

Investment Strategies

Implementing Portable Alpha Strategies in Institutional Portfolios

Interest in portable alpha strategies among institutional investors has grown in recent years as investors seek to make more efficient use of the capital at their disposal and enhance returns without materially altering the risk characteristics of their existing portfolio.

Portable alpha strategies establish economic exposure to a desired asset class through the use of derivative instruments, which allow investors to allocate surplus capital to other strategies that target conservative returns and that have low levels of volatility and correlation to the underlying asset class.

In a previous paper, *Portable Alpha: A Primer for Institutional Investors*, we provided readers with a comprehensive overview of these strategies. In this paper, we will focus on the practical implementation of portable alpha programs, and examine how these strategies can improve the risk and return profiles of institutional portfolios through actual case studies.

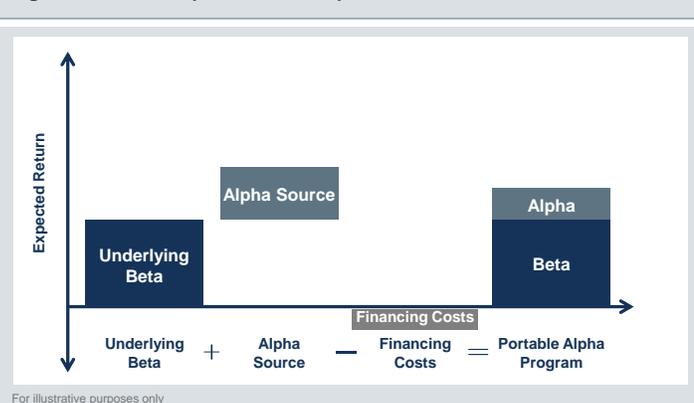
Portable Alpha Overview

Portable alpha programs aim to make more efficient use of a portfolio's existing allocations by freeing up capital to invest in return-enhancing strategies, with the objective of improving expected returns while preserving the portfolio's risk profile.

This is achieved by separating market returns ("beta") from the returns generated through active management ("alpha"), and then porting (or pairing) alpha generated in one asset class with the beta of another asset class, typically through the use of derivatives. Portability is not limited to pure alpha strategies such as absolute return or hedge funds; in fact, it is not uncommon to enhance returns through the use of conservative traditional asset class strategies. Figure 1 illustrates a basic breakdown of a portable alpha program's structure and return composition.

A portable alpha program can be structured in a number of ways, depending on the investor's ultimate objective. For example, a return-

Figure 1: Portable Alpha Return Composition



seeking investor may elect to replace direct investment in passive U.S. equities with U.S. index futures. Index futures (a derivative) require a minimal amount of capital to achieve the desired notional exposure, freeing up capital to allocate to an absolute return strategy. In contrast, another investor's objective may be to implement a portable alpha program within a liability-driven investing (LDI) setting. Such an investor might use a short-dated credit strategy as an alpha source and overlay it on their existing portfolio of long bonds. To achieve this, the investor would "borrow" against their cash bond holdings through the use of bond repurchase agreements (repos),¹ which would provide the capital necessary to invest in the overlay strategy. By making more efficient use of capital, either through the use of derivatives or borrowing, investors are able to employ leverage in a structure where they can maintain full exposure to a desired asset class while simultaneously enhancing expected returns.

Reframing the Investment Objective of the Alpha Component

When an investor implements a portable alpha program, they are effectively changing the performance hurdle of their alpha strategy from an absolute return target to simply the cost of financing. This means that as long as the alpha strategy exceeds the implicit cost of the leverage required, it will be additive to portfolio performance. This reframing allows for the use of more conservative alternative strategies within a portable alpha structure and opens the door to strategies that may not have the return characteristics necessary to be included on a stand-alone basis, but can add significant value within an overlay.

Key Considerations

Our previous paper on portable alpha contained an in-depth discussion of the key considerations involved in the development of a portable alpha program. Below, we provide an overview of these considerations, which will be reflected in the case studies that follow.

- **Objectives:** What are the investor's objectives in implementing a portable alpha program? Return expectations, volatility, drawdown risk, and tracking error are examples of some of the factors that should be considered in the strategy development and design process.
- **Alpha source:** What is the source of alpha (or excess returns), and what is the alpha target? Emphasis should be placed on alpha sources with strong track records of proven and sustainable outperformance, and low or acceptable exposure to general market risks.
- **Beta source:** What is the source of the existing market (or beta) exposure in the portfolio? Suitable beta proxies are typically liquid, and have low tracking error to the underlying beta.
- **Structure:** How will the program be structured in order to achieve desired objectives? Considerations include the asset mix, leverage ratio, and cash buffer.

¹ Repurchase agreements are a form of short-term borrowing in government securities.

- **Risk management:** The complexity embedded in portable alpha programs requires robust risk-management processes and systems to ensure that predetermined risk limits are respected and to support ongoing management.

Other important considerations might include ensuring that alpha and beta sources are not highly correlated with one another, and that the underlying liquidity in both is well understood and accounted for. Additionally, the question of monitoring should be addressed, as these strategies may require additional administration and frequent rebalancing.

Portable Alpha in Practice

The next section demonstrates these considerations put into practice and features two case studies that use real life examples of institutional investors employing portable alpha strategies in their portfolios. Analysis for the two case studies was based on forward-looking assumptions and expected returns over the next 10 years, as well as an examination of how those strategies would have performed historically. While past performance is not indicative of future results, it can provide a useful context for understanding the robustness of various investment strategies and can help identify important risks. We focused our historical analysis on the consistency of past returns and risk metrics compared with expectations, the consistency of portable alpha strategy returns over time, and the consistency of the alpha source over time.

Case Study 1 illustrates how a return-seeking portfolio with allocations to passive equities might use a portable alpha program to improve returns, while Case Study 2 demonstrates the use of a portable alpha program in an LDI portfolio that has the objective of achieving incremental yield on a portfolio of long-dated government bonds.

Case Study 1: Improving Passive Investment Returns

Objective	Underlying Beta	Alpha Source	Structure
Improve returns on U.S. equity allocation	S&P 500 Index	Equity Market Neutral Strategy	S&P 500 Index Futures Equity Market Neutral Strategy Cash

In our first case study, a pension plan has structured a portable alpha strategy with the goal of enhancing returns on its passive U.S. equity allocation. Figure 2 illustrates the original and new structure of this portfolio. The restructured portfolio is using S&P 500 Index futures as its beta source to provide passive exposure to large cap U.S. equities, with a small amount of capital posted for margin (5%). The remaining assets are invested in the alpha source, which in this case is an equity market neutral strategy, and the portfolio has a cash buffer (25%) to manage margin requirements and other liquidity and rebalancing needs. Overall portfolio leverage is 100% (including cash).

The use of leverage is an important component of any portable alpha strategy, as only a fraction of notional amount is required to provide economic exposure of 100% to the asset class. In this case, leverage is embedded in the S&P 500 Index futures.

Figure 2: Portable Alpha Equity Market Neutral Portfolio Structure

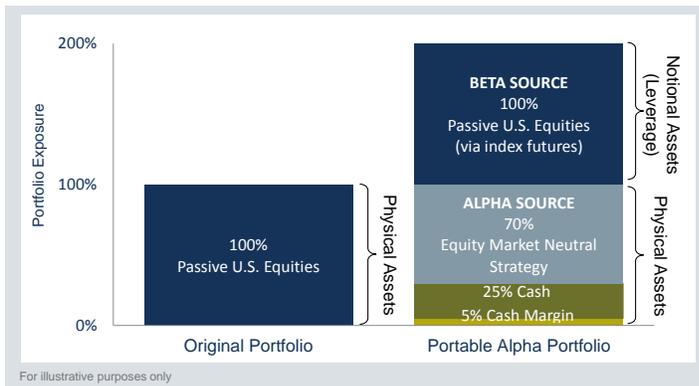


Figure 3: Forward-Looking Return and Risk Expectations

	Original Portfolio	Portable Alpha (A)	Portable Alpha (B)
Leverage	0%	50%	100%
Equity Beta	1	1	1
Annualized Expected Return	7.3%	8.1%	9.0%
Volatility (Standard Deviation)	14.3%	14.7%	15.2%
Annual Downside Risk	-25.5%	-27.8%	-30.1%
Annualized Expected Value Added	-	0.8%	1.7%
Sharpe Ratio	0.39	0.43	0.48

For illustrative purposes only
Based on expected 10-year risk and return characteristics.
Refer to appendix for modeling assumptions and disclosures. Hypothetical performance analyses are for illustrative purposes only and there is no guarantee that hypothetical returns or projections will be realized.

Figure 4: Expected Volatility

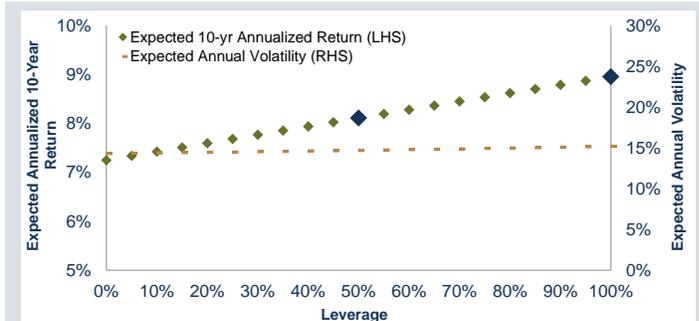


Figure 3 compares the forward-looking return and risk expectations of the original portfolio with those of two portable alpha structures – one, Portable Alpha Portfolio A, is 50% leveraged, while the other, Portable Alpha Portfolio B (the structure originally presented in Figure 2) is 100% leveraged (including cash). We found that Portable Alpha Portfolio A meaningfully outperforms the passive portfolio over a 10-year period while only marginally increasing the overall risk profile, as measured by volatility.

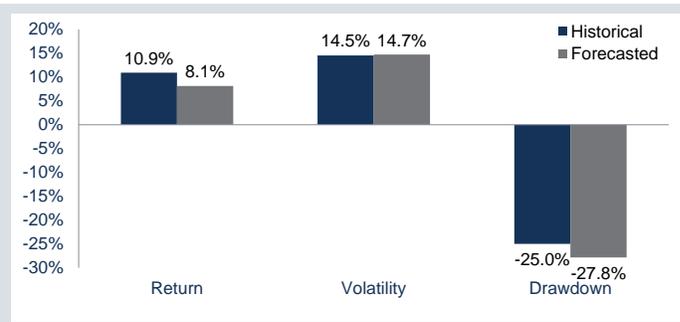
Furthermore, while the risk characteristics of the portfolio change slightly, the performance of Portable Alpha Portfolio B indicates that outperformance of portable alpha portfolios persists across leverage levels. As illustrated by Figure 4, the portable alpha program consistently delivered attractive risk-adjusted returns relative to the passive portfolio, with improvement in returns outpacing increases in volatility as leverage levels were increased.

While increases in the downside risk at higher leverage levels are moderate in this example, greater leverage may result in more frequent rebalancing

during volatile sell-offs. This can reduce the effectiveness of a portable alpha program and limit its value-add potential. In practice, typical leverage applied with liquid beta sources such as the S&P 500 Index used in this example range between 50% and 100%, with a meaningful portion of the portfolio allocated to cash (i.e., 30% of physical assets in our examples).

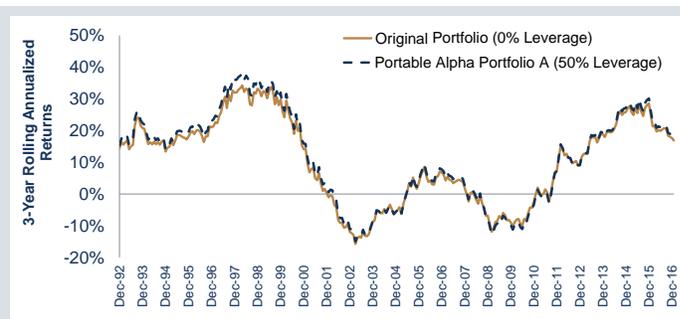
Turning to the historical performance and risk characteristics of Portable Alpha Portfolio A, these were generally consistent with the forward-looking results. Figure 5 provides a summary of the portfolio’s return, volatility, and drawdowns for both historical and forward-looking scenarios.

Figure 5: Portable Alpha Portfolio A – Historical and Forecasted Returns



For illustrative purposes only
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Historical period being reported is from December 31, 1989 to January 31, 2017.

Figure 6: Rolling 3-Year Return - Portable Alpha Portfolio A vs. Original Portfolio



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To assess performance consistency over time, we mapped the 3-year rolling annualized return of Portable Alpha Portfolio A against passive U.S. equities. Figure 6 shows that the portable alpha strategy adds incremental value without meaningfully altering the risk profile, as evidenced by generally similar performance of the two portfolios during periods of negative return.

In summary, this analysis suggests that portable alpha programs can be effective tools in helping institutional investors achieve meaningfully higher returns compared to traditional passive equity allocations, with only a marginal increase in overall risk.

Case Study 2: Achieving Incremental Yield in an LDI Portfolio

Objective	Underlying Beta	Alpha Source	Structure
Improve returns on long bonds	FTSE TMX Canada Long Term Overall Bond Index	Enhanced Cash Strategy	Bond Repos (overlay) Enhanced Cash Strategy Cash

In our second case study, a pension plan is using an LDI approach to match the interest rate characteristics of its liabilities by building a portfolio of long duration government bonds. The pension plan sponsor would like to enhance the return of its long bond exposure without altering the duration or risk profile of its physical portfolio. To achieve this objective, the plan has implemented a portable alpha program by borrowing against a portion of its bond portfolio through the use of repurchase agreements (repos) and investing the proceeds in an enhanced cash strategy – in this case, a portfolio of short duration yield-enhancing securities. In practice, the equity market neutral strategy used as an alpha source in Case Study 1 could also be used in a long bond-oriented strategy such as this one. However, as seen in this example and as is often the case, investment mandate restrictions may limit exposure to certain strategies or asset classes, such as equities.

Figure 7: Portable Alpha Enhanced Cash Portfolio Structure

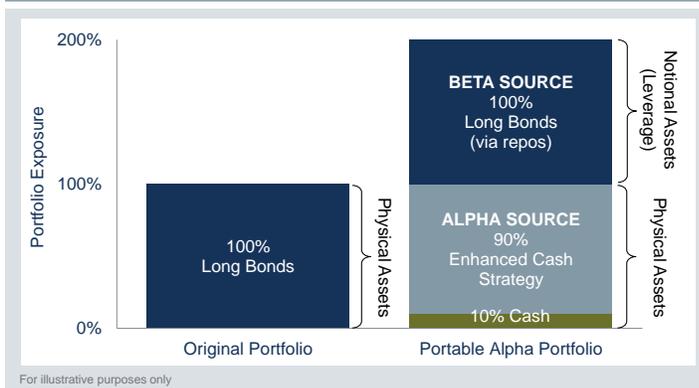


Figure 7 illustrates the structure of the original and portable alpha portfolios. The restructured portfolio maintains the desired exposure to the plan’s liability stream via long duration bond repos, while effectively enhancing expected returns by overlaying a “cash plus” strategy. As in the previous example, leverage embedded in repos allows the plan to re-invest physical capital sourced from long bonds into the alpha strategy. Overall portfolio leverage is 100% (including cash).

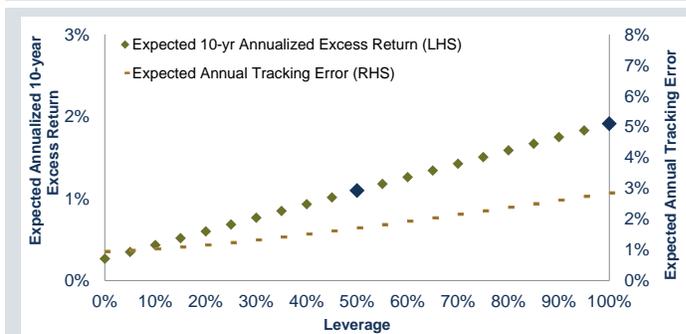
Figure 8: Forward-Looking Return and Risk Expectations

	Original Portfolio	Portable Alpha (A)	Portable Alpha (B)
Leverage	0%	50%	100%
Duration (yrs)	14	14	14
Annualized Excess Return	0.3%	1.1%	1.9%
Tracking Error	1.0%	1.7%	2.9%
Annual Funding Risk	-3.1%	-5.3%	-8.1%
Information Ratio	0.28	0.64	0.67

For illustrative purposes only
Based on expected 10-year risk and return characteristics.
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Because the plan’s objective is to reduce interest rate risk while simultaneously maintaining desired expected excess returns, we can evaluate the effectiveness of this program in the context of excess returns and risk (known as tracking error) relative to liabilities.

Figure 9: Expected Tracking Error

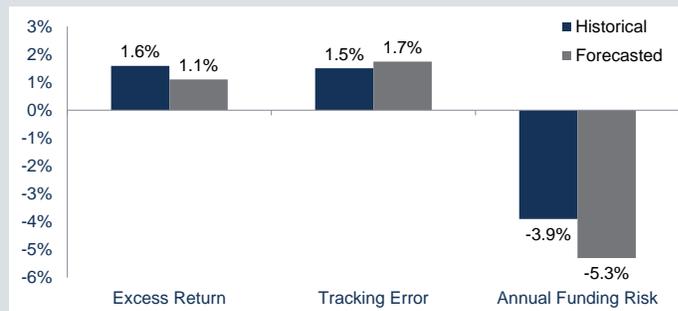


The results of our analysis are summarized in Figure 8, which compares the forward-looking return and risk expectations of the original portfolio with those of two portable alpha structures – one, Portable Alpha Portfolio A, is 50% leveraged, while the other, Portable Alpha Portfolio B (the structure originally presented in Figure 7) is 100% leveraged

(including cash). Portable Alpha Portfolio A is expected to outperform liabilities by 1.1% annually over a 10-year period, though achieving this enhanced return increases tracking error and annual funding downside risk – the risk that assets will underperform liabilities in any given year.

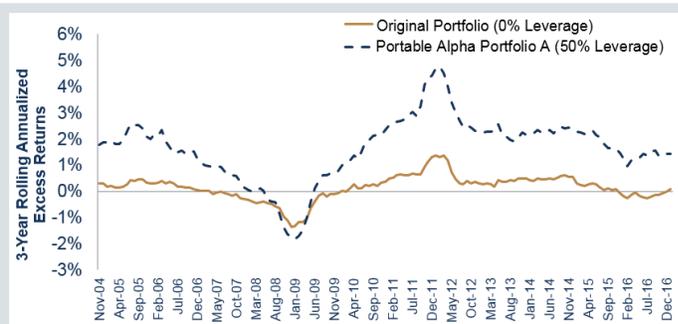
The relative risk of the portable alpha program is influenced by the risk characteristics of the enhanced cash strategy and leverage. The enhanced cash strategy has a small amount of sensitivity to some factors that influence liabilities; in other words, the alpha source is somewhat correlated with the underlying beta, which has the effect of accentuating both outperformance and underperformance. This correlation in both beta and alpha sources is further amplified by leverage, which results in the higher overall tracking error of the portfolio as well as the increase

Figure 10: Portable Alpha Portfolio A – Historical and Forecasted Returns



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 Historical period being reported is from November 30, 2001 to January 31, 2017.

Figure 11: Rolling 3-Year Return – Portable Alpha Portfolio A vs. Original Portfolio



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 Historical period being reported is from November 30, 2001 to January 31, 2017.

in annual funding downside risk. Increasing leverage to 100% (Portable Alpha Portfolio B) can be expected to produce even higher expected excess returns but generates a commensurate increase in tracking error, as shown in Figure 9.

Once again, the historical characteristics of the portable alpha portfolio were consistent with forward-looking results – this is shown in Figure 10. However, as demonstrated in Figure 11, rolling return analysis revealed that there can, and likely will, be instances when the portable alpha strategy underperforms. The degree of periodic underperformance is influenced by the risk and return characteristics of the alpha source as well as the degree of leverage.

In summary, our analysis of a portable alpha program in an LDI setting

suggests that such strategies can help pension plans improve returns relative to liabilities with a tolerable degree of tracking error and funding risk, although special consideration should be given to the structure (e.g., correlation of alpha source to plan liabilities) and the degree of leverage.

Risk and Return Characteristics

While alpha sources selected for portable alpha strategies aim to deliver consistent uncorrelated returns, like all investments, they are susceptible to periods of underperformance, which in turn influences the performance of the portable alpha program overall. Figure 12 provides a summary of risk and return characteristics for the two alpha sources used in our case studies.

While both strategies generated positive returns over the majority of the measurement period, instances of negative returns occurred approximately 7% of the time for both strategies.

As demonstrated in the case studies, these portable alpha programs were

Figure 12: Risk & Return

	Equity Market Neutral ¹	Enhanced Cash ²
Annualized Return	6.4%	5.1%
Annual Volatility ³	3.3%	2.4%
Downside Risk ⁴	-4.8%	-1.0%
% of Positive Return ⁵	92.6%	93.3%
% of Returns Exceeding Target ^{5,6}	59.3%	73.3%

¹ Calculated over the period Jan. 1990 to Jan. 2017
² Calculated over the period Dec. 2001 to Jan. 2017
³ Calculated from monthly returns
⁴ Calculated from rolling 12-month returns
⁵ Calculated from calendar year returns
⁶ Equity Market Neutral and Enhanced Cash Strategy have a 4.3% and 3.7% 10-yr expected return respectively
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generally able to achieve their objectives of improving returns and portfolio efficiency while keeping risk characteristics relatively unchanged. Importantly, the success of portable alpha programs is highly dependent on the risk and return characteristics of the alpha source itself, though most strategies will experience occasional periods of underperformance regardless of the alpha source selected.

Leverage and rebalancing can also have a material impact on the performance of the overall program and must be carefully considered. In periods of stress or extreme market volatility, an insufficient cash buffer may force the sale of the alpha source in order to rebalance the portfolio, resulting in lower absolute and excess returns for the portable alpha program relative to expectations.

These factors underscore the importance of discipline and a long-term investment horizon for institutional investors considering such solutions.

Conclusion

Portable alpha programs have become an important tool for institutional investors seeking to improve portfolio returns. Our analysis suggests that portable alpha programs can be effective in both return-seeking and liability-driven portfolios; however, successful implementation of such solutions requires careful consideration of risk/return objectives, structure, governance, and oversight. We expect to see continued growth in the use of such strategies as institutional investors and plan sponsors seek to enhance portfolio performance and improve funded status in an environment of low yields and moderating expected returns.

For additional details, please contact your PH&N institutional portfolio manager,
or call 1-855-408-6111 or email institutions@phn.com

Appendix

Figure 13: Correlations Table

	Cash	Long-Term Bonds	Liabilities	U.S. Equities	Equity Market Neutral	Enhanced Cash Strategy
Cash	1					
Long-Term Bonds	0.08	1				
Liabilities	0.05	0.99	1			
U.S. Equities	-0.19	0.00	0.03	1		
Equity Market Neutral	0.01	-0.12	-0.09	0.20	1	
Enhanced Cash Strategy	0.04	0.55	0.59	0.53	0.15	1

Correlations estimated using historical data since 1990.

Figure 14: Capital Market Assumptions

Asset Class	Representative Data Series	Expected 10-yr Annualized Return	Expected Annual Volatility
Cash	FTSE TMX Canada 91 Day T-Bill Index	1.7%	0.4%
Long-Term Bonds	FTSE TMX Canada Long Term Overall Bond Index	3.0%	7.3%
U.S. Equities	S&P 500 Index (CAD)	7.3%	14.3%
Equity Market Neutral	HFRI EH: Equity Market Neutral Index (USD)	4.2%	4.1%
Liabilities	FTSE TMX Canada Long Term Government Bond Index	2.7%	7.6%
Enhanced Cash Strategy	Custom ¹	3.6%	2.8%

¹ 1 70% FTSE TMX Canada Short Term Corporate Bond Index, 10% PH&N Mortgage Pension Trust, 10% BofA Merrill Lynch US High Yield Master II (USD), 3.3% S&P/TSX Composite Index, 3.3% S&P 500 Index (CAD), 3.3% MSCI EAFE Index (CAD).

* Assumptions represent the views of PH&N for the purposes of illustrating and understanding the potential risk-reward trade-off of different portfolio decisions. Investors should be aware of the limitations using forward-looking assumptions in that there is absolutely no guarantee that future performance will occur according to any ex-ante expectation.

For the purposes of this simulation, U.S. dollar returns reported for the HFRI Equity Market Neutral Index and the BofA Merrill Lynch US High Yield Master II are assumed to be equivalent to Canadian dollar returns (ignoring cost of hedging).

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