



INDEPENDENT FIDUCIARY SERVICES, INC.

Portable Alpha
Theory, Mechanics, Risks,
Implications and Applications

“In my ideal world, pension fund managers would have all Long/short (market-neutral) managers (who have shown they can add value), and then do their asset allocation with index funds or derivatives, or both.”

- Dr. William F. Sharpe

Jonathan P. Horgan, CFA, CAIA

Portable Alpha: Theory

The Capital Asset Pricing Model (CAPM) is typically used to decompose the total return of an investment into three principal elements: the risk-free rate, a beta (β) component, and an alpha (α) component. CAPM is represented by the following formula:

$$\mathbf{R} = \mathbf{r}_f + \beta (\mathbf{R}_m - \mathbf{r}_f) + \alpha$$

CAPM states that the return of an investment is equal to the sum of the risk-free rate (\mathbf{r}_f), a volatility-adjusted market risk premium [$\beta (\mathbf{R}_m - \mathbf{r}_f)$], and an error term (α). Beta is the return from bearing **market risk**, while alpha is the return from bearing **active risk**, or risk in excess of the market. Beta can also be thought of as a standardized measure of systematic (non-diversifiable/market) risk, where a beta above one ($\beta > 1$) implies risk greater than the market, while a beta below one ($\beta < 1$) implies risk less than the market. Alpha can also be thought of as the residual, or excess return, relative to a benchmark, and it can be either positive (pure skill or chance luck) or negative (no skill). Finally, beta is considered abundant and inexpensive, while alpha (if pure skill) is considered scarce and costly.

Market efficiency is not uniform across the capital markets; large-cap stocks are generally considered to be an alpha “barren” market segment, while small-cap stocks are generally considered to be an alpha “fertile” market segment. Nevertheless, acquiring alpha by targeting a specific market segment may prove futile, as alpha fertility is variable and alpha capacity is finite. Accordingly, a manager who generates alpha must be subsidized by another manager who fails to generate alpha, implying a zero-sum outcome. Therefore, regardless of market segment (e.g., emerging markets), investment structure (e.g., hedge fund), or manager history (e.g., statistically significant information ratio), the challenge of generating a consistent alpha stream is quite formidable.

In traditional mean-variance asset allocation, alpha and beta are intertwined. Most investors follow a “beta first” model; acquiring beta (market risk) first, and then pursuing alpha (active risk). Thus, the pursuit of alpha is subordinate to the acquisition of beta. More importantly, alpha and beta are sourced from the same opportunity set, resulting in suboptimal asset deployment as investors effectively overpay for beta exposure. Furthermore, generating alpha in many of the proportionally higher allocated opportunity sets (e.g., core fixed income, large cap) is considerably more difficult than generating alpha in the proportionally smaller allocated opportunity sets (e.g., small-cap, emerging markets). Thus, linking the pursuit of alpha to the asset allocation decision actually constrains the alpha opportunity set. As a result, active management via traditional mean variance asset allocation has often failed to achieve its primary goal; to outperform the policy index by a sufficient margin while controlling for risk.

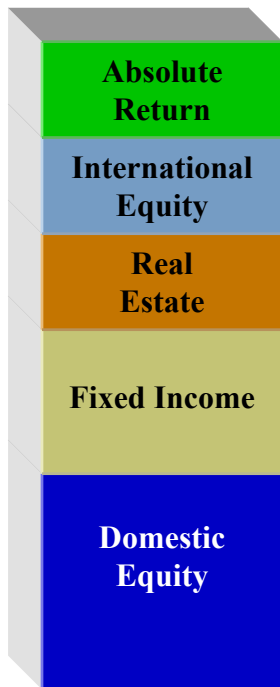
Portable alpha represents a paradigm shift away from active management via traditional mean variance asset allocation. Rather than simply attempting to outperform the policy index while controlling for risk and sourcing alpha from within beta, portable



alpha attempts to outperform the policy index with greater consistency and by a wider margin by sourcing alpha independently from beta, resulting in a more efficient portfolio. Through financial engineering (primarily derivatives), investors disaggregate the alpha and beta components of their portfolio, freeing themselves from the outdated “beta first” model and embracing a more logical “alpha first” model. In the process, investors acquire beta at the lowest possible cost, **source alpha wherever it exists**, and then port the alpha onto the beta as a means to enhance returns. In this model, alpha and beta are no longer sourced from the same opportunity set. Instead, alpha is sourced from an unconstrained opportunity set.

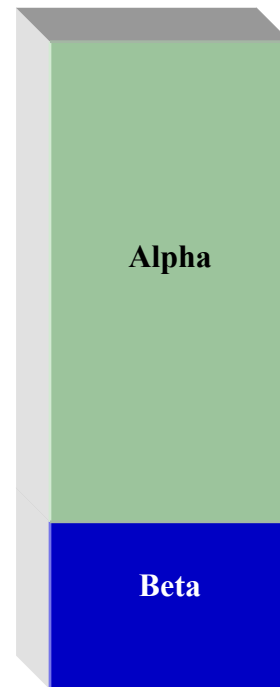
“Beta-first” Model

*Source alpha from within beta
Alpha opportunity set **constrained***



“Alpha-first” Model

*Source alpha independently from beta
Alpha opportunity set **unconstrained***



Portable alpha results in a significant adjustment to the CAPM:

$$R = \alpha + [r_f + \beta (R_m - r_f)]$$

In this version, alpha is now a stand-alone investment, rather than the residual return derived exclusively from within the beta component. Therefore, portable alpha strategies allow investors to maintain their strategic asset allocation, while simultaneously adding (porting) value added incremental returns to those asset classes which are more alpha-deprived.

Portable Alpha: Mechanics of Beta Acquisition

Typically, portable alpha strategies are engineered through futures or swaps. Investors cost-effectively acquire beta, deploy the majority of their assets toward alpha generating strategies, and then “port” the alpha onto the underlying beta. Thus, investors “equitize” or “bondize” their cash for a specific notional amount at only a fraction of the true underlying cost. While the concept of portable alpha is conceptually appealing and intuitive, the challenge of implementing such a strategy is not without its risks.

The decision to acquire beta with futures or swaps is not mutually exclusive. Some investors employ a core portable alpha strategy using futures, complemented by a satellite portable alpha strategy using swaps. When assessing a portable alpha strategy, investors must weigh the relative merits of beta acquisition using futures, or swaps, or both. It is also important to recognize that significant differences exist among betas; the S&P 500 is cheap and easy to replicate, while the MSCI EAFE is expensive and difficult to replicate. **Exhibit 1** contrasts futures to swaps along multiple risk dimensions, including: credit risk, liquidity risk, tracking error risk, pricing risk, cash efficiency, maintenance costs, administrative costs, trading costs, and time horizon.

Exhibit 1 – Risk Dimension Comparison, Futures vs. Swaps

Swaps	Risk Dimension	Futures
High	Credit Risk	Low
High	Liquidity Risk	Low
Low	Tracking Error Risk	High
High	Pricing Risk	Low
High	Cash Efficiency	Low
Low	Maintenance Costs	High
High	Administrative Costs	Low
High	Trading Costs	Low
High	Time Horizon	Low

Futures are **standardized** and traded on an exchange, resulting in zero credit risk, high liquidity, low trading costs, and low pricing risk. Nevertheless, their standardization results in higher tracking error risk, higher cash inefficiency (10% reserve), and higher maintenance costs (variation margin). Alternatively, swaps are **customized** and traded over-the-counter, resulting in higher credit risk (some of which can be mitigated), lower liquidity, higher trading costs, higher pricing risk, and higher administrative costs (legal/ISDA, reset feature). Despite these obstacles, swaps remain very appealing due to their open architecture feature, which results in lower tracking error risk, lower maintenance costs, and greater cash efficiency (0% reserve). Finally, both futures and swaps present issues relating to plan governance and plan restrictions, as well as the possibility of plan sponsor unfamiliarity and reluctance.



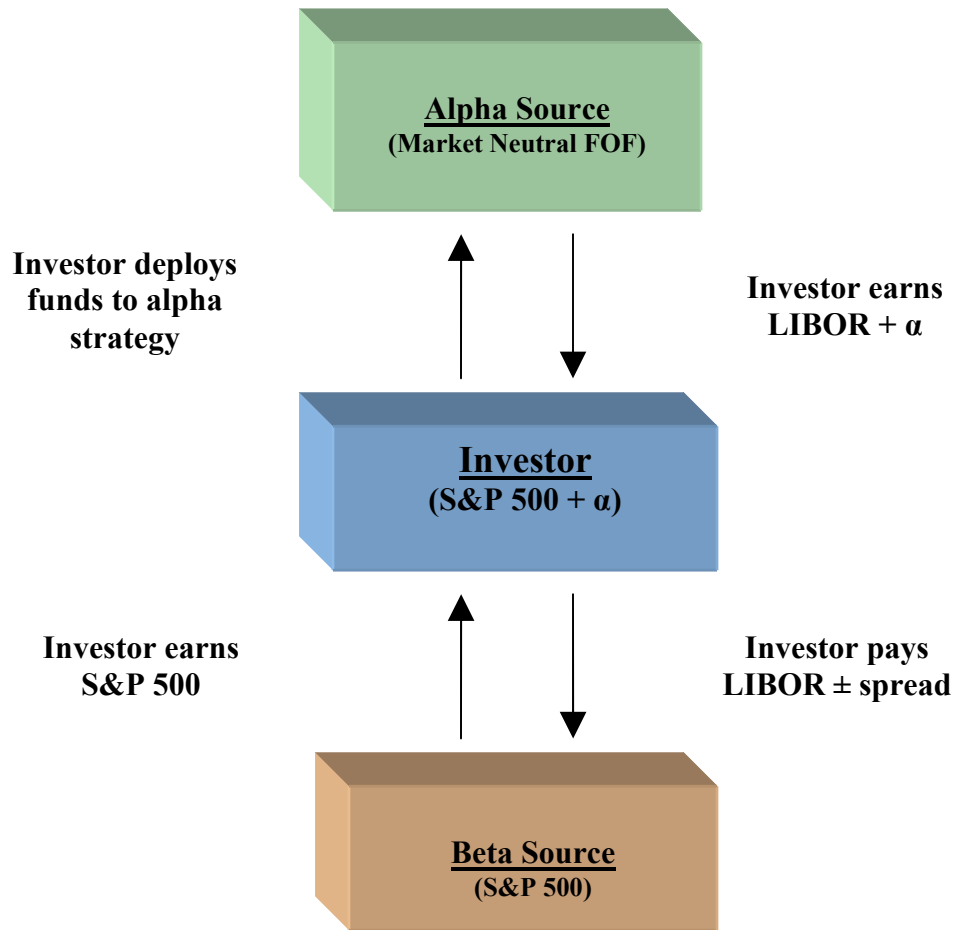
Portable Alpha: Risks

Implementing a portable alpha strategy requires careful consideration of a number of distinct and critical risk factors. Decisions relating to the implementation of a portable alpha strategy can have significant implications for the long-term success of the strategy, regardless of whether those decisions pertain to beta acquisition or alpha generation. Some of the more important alpha-related risk factors investors must consider include:

- Level of alpha hurdle rate due to embedded financing costs
- Potential for alpha erosion due to transaction costs and management fees
- Strength/Weakness of alpha sourcing process (manager selection)
- Number of alpha sources and correlation among alpha sources
- Alpha strategy types (low tracking error vs. high tracking error)
- Purity of alpha (potential for unintended leverage)
- Stability of alpha (non-cyclical)
- Sustainability of alpha (alpha capacity is finite)

In short, the success of a portable alpha strategy relies on producing a stable and pure alpha stream large enough to clear the embedded financing costs of acquiring the underlying beta exposure. In theory, an investor effectively offsets the returns earned from the portable alpha strategy with the LIBOR paid to acquire the beta. The diagram on the following page illustrates how an investor can offset this financing cost, and then port an uncorrelated alpha onto the underlying beta. In this example, the investor pays LIBOR plus/minus a spread to acquire the total return on the S&P 500, and then deploys the majority of his assets to an alpha source. Ultimately, the investor nets the LIBOR earned on the alpha source with the LIBOR paid to acquire the beta, leaving him with the total return on the S&P 500 plus the alpha.





One critical risk factor embedded in this process is that beta financing costs are variable, volatile and highly idiosyncratic. More specifically, financing costs for any product, such as the Russell 2000 or the S&P 500, are different at any point in time and are affected by different economic and capital market forces. Moreover, financing costs fluctuate based on systemic liquidity conditions; they may be high during periods of tight monetary policy and during periods of severe market stress (e.g., September 1998), but low during periods of loose monetary policy (e.g., 2002). Currently, financing costs are high, resulting in a relatively high hurdle rate for portable alpha strategies. Finally, in addition to financing costs, high transaction costs and high management fees may also combine to erode the alpha overlay, reducing the utility of the strategy.

Generating a stable and pure alpha stream is a challenging task. Sourcing a manager who can generate this type of alpha stream is equally, if not more, challenging. In a successful portable alpha strategy, investors must define which types of alpha are most suitable, and then **source and acquire** those alpha streams which are pure, stable, and sustainable. In terms of the number of and type of alpha sources, investors should target multiple alpha streams, each of which exhibits a low correlation to the underlying beta, and to each other. Typically, these strategies are absolute return oriented. Low tracking error (alpha variability) strategies include: LIBOR arbitrage, market neutral hedge funds,



and diversified fund of hedge funds; high tracking error absolute return strategies include: active currency management, global tactical asset allocation, and single manager, single-strategy hedge funds. It is important to note that alpha strategies are not mutually exclusive, allowing investors to select one or more strategies which fit their specific risk-return profile.

If the alpha streams are not pure, but rather a disguised beta or an exotic beta (e.g., liquidity risk premium, credit risk premium, options writing), then the plan will exhibit unintended leverage in the form of a beta greater than 1 (parity). “In practice, most alpha strategies are a continuously evolving set of exposures to a variety of betas – some overweights, some underweights.” (Brittain et. al, PIMCO). Thus, many alpha managers employ tactical exotic beta tilting as a means to source alpha. Investors must be mindful of this and work to ensure adequate transparency in order to ascertain any material changes to the alpha strategy’s underlying risk exposures. In addition to concerns over alpha purity, investors must also consider the stability of the alpha relative to financing costs, as well as the sustainability of the alpha source. Thus, the alpha engine must be robust and flexible, as alpha fertility is highly variable across the capital market spectrum.

Portable Alpha: Implications and Applications

Currently, plan sponsors are struggling with a number of key issues affecting the status of their plans, including: recent changes to existing pension and accounting laws, liability extension via low interest rates, weak asset growth via low prospective returns, dissatisfaction with the underperformance of traditional long-only managers, a declining workforce and a rapidly aging retiree population, and a relatively high actuarially assumed discount rate, typically between seven and eight percent (7% - 8%). “As a result, the importance of alpha in the portfolio return equation is not only taking on new significance across the investment community, but also shifting the thinking about where to find alpha and how to integrate it into portfolios for sustained incremental returns” (Northwater Capital Management).

Clearly, implementing a portable alpha program involves multiple decision points, both on the alpha selection/generation front and on beta acquisition front. More importantly, each decision point injects a potential risk factor to the success of the program. Despite their inherent risks, portable alpha strategies also offer potential rewards. The primary reward is better risk-adjusted returns, achieved by preserving the strategic asset allocation and transporting alpha onto those alpha-deprived asset classes, such as domestic fixed income or domestic large-cap equity. In addition to improving risk-adjusted returns, portable alpha also widens the opportunity set by disaggregating alpha from beta. Consequently, investors are free to source alpha from those market segments where it is more abundant or from those types of strategies where constraints have been relaxed (hedge funds). Furthermore, portable alpha strategies optimize the allocation of plan resources, as plans acquire beta at the lowest possible cost and pay for only pure skill (alpha). Portable alpha strategies also facilitate more efficient and more objective evaluation of alpha managers by simplifying and isolating the alpha component



(total return less LIBOR) in total return. Moreover, portable alpha strategies can be used to complement and enhance a liabilities hedging program, enabling plan sponsors to minimize surplus volatility¹ while gradually closing the funding gap. In this hybrid strategy, derivatives (futures/swaps) are used to extend the duration of the plan to more closely match the duration of the liabilities. Assets are then deployed to alpha generating strategies and periodically ported onto the beta (liability duration), thereby gradually narrowing the funding gap over time. Finally, it is important to note that portable alpha strategies do not represent an all or nothing proposition. Investors can choose to gradually integrate portable alpha into their portfolio by adopting this type of strategy for one or more asset classes/market segments, such as large-cap equities and/or investment grade fixed income.

Portable Alpha: Conclusion

Portable alpha strategies represent an additional tool that an investor can use to build a superior risk-adjusted portfolio. Investors isolate alpha from beta, maintain their strategic asset allocation, and abandon the “beta-first” model. Instead, investors embrace the “alpha-first” model, sourcing alpha from any opportunity set and “porting” it onto the underlying beta. In the “beta-first” model, the focus is on relative return, or benchmark + 2% or more. Alternatively, in the “alpha-first” model, the focus is on absolute return, or LIBOR + 4% or more. Multiple, uncorrelated alpha streams ported onto the underlying market exposure can also create a portfolio which exhibits an asymmetric risk-return profile. Put differently, a portfolio which exhibits positive skewness (more large positive events than large negative events), which has the effect of reducing downside risk while still allowing for upside gains. Ultimately, portable alpha attempts to outperform the policy index with greater consistency **and** by a greater margin by separating alpha from beta.

¹ Surplus volatility can be defined as the variability of asset returns (market-based) less liability returns (economic-based).



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