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Short-term hedge fund performance

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ABSTRACT

Hedge fund returns are often explained using linear factor models such as Fung and Hsieh (2004). However, since most hedge funds live only for 3 years, these linear regressions are subject to over-parameterization. I improve the out-of-sample accuracy of the linear factor model by combining cross-sectional and time series information for groups of hedge funds with similar investment strategies. The additional cross-sectional information allows more accurate estimates of risk exposures. I also propose a trading strategy based on this methodology for extracting substantially larger risk-adjusted returns.

1. Introduction

The hedge fund industry has grown quickly over the last two decades. It is not surprising that both practitioners and academic researchers are interested in understanding hedge funds. Despite various attempts to explain hedge fund returns, simple linear factor models are still the most commonly used. Formerly, factors from the CAPM, Fama and French (1992) and Carhart (1997) models were applied to hedge funds.[1] This ad hoc approach cannot take into account all the peculiarities of hedge funds. Factors extracted directly from hedge fund returns are more specific and, as empirical evidence suggests, have stronger explanatory power.[2] Straightforward implementation of linear models has made them popular tools in the investigation of hedge fund performance. However, risk exposures estimated by these models are unstable in small samples. Since most hedge funds have a life span of only 30–40 months, linear models become inappropriate. This leads to poor forecasting power and a low probability of picking the best hedge fund performers for an investor.

To overcome the problem of a short sample and the resultant unreliability of estimates, it is possible to combine the cross-section with the time series, i.e. to operate with panel data. I group hedge funds by their investment strategy. This approach yields reliable estimates even when the time series are not lengthy. The main idea behind this approach is that the hedge funds following the same investment style are comparable in terms of the magnitude of risk exposures. I examine several panel data methods and show empirically their superior forecasting abilities over conventional linear factor models. Root mean squared prediction error in panel data models is monthly 10–15% smaller than in linear regressions, and the rate of diminishing is significant.

Forecasting power is directly related to the persistence concept. Although the problem existed for years, there is no clear-cut answer as to whether fund returns persist over time. For example, Brown et al. (1999) use raw as well as risk-adjusted returns from the CAPM, and excess returns over the style benchmarks to show little performance persistence in hedge funds. On the contrary, Agarwal and Naik (2000a) and Agarwal and Naik (2000b) reveal substantial persistence in quarter returns using excess returns over the average style-return and (non-)parametric tests. They also find that "losers" are more persistent than "winners". Significant persistence was found by Edwards and Caglayan (2001) for both "winners" and "losers". Capocci and Huebner (2004) apply the four-factor model of Carhart (1997) and the model of Agarwal and Naik (2004) and find no persistence among either "winners" or among "losers", but limited evidence of persistence in returns of the middle decile funds. More recently, Kosowski et al. (2007) applied Bayesian econometrics and a bootstrap procedure to evaluate hedge fund performance. They find that hedge fund returns persist

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[1] See Hasanhodzic and Lo (2006).

[2] See Agarwal and Naik (2000a,b), and Fung and Hsieh (2004).

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Table 1
Summary statistics of hedge fund ages.

Style	Mean	Min	Max	25%	50%	75%
Global macro	4.18	0.08	15.42	1.50	3.17	5.81
Equity long/short	4.34	0.08	15.42	1.67	3.42	6.00
Emerging markets	5.00	0.08	15.42	2.25	3.92	7.02
Event driven	4.52	0.08	15.42	1.75	3.58	6.15
Fixed income	4.60	0.08	15.42	2.00	3.75	6.17
Distressed	5.24	0.08	15.42	2.00	4.00	7.83
Multi-strategy	4.02	0.08	15.42	1.58	3.17	5.58
Managed futures	5.23	0.08	15.42	2.17	4.08	7.25
Arbitrage	5.14	0.08	15.42	2.00	4.25	7.33

Table demonstrates several statistics on hedge fund ages: mean, minimum, maximum, 25% quantile, median, and 75% quantile. Hedge funds are grouped by seven investment styles: global macro, equity long/short, emerging markets, event driven, fixed income, distressed, multi-strategy, managed futures, and arbitrage. ages are presented in months. The sample period is January 1994–May 2009.

over a one-year horizon. While some empirical studies reveal a "reasonable degree" of persistence, the others do not find any predictability in returns (Kat and Menexe, 2003) or find the time-varying persistence (Capocci, 2002). Though being not well explained yet, the persistence is crucial for investors hoping to include "winner" funds into their portfolios. Persistent returns make funds with good past performance particularly attractive and can be regarded as a motivation for a fund manager.

Controversial results on the performance persistence can be explained by a number of biases existing in the data. The panel data methods solve some of these biases and provide better estimates of an alpha-parameter comparing to the traditional linear factor models which are used in the majority of persistence studies. As a result, the methodology proposed in this study allows estimating alpha which demonstrates higher persistence.

I also suggest investment strategy which gives above-average compensation: the Sharpe ratio is 18% higher than the average Sharpe ratio in the sample.

The remainder of the paper is organized in the following way: Section 2 presents econometric methods based on the panel data. Section 3 describes the data used in the analysis. As the core of the paper, Section 4 applies proposed methods and tests their performance out-of-sample. Section 5 summarizes the main findings

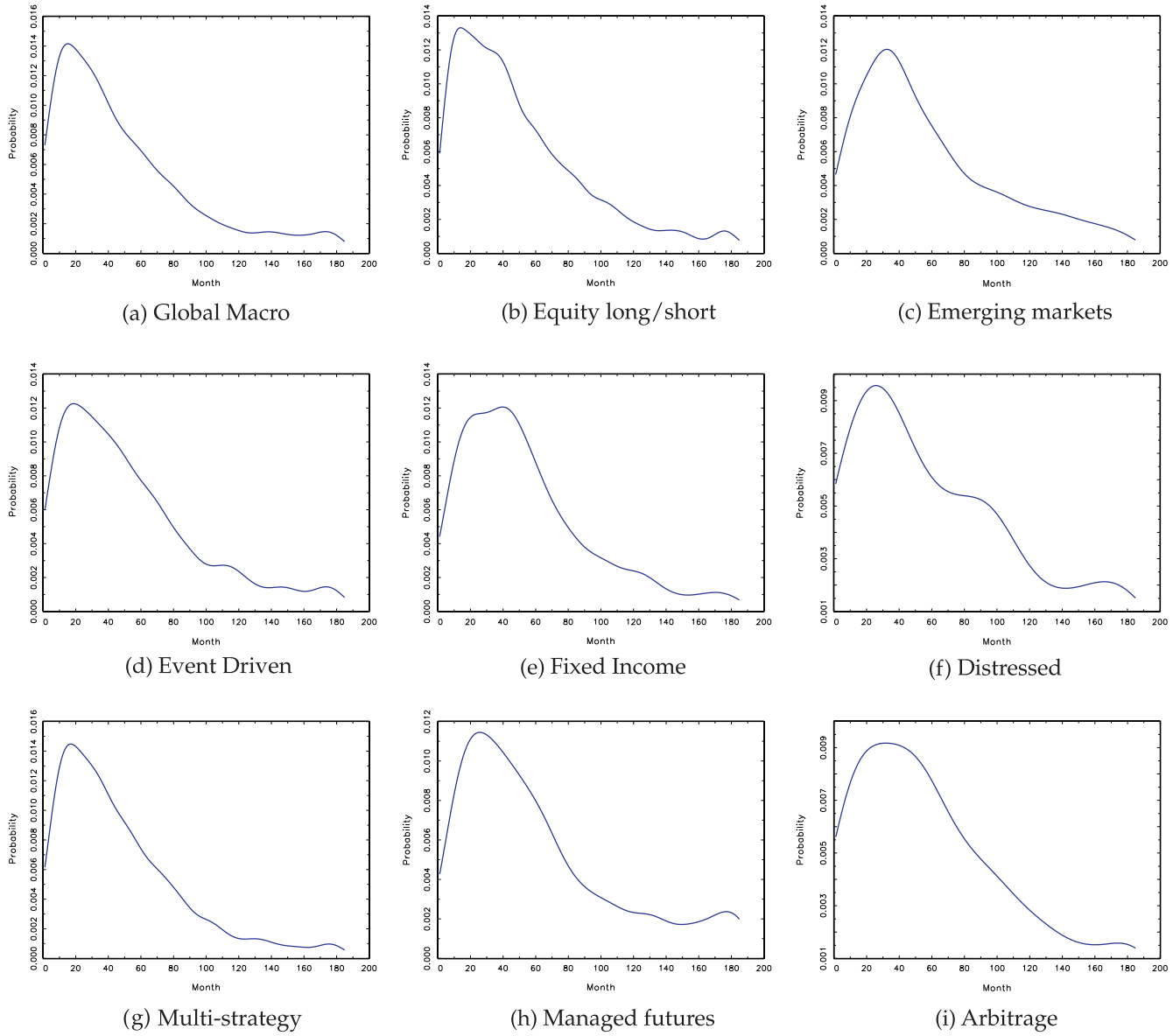

Fig. 1. Kernel densities of hedge fund ages. The graphs illustrate Kernel densities of the hedge fund ages; *x*-axes denote months and *y*-axes probability density.