index. Index returns do not reflect any fees, expenses or sales charges.

On the other hand, by definition, truly passive funds will always fall short of their benchmarks, unless they have zero fees and expenses.

1 Source: Invesco, "Getting smart about beta," September 2016. The study examined simple and transparent versions of well-established factor and weighting methodologies that are both widely recognized and commonly implemented. We tested these methodologies based on the earliest date for which we could obtain reliable factor data. The testing period for US smart beta strategies was December 1991 through December 2015, which included five full market cycles.

Key takeaways:

At the beginning of this paper, we noted that investments are often analyzed like sports. This "winner and loser" analysis misses perhaps the most important point of all — in investing, "victory" is different for everyone. Simply trying to pursue the highest possible returns may require untenable levels of risk for some investors, putting their goals in jeopardy. Rather, Invesco believes in a high-conviction approach:

- We believe investors should focus on their unique goals, time horizon, risk tolerance and other factors, and invest in a well-designed portfolio that has the potential to meet their objectives with the lowest possible level of risk.
- To do that, we believe investors need to ignore the myths and consider the benefits and risks of all types of strategies, including active, smart beta and traditional passive strategies.
- At Invesco, we believe high-conviction portfolios can include traditional passive approaches, smart beta strategies and actively managed funds that are all intentionally chosen and allocated with a client's goals in mind.

Explore High-Conviction Investing with Invesco

At Invesco, we're dedicated to delivering an investment experience that helps you get more out of life. Our comprehensive range of high-conviction investment capabilities is designed to help you build portfolios in more precise and impactful ways, and not just settle for average. This high-conviction approach is built on three core tenets:

A pure focus on investing	All we do is investment management. That means we are solely focused on delivering high-conviction portfolio solutions to meet your unique needs.
Diversity of thought	Each of our investment teams is empowered to implement its own trusted investment philosophy and process. Our diverse range of capabilities allows you to create high-conviction portfolios custom-built for your needs.
Passion to exceed	We are passionate about going beyond average to uncover high-conviction opportunities and provide an exceptional client experience.

Important information

Sharpe Ratio is a measure for calculating risk-adjusted return and is the average return earned in excess of the risk-free rate per unit of volatility or total risk.

Alpha is a measure of the difference between a fund's actual returns and its expected performance, given its level of risk as measured by beta.

The opinions expressed are those of the author, are based on current market conditions and are subject to change without notice. These opinions may differ from those of other Invesco investment professionals.

The information provided is for educational purposes only and does not constitute a recommendation of the suitability of any investment strategy for a particular investor.

A value style of investing is subject to the risk that the valuations never improve or that the returns will trail other styles of investing or the overall stock markets.

Stocks of small and mid-sized companies tend to be more vulnerable to adverse developments, may be more volatile, and may be illiquid or restricted as to resale.

Larger, more established companies may be unable to respond quickly to new competitive challenges such as changes in consumer tastes or innovative smaller competitors. Returns on investments in large-capitalization companies could trail the returns on investments in smaller companies.

Growth stocks tend to be more sensitive to changes in their earnings and can be more volatile.

Individual security names are used for illustrative purposes only and are not buy/sell recommendations.

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