

Characterization of Hedge Fund Strategies: A Bayesian Model Averaging Approach

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Prof. Dr. Rajna Gibson

Assistant: Nikolay Ryabkov

Author: Gregory Hung



Executive Summary

In the wake of a structural change in the asset management industry where hedge funds have become a building block in institutional investor's portfolios there is an increasing demand to understand the nature and sources of hedge fund returns. This thesis characterizes hedge fund strategies based on their sensitivities to a set of exogenously selected market factors using Bayesian model averaging (BMA), a technique that properly accounts for model uncertainty by basing inference about parameters on weighted averages over all possible models. BMA assigns posterior model probabilities to all models where the probability is proportional to a model's data fit. The probabilities of the best models for the full history of the Edhec indices range from 3 percent for relative value to 28 percent for merger arbitrage indicating a significant amount of model uncertainty.

We find that models selected by BMA are well able to explain a large portion of hedge fund strategies' returns thereby shedding light on the risks that hedge funds are exposed to. The adjusted R^2 values of the best models for the full history of the Edhec indices (Jan 97 to May 07) range from 0.36 for CTA global to 0.92 for long/short equity with all strategies but CTA reporting values of above 0.5. Long/short equity and event driven strategies can be modeled most accurately while it is more difficult to capture the return behavior of CTA, fixed income and convertible arbitrage.

According to the identified factors that receive high posterior inclusion probabilities and are thus strongly supported by the data, most strategies can be very well characterized in retrospect. However, due to the dynamics of hedge fund strategies that cause substantial model instability over time it does not seem possible to provide a unique classification system for hedge funds based on characteristic sensitivity (i.e. beta) profiles.

Further, we test for factor stability by performing a 60-month simple rolling regression of the factors that receive at least positive support from the data according to the posterior inclusion probability. Even though these factors are naturally time-varying to some extent we find a fair degree of stability of these factors with a few exceptions.

Our approach and results can help investors gain a better understanding of the return behavior of hedge funds and the risks they are exposed to, and make better portfolio allocation decisions in terms of diversification of systematic risk.