

STANDARD DEVIATION S

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Portable Alpha: Beta & Alpha - Both Important, Totally Different Great Together

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Conventional wisdom often differentiates Alpha from Beta by defining Alpha as “skill-based” as opposed to market-based return. While Alpha is typically generated by the skill of the manager, there are other fundamental differences between Alpha and Beta. The purpose of this paper is to describe the benefits of harnessing not only the manager skill, but importantly, the math of risk management to combine dependable portable Alpha strategies with Beta driven appreciation.

Beta (Market Returns)

Beta, or market returns, are generated by the fundamental growth of populations, economies and wealth. Depending on the time frame, Beta has been a dependable source of 5-7% real return over long periods (20 years or more) of time. There has been no correlation between market volatility and return. In fact, periods of low Beta volatility can be exceptionally profitable (late 1990's) and high standard deviations may accompany major downdrafts. Investors in Beta measure returns relative to Index performance.

Alpha (Returns on Risk)

Alpha returns do not benefit from underlying growth factors. Absolute returns are generated from skill-based risk-taking. Volatilities and correlations between securities and derivatives employed in the generation of Alpha determine the range of potential return. By applying the math of risk management to measure the sources of Alpha, one can focus the benefits of Alpha to make them transportable. The necessary tools are based on measurable and manageable elements of market risk that drive Alpha returns. Tools that measure resulting returns based on risk, such as Sharpe ratios, are appropriate benchmarks for Alpha performance.

Why Transport Alpha?

Since the turn of the century the combination of high equity volatility and poor returns has pushed institutions to examine “Portable Alpha” as a means of enhancing “Beta” investment performance. The application of portfolio theory to reduce pure Beta dependence while stabilizing volatility has become an important focus for investors seeking greater consistency.

Portable Alpha

Increasingly, investors are taking advantage of the mathematical benefits of adding Alpha strategies to benchmark returns. Access to reliable benchmark Beta has become widely available and efficiently priced to accommodate portfolios of sizeable proportions. Creating Alpha is complex. Making it transportable adds further challenges. Alpha is most efficiently transportable *when managed to a stable level of risk and dependably low correlation to Beta*.

Once the Beta has been selected, it is up to the investor to employ a completely different tool box and skill set to insure the Alpha selected will remain sufficiently portable, i.e. dependable and uncorrelated, to enhance portfolio performance. The stability of diversification and volatility can be just as important as returns for the combined portfolio. A properly designed portable Alpha program can be constructed and managed to reliably mitigate risk and improve portfolio returns.

When Alpha Creation Becomes Portable

The risk of an index, whether in equities or in fixed income, varies greatly. The large second derivative of volatility (the volatility of volatility) and a relatively low Sharpe ratio are the price the investor pays for the strength of the underlying, if not always readily apparent Beta returns. Controlling volatility is difficult and therefore too expensive to be practical. But risk does not drive Beta returns, so allowing it to vary has little to do with Beta return. Once the investor chooses an index to capture the underlying Beta return, the key to combining with an Alpha strategy is to manage the manageable part, the risk-dependent Alpha. The investor

has to be certain to avoid adding to the risk in the already uncontrollable Beta component and be sure to add stable Alpha to provide consistent benefit.

The most often considered Alpha generator for an equity portfolio is an equity long/short strategy such as “market neutral” or long/short sector funds that sell low correlation to the indices and absolute returns. One of the major problems with the long/short alternative is that there has been an unusually large and growing amount of Beta in equity hedge fund returns over the past couple of years. Broadening the scope of long/short Alpha strategies to incorporate a wide array of markets and approaches can mathematically stabilize the Alpha performance and improve the level of success.

We will review the opportunities for a Beta investor who wants to improve performance, both in terms of total return and consistency. The necessary components for a dependable source of Alpha include strategies that provide:

- **Consistent risk diversification**
- **Stable volatility**
- **Risk-adjusted returns significantly higher than the Beta benchmark.**

Note the words, “dependable,” “consistent” and “stable.” There is far too much portfolio design and management discussion required to cover absolute return strategy management for the focus of this paper, so we will rely on an assumption of active, competent risk management to generate the raw Alpha component. Here we will cover the reasons why managing the Alpha to the three objectives above are essential in creating Alpha that is *transportable*.

Managing Alpha Risk

Starting out without the benefit of the long term growth of Beta means managing investments against a benchmark of pure risk and requires a highly specialized skill set. **Managing risk is a process of defining ranges of outcome before the occurrence (ex-ante). Alpha strategies depend on risk for return. The expected ranges of volatility (volatility of volatility) and ranges of correlation (volatility of correlation) can be accurately measured and used in constructing sound transportable structures. Well diversified portfolios of multiple buckets of hedge fund strategies can be managed to conform to tight ranges of volatility and correlation.**

Steps To Implement Portable Alpha

To create a combined Alpha and Beta portfolio, an investor needs an absolute return strategy manager with a complete risk management tool kit. The manager must manage the portfolio of widely diversified absolute return strategies in a manner that stabilizes the Alpha component. The most reliable source

of absolute return is a widely diversified portfolio of hedge fund strategies.

Because the nature of hedge fund returns and their correlations change over time, the Alpha manager must actively manage risk allocations and hedge fund selections to reach the following objectives:

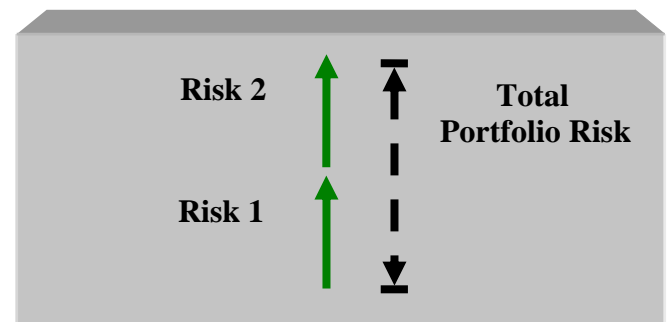
- 1) Stable volatility
- 2) A low correlation to the index used for Beta
- 3) A high Sharpe ratio

The manager should have a proven record in measuring and achieving success in all of the above.

Risk vectors are a helpful tool in measuring Beta and Alpha risks and correlations. The length of each line shows the amount of expected volatility. The angle created by the intersection of the two lines shows the correlation of their risks.

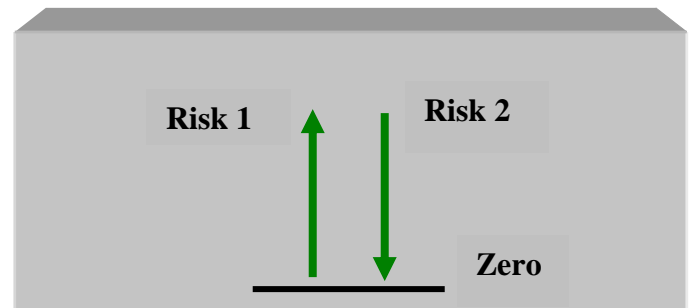
If we observe the risk of a portfolio comprised of a combination of two perfectly correlated risks that are both long investments, the combined vectors are double the original volatility. Returns are also doubled, in both positive and negative directions.

Vector Series I



If the portfolio comprises one long and one short vector of perfectly correlated risk, the result is zero volatility, and zero return:

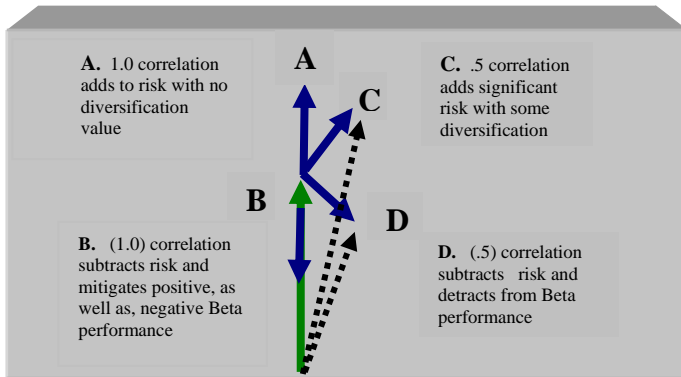
Vector Series II



When we add Beta and Alpha where the Beta is an equity index such as the S&P 500, we can expect the Beta volatility to be larger than that of the Alpha. When Alpha

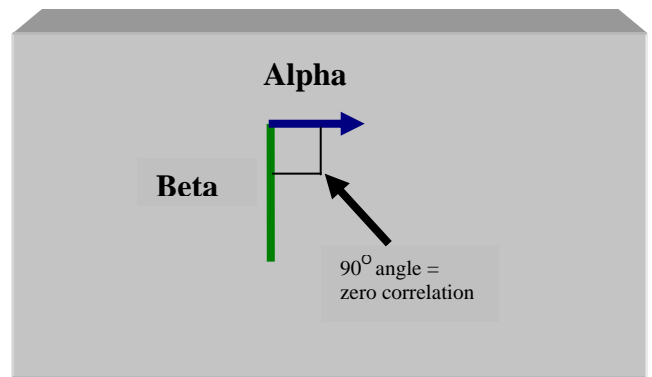
correlation is not properly managed, the vector angles swing against the Beta, creating undesirable shifts in Alpha + Beta portfolio risk as shown by the length of the dotted lines below.

Vector Series III



The object of Portable Alpha is to hold the right angle of zero correlation to the Beta vector and hold the length of the Alpha vector constant at a selected target level as shown below.

Vector Series IV



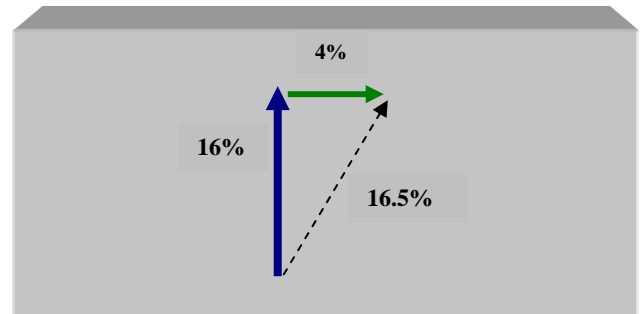
A typical long/short equity Alpha strategy contains sufficient "Beta" to show a correlation of .5 or higher. The table below shows the results of adding an Alpha strategy with .5 correlation to the Beta (see vector C above). If one assumes a Beta Sharpe ratio of .3 and an Alpha Sharpe of 1 the result is an increase in standard deviation from 16 to 18.3%.

When the Alpha holds to a perfect zero correlation, mathematics produce desirable results as shown in the S&P 500 example below:

Statistical Table A

	BETA	ALPHA	PORTFOLIO
CORRELATION	1	0.5	0.9
VOLATILITY*	16%	4%	18.3%
EXCESS RETURN OVER LIBOR	4.8%	4%	8.8%
SHARPE	0.3	1	.48

Vector Series V



We can constrain our Alpha and Beta portfolio to a maximum risk tolerance of 0.5% increase in volatility over the Beta benchmark. Using a portfolio risk budget of 16.5%, the 0.5 correlation drastically reduces the amount of Alpha exposure we can employ for the portfolio from 4% to 1%. The return increases from 4.8% to 5.8% as shown below.

The Beta + Portable Alpha portfolio generates a volatility level only slightly higher (16.5%) than the S&P (16%) and uses maximum diversification benefit to enhance the return and Sharpe Ratio of the portfolio.

Statistical Table B

	BETA	ALPHA	PORTFOLIO
CORRELATION	1	0.5	0.9
VOLATILITY*	16%	1%	16.5%
EXCESS RETURN OVER LIBOR	4.8%	1%	5.8%
SHARPE	0.3	1	0.36

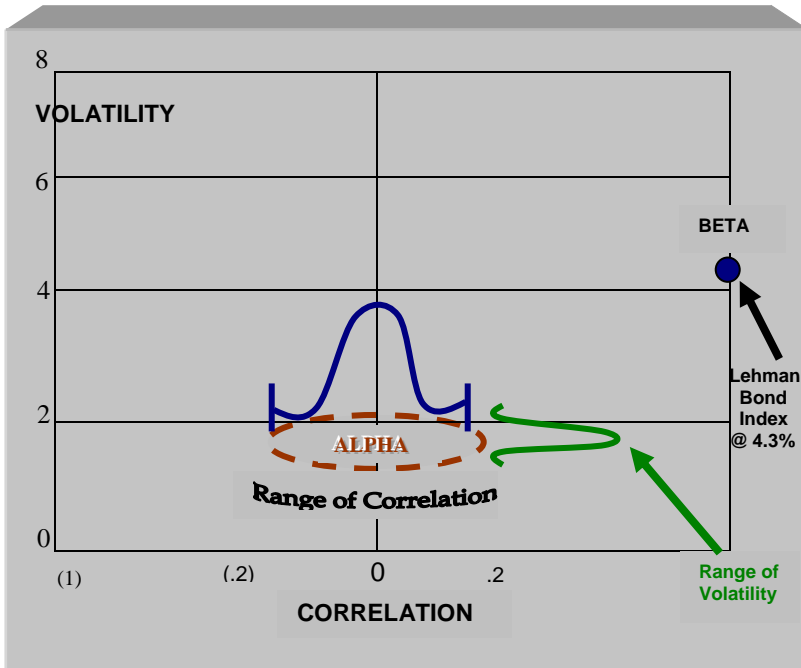
* $\sqrt{A^2 + B^2 + (2AB) \times \text{correlation}}$

Statistical Table C

	BETA	ALPHA	PORTFOLIO
CORRELATION	1	0	0.8
VOLATILITY*	16%	4%	16.5%
EXCESS RETURN OVER LIBOR	4.8%	4%	8.8%
SHARPE	0.3	1	0.53

The S&P Example shows the significant increase in return from 4.8 to 8.8% for almost identical risk of the blended portfolio. The benefit of the Portable Alpha Combined Portfolio is driven by the improved Sharpe and low correlation of the imported Alpha. Return is not only more reliable, but 300 basis points higher than the .5 correlation shown in Table B.

FERRELL Heat Map SM



The FERRELL Heat Map shown above summarizes the characteristics of Alpha that is completely portable. The vertical axis represents the level of volatility and the horizontal scale shows range of volatility from correlation (-1) to 0 to +1 against the Beta Index.

The Beta strategy, in this case the Lehman Bond Index, rests at the 5 year average of 4.3%. Since the Lehman Index has a correlation to itself of 1, it stays locked at the far right of the Heat Map.

The Alpha Strategy should be managed within tight limits of volatility. In the example shown above the Alpha standard deviation varies only from 1.7% - 2.1%. The Alpha Strategy correlation will necessarily vary over time, but the portfolio should be managed to hold the range of correlation that maintains the powerful diversification value. The example shows an Alpha Strategy managed to maximize its diversification impact within a narrow (.2) to .2 average range.

The bell curves applied to the “flying saucer” shape of the Alpha performance characteristics provide the statistical probability of stable performance. An Alpha portfolio that maintains the Heat Map pattern shown above will greatly improve Beta performance.

Portable Alpha Implementation

In starting a program, an investor may choose to set up managed accounts and provide margin for futures exposure to the selected index. Alternatively, total rate of return swaps can be used. These sometimes necessitate the establishment of a special purpose vehicle (SPV) but often provide lower maintenance over time.

After the Beta exposure Index and Alpha “engine” are selected, creating the Portable Alpha construct requires the following steps:

1. Choice of “tools used” to gain Beta exposure
2. Negotiation of terms
3. Legal and Accounting documentation
4. Operational maintenance
5. Ongoing risk management
6. Portfolio rebalancing
7. Reporting
8. Performance analysis

Investors may choose to employ the services of a trusted consultant to select the appropriate talent required to implement a combined Alpha/Beta portfolio. However, the financial engineering skills required to manage a Portable Alpha strategy are also suitable to structure and manage the combined Alpha/Beta portfolio. The one-stop-shopping approach enables the manager to control the entire process and reduces the cost of multiple participants.

*
$$\sqrt{A^2 + B^2 + (2AB) \times \text{correlation}}$$

The cost of establishing the Beta Index exposure varies according to the liquidity of the Index and the availability of a swap counterparty seeking to offset existing exposure. The manager should be totally objective in order to select the most cost efficient providers of swaps and futures options with minimum slippage. The appropriate options to fine tune the program for the optimal benefit of each investor is naturally path dependent. Operational stages 3-8 should be customized to suit individual client requirements.

Summary

If the investor can find an Alpha strategy that is truly “portable” and the manager with the ability to manage the combined Alpha + Beta portfolio then the benefits of lower risk and more predictable ranges of investment performance can be achieved. The investor will end up with an optimal Alpha component that will reliably provide a cushion to Beta volatility and a positive return component to enhance return while maintaining exposure to the long range Beta growth.

FOR QUESTIONS OR COMMENTS ON THIS ARTICLE OR MORE INFORMATION ON PORTABLE ALPHA MANAGEMENT PLEASE CONTACT: REBECCA L. HAYWARD – DIRECTOR OF MARKETING
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