Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

FEBRUARY 2020

Active management environment – supporting materials

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	0.55	0.75	(0.15)	(0.70)	(0.90)
US Small	0.85	1.00	1.48	0.63	0.48
International Developed	0.70	0.87	1.26	0.56	0.39
International Developed Small	0.90	1.04	0.94	0.04	(0.10)
Emerging Markets	0.90	1.06	1.36	0.46	0.30
Cash	0.15	0.18	0.28	0.13	0.10
TIPS	0.28	0.41	0.11	(0.17)	(0.30)
US Treasury	0.31	0.54	0.84	0.53	0.30
Global Sovereign	0.45	0.54	1.21	0.76	0.67
Core Fixed Income	0.32	0.45	0.83	0.51	0.38
Core Plus Fixed Income	0.35	0.50	(0.92)	(1.27)	(1.42)
High Yield	0.50	0.70	(0.66)	(1.16)	(1.36)
Global Credit	0.35	0.50	0.52	0.17	0.02
EM Debt Hard	0.60	0.74	0.33	(0.27)	(0.41)
EM Debt Local	0.68	0.85	(0.24)	(0.92)	(1.09)
US REIT	0.68	0.91	0.93	0.25	0.02

Source: eVestment, 10 years ending 9/30/18

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.

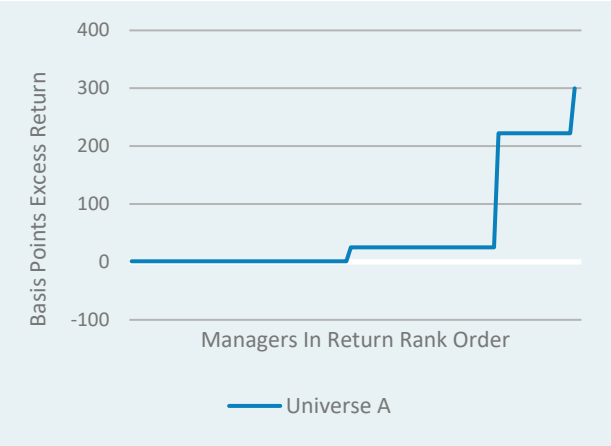
— Each universe has 100 managers

— Each universe has an average excess return of 50 basis points

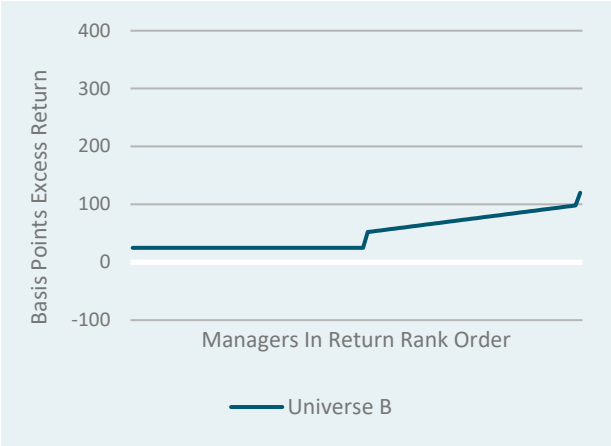
— Each universe has a median excess return of 25 basis points

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.

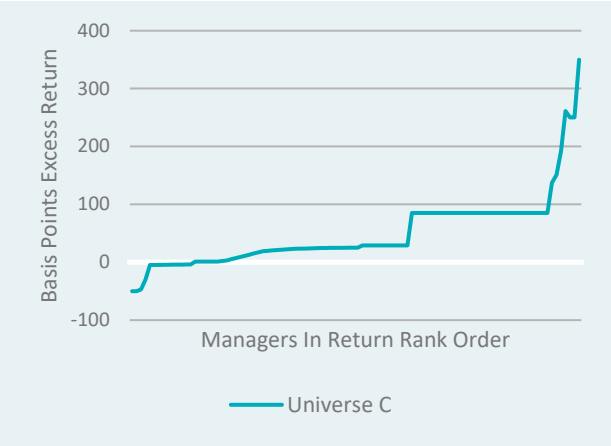
UNIVERSE A



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.

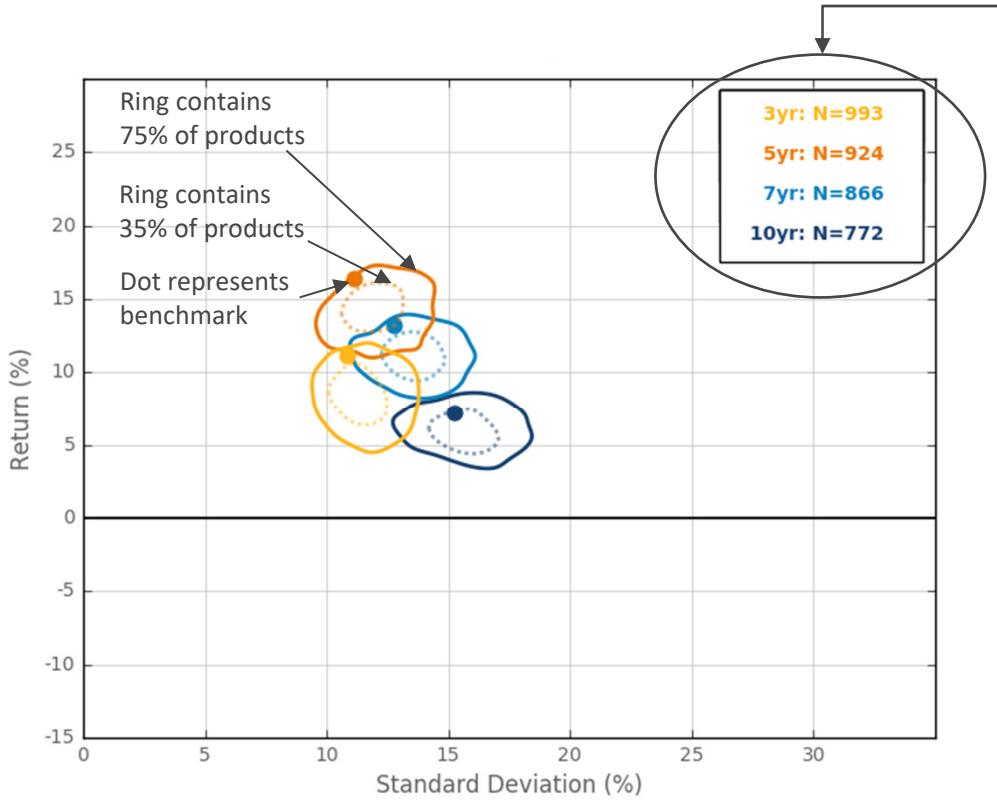
Active managers had significant ability to add return relative to the benchmark at similar and lower levels of volatility.

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 product 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.

Understanding universe charts

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 products 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 products with markedly higher risk investment styles.

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

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

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

Methodological note

As a means of describing the distribution of products in risk-return space, we estimate joint probability distribution functions (PDF) using product 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 product 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 library1, where the bandwidth (a parameter governing the smoothing) is estimated by Scott's Rule2. 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-Rhapson method.

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

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

Product behavior as sampling

THE TRADITIONAL APPROACH

The concentration on the median product 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.

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 products 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 products in the universe and avoids concentrating on any single portfolio. It allows us for the first time to describe product 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.