Do Funds-of-Funds Deserve Their Fees-on-Fees?

Andrew Ang
Matthew Rhodes-Kropf
Rui Zhao

May 2006
Federal Reserve Bank of Atlanta
Financial Markets Conference
Motivation: Are FoFs Bad Deals?

- A fund-of-funds (FoF) is a hedge fund that primarily invests in other hedge funds (HFMs)
- Growth of FoFs is remarkably fast
  - FoFs now receive over 35% of cash inflows into HFMs+FoFs
  - Various benefits
    - Invest in funds closed to new investment
    - Lower minimum investment
    - Diversification benefits
    - Professional portfolio management

- But...
Motivation: Are FoFs Bad Deals?

- At first glance, investors pay a hefty price for investing in FoFs:
  - Double fee structure
    - Average management fee of 1.5%
    - Average incentive fee of 10%
    - Must also pay all underlying hedge fund fees (average 1.5% management fee and 20% incentive fee)
  - FoFs tend to underperform HFs after fees
Motivation: Are FoFs Bad Deals?

- Average Monthly Excess Returns (%):

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFs</td>
<td>0.58</td>
<td>0.54</td>
</tr>
<tr>
<td>FoFs</td>
<td>0.27</td>
<td>0.32</td>
</tr>
<tr>
<td>Difference</td>
<td>0.31</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Do Funds-of-Funds Deserve Their Fees-on-Fees?
Outline

• Why observed HFs are NOT the correct benchmark for FoFs
• What is the correct benchmark?
• How can we determine if FoFs add value?
• Conclusion
FoFs and HFs Cannot be Directly Compared!

- Consider an individual investor wanting to invest in HFs:

**Direct HF Investment =>**

- HFs available to the individual investor
- Large asymmetric information problems
- Need to locate, evaluate and monitor HFs

**Indirect HF Investment =>**

- FoF searches for suitable HFs

**True FoF Benchmark**
FoFs and HF\text{s Cannot be Directly Compared!\

- Assume that FoF managers have skill on average
- \textbf{"Skilled"} investors with large amounts of capital and expertise directly invest in HF\text{s}
- But, \textbf{"unskilled"} investors with little capital or no expertise would choose to use FoF\text{s}
- Thus, the HF\text{s that we observe in data are funded either directly by skilled investors or indirectly through FoF\text{s}
FoFs and HFs Cannot be Directly Compared!

- Imagine a world without FoFs. All unskilled investors are forced to directly invest in HFs.
- Now, many unskilled investors would invest in bad HFs. These bad HFs would not have received funding in a world where FoFs exist.
- In data, HFs receive funding either from skilled investors or indirectly from skilled FoFs. The HFs in data are biased upwards compared to the full HF universe.
FoFs and HFs Cannot be Directly Compared!

- Extreme Example
  Assume that the true HF universe is normal, but that the worst 20% of HFs are not funded. In data, we observe a truncated distribution of HFs that is biased upwards.
This benchmark “funding” bias of HFs is very different from reporting biases.

HF databases have mediocrity biases:
- The most successful funds do not report (Ackermann, McEnally and Ravenscraft, 1999)
- The worst hedge funds stop reporting (Malkiel and Saha, 2004)

But these biases all involve whether funded HFs report or do not report to databases.

Our benchmark bias involves the unobserved unfunded set of HFs which constitute the true FoF benchmark.
Do FoFs Deserve Their Fees-on-Fees?

- Answer depends on who is asking the question
  - The more skilled an investor is, the less likely she finds FoFs valuable
  - The less risk-averse an investor is, the less value a FoF provides
  - Answer also depends on investment opportunity set of the investor
How to Construct the FoF Benchmark

- Consider an investor who has chosen to invest in a FoF.
- At the margin, she must be, on average, indifferent between investing in a FoF or investing in a HF that she could find on her own.
  - Revealed preference, through an asset allocation problem, can be used to characterize the true FoF benchmark.
The Portfolio Allocation Problem

- Mean-Variance Utility

\[ U = \mathbb{E}(r_p) - \frac{\gamma}{2} \text{var}(r_p) \]

- What is the true, unobservable hedge fund distribution available to unskilled investors?

  is the same question as:

- What makes an investor indifferent between a direct HF investment on her own and a FoF investment?
Benchmark Assets (AC6)

- **U.S. Equities**
  - Ibbotson S&P500 Large Cap index, Russell 2500 Mid-to-Small index, MSCI Large Cap Value and Growth index

- **U.S. Bonds**

- **Commodities**
  - Goldman Sachs Commodity index

- **Foreign Equities**
  - MSCI country returns for U.K., Japan, Germany and France, and Emerging Market index

- **Foreign Bonds**
  - U.K., German and Japanese 1-month Eurobond returns in U.S. dollars
Benchmark Assets

Inputs

- Median excess return
- Median standard deviation
- Median Dimson-adjusted correlations
  - Account for non-synchronous trading/reporting effects
  - Three lag adjustments

➢ These represent a typical HF or FoF

Ang, Rhodes-Kropf and Zhao

Slide 16
## Effect of Lags on HF Correlations

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>No Lags</th>
<th>1 Lag</th>
<th>2 Lags</th>
<th>3 Lags</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Large Cap</td>
<td>0.207</td>
<td>0.316</td>
<td>0.407</td>
<td>0.423</td>
</tr>
<tr>
<td>Equities Small Cap</td>
<td>0.264</td>
<td>0.356</td>
<td>0.401</td>
<td>0.406</td>
</tr>
<tr>
<td>Growth</td>
<td>0.191</td>
<td>0.293</td>
<td>0.354</td>
<td>0.350</td>
</tr>
<tr>
<td>Value</td>
<td>0.162</td>
<td>0.244</td>
<td>0.296</td>
<td>0.329</td>
</tr>
<tr>
<td>U.S. Long-Term Gov</td>
<td>-0.008</td>
<td>-0.052</td>
<td>-0.079</td>
<td>-0.087</td>
</tr>
<tr>
<td>Bonds Inter-Term Gov</td>
<td>-0.048</td>
<td>-0.106</td>
<td>-0.134</td>
<td>-0.112</td>
</tr>
<tr>
<td>Long-Term Corp</td>
<td>0.037</td>
<td>-0.006</td>
<td>-0.016</td>
<td>-0.026</td>
</tr>
</tbody>
</table>
The true FoF benchmark is the underlying distribution of both funded and unfunded HFs faced by unskilled investors.

The ex-ante utility gain of adding a HF drawn from the true distribution must be the same as adding a FoF.

We characterize the benchmark distribution in terms of:
- Mean
- Volatility
- Left-hand tails [in the paper]
Characterizing the True FoF Benchmark

- Denote moments of the FoF benchmark distribution with “B’s”
- We know that the true FoF benchmark must be WORSE than the observed HF distribution
- We assume:
  - $\mu_B < \mu_{HF}$
  - $\sigma_B > \sigma_{HF}$
Characterizing the Benchmark Mean $\mu_B$

$\sigma_B = \sigma_{HF} = 3.876\%$

$\mu_B$ $\mu_{HF} = 0.873\%$
Characterizing the Benchmark Mean $\mu_B$

- In data, $\mu_{HF} = 0.873\%$, $\sigma_{HF} = 3.876\%$

<table>
<thead>
<tr>
<th></th>
<th>No Short Sales</th>
<th>Short down to -20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\gamma = 4$</td>
<td>0.710</td>
<td>0.789</td>
</tr>
<tr>
<td>$\gamma = 8$</td>
<td>0.731</td>
<td>0.837</td>
</tr>
<tr>
<td>$\gamma = 12$</td>
<td>0.825</td>
<td>0.947</td>
</tr>
</tbody>
</table>

Case 1: Assume $\sigma_B = 3.876\%$

AC6 + FoF

Case 2: Assume $\sigma_B = 1.1 \times 3.876\%$

AC6 + FoF

FoFs add value if an investor thinks she would obtain at most 0.710%, on average, or 0.162% (1.96% pa) less than observed HF returns.
Characterizing the Benchmark Volatility $\sigma_B$

$\mu_B = \mu_{HF} = 0.873\%$

$\sigma_{HF} = 3.876\%$

$\sigma_B$
**Characterizing the Benchmark Volatility $\sigma_B$**

- In data, $\mu_{HF} = R_f + 0.54\%$, $\sigma_{HF} = 3.876\%$

<table>
<thead>
<tr>
<th></th>
<th>No Short Sale</th>
<th>Short down to -20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\gamma = 4$</td>
<td>$\gamma = 8$</td>
<td>$\gamma = 12$</td>
</tr>
<tr>
<td>$\gamma = 4$</td>
<td>$\gamma = 8$</td>
<td>$\gamma = 12$</td>
</tr>
</tbody>
</table>

| Case 1: Assume $\mu_B = R_f + 0.54\%$ | | |
| AC6 + FoF | - | 6.839 | 4.782 | 6.504 | **4.233** | 3.665 |

| Case 2: Assume $\mu_B = R_f + 0.9 \times 0.54\%$ | | |
| AC6 + FoF | - | 5.868 | 4.204 | 5.511 | 3.691 | 3.228 |

Investors prefer a FoF if their own HF investments are, on average, 0.357% more volatile than observed HF returns.
Comparing HF portfolios with FoFs

- Institutional investors often invest in a portfolio of HFs. Should they do this on their own, or should they use a FoF?
- Create artificial FoFs: portfolios of 10 randomly selected HFs
- Compare adding a FoF with adding an artificial FoF
- Even for institutional investors who can diversify HF investments by themselves, FoFs can add value!
Comparing HF portfolios with FoFs

- Characterize the mean benchmark return, $\mu_B$, from an institutional investors’ perspective

- In data, $\mu_{AFoF} = 0.853\%$, $\sigma_{AFoF} = 2.53\%$

<table>
<thead>
<tr>
<th>AC6 + Fof</th>
<th>$\gamma = 4$</th>
<th>$\gamma = 8$</th>
<th>$\gamma = 12$</th>
<th>$\gamma = 4$</th>
<th>$\gamma = 8$</th>
<th>$\gamma = 12$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\sigma_B = 2.53%$</td>
<td>-</td>
<td>0.745</td>
<td>0.769</td>
<td>0.733</td>
<td>0.744</td>
<td>0.763</td>
</tr>
<tr>
<td>$\sigma_B = 1.1 \times 2.53%$</td>
<td>-</td>
<td>0.769</td>
<td>0.803</td>
<td>0.754</td>
<td>0.774</td>
<td>0.798</td>
</tr>
</tbody>
</table>

Institutions will use FoFs if they believe their own chosen HFs would do, on average, at least $0.108\%$ (2.40% pa) worse than observed HF average returns.
Conclusion

- FoF returns should not be directly benchmarked to HF returns
- We characterize the true benchmark distribution of FoF returns using revealed preference (asset allocation certainty equivalents)