

**Title:** 'How hedge fund investors can improve their alpha forecasting ability'

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## Introduction

Many hedge fund investors are becoming more discerning regarding whether they pay for performance that is the result of alpha or beta exposure to common risk factors. Unfortunately, when it comes to identifying and forecasting alpha, hedge fund investors face a couple of challenges. First, investors need to identify the funds that have skill and did not just generate good performance as a result of luck. This is a serious problem given the large number of funds in existence - according to Hedge Fund Intelligence, there are now over 8000 hedge funds in existence managing over \$1.5 trillion. Second, investors face a challenge in precisely estimating fund performance given funds' relatively short track record - the median length of fund life in many hedge fund data sets being about three years long. This issue is of particular relevance for many recently founded Asia-focused funds.

Fortunately recent work by Robert Kosowski, Narayan Naik and Melvyn Teo<sup>1</sup> presents solutions to these twin challenges facing investors. Their work can help investors to increase the alpha (information ratio) of a portfolio of hedge funds by more than 50% (100%) compared to standard hedge fund picking approaches. Below we discuss how this superior performance is achieved.

## Skill versus Luck

The problem of investing in hedge funds whose performance is due to luck can be illustrated in the context of an imaginary coin flipping contest in Las Vegas. If we face a large number of coin flippers, say 10,000 or more, we would expect some of the coin flippers to achieve say 40 tails in 50 consecutive coin flips despite the fact that the coins are fair. We can use the binomial distribution (that a fair coin follows) to determine whether a particular coin flipper achieved more tails (or heads) than we would have expected just by chance. Similarly, there are now almost 10,000 hedge funds in existence so we face the same problem that some funds with prima facie impressive performance may just be lucky.

Alpha performance is calculated within a framework that decomposes hedge fund returns into three main components: (1) alpha (or risk-adjusted performance) in addition to compensation for risk bearing (consisting of (2) the beta (or loading) on (3) risk factors). These risk factors include option-based factors to allow for options and dynamic trading strategies. The risk factors or risk premia reflect equity market risk, interest rate risk, credit risk, currency risk and volatility risk.

Unfortunately in contrast to the coin flip, the distribution of the hedge fund alpha is generally not known. However there are methods, so-called bootstrap techniques, to derive the distribution of alphas if managers had no skills. Thus, the actual observed performance can be compared to the performance under the hypothesis of pure luck, enabling us to say whether funds were just lucky or not. This is done by generating artificial returns that are

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<sup>1</sup> Kosowski, Robert, Narayan Naik and Melvyn Teo, 'Do Hedge Funds Deliver Alpha? A Bayesian and Bootstrap Analysis', *Journal of Financial Economics*, Forthcoming.

obtained by setting the alpha equal to zero and resampling residuals from the actual regression residuals. Due to the resampling of residuals some of these artificial returns may show a non-zero alpha but this will be entirely due to luck (captured here by draws out of the mean zero distributed residuals).

An analysis of the most comprehensive hedge fund database available to hedge fund analysts and consisting of more than 9000 funds in existence between 1990 and 2002, shows that the performance of the top hedge funds cannot be explained by luck. Long/short equity and directional funds generated particularly statistically significant alpha.

The fact that some funds have genuine skill raises the question of how to forecast their alpha and pick funds out of this large universe to form optimal portfolios of hedge funds. Here investors face the second problem of how to precisely measure the performance of hedge funds given that many hedge funds have relatively short sample periods. Fortunately a new methodology can be used to dramatically increase the forecasting ability of investors.

### **Father and Son – Superior Alpha Forecasts using the Seemingly Unrelated Regression Approach**

The second methodology can be illustrated by means of the following loose analogy. George Soros is one of the most successful hedge fund investors and his eldest son, Robert Soros, has been involved in his father's investment management company. Let's assume that we want to invest with Robert Soros after observing his 2-year track record. Clearly it is difficult to judge his investment performance with such a small sample period. Now let's assume that the investment ability of Robert Soros is somehow related to that of his father (maybe due to his upbringing or due to common genes). If that was the case, we could potentially use the performance of George Soros to update our belief of how his son will do. This can be done by combining the historical information regarding the son's performance with that of the belief formed based on the father.

This is only a very loose analogy but it captures the gist of the methodology of the Seemingly Unrelated Regression (SUR) approach in a Bayesian framework. Essentially we are using information in a longer time series ('father's') to estimate more precisely an alpha from a short time series ('son's') based on the assumption that the two time series are correlated. In the case of the hedge fund methodology, the 'father' corresponds to so-called passive non-benchmark assets that sometimes have five times longer sample series than individual funds and that should be correlated with individual funds.

These passive non-benchmark series that are chosen are the HFR hedge fund category indices. Thus when evaluating a fund with a short track record in the long-short equity category, for example, we pick the HFR long-short equity index as a passive non-benchmark asset. Alpha performance of this passive non-benchmark asset is measured with respect to the same benchmark assets as that for the funds' alpha. The Bayesian component in this framework is the pricing uncertainty regarding how well the benchmark model fits the passive non-benchmark series. It can be shown that the resulting posterior alpha estimate of a fund's alpha in this framework is generally more precise. Kosowski, Naik and Teo show that the Bayesian alpha is typically lower than the standard Ordinary Least Squares (OLS) alpha estimate for the top 1% of funds (who often turn out to have particularly short track records). This result can be illustrated in the context of a long-short equity fund where we estimate how the long-short equity index – the passive non-benchmark asset in this case – performed relative to the non-benchmark asset. It may be that many recent short-lived long-short equity funds performed well in the late 1990s, but would have found it more difficult to generate the same alpha performance relative to the benchmark in

previous years. If the Bayesian posterior alpha for a top long-short equity fund is lower than the OLS alpha then this can be interpreted as showing that the long-short index performed worse relative to the benchmark over the longer series. This implies that using information in seemingly unrelated time series with a longer history leads to a downward adjustment of traditional performance measures. A powerful way of testing the practical superiority of Bayesian alphas is to see whether they are better at forecasting future alphas.

Crucially, the authors therefore also test whether sorting funds based on this Bayesian alpha into decile portfolios each January generates superior returns. They find that the alpha of the top decile of hedge funds goes up by more than 50% and the information ratio increase by more than 100%. This is even more impressive given that sorting hedge funds based on past standard OLS alpha does not generate performance persistence. It appears that OLS alphas of the top funds are often imprecisely measured and highly volatile since funds that did well in the past often did so due to high risk taking which does not guarantee high returns in the future.

The study also shows that these results are robust in practice and also relevant for institutional investors. A large \$5 billion fund of funds, for example, may not be able to invest only in relatively small hedge funds. For this reason the study also does sensitivity tests and shows that the superior alpha forecasting ability of the Bayesian alpha is not due to small funds or other data biases such as artificial serial correlation or backfill, survivorship and incubation bias.

## Conclusion

Many hedge fund investors in 2006 face the problem of selecting the best hedge funds from a large universe of funds with oftentimes a short track record. Clearly qualitative and quantitative information feeds into this decision. Fortunately a new methodology has been developed to dramatically improve the alpha forecasting ability of investors and increase the resulting information ratio of a portfolio of the funds by more than 100% compared to standard selection rules. As more investors become discerning about separating alpha from beta exposure, these measures will become more and more indispensable for both investors and managers who monitor their benchmark performance.

## Bibliography:

Kosowski, Robert, Narayan Naik and Melvyn Teo, 'Do Hedge Funds Deliver Alpha? A Bayesian and Bootstrap Analysis', *Journal of Financial Economics*, forthcoming.

## About the author:

Robert Kosowski is an Assistant Professor in Finance at INSEAD. He holds a BA and MA in Economics from Trinity College, Cambridge University, and an MSc in Economics and PhD from the London School of Economics. Robert Kosowski's research on hedge funds and mutual funds has been published in top finance journals including the *Journal of Finance* and the *Journal of Financial Economics*. Robert has worked for Goldman Sachs in London, the Boston Consulting Group in Germany, and Deutsche Bank in New York City. From September 2006 onwards, Robert will be affiliated with the Tanaka Business School at Imperial College, London.

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