I have certainly had my share of verbal altercations while debating about alpha. What I propose to show in this article is that, as it is currently defined, there really is no positive alpha, or perhaps more importantly, that positive alpha, as it is now presented, has no meaning. While a manager or investor might invest and create a positive return on the assets invested, no manager or investor over time actually provides any excess return compared with the market.

This presents a fundamental issue because investment managers constantly are waving their alphas around, making claims that confuse investors, even professionals. I hope that this article forms the beginning of a debate, albeit an aggressive one, that ultimately will lead to a fundamental change in the way managers and their results are viewed and measured in the future. I hope that this article contributes to the enhancement of investment consulting.

Alpha often is considered to be the “value” that a portfolio manager adds to or, in the case of negative alpha, subtracts from a fund’s return. In essence, alpha is the incremental difference in return between a manager’s actual result and the expected result given the “level of risk” as determined by the beta of the portfolio.

The larger the alpha, the greater the value a manager of a portfolio is presumed to have offered through active management.

Jensen's formula for calculating alpha is as follows:

$$\alpha = R_p - [R_f + \beta_p (R_m - R_f)]$$

(1)

where

- $R_p$ is the return of the portfolio
- $R_f$ is the risk-free rate
- $\beta_p$ is the beta of the portfolio
- $R_m$ is the return of the market

Alpha, as defined above, refers to price-adjusted volatility; that is, performance returns that exceed the market, adjusted by the volatility of the portfolio’s beta compared to the market’s beta, which is defined as 1.

Invariably the return of the market is a benchmark used to assess the performance of an asset manager. It is usually an index that is believed to most closely represent the investments contained within the portfolio being measured.

But regardless of how similar the benchmark index is to the portfolio, unless they are identical there is an issue of validity.

Equation 1 suggests a fundamental problem with alpha as an assessment tool. The operative term in equation 1 is $R_m$, the expected return of the market. But what is the expected rate of return of the market? And which market? Are we talking about the whole world, or just the S&P 500, or maybe the Russell 1000, or the Dow Jones Industrial Average (DJIA), or perhaps the EAFE (the MSCI Europe, Australia, Far East index)? Table 1 shows the year-to-date figures as of December 31, 2010.

<table>
<thead>
<tr>
<th>Index</th>
<th>YTD December 31, 2010</th>
<th>10-year Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P 500</td>
<td>+15.10%</td>
<td>16.31%</td>
</tr>
<tr>
<td>DJIA</td>
<td>+11.02%</td>
<td>15.58%</td>
</tr>
<tr>
<td>Russell 1000</td>
<td>+16.10%</td>
<td>16.52%</td>
</tr>
<tr>
<td>EAFE</td>
<td>+7.80%</td>
<td>18.57%</td>
</tr>
</tbody>
</table>

While the domestic market indexes in Table 1 are similar in that all are large-cap core, they are dissimilar enough to result in different year-to-date rates of return (and standard deviations). Interestingly, the DJIA is contained within the S&P and the Russell 1000, and the S&P 500 is essentially contained within the Russell 1000.

Incorrect Presumptions

Accordingly, I respectfully suggest the formula used to define alpha uses two incorrect presumptions, and when a portfolio is normalized for these two presumptions, alpha disappears.

Recall that returns for all asset categories eventually will revert to the mean, so management and overhead costs necessarily force returns to come in below the mean. The eventual mean reversion in asset categories, coupled with management and overhead costs, necessarily forces returns less than the mean.

My business partner challenged me on this assertion.

"Suppose my index is the S&P 500, and I only buy five stocks at a time," my business partner said. "You are telling me I am going to revert to the mean of the S&P?"

"If you only bought and sold five stocks at a time, especially if you held each for more than a year, it would take me a very long time to prove my point," I said. "But the longer you trade within an index, the greater the probability that you would approach the long-term mean of that index."

I’m not sure that he found this argument persuasive.

The smaller the universe used for this example the easier it is to see the point. I was obliged to come up with a better illustration. Let’s say we have a manager who is limited to the 30 DJIA stocks and that he can buy only within that stock universe.

If he owned all 30 stocks, he essentially would be the DJIA (for this example weighting is ignored).
When this manager’s management and transaction costs are subtracted from his returns, he underperforms the average. According to modern portfolio theory, if he buys his stocks piecemeal, picking and choosing among the 30 stocks, he will buy and sell, and buy and sell, and over time he should revert to the average of the index, from which the cost of his overhead must be deducted, again causing him to underperform the index.

Statistically, it is possible for a manager to get lucky and beat the average for a time, but mean reversion eventually would bring him in line with the average, because that is what mean reversion does.

So how do managers beat their benchmarks? They “style drift”—they buy stocks that are not within their indexes. Effectively they cheat.

So one has to ask the following question: Is it fair to compare a manager who has maintained the integrity of a fund and remained within the benchmark to another who has chosen to try to improve returns by buying outside of the benchmark?

I suggest no. Attribution analysis purports to weed out the difference between luck, timing, and stock selection. But I suggest that, just like alpha, any excess to be attributed must be deducted, again causing him to underperform the index.

A Thought Experiment

Unless a manager has a portfolio that is identical to an index, how does one measure two portfolios that are inherently different? The less identical they are, the less meaning that can be attributed to that measurement.

An equitable benchmark must be an index that really represents the holdings contained within it. What does that mean? The answer has to be a custom benchmark. Hence the portfolio itself becomes the benchmark, for that is the only thing that truly represents the holdings contained within it.

And using this most-accurate benchmark, positive alpha disappears. So there is no alpha (or rather, no positive alpha, only negative alpha).

Let’s test this presumption by assuming a model portfolio that returns 8 percent gross before fees, transaction costs, and expenses, and a risk-free rate of 0.12 percent.

Plugging these values into equation 1,

\[ \alpha = R_p - [\beta_i (R_m - R_f)] \]

we get:

\[ \alpha = 8 - [0.12 + (8 - 0.12)] \]

\[ \alpha = 8 - [0.12 + (7.88)] \]

\[ \alpha = 8 - 8 \]

\[ \alpha = 0 \]

Remember, we have yet to subtract transaction and asset management costs, which render the portfolio return below the gross return. Positive alpha is defined as the excess return above the expected return. Hence there is no positive alpha. Try this yourself, with whatever numbers you like. If the numbers truly represent the portfolio you are trying to measure, there should never be positive alpha because your benchmark is your portfolio. If there is positive alpha, you have done something incorrectly.

Likewise because there no longer can be anything to “attribute” to excess returns, except luck, attribution analysis becomes a fruitless exercise.

So for those who ask why I presume that the beta of the portfolio should be 1, I answer: “For the same reason that the return of the market cannot use a dissimilar index to compare portfolios, the beta of a dissimilar index cannot be used to create the measuring beta, and because the beta of the portfolio is a term in the equation for calculating alpha, if it is inaccurate it must lead to an incorrect result.

Epiphany

Back in the late 1990s in my pre-CIMA days, I bought a technology mutual fund with a beta less than 1. Even the glossy sheet that explained all about the fund said it had a beta less than 1. In my ignorance, I presumed that it was referring to the beta of the S&P. I learned that betas can be deceiving.

As the fund went down in late 2000—and down and down and down—I decided one day to phone the fund company and ask, “How come this fund is dropping so much more than the S&P? I thought its beta was only 0.8.” There was a slight pause before the polite voice on the other end said: “Compared to the technology index, its beta is 0.8. The beta used to measure this fund isn’t the S&P 500’s.”

What an epiphany.

First and foremost, the beta of each index is always 1, because its volatility is measured against itself. The volatility of the S&P measured by the 10-year standard deviation (16.31 percent) is not the same as the volatility of the EAFE measured by the 10-year standard deviation (18.57 percent). But beta is the beta of the index, and the beta of the S&P is 1, the beta of the EAFE is 1, the beta of the DJIA is 1, and the beta of the Russell 1000 is 1.

Equation 2 is one formula for calculating beta.

\[ \beta_i = \frac{\sigma_i (\rho_{im})}{\sigma_m} \]  

where

\[ \beta_i \] is the beta of the index being measured
\[ \sigma_i \] is the standard deviation of what is being measured
\[ \rho_{im} \] is the correlation with the market
\[ \sigma_m \] is the standard deviation of the market

For an example, let’s do the beta of the EAFE. It equals the standard deviation of the EAFE (18.57) times its correlation with itself (1), all divided by the standard deviation of the market (18.57), or 1. The beta of the EAFE is 1.

The fact that a portfolio is composed of stocks within an index does not mean that the characteristics of that index accurately represent the portfolio. Just look at the year-to-year
date numbers of the DJIA, the S&P 500, and the Russell 1000 in table 1. The more securities in common between the portfolio and the index, the greater their similarities and the closer their correlations, until the point is reached where the portfolio actually incorporates all of the securities in the index and their weighting, at which time the portfolio actually is that index. But before that point, the more dissimilar they are, the less representative the index.

A Replacement for Alpha

If alpha is meaningless as a value for comparing managers, is there an alternative? I believe the answer is yes.

A fairer method might be to categorize each manager based upon risk-adjusted returns. I’m not suggesting the Sharpe, Sortino, or Treynor ratios. How about Modigliani? The formula for Modigliani (Franco and Leah, hence Modigliani “squared”) follows:

\[ M^2 = [1 – \frac{\sigma_m}{\sigma_p}] \times \text{[T-bill return]} + [\text{om}]/\text{[actual return]} \]

where 
- \( \sigma_m \) is the standard deviation of measuring index
- \( \sigma_p \) is the standard deviation of the comparative portfolio

Equation 3, like equations 1 and 2, uses the standard deviation of a measuring index (a market). I find it works best, however, to substitute a manager’s standard deviation for the standard deviation of the index. I call this modified \( M^2 \) just “M.”

The computation normalizes the two portfolios and shows the comparative return of one manager when the return is adjusted to reflect the same risk (standard deviation) as the other. Whichever has the highest risk-adjusted return wins (at least this round). Several competing managers can be placed on a matrix using the same formula.

This method works with any index and any portfolio because it is always expressed in the same terms—return per unit of risk. It works because it no longer matters how much style drift is present in a manager’s portfolio.

I believe M is a fair method of comparing portfolios. I suggest managers be ranked against their indexes or each other by putting them in a common matrix with their returns along the X axis and their standard deviations along the Y.

By equalizing their standard deviations, we find out which has the better net risk-adjusted performance. This creates a snapshot that does not imply a forecast for results of future investing, but for me it is the best way to compare different portfolios in a dynamic investment universe.

I generally like the Sharpe and Sortino ratios because they adjust for standard deviation as a measure of volatility, but I have an issue with their incorporation of the risk-free rate, especially for portfolios that contain a fair percentage of foreign issues because the risk-free rate varies around the world and makes it hard to make comparisons. A standardized risk-free rate would lead to a better comparison.

Perhaps rather than using risk-free rates of return M should use absolute return adjusted to similar standard deviations.

The Treynor ratio has its own set of issues due to problems with beta, discussed above. The Treynor ratio is the return on the investment minus the risk-free rate, all divided by the portfolio’s beta.

The problem with the Treynor ratio is that a portfolio’s beta cannot be correctly derived from an index that is inherently different from itself and by definition equals 1. This reduces the Treynor ratio to the return minus the risk-free rate, which is a worthless result. (It subtracts the risk-free rate the same way the Sharpe and Sortino ratios do.)

An alternative for those who cannot accept a world without alpha would be to redefine alpha.

This new alpha could be the excess return after portfolios are adjusted (normalized) to reflect an identical standard deviation. New alpha would be the risk-adjusted “bonus.” This does not suggest that any particular manager continuously would outperform his peers; new alpha would merely reflect the risk-adjusted performance history of a given manager. I suggest that comparing risk-adjusted returns offers more comparative validity on an historical basis.

The advantage of using M is that much of the financial universe would be subject to the same conditions, such as in the case of the 2007–2009 decline; hence M would allow for reasonable comparison of portfolios that have the same investment history. Certainly standard deviation has its faults. But skewness, fat tails, and other nonnormal distributions often are caused by datasets that are too small. Abnormalities tend to disappear over longer time frames and larger datasets.

Other Implications

A number of performance measurement tools should be challenged as to their value and validity, namely any involving an equation that incorporates the use of the return of the market \( (R_m) \), beta of the market \( (B_m) \), or beta of the portfolio \( (B_p) \). Performance measurement can be improved and made more accurate if standards are applied equally in the measurement.

Two examples are tracking error and information ratio. Tracking error is the annualized standard deviation of monthly excess returns. Information ratio is the average excess return difference between a portfolio and its benchmark divided by the standard deviation of the excess return.

I suggest, however, that there are no excess returns upon which to compute standard deviation for tracking error or to compute the information ratio, so the formulas produce dubious results.

Where Do We Go from Here?

I realize that not everyone will agree that positive alpha does not exist. Some readers assuredly will continue their attempt to beat the market.
Comparing two or more portfolios is best done by equating them on the basis of volatility (standard deviation) and seeing which produced the higher return. Then our value as investment consultants, fund managers, or CIMA certificants should not be derived from trying to beat some abstract index. We must recognize that much of the investment process is beyond our control.

We can, however, provide added value for our clients by seeking to reduce portfolio volatility through proper diversification and striving to produce the highest possible return for the lowest possible risk.

While ours is a dynamic objective—one that is always changing—our efforts will increase the probability of investor success, which in turn will lead to better outcomes. Our worth must be measured by those outcomes, not in alpha.

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Disclaimer: The views represented in the article are those of the author and do not reflect the views of UBS.

References


Conclusion

Commodity equities represent a broadly diversified investment in global growth, especially growth due to emerging markets. They do not require continued increases in commodity prices to be profitable. Natural resource equities won’t enhance returns over a commodity futures index or be correlated to the index. Rather, commodity equities are moved by the same factors as underlying commodity prices but represent a nuanced, diversified way of benefiting from supply-demand imbalances.

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Endnotes

1 Some investors do hold gold coins, and undoubtedly somewhere, someone is holding a gold bar or two in a safe deposit box. In some countries, notably India, people use gold jewelry as a form of savings. Gold is the only market where this practice is possible due to its high price per ounce.

2 The mechanics of settling futures contracts is more complicated than described here. However, the required transactions take place at the brokerage and clearing houses and are not material to this discussion.

3 Goldman Sachs indexes were used here, but any method of showing the spot and near-contract futures prices would look about the same.

4 Some markets show an undulating pattern. Because CLFs typically invest in the near-term futures contract, contango is defined here based on such near-term relationships, even if the markets revert to backwardation in the more distant future.

5 This could be a mutual fund, an exchange-traded fund, or a structured note.

6 Dow Jones-UBS Commodity (DJ-UBS) Index is designed to be a highly liquid and diversified benchmark for the commodity futures market; it comprises futures contracts on 19 physical commodities. The S&P Goldman Sachs Commodity Index (GSCI) contains as many commodities as possible, with rules excluding certain commodities to maintain liquidity and investability in the underlying futures markets. The GSCI comprises 24 commodities including energy products, industrial metals, agricultural products, livestock products, and precious metals.