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JANUARY 2016

Active Management Environment

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# The active management environment

Our work on the active management environment addresses some of the shortfalls of traditional active management analysis, which uses the median manager to describe the active management universe as a whole. We refer here to the traditional method as the old approach.

These new insights have allowed for us to better understand the range of impacts that active management can have on portfolio outcomes. **This document marks the 2<sup>nd</sup> year of the new approach. For first time readers, extensive supporting material has been included in Appendix 1. For those familiar with the new approach, please read on.**

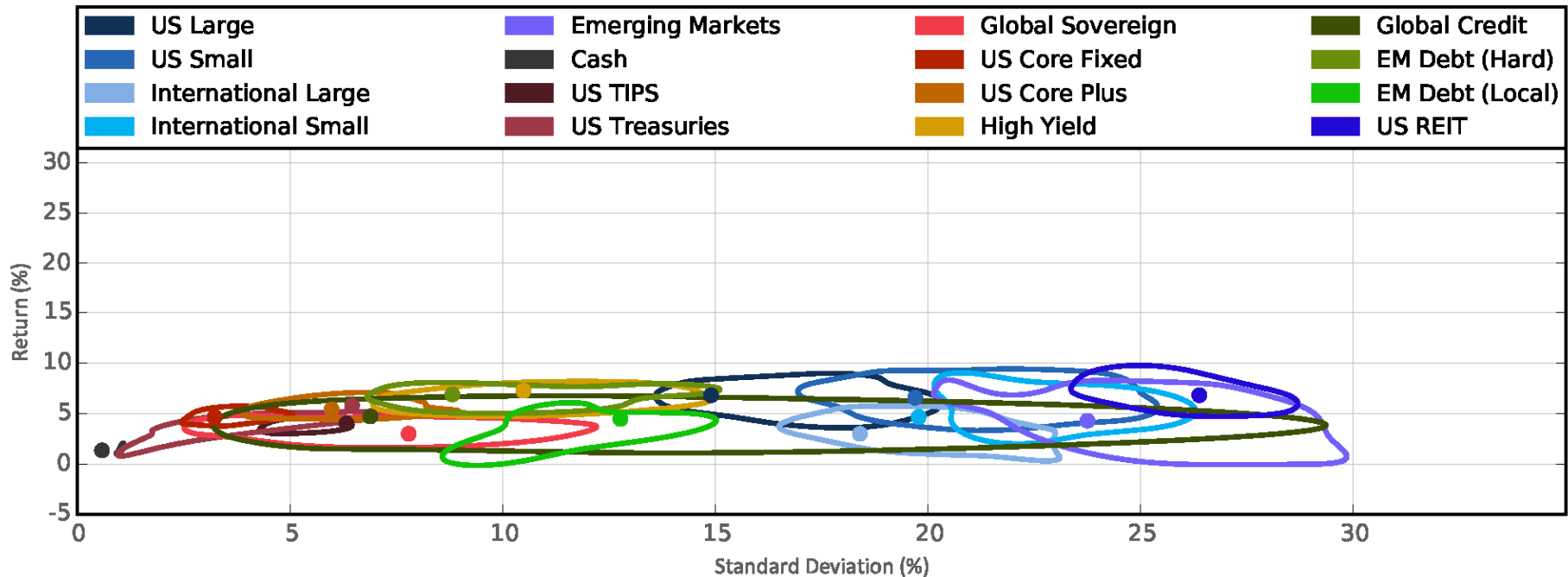
- Even without skilled manager selection there are many cases where active management can help investors achieve better portfolio outcomes in risk and return terms.
- Those better portfolio outcomes may come from additional return or lower risk. Not all investors have the same definition of better outcomes, and the trade-offs facing them vary by universe.
- Adding skilled manager selection to the process can add additional value in portfolio construction.
- Fees remain an important part of the active management conversation. Fees and survivorship bias should be taken into account when analyzing active management universes.

Using the median manager to decide whether active management is appropriate can be misleading. This new tool can help investors make more informed decisions.

# The true investment opportunity set

The investment opportunity set is often represented in a risk-return chart, with asset classes represented by single-point benchmarks, and possibly single-point median managers to represent active management. In reality the active management universes in each asset class are extensive. Much of the risk-return surface between 3% and 12% return and between 2% and 28% volatility is covered, and many parts of that space are covered by multiple active management universes.

## RISK-RETURN REGIONS ACROSS ASSET CLASSES: 10 YEAR RESULTS



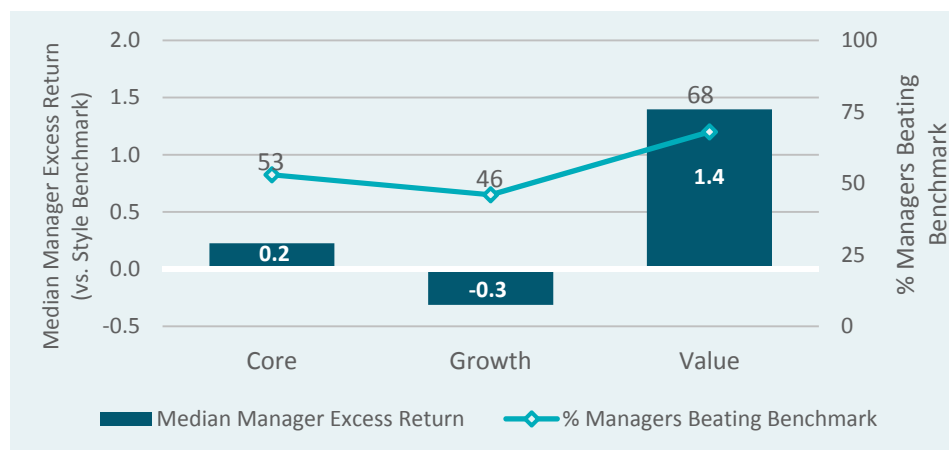
*This represents 10-year manager performance data and 75% contour areas  
Source: eVestment, as of 9/30/2014. Universe returns have been adjusted for fees and survivorship bias.*

# Asset class environments

# Equities – U.S. large cap

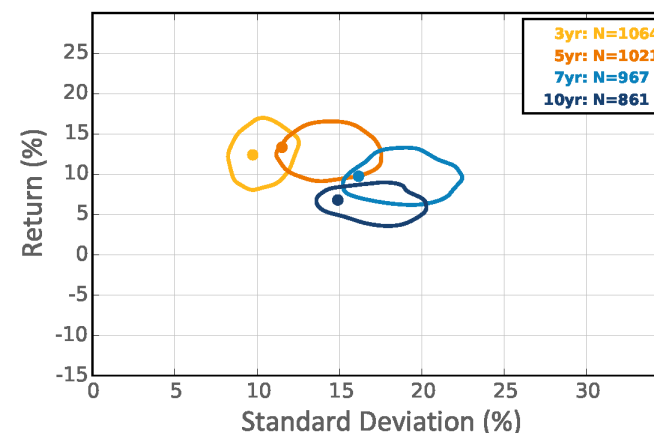
- The evidence suggests that U.S. large cap equity has been a fairly efficient asset class over the trailing 3, 5, 7 and 10-year time periods. The benchmark tends to exhibit less volatility than the universe. Some managers have been able to produce better returns even at this lower level of volatility, but most active managers have simply increased their volatility exposure. There seems to be a weak relationship between managers assuming additional volatility and achieving additional return.
- In a negative year for large cap U.S. equity markets (through September 30<sup>th</sup>), the median large cap value manager generated the largest positive excess return, with about two-thirds of the managers outperforming the style benchmark.
- In contrast to value, the year-to-date relative performance of the median large cap growth manager has been more muted, modestly lagging the style benchmark.

## U.S. LARGE CAP ACTIVE MANAGER PERFORMANCE YTD



Source: eVestment, as of 9/30/2015, gross of fees

## U.S. LARGE

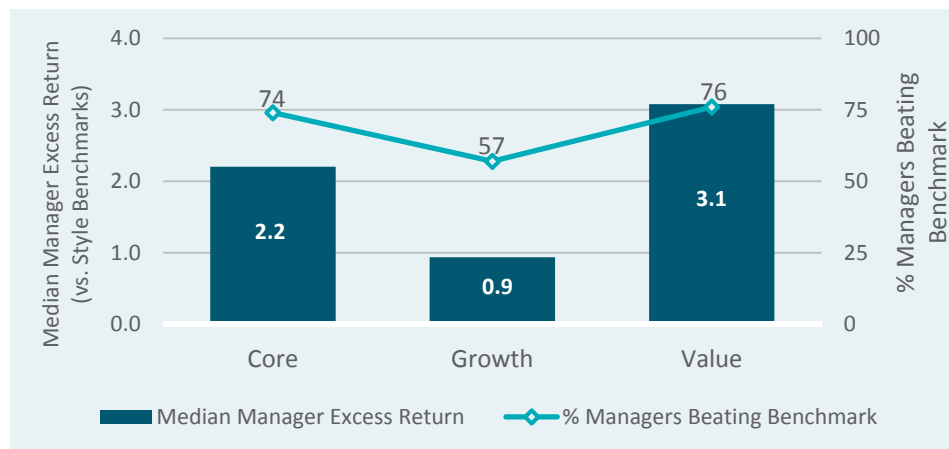


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Equities – U.S. small cap

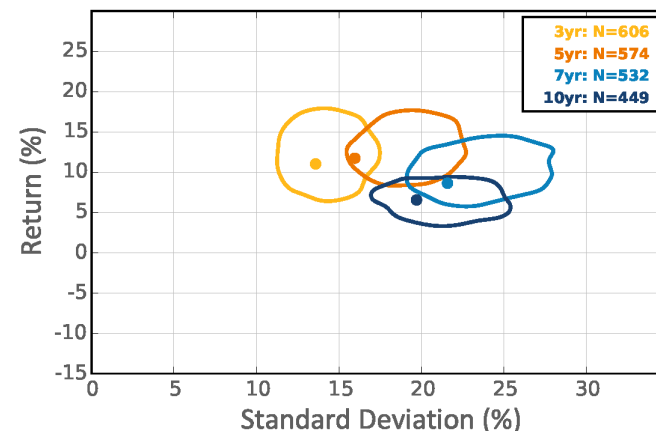
- Over the long term it seems clear that there is little relationship between the amount of risk that U.S. small cap managers take relative to the benchmark and their ability to outperform that benchmark. This can be seen in particular over the 10 year period, where the distribution of manager outcomes is essentially flat, similar to that seen in the large cap U.S. equity space.
- Over longer term time periods fewer managers than in the large cap U.S. space choose to take on greater risk relative to the benchmark. At the same time there appears to be some evidence that managers have been able to produce excess return over most time periods, and to be able to do so more effectively than in the large cap U.S. space.
- Although U.S. small cap equities significantly lagged their larger counterparts in 2015, most active small cap managers outperformed their respective style benchmark, with the median value manager generating the largest positive excess return. Similar to the large cap space, the median small cap value manager generated the most favorable excess return year-to-date.

U.S. SMALL CAP ACTIVE MANAGER PERFORMANCE YTD



Source: eVestment, as of 9/30/2015, gross of fees

U.S. SMALL

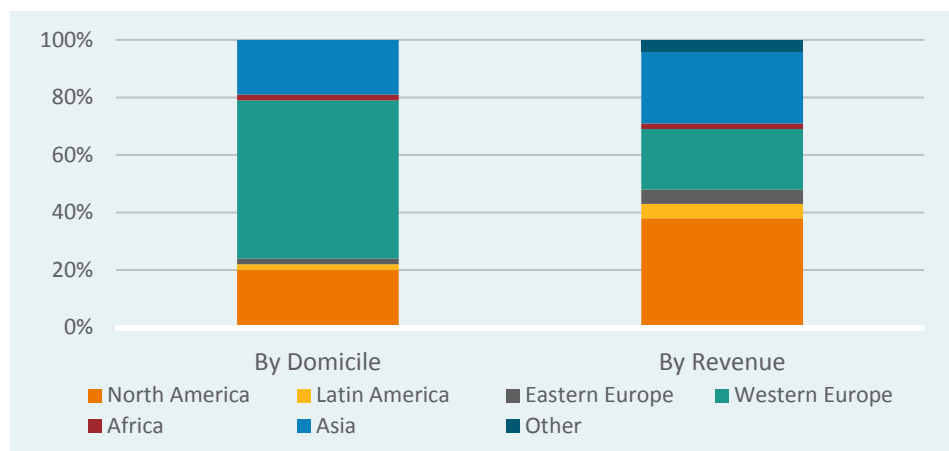


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Equities – international developed

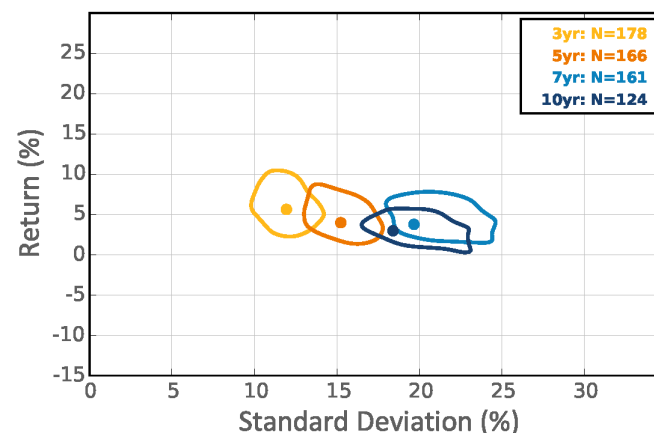
- In the most recent 3 and 5-year periods a majority of international developed managers outperformed the benchmark, and more than half did so with less volatility. While many active managers outperformed the benchmark over longer time periods examined, most managers did so with higher volatility. Despite this, it appears clear that over all of the time periods examined there is in fact a negative relationship between the degree of excess risk taken and the excess return generated. As managers increase the risk in their portfolio they increase the chance of underperformance.
- There is often a significant difference between an active manager’s geographic exposures and the true underlying economic exposures (the country in which a company is domiciled versus the countries the company’s operations are exposure to). A manager’s economic exposure to emerging markets and North America is typically greater than indicated by geographic exposures. On the other hand, a manager’s economic exposure to Europe is often lower than the manager’s geographic exposure to this region. This increasing divergence is a testimony to increasing globalization.

## EXAMPLE OF INTERNATIONAL DEVELOPED MANAGER



Source: sample manager

## INTERNATIONAL LARGE



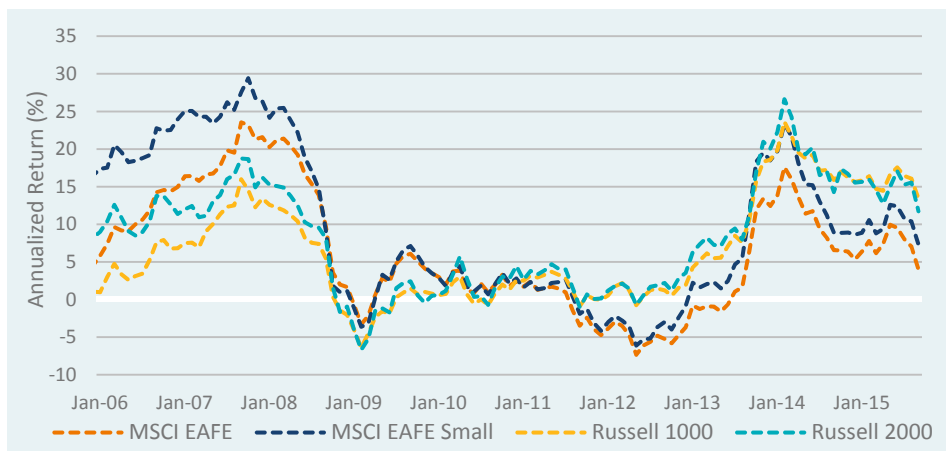
Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.



# Equities – international developed small cap

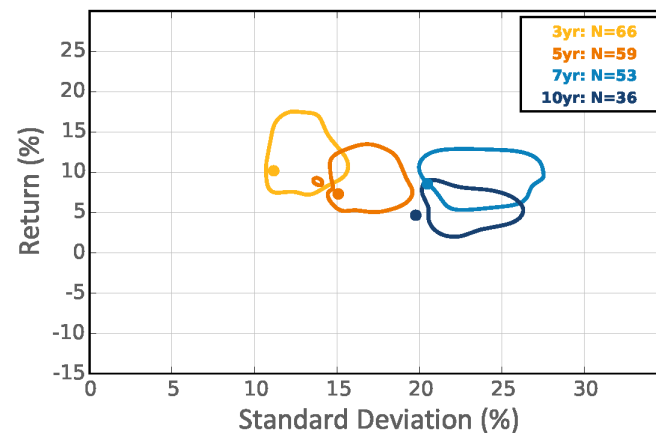
- Most active international small cap strategies have displayed higher volatility than the MSCI EAFE Small Cap Index across each time horizon examined. This is particularly noticeable over the long term. One of the reasons for higher volatility is an allocation to emerging markets, which have exhibited higher volatility than developed markets.
- In most cases it is also clear that active managers in the international developed small cap space have produced better returns than the benchmark. It is important to note that the level of outperformance does not seem related to the level of excess risk taken.
- While over recent years domestic equities outperformed international developed markets, this has not always been the case, as leadership changes over time. The international developed small cap equity asset class continues to be less efficient. As of Q3 2015, the eVestment database listed 121 strategies in the space while there were more than 550 strategies focused on larger cap international companies.
- On average, smaller companies are more tied to their local economies than their larger counterparts, which could provide greater diversification and could potentially improve risk-return characteristics within an equity portfolio.

## 5-YEAR ROLLING ANNUALIZED PERFORMANCE



Source: MSCI, Russell, as of 9/30/2015

## INTERNATIONAL SMALL

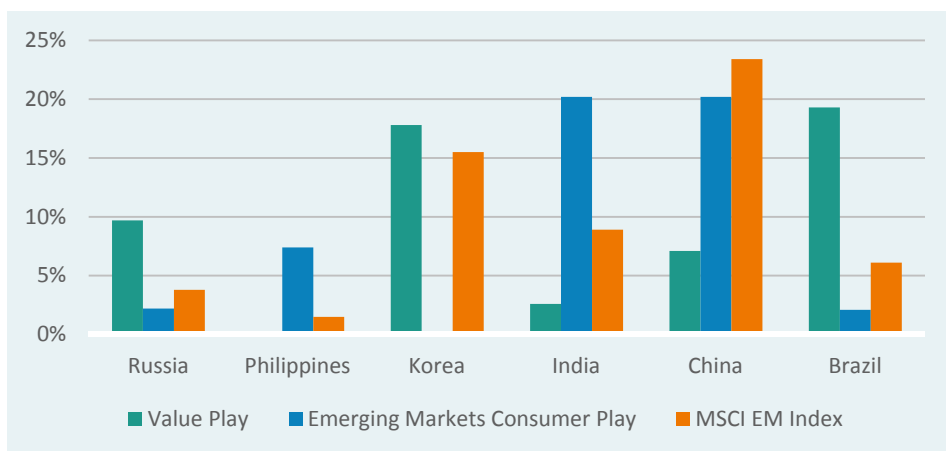


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Equities – emerging markets

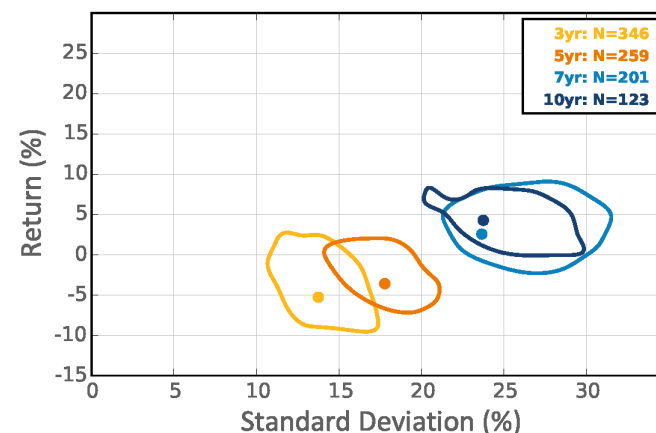
- The majority of emerging market equity managers outperformed the index over the most recent 3, 5, and 7-year periods. Many strategies experienced greater than benchmark volatility over 7 and 10-year periods, but this has been less apparent recently. Over all of the time periods observed most active managers achieved excess returns relative to the benchmark. However, there was a clear negative relationship between the amount of risk taken and the amount of return generated – managers who took more risk were likely to produce lower return.
- Active managers in the space employ very different country and sector allocations depending on the type of inefficiency or secular theme they are attempting to exploit.
- In 2014 Russia was likely the most cited emerging markets country - in 2015 it was China. Despite short-term equity market volatility, China remains a key emerging market economy and the second largest stock market in the world by market cap. China A-shares, comprised of incorporated Chinese companies in mainland China, account for approximately 75% of combined Chinese market capitalization. China is taking measures to meet MSCI requirements for inclusion of A-shares into the MSCI Emerging Markets Index. Emerging market managers might also allocate to frontier markets countries, which are often listed on developed market stock exchanges.

## COUNTRY ALLOCATIONS OF EMERGING MARKET MANAGERS



Source: eVestment, sample managers

## EMERGING MARKETS



Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Fixed income – U.S. TIPS

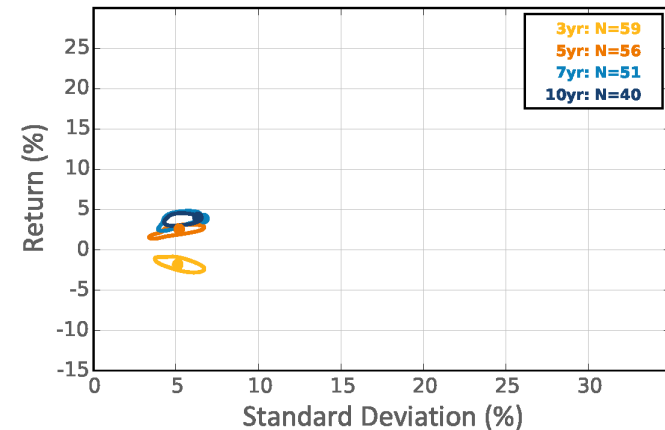
- Over each time period examined the TIPS asset class has been highly efficient, with active managers producing minimal added value relative to the benchmark, and with a tight distribution of manager outcomes relative to the benchmark. In most time periods there appears to be a modest upward tilt to the universe, suggesting some small amount of compensation for managers who take extra risk relative to the benchmark. This relationship appears to have reversed over the most recent three years, however.
- US TIPS 10-year inflation breakeven spreads remain near the lower end of their historical long-term average. This is likely driven by continued concerns about future global economic growth.
- The expectation of rising inflation contributes to investor demand for TIPS.
- While active management in TIPS has provided little excess return relative to the benchmark, TIPS exposure may still provide some diversification and risk management benefits.

## 10 YR TIPS BREAKEVEN



Source: Federal Reserve Bank of St Louis, as of 11/1/2015

## U.S. TIPS

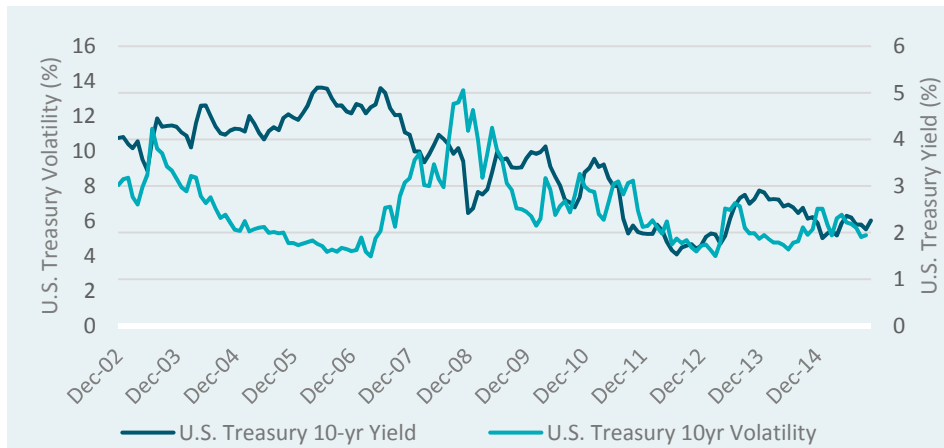


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Fixed income – U.S. treasury

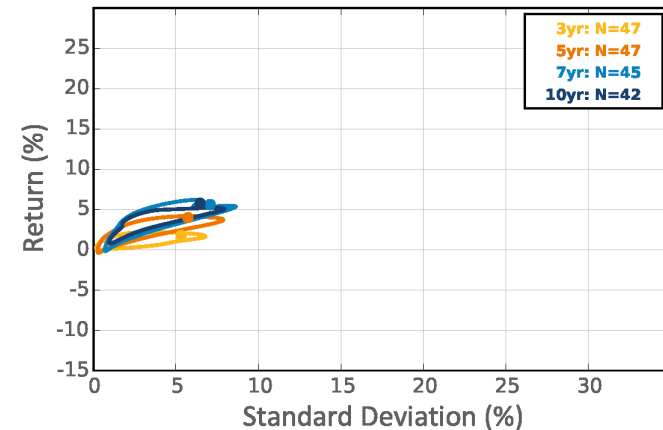
- While the active management universe for U.S. Treasury securities has shown a higher degree of dispersion relative to TIPS, the risk-reward tradeoff remains mostly consistent across time periods examined. Active manager returns are highly correlated to volatility. Active managers typically produce lower returns than the benchmark but with less volatility, and there appears to be a positive relationship between volatility and return.
- The Federal Reserve increased interest rates by 25 basis points in December; however, long-term rates remain well below their historical average. Concerns over future economic growth continue to weigh on rates.
- Managers with biases towards remaining underweight duration in anticipation of higher interest rates have recently underperformed as long-term rates have been more stable than expected.
- Active management in this space is directly related to the risk environment. The very clear relationship between risk and return over multiple time periods, unlike most other asset classes, leaves the investor with a relatively clear risk management payoff decision to make.

## U.S. TREASURY YIELDS AND VOLATILITY



Source: Bloomberg, as of 11/1/2015

## U.S. TREASURY

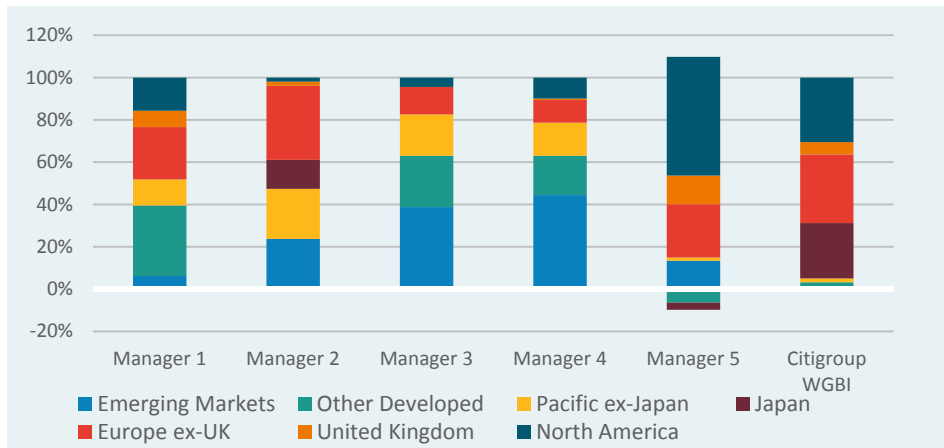


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Fixed income – global sovereign

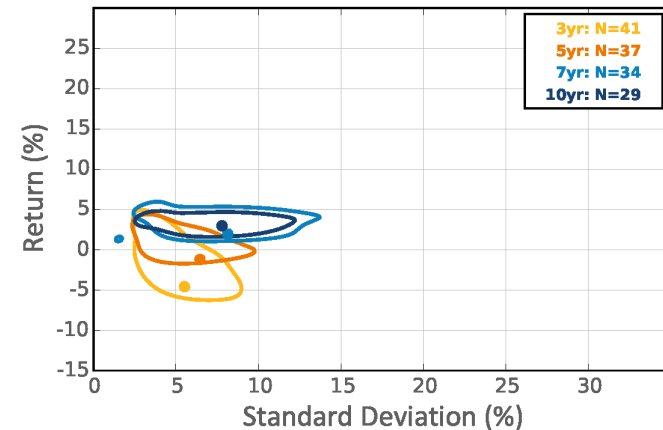
- Evidence suggests that dispersion of global sovereign active manager returns has recently increased due to rising idiosyncratic risks and divergent global central bank policies. Over most time periods active managers have produced returns similar to the benchmark but with less volatility, and there has been little or no relationship between the level of risk taken and the level of return achieved. Over more recent periods managers have produced excess returns while taking less risk than the benchmark.
- Global bonds have offered interest rate diversification benefits within diversified fixed income portfolios. Developed market yields (ex: Europe & Japan) have remained low, and have been driven by continued bond purchases by the ECB and Bank of Japan. Commonly used benchmarks are tilted towards the largest borrowers (ex: Germany, Japan, the U.K. and the U.S.).
- Many managers use off-benchmark securities, such as credit and currency, in an attempt to add value relative to a sovereign-only benchmark. It remains unclear whether the results of these exposures should truly be attributed to benchmark-relative performance, or should be thought of differently.

**GLOBAL BOND MANAGER COUNTRY EXPOSURES**



Source: sample managers

**GLOBAL SOVEREIGN**

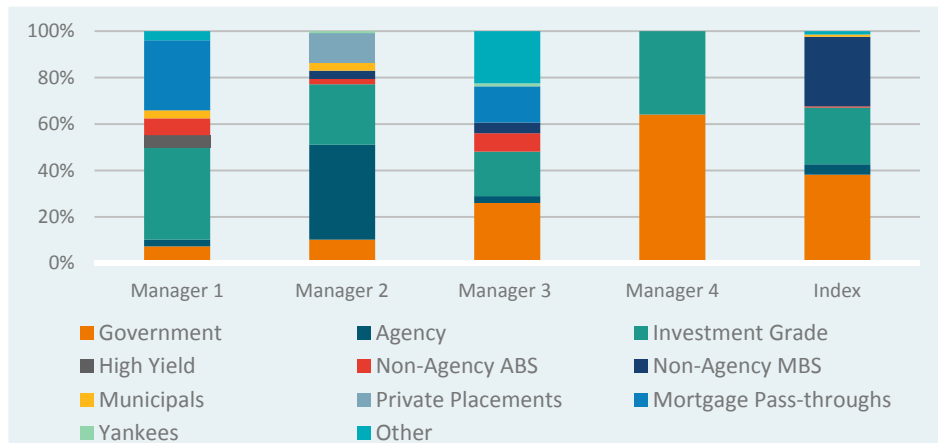


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Fixed income – U.S. core

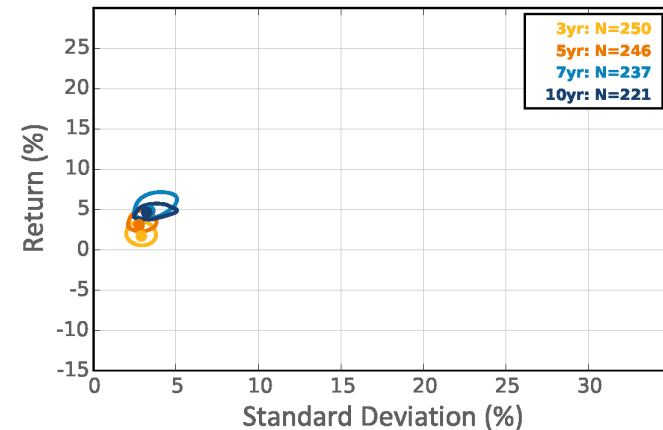
- Over all time periods examined the core fixed income asset class appears to be highly efficient and shows little dispersion between active managers and the benchmark.
- Core bond portfolios are designed to provide income and return while delivering low correlation to equities. With U.S. Treasury yields remaining below the long-term historical average, active managers in the space are increasingly taking on exposure to off-benchmark allocations (ex: high yield, municipal bonds, ABS, and private placement bonds). Managers generally take on these exposures with the intent to achieve excess returns relative to the benchmark.
- The role of active management in the core fixed income space appears limited, due to tight universe dispersion.

## CORE BOND MANAGER SECTOR EXPOSURES



Source: sample managers

## U.S. CORE

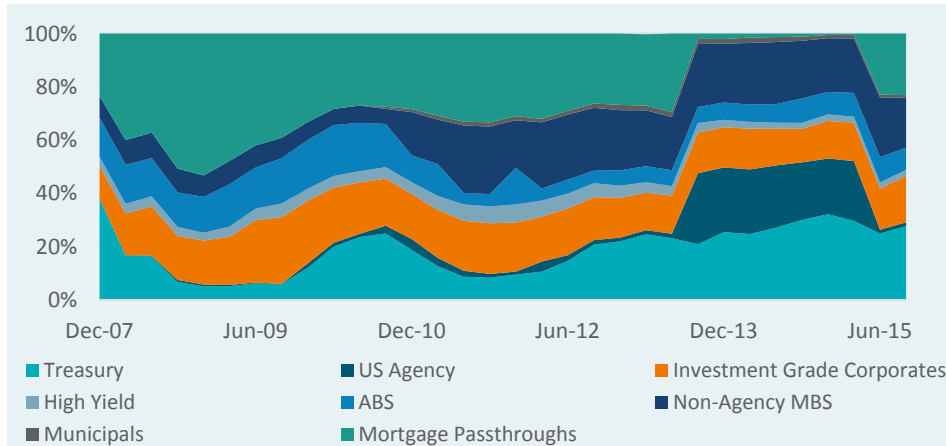


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Fixed income – U.S. core plus

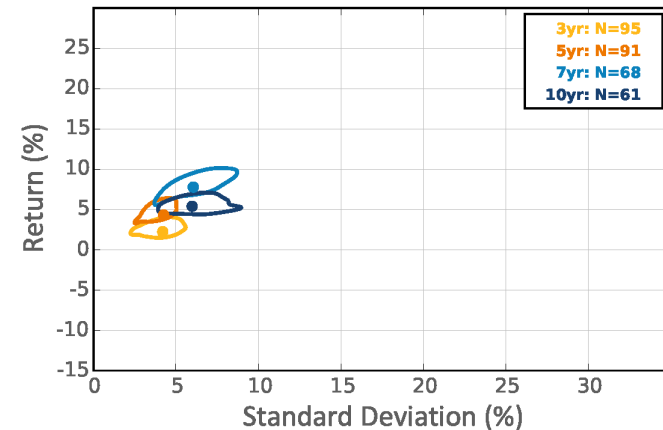
- While still relatively constrained, the core plus fixed income manager universe demonstrates higher dispersion than the core bond universe. This may be because managers have greater ability to implement off-benchmark allocations to lower quality and non-U.S. dollar denominated bonds. There appears to be a positive relationship over some time periods between the risk of the portfolio and the return generated, although for longer time periods this effect appears to diminish.
- Over the long-term, there seems to be a positive trade-off between risk and return within the space.
- More recently, as market volatility has increased, managers with exposures to higher beta assets have reallocated to higher quality securities in order to minimize potential drawdowns.
- The role of active management in the core plus fixed income space, while generally limited, is predicated on the belief that managers can add value through security selection and sector rotation while minimizing volatility.

## CORE PLUS MANAGER ASSET ALLOCATION SHIFTS



Source: eVestment, sample manager

## U.S. CORE PLUS

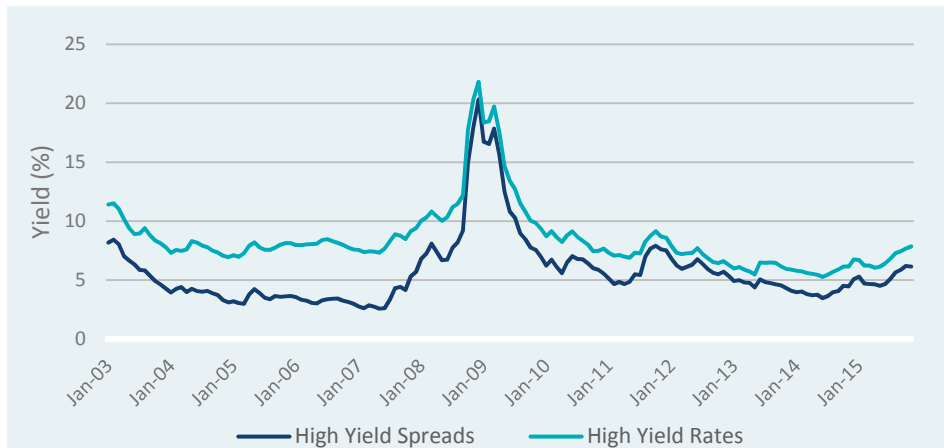


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Fixed income – high yield

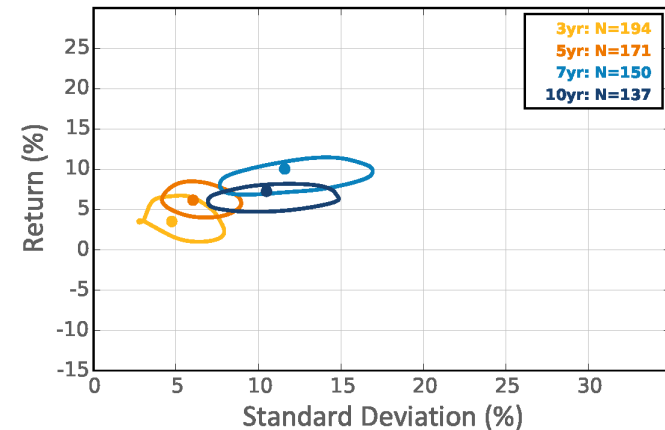
- Over the long-term active managers in the high yield space demonstrate greater dispersion around the benchmark than in shorter periods. There appears to be a limited, though mildly positive, payoff between risk and return. However, it should be noted that over longer time periods little of the universe remains above the benchmark return level and the amount of compensation for risk taken is fairly small.
- More recently, as high yield bond spreads widen because of falling commodity prices, investors' appetites have remained strong as they continue to search for higher yielding assets. While U.S. corporate balance sheets remain generally healthy, there are increasing concerns regarding greater leverage and continued supply of new issuance as interest rates rise.
- High yield bond market volatility is highly correlated to the economic business cycle. Avoiding idiosyncratic risks resulting from ratings downgrades or defaults is an important consideration for active management.

## U.S. HIGH YIELD



Source: Federal Reserve Bank, Bank of Merrill Lynch, as of 11/1/2015

## HIGH YIELD



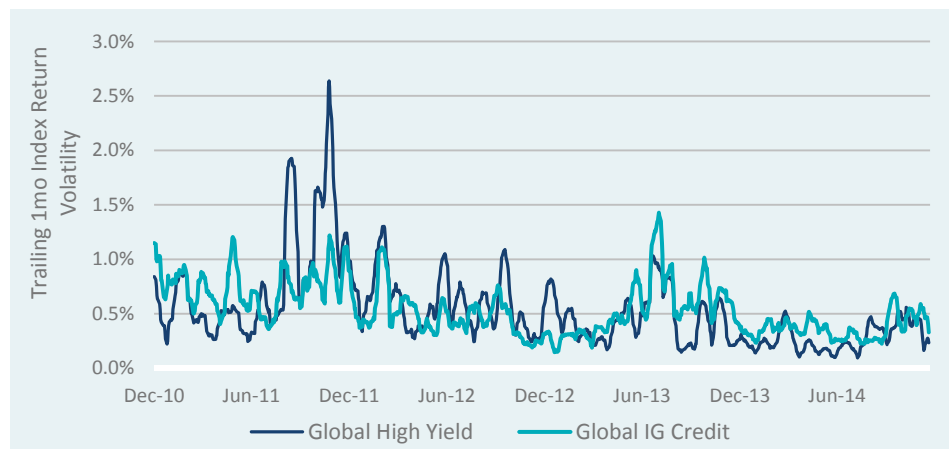
Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.



# Fixed income – global credit

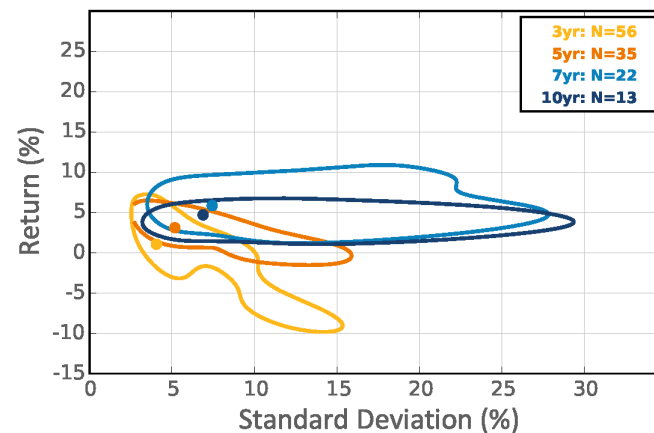
- Over all time periods examined the global credit active manager universe has demonstrated a high degree of dispersion relative to the benchmark. Over longer periods few managers have provided excess returns with lower volatility than the benchmark. However, as volatility has come down, dispersion has decreased with fewer managers successfully adding value. Over longer time periods there appears to be little to no relationship between risk and return.
- More recently active managers have sought to limit their exposure to volatility in order to reduce potential drawdowns.
- Interest rates in developed markets remain below their long-term historical average due primarily to continued global central bank monetary policy. In an effort to provide excess returns, active managers continue to take off-benchmark exposures.
- During periods of heightened market volatility, managers with flexible investment mandates often take on exposure to lower quality bonds providing liquidity to the market. These managers have benefited as markets and spreads normalize.

## GLOBAL CREDIT VOLATILITY



Source: Bloomberg, as of 11/30/15

## GLOBAL CREDIT

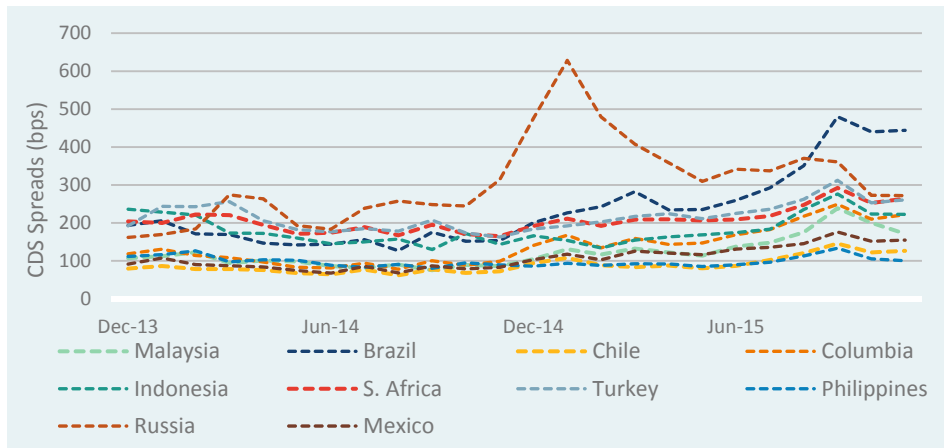


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Fixed income – emerging market debt (hard)

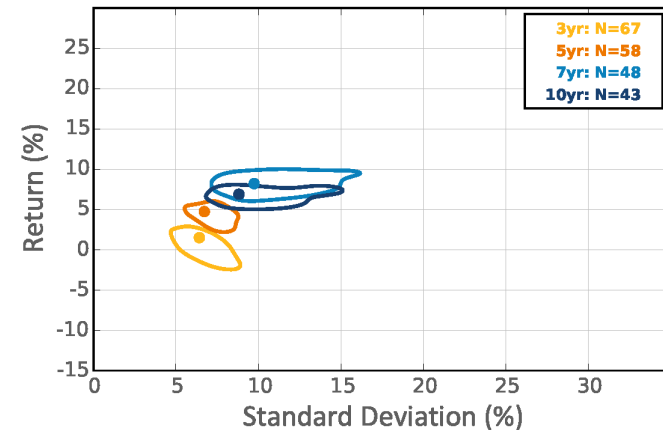
- Managers in the emerging market debt (EMD) hard currency universe have struggled to produce excess returns relative to the benchmark. While over short time periods there has been a negative relationship between risk and return, over longer periods this relationship has flattened out, with little apparent relationship between the returns generated and the risk taken.
- Managers in the universe have historically included off-benchmark exposures to quasi-sovereign and hard currency corporate credits in an effort to increase returns.
- EMD hard currency spread volatility has increased recently due primarily to low commodity prices and concerns about future global economic growth. In addition, concerns over geopolitical risks remain. Concerns also remain regarding the impact from continued rate hikes by the Federal Reserve, and continued U.S. dollar strength.

**EMERGING MARKET DEBT CDS SPREADS**



Source: JPMorgan, eVestment Analytics, as of 11/30/15

**EMERGING MARKET DEBT (HARD)**

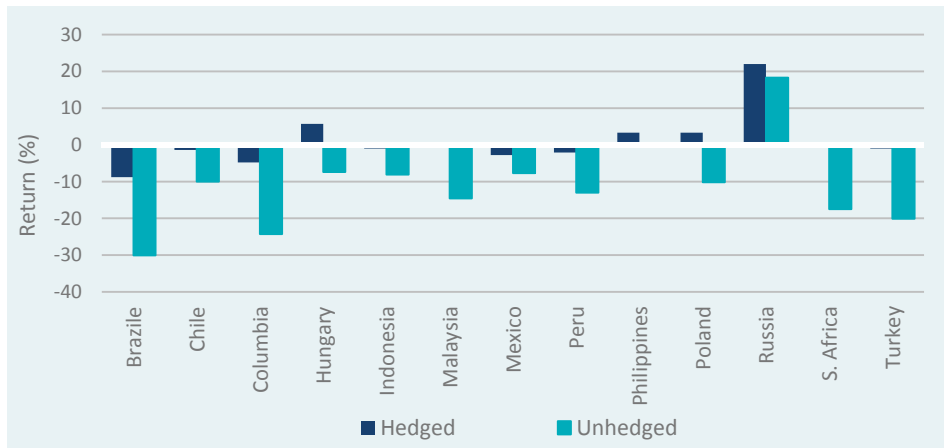


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Fixed income – emerging market debt (local)

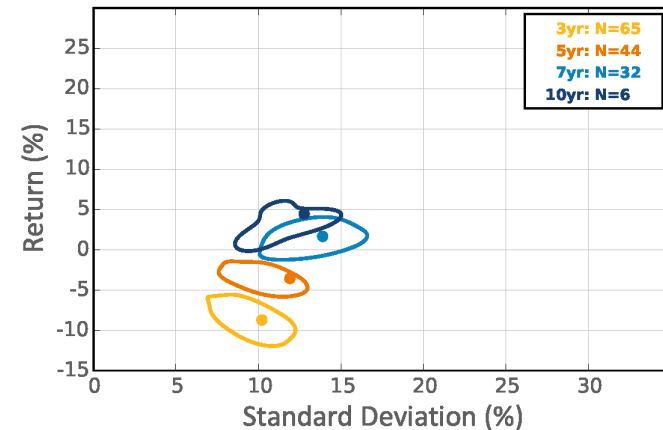
- Over longer time periods there has been a slightly positive relationship between risk and return in the emerging market debt local universe. However, over recent periods managers appear to have reduced risk relative to the benchmark, and have managed to generate excess returns while doing so.
- There remain concerns in this marketplace over rising default risk, the recent appreciation of the U.S. dollar, and timing of Federal Reserve rate hikes.
- Recent performance of the sector has been negatively impacted by the relative weakness in emerging market currencies, continued low commodity prices, and concerns over dampening global economic growth.
- Managers in the space who in the past benefited from taking large exposures to off-benchmark allocations have been negatively impacted as EMD spreads widen.

EMERGING MARKET DEBT COUNTRY RETURNS YTD



Source: JPMorgan, GBI-EM Global Diversified Index, as of 9/30/15

EMERGING MARKET DEBT (LOCAL)

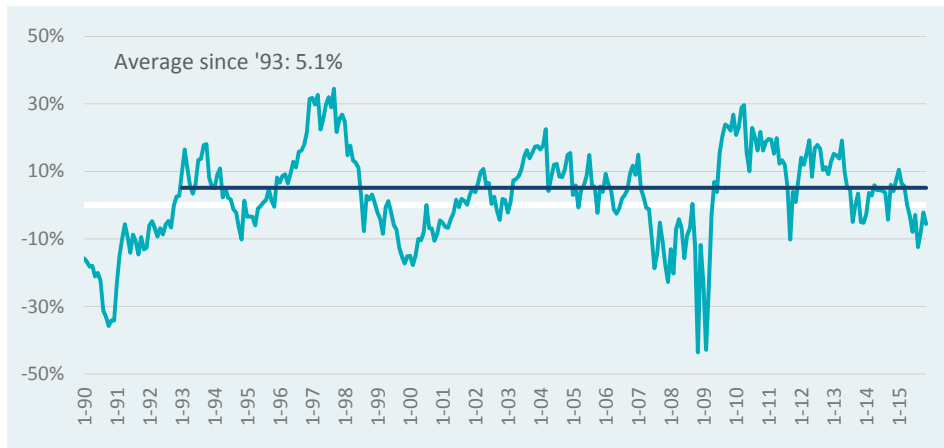


Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# U.S. REITs

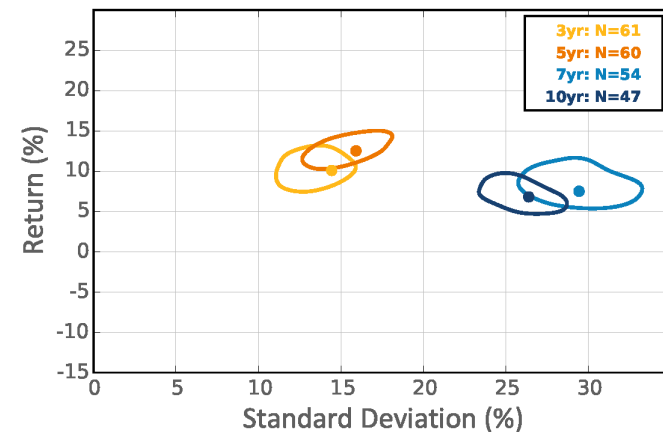
- Active managers have been able to add value and/or reduce volatility over the long term. There remains a relatively flat relationship between risk and return, however, with little evidence that increased risk has generated excess return. In some cases (over the longest time periods) the relationship is in fact inverted. Over shorter time periods, however, managers appear to have been able to generate greater return when taking above market risk.
- Macro forces have recently been a major driver of performance while fundamentals remain generally positive. Uncertainty surrounding rising U.S. interest rates has fueled volatility. However, over long periods of time managers have been able to take advantage of high volatility in REIT valuations, which tend to fluctuate rapidly.
- REITs are typically used to gain liquid exposure to real estate.

## SHARE PRICE PREMIUM TO NAV



Source: Greenstreet, Deutsche Asset & Wealth Management, as of 11/30/15

## U.S. REITS



Source: eVestment. Universe returns have been adjusted for fees and survivorship bias.

# Appendix 1: the new approach

# The active/passive question

The decision of active or passive management is faced by every investor. This problem is characterized by:

- A desire to boil the question down to a simple yes/no decision
- A desire to quantify where possible
- Lots of data to analyze and limited computing power to use
- Difficulties in determining whether manager outperformance was skill or luck
- Identifying the “best” manager is easy, when looking back through time

# Traditional approach to managers

The traditional approach to analyzing active management often involves the following:

- Rank the managers on a single metric (return, for example)
- Pick the manager in the middle of the rank (the median manager)
- Use the properties of that manager to describe the universe

# Traditional approach to managers

Median manager excess return minus expected fees is an oversimplified approach to analyzing managers.

Asset Class	Commingled Fund Fee	Mutual Fund Fee	Median Manager Excess Return	Median Excess Returns NET of Commingled Fund Fees	Median Excess Returns NET of Mutual Fund Fees
US Large	0.65	0.85	0.56	(0.09)	(0.29)
US Small	0.87	1.08	1.26	0.39	0.18
International Developed	0.76	0.96	1.13	0.37	0.17
International Developed Small	0.96	1.09	2.00	1.04	0.91
Emerging Markets	0.95	1.19	1.36	0.41	0.17
Cash	0.11	0.23	0.30	0.19	0.07
TIPS	0.21	0.47	0.07	(0.14)	(0.40)
US Treasury	0.5	0.46	-1.44	(1.94)	(1.90)
Global Sovereign	0.5	0.65	1.18	0.68	0.53
Core Fixed Income	0.33	0.54	0.45	0.12	(0.09)
IG Corp Credit	0.26	0.6	0.65	0.39	0.05
High Yield	0.62	0.73	-0.15	(0.77)	(0.88)
Global Credit	0.54	0.5	0.97	0.43	0.47
EM Debt Hard	0.65	0.79	0.42	(0.23)	(0.37)
EM Debt Local	0.73	0.86	0.09	(0.64)	(0.77)
US REIT	0.67	0.92	1.22	0.55	0.30

Source: eVestment, 10 years ending 9/30/2015



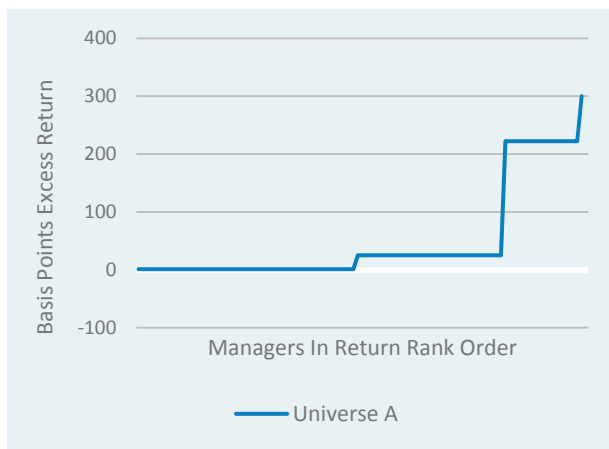
# The problem with medians

Using the median manager to describe the universe can be very misleading. To show why we can create three imaginary universes.

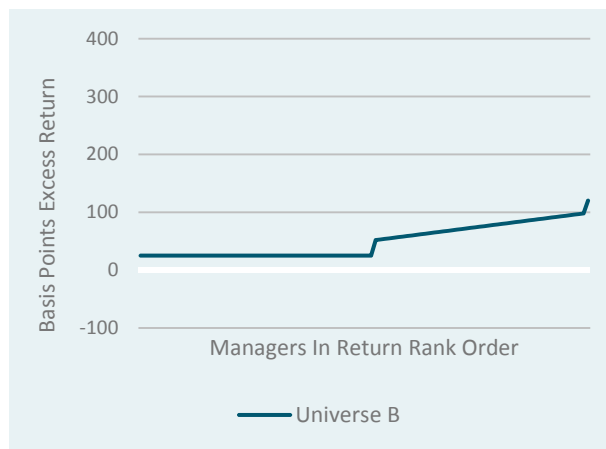
- Each universe has 100 managers
- Each universe has an average excess return of 50 basis points
- Each universe has a median excess return of 25 basis points

Simply using the median manager as a description of the universes would be highly misleading – the median manager in each case would be the same even though the behavior within each of these universes is very different.

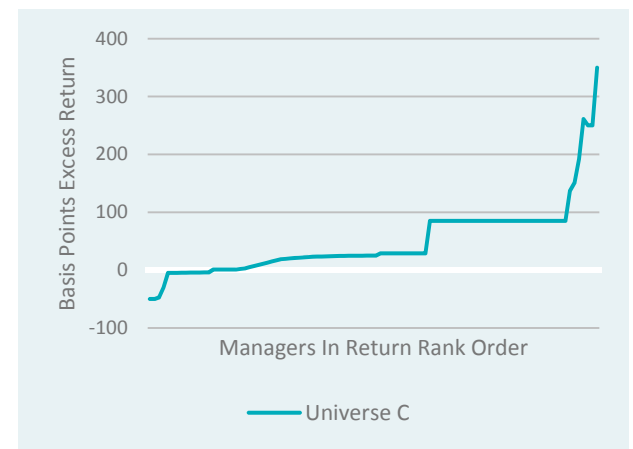
**UNIVERSE A**



**UNIVERSE B**



**UNIVERSE C**



*Representative Data Only*

# Also, investors have different needs

The standard approach effectively assumes all investors behave in the same way towards risk and return. This assumption is flawed.

In reality, investors have different...

- Levels of funding
- Propensity of sponsor to add funds where needed
- Areas of legal authority
- Investment histories
- Board member experience
- Theoretical and practical opinions about investment management

These wide range of differences will by definition mean that investors should approach active management analysis in different ways.

# Alternative approach to managers

The alternative approach to thinking about managers:

- Use the risk and return characteristics of all of the managers in the universe to calculate properties of the universe as a whole
- Plot the output of this analysis to demonstrate the behavior of the universe over time visually

Our goal is, where possible, to move away from using the median manager to describe active management behavior.

# The active management environment

Our work on the active management environment addresses some of the shortfalls of traditional active management analysis. These new insights allow for us to better understand the range of impacts that active management can have on portfolio outcomes.

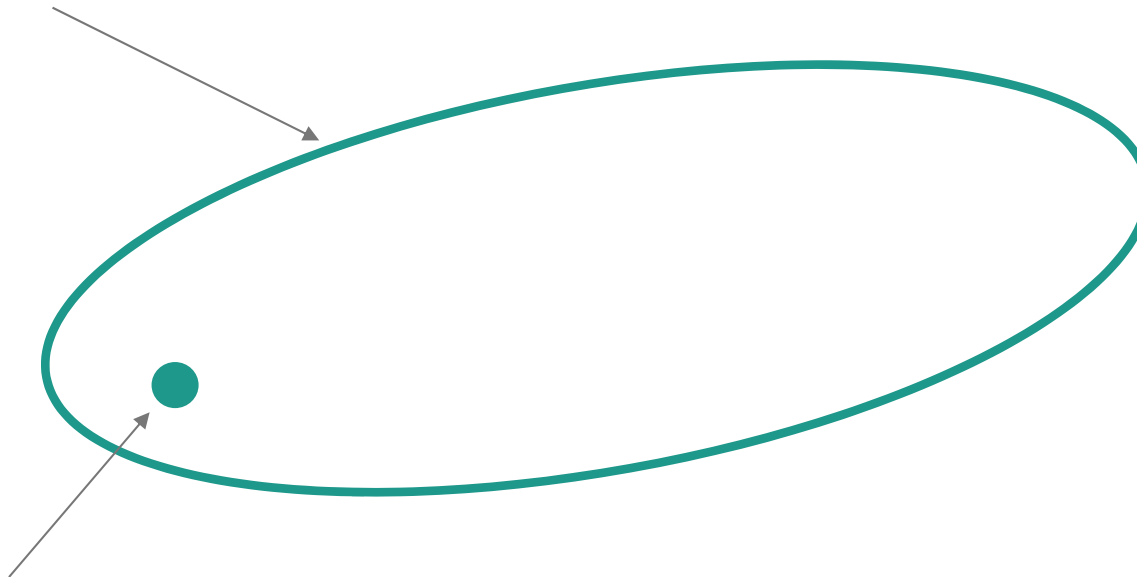
- Even without skilled manager selection there are many cases where active management can help investors achieve better portfolio outcomes in risk and return terms.
- Those better portfolio outcomes may come from additional return or lower risk. Not all investors have the same definition of better outcomes, and the trade-offs facing them vary by universe.
- Adding skilled manager selection to the process can add additional value in portfolio construction.
- Fees remain an important part of the active management conversation. Fees and survivor bias should be taken into account when analyzing active management universes.

Using the median manager to decide whether active management is appropriate can be misleading. This new tool can help investors make more informed decisions.

# How to read a universe chart

The line represents the area where we would expect to find 75% of all of the managers in the universe for the time period covered.

All universe data has been adjusted downwards to reflect the effect of fees and of survivorship bias.



The dot represents the behavior of the benchmark over the period concerned.

The relative positioning of the benchmark compared to the universe area tells us about the possible benefits of active management.

The shape of the probability density function will not be oval in most cases. The size and shape of the area calculated contains important information about the behavior of active managers and the outcomes achieved.

# Some possible scenarios

Active managers were able to add volatility, but rarely were able to generate compensation for that volatility.



Active managers who reduced volatility had to give up significant return to do so.

Active managers were rarely able to produce much more return than the benchmark in absolute terms.



Volatility reduction by active managers resulted in little or no return reduction.

Active managers had opportunities to add return, both at similar levels of volatility to the benchmark and incrementally at higher volatility levels.



Few managers took advantage of the opportunities available to reduce volatility relative to the benchmark.

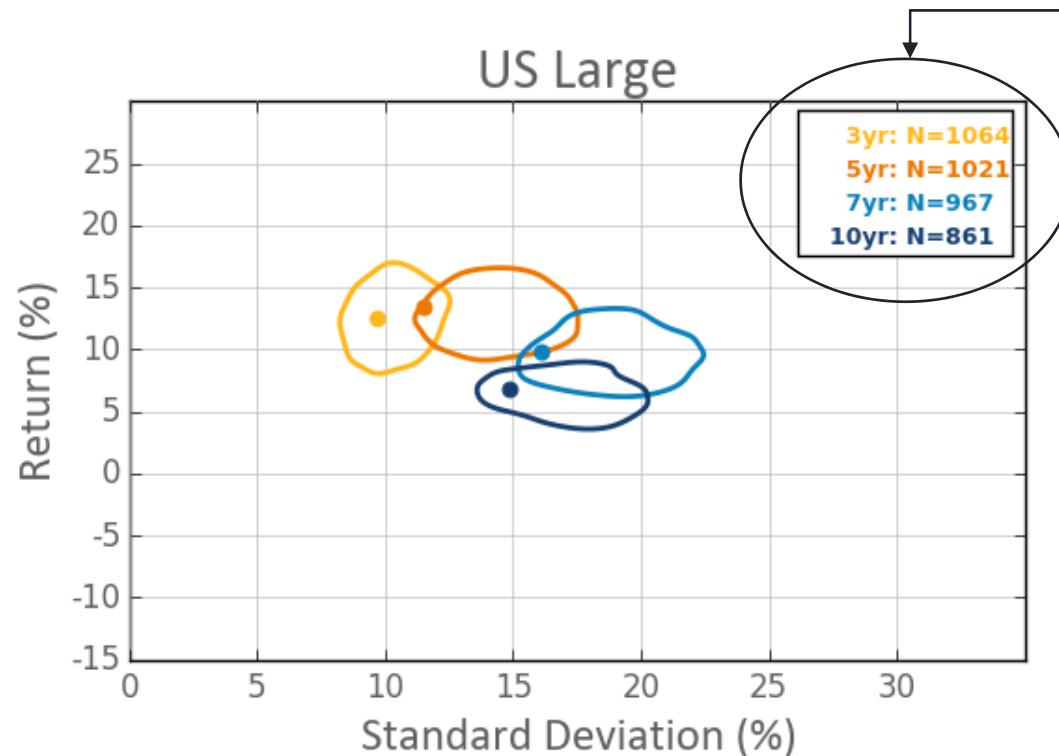
Active managers had significant ability to add return relative to the benchmark at similar and lower levels of volatility.



Most of the active manager universe chose to reduce volatility relative to the benchmark.

# Tracking universes through time

Tracking the behavior of a single universe through time can provide insight into the way that active management has changed in that space over those time periods.



The movement of the universe, the change in shape and of size all provide information about active manager behavior.

The number of products included in the analysis provides insight into the robustness of the analysis.

The relative position of the benchmark relative to the universe may also change through time, representing dynamic structure changes through time.

Throughout this report each asset class universe chart is placed at the same position on the page, at the same size and with the scales of the axes identical. This allows for easy comparison between universes.

# Appendix 2: supporting documents



# Possible investor behaviors

Investors with high risk tolerance and a need for high return might consider significant volatility increase.



Other investors would be more likely to be best served by passive approaches.

Investors prepared to run some downside risk might consider active managers offering modest risk reduction although passive management a good alternative.



Other investors might well choose passive approaches to this universe.

Investors with high risk tolerance might consider active managers with markedly higher risk investment styles.



Investors who would normally invest passively might think about active managers with volatility levels similar to the benchmark.

Investors with at or above market levels of risk tolerance might hire active managers with those strategies in the expectation of higher return.



Other investors might hire active lower volatility managers. Passive management is unlikely to be appropriate.

# Methodological note

As a means of describing the distribution of managers in risk-return space, we estimate joint probability distribution functions (PDF) using manager reported performance. The joint PDF is a mathematical description of the probability of observing a given outcome within some region of risk-return space, such that the integral of the function over all possible outcomes is one.

To estimate the PDF, we assume the reported manager performance numbers represent an independent, random sampling of outcomes from the opportunity set within the asset class considered. While this is not perfectly true, as commonalities in strategy and imitation will lead to clustering, it is a reasonable approximation. We apply multivariate kernel density estimation, which effectively smooths the point-wise sampling of outcomes. We choose the Gaussian kernel density estimator implemented in Python within the SciPy library<sup>1</sup>, where the bandwidth (a parameter governing the smoothing) is estimated by Scott's Rule<sup>2</sup>. This approach is non-parametric and makes no specific assumption about the underlying probability distribution (as opposed to fitting e.g. a multivariate normal distribution).

Probability contours are defined as curves enclosing the designated percentage of most likely outcomes (e.g. the 75% probability contour encloses the outcomes most likely to be observed 75% of the time). We determine these using Monte Carlo integration by resampling the kernel density estimate and iteratively converging the result using the Newton-Raphson method.

1) <http://www.scipy.org/>

2) D.W. Scott, "Multivariate Density Estimation: Theory, Practice, and Visualization", John Wiley & Sons, New York, Chicester, 1992.

# Manager behavior as sampling

## THE TRADITIONAL APPROACH

The concentration on the median manager behavior has historically forced us to throw useful information about universes away. More than that, it has forced us to focus too hard on the specific results that specific products achieved over the particular time period we are measuring.

Doing this forces us to discard almost all the information about all of the products other than those at the median and quartile breaks, and to concentrate in detail on the characteristics of those specific products which happen to fall on those break lines. Those products, however, may provide little useful insight for us to help guide the decision process about use of active management.

This combination of too little information being used about most products in a universe and too much being used about a very small number of products selected simply because of their rank order in the universe is likely to lead to misunderstandings about the nature of active management.

## THE UNIVERSE AS A WHOLE

The alternative approach that we propose in this document, and which will be covered more fully in an upcoming paper, takes a different approach, and uses a tool which is broadly used in the scientific community – the joint probability density function. Details of the

calculation methodology used can be found on page 31 of this document.

What we are trying to do is to produce a description of the universe as a whole: we regard individual products as having no particular value on their own, but simply as random samples from the true universe. No particular portfolio is important in itself, but each portfolio adds a small amount of information about the likely true characteristics of the universe that they represent. Each portfolio is simply a random draw from an infinite universe of active managers in that asset class.

## A GRAPHICAL ANALYSIS

We use this information to plot an area representing the characteristics of the universe on a standard risk-return chart. This area represents the true characteristics of the active management universe – not simply the behavior of one product in that universe. It uses information about all of the managers in the universe and avoids concentrating on any single portfolio. It allows us for the first time to describe manager universes in their own terms, clearly, visually and in a robust fashion.

Maybe the most important characteristic of these ranges is that it provides us with a much clearer view of the investment opportunity set available to investors as a whole. That opportunity set is not a single point on the chart, as represented by a benchmark or a median: it is in fact an area, and for many universes quite an extensive one.

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