Investible Benchmarks & Hedge Fund Liquidity

Marc Freed, Mark Hurrell, Ben McMillan
Lyster Watson & Company
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After many years, investors have identified two key problems with hedge fund investments

- Few funds demonstrate persistent returns from year to year: funds tend to meander between positive and negative α

- A high percentage of the returns of some hedge fund strategies are beta (β), not alpha (α)
I. Hedge Fund $\alpha$ and $\beta$ Over Time

II. $\beta$ Concentration at the Strategy Level

III. Orthogonal Indexation of Hedge Funds

IV. Quantifying Hedge Fund Beta

V. Investible Benchmarks & Hedge Fund Liquidity

VI. Performance
Hedge Fund $\alpha$ and $\beta$ Over Time
Hedge Fund $\alpha$ and $\beta$ Over Time

- Look at the migration of “alpha” for different managers over different time periods

- Look at characteristics of hedge fund “Beta” for different strategies over time
Persistence of Hedge Fund “Alpha”

Look at Long/Short Equity North America funds with 12 months of performance, as of Jan 2006:

Focus on just the top decile

…and rank them according to our proprietary metric, “True Alpha®” (TA)

Hedge Fund Data Source: HedgeFund.Net. The data depicted on this page is based on Lyster Watson’s reclassified hedge fund database (the “Data”). The ranking of investment funds contained in this presentation (the “Rankings”) are based solely on Lyster Watson’s patented True Alpha® metric and, as such, does not represent the sole manner for ranking relative performance of investment funds. Users of this presentation should not rely upon the Data or the Rankings to make an investment decision and should note that past performance is not an indication of future performance.
Persistence of Hedge Fund “Alpha”

1st vintage takes all Long/Short Equity North America funds with 12 months of performance, as of Jan 2006:

...and observe their rank 12 months later

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Persistence of Hedge Fund “Alpha”

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Persistence of Hedge Fund “Alpha”

Top 10% of Funds' True Alpha® Scores: t+36

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β Concentration at the Strategy Level
We start by looking at 283 Long/Short Equity funds for 12 months ending Oct 2010:

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Constructing the Long/Short Equity Opportunity Set

Randomly select 5 funds...

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Constructing the Long/Short Equity Opportunity Set

...and create a portfolio

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Constructing the Long/Short Equity Opportunity Set

Select 5 more funds at random…

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Constructing the Long/Short Equity Opportunity Set

...and create a 2nd portfolio

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Select another 5 funds at random…

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Constructing the Long/Short Equity Opportunity Set

...and create a 3rd portfolio
Now we have 3 randomly created portfolios of Long/Short Equity funds

Repeating this process over and over gives a “cloud” of portfolios

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A “heatmap” of these portfolios looks like:

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Constructing the Long/Short Equity Opportunity Set

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Convertible Bond Arbitrage
Jun07 to May08

Hedge Fund Data Source: HedgeFund.Net. The data depicted on this page is based on Lyster Watson’s reclassified hedge fund database (the “Data”). Users of this presentation should not rely upon the Data to make an investment decision and should note that past performance is not an indication of future performance.
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Commodity Trading Advisors

Jun07 to May08

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Orthogonal Indexation of Hedge Funds
Capital Market Line = Strategy Market Line

Given a risk-free rate and a market return on a specific hedge fund strategy, one can draw a Strategy Market Line that illustrates the range of returns one can earn on portfolios comprising only combinations of those two assets.
Orthogonal Indices Are Unique

- True $\alpha^\circ$ measures the shortest distance from a fund to the market line.
- True $\alpha^\circ$ gives managers credit only for performance unavailable from the market.
- True $\alpha^\circ$ is a unique statistic that measures both relative return generation and risk management.
True $\alpha^\circ$ Calculation

True $\alpha^\circ$ is an application of the Pythagorean Theorem

- True $\alpha^\circ$ is the positive root when a fund outperforms the market
- True $\alpha^\circ$ is the negative root when a fund underperforms the market
- True $\alpha^\circ$ equals zero when a fund yields a market return

$$\text{Alpha} = \pm \sqrt{(\sigma_{\text{Fund}} - \sigma_{\text{Market}})^2 + (R_{\text{Fund}} - R_{\text{Market}})^2}$$
Orthogonal Indexation of Hedge Funds

OIS Isolates Non-Market Performance

The orthogonality of the chords $AM_A$ and $BM_B$ to the Strategy Market Line $RFM_AM_B$ means that the performance they measure is linearly independent of the market line.
OIS Gives No Credit for Leverage

- Decomposition of risk and return shows that True $\alpha^\circ$ gives no credit for leverage.
- It is based solely on the adjustment to risk and return achieved by a fund, e.g. $A$, relative to its Orthogonal Index on the market line, e.g. $M_L$.
- For this reason, we refer to True $\alpha^\circ$ more formally as a fund’s “Orthogonal Index Score” or OIS.
OIS Captures Market Effects

All funds on a line parallel to the market line receive the same True $\alpha$ score.

$R_A = R_{A^*}$ and $-\sigma_A = -\sigma_{A^*}$

$\rightarrow \alpha = \alpha^*$

Their Sharpe Ratios, the slopes of the dotted green lines, differ because they do not depend on the market.
Market Sharpe Ratio
Governs True $\alpha^\circledR$

Market Sharpe Ratio $= \tan \theta$

$\Delta R = \alpha \cdot \cos \theta$

$\Delta \sigma = - \alpha \cdot \sin \theta$

$\tan \theta = \sin \theta / \cos \theta = - \Delta \sigma / \Delta R$

The higher the Sharpe Ratio, the more important the role of risk reduction in $\alpha$ generation.

The lower the Sharpe Ratio, the more important the role of return production in $\alpha$ generation.
True $\alpha^\circ$ Varies With Market Conditions

- Sharpe Ratios depend only upon the risk free rate $R_F$ and the performance of the asset so the Sharpe Ratio of $A$ is the same for any market return $M_j$.

- $A$’s True $\alpha^\circ$ is greater in market $M_2$ than in market $M_1$ because $M_2$ describes a less favorable environment than $M_1$. 
True $\alpha^\text{®}$ Attribution with Low Volatility

• 12/29/06: SPY = 141.62
• 12/31/07: SPY = 146.21
• $\sigma = 15.96\%$

• In a directionless market with low volatility, True $\alpha^\text{®}$ tends to reward risk management and return generation equally

• Such environments give managers their best opportunities to demonstrate skill

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True $\alpha^\circledR$ Attribution in a Bull Market

- 3/31/09: SPY = 81
- 3/31/10: SPY = 117
- $\sigma = 18.56\%$

- During periods of strong equity returns, risk management plays a much more important role in True $\alpha^\circledR$ generation

- When everyone has positive returns, managers distinguish themselves by the risk management skills

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True α® Attribution with High Volatility

- 10/31/10: SPY = 118.5
- 10/31/11: SPY = 125.5
- σ = 21.23%

- During periods of high volatility, return generation plays a much more important role in True α® generation
- When volatile markets restrict risk-taking, managers distinguish themselves by their ability to generate returns

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Quantifying Hedge Fund $\beta$
Regression Results

Running an OLS regression of each strategy on various risk factors:

<table>
<thead>
<tr>
<th>True Alpha Strategy</th>
<th>R²</th>
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<tbody>
<tr>
<td>Long/Short Equity North America</td>
<td>95%</td>
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<tr>
<td>Event Equity</td>
<td>89%</td>
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<tr>
<td>Long/Short Equity Emerging Markets</td>
<td>84%</td>
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<td>Long/Short Equity Developed Asia</td>
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<td>Credit</td>
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<td>Long/Short Equity W. Europe</td>
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<td>Distressed</td>
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<td>Convert Bond Arbitrage</td>
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<td>Directional Macro</td>
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<td>Statistical Arbitrage</td>
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<td>Quantitative Multi-Markets</td>
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</tr>
<tr>
<td>Volatility Arbitrage</td>
<td>13%</td>
</tr>
</tbody>
</table>

Some can be well explained using liquid, exchange-traded instruments

…Others can’t


Hedge Fund Data Source: HedgeFund.Net.
This is a representative sample from diagnostic regressions.
Regression Results

...into a liquid, tradeable vehicle
Investible Benchmarks and Liquidity
Portfolios of ETFs or futures contracts that deliver most of the returns available from a bundle of hedge funds are “Investible Benchmarks”

Investible Benchmarks have better liquidity (daily) than most hedge funds

Investors should consider some portion of hedge fund returns in excess of investible benchmarks to be a liquidity premium
## Yield Compensation for Less-than-preferred Liquidity

<table>
<thead>
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<th>% per deferred period</th>
<th>Preferred Liquidity</th>
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<td><strong>Actual Liquidity</strong></td>
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<td>Annual</td>
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You may download a PDF of this article at
True Alpha® Tracker Performance
Comparison of Absolute Return Differences
Time Period: October 2006 thru September 2011

As of 09/30/2011
True Alpha® Long/Short Equity North America Tracker (L/S ENA Tracker) performance is presented net of fees. The data assumes a 0.90% annualized deduction for management fees and expense and hypothetical performance prior to 2011. The historical performance presented includes actual portfolio data, as of 1/1/11, from a proprietary account. Past performance is not an indication, or guarantee, of future results. This is not an offer or an advertisement. Refer to Appendix for important disclosures and index notes.
The True Alpha® Trackers are designed to capture the best risk/return characteristics of alternative investments.

As of 09/30/2011
Past performance is not an indication, or guarantee, of future results. All Tracker performance is presented net of a 0.90% annualized deduction for management fees. Prior to 2011, all of the True Alpha® Trackers’ performance histories presented are hypothetical, however in 2011, two of the Trackers presented began trading live accounts:

1. True Alpha® Long/Short Equity North America Tracker Index (TA LSE NA) performance includes actual portfolio data, as of 1/1/11, from a proprietary account.

2. True Alpha® Long/Short Equity Emerging Markets Tracker Index (TA LSE EM) performance includes actual portfolio data, as of 5/1/11, from a proprietary account.

Fees charged to other accounts may differ from those noted. This is not an offer or an advertisement. Refer to Appendix for important disclosure notes.
Appendix
Appendix: Important Disclosure Notes

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TrueAlpha® Tracker investable hedge fund replication indices are comprised of liquid, tradable securities; which may include ETFs, ETNs, listed futures contracts, foreign currency contracts and government bonds, and money market assets. There can be no assurance that returns will be correlated with risk factor characteristics on an underlying fund or strategy level. In addition, there can be no assurance that the risk factor proxies selected will emulate desired return characteristics. There are market risks involved in investing in hedge funds and risks associated with investing in the liquid, tradable securities (i.e., risk factor proxies) used in attempting to replicate hedge fund results. There is no guarantee of any particular result. Hypothetical performance is presented net of fees, assuming a 0.90% annualized deduction for management fees and other expenses. The returns are net of fees that may differ from the fees charged to other accounts. Past performance is not an indication, or guarantee, of future results. The performance data is unaudited and has been computed by Lyster Watson. Accordingly, while this data was obtained from sources believed to be reliable, Lyster Watson provides no assurances as to its accuracy or completeness. Hypothetical or model performance results have certain inherent limitations. Unlike an actual performance record, simulated results do not represent actual trading and accordingly, may have under- or over-compensated for the impact, if any, of certain market factors, such as market disruptions and lack of liquidity. In addition, hypothetical trading does not involve financial risk and no hypothetical trading record can completely account for the impact of financial risk in actual trading (for example, the ability to adhere to a particular trading program in spite of trading losses). Simulated performance is subject to the fact that it is designed with the benefit of hindsight. There can be no assurance that Lyster Watson would have selected or will select underlying funds or risk factor proxies similar to those taken in the results presented. There are frequently sharp differences between the hypothetical performance results and the results subsequently achieved by any particular trading or investment program.

True Alpha® Trackers employ a consistent non-discretionary methodology that produces dynamic allocations to risk factor proxies that are updated monthly. These collective proxies form portfolios that capture returns that correlate closely to a strategy-specific hedge fund index, which is enhanced through the patented True Alpha® rating and ranking system.

- True Alpha® Credit Fixed Income Tracker Index (TA CFJ) replicates a non-investable index of managers who combine a fundamental analysis of firms with a quantitative analysis of the values of their fixed income securities to isolate the credit risk from the duration and convexity risks that affect all fixed income assets. Some managers calculate the values of embedded options related to prepayment and default. Managers may establish duration-weighted long and short positions that are long credit risk that they expect to decline and short credit risk that they expect to increase. Some managers perform fundamental analyses on firms and invest in wide ranges of credit securities often with a bias toward event driven situations with near term catalysts for significant movement and use low to moderate leverage.

- True Alpha® Event Equity Tracker Index (TA EVE) replicates a non-investable index of managers who typically use fundamental research to identify opportunities arising from corporate events such as: restructurings, reorganizations, turnarounds, spin-offs, bankruptcies, break-ups, mergers and other unique growth situations and market anomalies. Investments may include long and short positions throughout the capital structure. Managers in this strategy tend to use generally little leverage.

- True Alpha® Long/Short Equity Emerging Markets Tracker Index (TA LSE EM) replicates a non-investable index of long/short equity managers who identify fundamentally strong and weak companies within a particular geography and then buy and sell the individual stocks within them based on fundamental analysis at the firm level. Some managers use futures and options based on industry indices to manage exposure and enhance returns, and can employ leverage. The performance presented includes actual portfolio data since May 1, 2011 and hypothetical performance as of April 30, 2011. Performance is presented net of fees, assuming a 0.90% annualized deduction for management fees and expenses, which may differ from the fees charged to other accounts.

- True Alpha® Long/Short Equity North America Tracker Index (TA LSE NA) replicates a non-investable index of long/short equity managers who identify fundamentally strong and weak companies within a particular geography and then buy and sell the individual stocks within them based on fundamental analysis at the firm level. Some managers use futures and options based on industry indices to manage exposure and enhance returns, and can employ leverage. The performance presented includes actual portfolio data since January 1, 2011 and hypothetical performance as of December 31, 2010. Performance is presented net of fees, assuming a 0.90% annualized deduction for management fees and expenses, which may differ from the fees charged to other accounts.
Appendix: Additional Disclosure Notes

Index Disclosure & Definitions:
The index information is included to show general risk return data and is not intended to imply that the Fund’s portfolio will be similar to the indices either in composition or element of risk. The indices are not investable. Source: Bloomberg.

- Barclays Aggregate Bond Composite Index is comprised of approximately 6,000 publicly traded bonds including US Government, mortgage-backed, corporate, and Yankee bonds with an approximate average maturity of 10 years.
- Barclays High Yield Credit Bond Index covers the universe of fixed rate, non-investment grade, publicly traded bonds (rated Ba1/BB+ or lower). The bonds have at least one year to final maturity, as well as at least $150 million par amount outstanding.
- HFRI FOF: Conservative Index contains Fund of Funds that are classified as “Conservative” and exhibit one or more of the following characteristics: seeks consistent returns by primarily investing in funds that generally engage in more “conservative” strategies such as Equity Market Neutral, Fixed Income Arbitrage, and Convertible Arbitrage; exhibits a lower historical annual standard deviation than the HFRI Fund of Funds Composite Index. A fund in the HFRI FOF Conservative Index shows generally consistent performance regardless of market conditions.
- HFRI Fund Weighted Composite Index is an equal-weighted index that currently includes over 2000 constituent funds, both domestic and offshore. No Fund of Funds are included in the Index. All funds report Net of All Fees returns on a monthly basis and must have at least $50 Million under management or have been actively trading for at least twelve (12) months to be included.
- HFRI Equity Hedge Total Index contains Equity Hedge strategies that maintain positions both long and short in primarily equity and equity derivative securities, from a wide variety of investment processes that can be broadly diversified or narrowly focused on specific sectors and can range broadly in terms of levels of net exposure, leverage employed, holding period, concentrations of market capitalizations and valuation ranges of typical portfolios.
- Lyster Watson Long/Short Equity North America Index contains hedge fund managers that identify fundamentally strong and weak companies within a particular geography and then buy and sell the individual stocks within them based on fundamental analysis at the firm level. Some managers use futures and options based on industry indices to manage exposure and enhance returns. Returns tend to be positively correlated with country indices. These managers can also employ leverage.
- S&P 500 Index (Dividends Reinvested) is a registered trademark of Standard & Poor’s, a division of The McGraw-Hill Companies, Inc. The Standard & Poor’s 500 (S&P 500). This is an unmanaged and market-value weighted index which includes a representative sample of 500 companies in leading industries of the U.S. economy. The diverse index comprises over 70% of the total market capitalization of all stocks traded in the U.S.