The timing ability of hybrid funds of funds

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Abstract

Hybrid mutual funds are funds that invest in a combination of stocks and bonds. Hybrid funds of mutual funds are funds that hold shares of other equity and fixed income mutual funds. This fundamental difference between these two types of hybrid funds makes them an ideal laboratory to examine their stock market timing ability. Using daily fund and index data I implement a multi-factor timing model which successfully controls for the fixed income exposure of hybrids funds. I find that as a group both types of hybrid funds failed to correctly time the market.

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Hybrid mutual funds are funds that invest in a combination of stocks and bonds. Hybrid funds of mutual funds are funds that hold shares of other equity and fixed income mutual funds. This fundamental difference between these two types of hybrid funds makes them an ideal laboratory to examine their stock market timing ability. Using daily fund and index data I implement a multi-factor timing model which successfully controls for the fixed income exposure of hybrids funds. I find that as a group both types of hybrid funds failed to correctly time the market.

1. Introduction

Funds of funds (FOFs) are mutual funds that hold shares of other mutual funds. Recently, FOFs have significantly grown in popularity. According to statistics from the Investment Company Institute (ICI), during the time period of this study the number of FOFs has more than doubled in size while assets have grown exponentially. In 1999, there were 212 funds with total net assets of $48 billion of dollars, as of the end of 2009 these numbers were 932 funds and $673 billion of dollars respectively. Finally, while equity mutual funds had net outflows during the 2010, FOFs received $134 billion in net new cash flow in 2010. Although the popularity of FOFs is unquestionable, very few academic studies are exclusively dedicated to them. To the best of my knowledge, Bertin and Prather (2009) is the only academic paper solely devoted to open-end FOFs and reports evidence of outperformance by FOFs when compared with traditional equity mutual funds[1].

[1] Some papers look at hedge funds of funds, for example Brown, Goetzman and Liang (2004). Real estate mutual funds are sometimes regarded as funds of mutual funds as in Chiang, Kozhevnikov, and Lee (2008).

Hybrid-FOFs, the subject of this study, is the most popular type of FOFs, accounting for as much as 80 percent of the funds of funds' total net assets[2]. Hybrid-FOFs invest in a combination of stock, bond and money market mutual funds, providing investors with a diversified portfolio at a reasonable price. Although each fund is different, hybrid-FOFs will normally hold between 3 and 20 mutual funds and invest 30%-70% of their assets in equity funds, 30%-60% in fixed income funds, and between 0% and 30% in money market funds[3]. The vast majority of hybrid-FOFs are actively managed. Their managers have more investment flexibility than traditional equity mutual funds which allow then to alter their portfolios configuration in response to changing market conditions.

Hybrid-FOFs are similar to traditional hybrid funds. They both offer investors a diversified portfolio which includes exposure to the equity, fixed income, and cash sectors of the market. Fund managers of both types of hybrid funds have a greater degree of investment flexibility in comparison to those of traditional equity or fixed income funds. This greater degree of investment freedom allows fund managers to actively change their portfolios mix in response to, or in anticipation of, market swings. However, hybrid-FOFs and hybrid funds do significantly differ in the type of assets they hold. Hybrid-FOFs hold shares of other mutual funds while hybrid funds hold individual securities. Given this fundamental difference between traditional hybrid funds and hybrid-FOFs, I set up to answer the following question: in comparison to hybrid funds, do hybrid-FOFs better time the market?

Market timing is an investment strategy in which fund managers try to identify the best times to be in or out of the market. To be successful in this strategy, fund managers must effectively forecast market peaks and troughs and rebalance their portfolio holdings accordingly.

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[2] According to data provided by the Investment Company Institute.
[3] Bertin and Prather (2009) report that their 2003 sample held a median number of 18 funds.

The timing ability of mutual fund managers is still a very active research topic[4]. Given that hybrid funds hold individual securities while hybrid-FOFs hold other funds- and both types of funds have a high degree of investment flexibility- they make them an ideal laboratory to study market timing ability. When hybrid funds go to the market to rebalance their portfolios, they incur in transactions costs which, based on Carhat (1997) and Wermer (2000), are significant. On the other hand, when hybrid-FOFs change their portfolio mix they just transfer funds between other (most commonly in-house) mutual funds, which can be a less costly alternative. Whether or not this difference in costs translates to savings for hybrid-FOFs' shareholders is still unknown.

There is also another significant difference between hybrid funds and hybrid-FOFs when it comes to rebalancing their portfolios. When a hybrid fund manager decides to alter the fund's portfolio, she is the one deciding which securities to buy or sell. However, when a hybrid-FOFs manager makes the same decision, he does so by moving funds within a list of diversified portfolios, perhaps with the consequence of diluting the effect of the manager's original decision. In a way, hybrid fund managers take micro-level decisions while hybrid-FOFs managers take macro-level decisions. Additionally, hybrid-FOFs managers are not only relying on their own abilities to forecast market movements but also betting on the abilities of other fund managers to outperform a benchmark and provide value to fund shareholders. This feature of hybrid-FOFs makes them resemble team-manage funds, a practice which based on Fant and O'Neal (1999) could lead to a high degree of portfolio diversification and consequently lower levels of fund risk. More recently, the evidence in Bar, Kempf, and Ruenzi (2009) corroborate the risk reduction benefits documented by Fant and O'Neal (1999), but find some evidence of underperformance by team manage funds.

[4] See for example Bollen and Busse (2004), Glassman and Riddick (2006), and Comer (2006).

This is not the first time the market timing ability of hybrid mutual funds is examined. Comer (2006) empirically studies the timing ability of two different samples of hybrid mutual funds during two sample periods and finds positive timing ability during the 1992-2000 time period. In a similar approach of that of Comer (2006), Rodríguez (2008) examines the market timing ability of global asset allocation funds, the global version of domestic hybrid funds. Rodríguez finds evidence of poor market timing ability when the model specifically controls for the fixed income component of the global asset allocation funds' portfolios.

In this study, I examine the market timing ability of a sample of 58 hybrid-FOFs and a size-matched sample of 116 traditional hybrid mutual funds. Given the significant presence of fixed income mutual funds in the portfolios of hybrid funds of funds, I implement a multi-factor model based on the work by Comer, Larrymore and Rodríguez (2009) which specifically controls for the presence fixed income securities in mutual funds portfolios. I find evidence of perverse timing ability in the two samples of hybrid funds, FOFs and traditional. For the group of hybrid-FOFs the evidence is consistent across sample partitions based on fund characteristics. I do find some evidence of good stock market timing ability for the hybrid funds with the lowest expense ratio and for the smallest in size.

The rest of the paper is organized as follows: Section 2 discusses the methodology while Section 3 provides a description of the data. Empirical results are presented in Section 4, while Section 5 provides the conclusions.

2. Methodology

2.1 Fund returns

Since I rely on fund returns to measure market timing ability, it is imperative to use a return model which effectively incorporates all the securities which spam the investment set of

traditional hybrid funds and hybrid-FOFs. Comer, Larrymore, and Rodriguez (2009) (hereafter CLR) provide just that. After presenting evidence that all major classes of mutual funds, and specially hybrids, hold a significant portion of their portfolios in fixed income securities, CLR extends the Carhart (1997) model by adding a set of bond indices to account for the fixed income exposure of hybrid funds. The evidence presented in CLR points to the fact that, when selecting hybrid funds, investors rely on the risk adjusted performance based on models which fail to account for the fixed income portion of hybrid fund's portfolio. The risk adjusted performance based on Carhart's model is overestimated in comparison with the two extensions of the Carhart's model presented in CLR. The authors conclude that the absence of bond indices in Carhart's model misleads investors that rely on alpha to select funds.

CLR propose two extensions of the Carhart (1997) model. These extensions include the four factors of Carhart's model plus bond indices to account for the fixed income exposure in the funds' portfolios. The work of Blake, Elton and Gruber (1993) and, more recently Comer (2006), serve as the basis to construct the extensions to the Carhart model presented in CLR. The first model CLR considers in the Carhart sector model (C-sector model). This model includes bond indices representing the different sectors of the fixed income market. The model includes indices for the government, credit, mortgage, and high yield sectors. The second model in CLR is the Carhart maturity model (C-maturity model). The C-maturity model includes fixed income indices for long maturity government/credit and intermediate maturity government/credit, plus indices for the mortgage and high yield. In this study I implement a model of market timing based on the C-maturity model.

The C-maturity model from CLR can be express as follows:

$$r_i = \alpha_i + \sum_{j=1}^{8} \lambda_j r_j + e_i \,. \qquad (1)$$

Where,

α_i : measures risk adjusted performance

r_i : is the excess return of the fund.

r_j 's: represents the excess returns on the following factors: market portfolio, long maturity government/credit, intermediate maturity government/credit, mortgage, high yield indices and the returns on the Fama-French (1993) size factor, book-to-market factor, and the Carhart (1997) momentum factor.

2.2 Timing model

Treynor and Mazuy (1966) (hereafter TM) introduced a non-linear model that measures the ability of fund managers to decrease (increase) market exposure prior to a market fall (rise). The TM model tests for a nonlinearity effect as a result of timing ability. A fund managed by a successful market timer will have a non-linear relationship with the market; on the other hand, a mutual fund that does not engage in market timing will have returns linearly related to those of the market. The TM approach has become one of the standards in the mutual fund literature to test the stock market timing ability. I examine timing ability by implementing a model which combines the TM approach with the return formulation in of the C-maturity model from CLR. That is, I add a quadratic market excess return factor to the C-maturity model of CLR to measure timing ability. Specifically, I estimate the following non-linear regression:

$$r_i = \alpha_i + \sum_{j=1}^{8} \lambda_j r_j + \delta_i r_m^2 + e_i \qquad (2)$$

where:

r_i : is the excess return of the fund and

r_m : is the excess return on the market index.

A $\delta_i > 0$ provides evidence of a fund manager with good market timing ability.

3. Data

The focus of this study is on the timing ability of hybrid-FOFs during the January 1999-June 2010 time period relative to the timing ability of a sample of traditional hybrid mutual funds. The hybrid-FOFs sample is composed of all FOFs listed on the December 1998 Morningstar Principia CD with a Morningstar Category of domestic hybrid or an asset allocation prospectus objective. For funds with multiple share classes, I include only one fund class in the sample since the management strategies are identical across the classes[5]. The total number of hybrid-FOFs in the final sample is 58. Each hybrid-FOF is matched with two traditional hybrid funds of similar size as measured by their total net assets. In the end, the fund sample includes a total of 174 funds, 58 hybrid-FOFs, and 116 hybrid funds. I use daily fund and index data to estimate timing ability. Bollen and Busse (2001) advocate the use of daily fund return data, as high frequency data improves the model power specially when measuring timing ability.

Table 1 here.

Table 1 presents some of the descriptive statistics of the sample. The information presented in Table 1 is based on the data from the Center for Research in Security Prices (CRSP) Mutual Fund Survivor-Bias Free Database. To estimate the values on the table, I first collect all

[5] For further details see Livingstone and O'Neal (1998) and O'Neal (1999).

the data for each fund and for the complete sample period, then I average each fund's time series of data. Finally, I compute the average value for all the funds in the sample. For the hybrid-FOFs sample, the average total net assets, expense ratio and turnover ratio are 1094 millions, 0.54% and 74.5% respectively. In comparison with traditional hybrid funds, hybrid-FOFs are larger, have lower expense ratio, and turnover their portfolios at a lower rate. The table also presents some information regarding the portfolio composition of these samples of funds. The average stock, bond, and cash allocations for hybrid-FOFs (hybrids funds) are: 60.81% (61.10%), 20.63% (31.16%), and 7.02% (4.08%) respectively.

I rely on daily fund and index return data to test stock market timing ability. The daily fund return data comes from CRSP. Daily data on the risk free rate, the Fama-French factors, and Cahart's Momentum factor comes from the Kenneth French data library website[6]. As in CLR, data on all bond indices come from Lehman Brothers dataset.

4. Empirical results

4.1 Portfolio exposures

To better understand how well the C-maturity model explains the variation in returns of the samples of hybrid-FOFs and hybrid funds, I use the style methodology first introduced by Sharpe (1992)[7]. Style analysis allows for the estimation of the fund's portfolio exposure to each market index from the publicly available fund returns. I estimate the portfolio exposure to all the factors in equation 1 in a total return version of the model. I restrict all the loadings on the factors to be between zero and one, and to sum to one, except the loadings on the factors of the zero investment mimicking portfolios of the Carhart's model. Table 2 shows the results of the style

[6] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[7] CLR also employ Sharpe style analysis to examine portfolio exposure to the set of factors included in their models.

analysis performed on an equally weighted portfolio composed of all the funds in both samples during the complete sample period.

Table 2 here.

The evidence in Table 2 show that the model works well, explaining 97 percent or more of the variation in fund returns. Also, for both samples, 7 out of 9 factor loadings are statistically significant at one percent. Similar to the descriptive statistics on Table 1, the style analysis reveals that on average hybrid-FOFs hold less equity and more cash than hybrid funds. Regarding bond allocations, the results show that on average hybrid funds hold less fixed income securities than hybrid-FOFs. However, both samples of funds hold a significant amount of fixed income securities as the average total exposure to bonds ranges between 36.82% for hybrid funds and 44.58% for hybrid-FOFs. This last point provides more support in favor of the use of the CLR model in estimating the timing ability of hybrids funds.

In the next section I estimate the marketing ability of both samples of hybrid funds by estimating a timing model based on the TM approach to measure timing ability and the CLR formulation which specifically controls for the fixed income exposure of these funds. Specifically, I estimate the C-maturity model (equation 1) with an additional quadratic term to measure timing ability.

4.2 Timing ability

I estimate the market timing ability of each individual fund, a total of 174, using daily fund return and index data during the January 1999 and June 2010 time period. Table 3 presents the results. Contrary to Comer (2006), I find evidence of negative timing ability for both samples of funds. For the sample of hybrids-FOFs, the average market timing coefficient is -0.2441, while

the median coefficient is -0.0869. However, both numbers are not statistically significant. At the individual fund level, 44 hybrid-FOFs (more than 75% of the sample) attained a negative timing coefficient with 14 coefficients statistically significant at the 5 percent level. On the other hand, 14 hybrid-FOFs showed timing ability, and only 3 hybrid-FOFs attained a positive and significant timing coefficient.

As a group, hybrid funds also show evidence of perverse timing ability. The average timing coefficient is -0.0088 while the median coefficient is -0.0741. As is in the case of hybrid-FOFs, both the average and the median coefficients are not statistically significant and the vast majority of the hybrid funds attained a negative timing coefficient. A total of 75 funds, or 64% of the sample, have negative market timing coefficients, with 13 being negative and significant. Forty one hybrid funds have a positive timing coefficient with only 13 of them statistically significant at the 5 percent level.

Table 3 here.

Although the statistical significance of the results is low, both sample of funds show perverse timing ability and the evidence is stronger for hybrid-FOFs. The difference between the average timing coefficient of hybrid-FOFs and traditional hybrid funds is -0.2353, although this value is not statistically significant. Also, in comparison with the sample of hybrid funds, a larger portion of the sample of hybrid-FOFs attained a negative timing coefficient. In sum, hybrid-FOFs and hybrid funds fail to successfully shift their portfolio holdings with the mission of timing the stock market. Given this evidence of poor timing ability, in the next section I explore the relationship between timing ability and observable fund characteristics.

4.3 Timing ability and fund characteristics

The previous section presented evidence of perverse timing ability by both hybrid-FOFs and hybrids funds. In this section I examine the correlation, if any, between timing ability and observable fund characteristics. I consider three variables which are standard in the mutual fund literature: total net assets, expense ratio, and turnover ratio. The fund data comes from CRSP and it is the same data presented on Table 1. For each fund I used the average value of each characteristic and then sorted the funds into quartiles based on their average. Given these sorts, the first quartile represents funds with the lowest values for each characteristic. Finally, for each quartile I compute the average timing coefficient. Table 4 presents the results.

Table 4 here.

The evidence of the poor timing ability of hybrid-FOFs is widespread. Regardless of the characteristic, all but one quartile have negative average timing coefficient. The only quartile with the positive coefficient is the third quartile based on average expense ratios. For the sample of hybrid funds, the table shows some evidence of positive market timing ability. The smallest hybrid funds and the hybrid funds with the highest average expense ratios show good timing ability. Also, good timing ability is present in the middle section of the partition of hybrids funds based on turnover ratio. In sum, regardless of the three fund characteristics examined here, hybrid-FOFs as a group failed to successfully time the market. On the other hand, when the sample of traditional hybrid funds is partitioned based of fund characteristics, some levels of fund characteristics are correlated with good timing ability.

4. Conclusion

Shares of hybrid funds of funds represent claims of portfolio consisting of a combination of equity and fixed income mutual funds. Hybrid funds of funds offer investors an actively managed and diversified portfolio at a sensible price. Hybrid funds of funds are similar to

traditional mutual funds, but differ in some fundamental issues. For example, hybrid funds of funds hold other funds and just transfer funds from one mutual fund to next when rebalancing their portfolios. Traditional hybrids on the other hand, hold individual securities and must go to the market when they decide to alter their portfolios. These significant differences make them an ideal laboratory to examine market timing ability.

In this study I examine the market timing ability of hybrid funds of mutual funds and a size-matched sample of traditional hybrid mutual funds during the January 1999-June 2010 time period. To measure timing ability, I use daily fund return and index data and implement a multi-factor timing model that includes both stock and fixed income indices, which make it ideal to examine hybrid funds. I find that both samples of hybrids, funds of funds and traditional, fail to successfully time the market. The perverse timing ability of hybrid funds of funds is worse than that of the traditional hybrid funds and widespread regardless of sample partitions based on several fund characteristics. On the other hand, the smallest in size and the most expensive traditional hybrid mutual funds show good timing ability.

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Table 1 Descriptive statistics

Variable	Hybrid-FOFs	Hybrid funds
Total net assets (million)	1094	611
	(116)	(85)
Expense ratio (in %)	0.54	1.27
	(0.39)	(1.19)
Turnover ratio (in %)	74.5	90.2
	(39.5)	(80.4)
Stock allocation (in %)	60.81	61.10
	(65.48)	(61.27)
Bond allocation (in %)	20.63	31.16
	(14.56)	(31.07)
Cash allocation (in %)	7.02	4.08
	(2.87)	(3.86)

This table presents descriptive statistics for the sample of hybrid FOFs and traditional hybrid funds. All values in the table, except net assets, are in percentages. Median values are in parenthesis. The values are means are the cross section mean across the values of all funds during the January 1999-June 2010.

Table 2 Portfolio exposures for the maturity model

	Hybrids-FOFs	Hybrid funds
Market	49.13***	57.11***
Size	4.41***	-5.87***
Book to market	4.90***	6.59***
Momentum	0.43	-0.07
Intermediate	21.97***	23.49***
Long	0	0
Mortgage	11.98***	9.75***
High yield	10.63***	3.58***
Cash	6.28***	6.06***
Adjusted r2	0.97	0.98

This table presents the average percentage exposure to the factors included in the maturity model for the sample of hybrids funds of funds and traditional hybrid funds. ***, **, * denotes statistical significance at the 1, 5 and 10 percent level respectively.

Table 3 Distribution of market timing coefficients

	Hybrid-FOFs	Hybrids funds
Mean	-0.2441	-0.0088
Median	-0.0869	-0.0741
Std. Deviation	0.8225	0.9832
Maximum	0.9188	9.1711
Minimum	-4.6128	-2.3389
Positive coeff.	14	41
Negative coeff.	44	75

This table presents the results of the estimation of the market timing coefficients based on the maturity model for the sample of hybrids funds of funds and hybrid funds. ***, **, * denotes statistical significance at the 1, 5 and 10 percent level respectively.

Table 4 Timing ability and fund characteristics

Panel A: Total Net Assets

Quartile	Hybrid-FOFs	Hybrid funds
1	-0.4719	0.0370
2	-0.3788	0.2721
3	-0.0028	-0.2404
4	-0.1156	-0.1038

Panel B: Expense Ratio

Quartile	Hybrid-FOFs	Hybrid funds
1	-0.0803	-0.0422
2	-0.0527	-0.0799
3	0.0036	-0.0782
4	-0.8176	0.1652

Panel C: Turnover Ratio

Quartile	Hybrid-FOFs	Hybrid funds
1	-0.0326	-0.0191
2	-0.0759	0.0424
3	-0.0627	0.0425
4	-0.7818	-0.1011

The table presents a comparison of the average timing coefficients three partitions of the two fund samples sample based on fund characteristics. Funds are sorted by their average total net assets, expense ratio, and turnover ratio and divided into quartiles with the first quartile representing funds with lowest value of each of the characteristics. For each quartile the average timing coefficient is presented. Data on fund characteristics comes from CRSP.