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Measuring Alpha in the Fund Management Industry:

Do Female Managers Perform Better?

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Abstract

This paper examines the performance of 358 European diversified equity mutual funds controlling for gender differences. Fund performance is evaluated against funds' designated market indices and representative style portfolios. Consistently with previous studies, no significant differences in performance and risk are found between female and male managed funds. However, perverse market timing manifests itself mainly in female managed funds and in the left tail of the returns distribution. Interestingly, at fund level there is evidence of significant overperformance that survives even after accounting for funds' exposure to known risk factors. Employing a quantile regression approach reveals that fund performance is highly dependent on the selection of the specific quantile of the returns distribution; also, style consistency for male and female managers manifests itself across different quantiles. These results have important implications for fund management companies and for retail investors' asset allocation strategies.

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1. Introduction

Since their launch towards the end of the 19

In the last fifty years the mutual fund industry has been the su

(2003) and Niessen & Ruenzi (2007), using a sample of US bond and equity funds respectively, reached the conclusion that there are no significant differences in the risk-adjusted performance of male and female managers. In a related study Beckmann & Menhoff (2008) analyzed the survey responses of 649 fund managers in the US, Germany, Italy and Thailand and confirmed that female fund managers are more risk averse and less overconfident than men.

The present paper contributes to the mutual fund performance literature in several ways. First, we compare the performance of male and female managed equity funds employing a large sample of European diversified equity funds which includes one of the largest proportions of female professionals in studies in this field. Second, for the first time in the literature we compare the ability of managers to predict not only market portfolio returns but also the size and growth of portfolios. To this end, we apply the approach of Treynor & Mazuy (1966) to the multi-factor Fama & French model (1996) in the spirit of Lu (2005). Third, we control for differences in style since funds are classified into fourteen investment categories and their performance is measured against a proper benchmark for each category. This ensures that we mitigate any of the biases related to inappropriate benchmarking that have been thoroughly examined by Lehmann & Modest 1987, Elton et al. 1993, and Sensoy 2009 inter alia. Fourth, owing to the considerable heterogeneity in returns both at fund and portfolio level we employ a quantile approach to explore fund performance and style consistency across various pre-specified regions of the returns distribution. Finally, we address the need highlighted by Banegas et al. (2013) for a more comprehensive research on European funds and especially for funds that invest across Europe.[1]

To preview our results, we find that gender does not influence fund performance and that women are not more risk averse than men. However, at fund level we detect statistically and economically significant alphas, mainly in the Eurozone Large Cap investment category. The documented over-performance of many individual funds becomes particularly important in the light of the turbulence experienced by financial markets resulting from the global financial crisis and the ensuing Eurozone debt crisis. In terms of market timing we document that women are worse market timers than men. In particular, half of women in our sample exhibit perverse market timing.

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[1] A widely known study that examines more than one European fund market is that by Otten and Bams (2002).

Although female managers are in charge of larger funds and shareholders in female managed funds pay on average lower mana

month, and dividing by the NAV at the beginning of the month. Returns are not adjusted for sales charges (such as front-end or deferred loads and redemption fees), since we are only concerned with fund manager's skills and investment strategy. Excess returns have been calculated with respect to the 3-month Euribor rate. Monthly prices of the relevant benchmark indices and the Euribor rate were obtained from Thomson Reuters (Datastream).

difference is only marginally significant. This finding could be explained by the argument of Barber & Odean (2001), who claimed that overconfident investors such as male investors might engage into more frequent trading, which is confirmed in our case by the substantially higher turnover ratio for male managers. Finally, female managers are in charge of larger funds while shareholders in female managed funds pay lower management fees. The latter might be due to behavioural factors in professional money management. As stated previously, male managers might have more confidence in their management skills, which leads them to claim higher compensation than female managers.

Table 3 presents some descriptive statistics for the employed series. The last column implies non-normality of the returns of male and female managed portfolios across the majority of investment styles. This is an important finding that motivates the use of the more robust quantile regression method as a tool for exploring the behaviour of the conditional returns distribution. A comparison of the two portfolios in terms of the median return and variability of returns provides some preliminary evidence on the performance of male and female managers. In particular, in general there are no statistically significant[3] differences either in the average return or in the total riskiness of the two portfolios. The latter sheds light on managers' attitude towards risk, allowing us to conclude that male and female managers exhibit similar risk appetite as in Atkinson et al. (2003). For better comparisons a synthetic portfolio that goes long in male managers and simultaneously short in female managers has been constructed and monitored across the various investment categories. Return statistics of the synthetic portfolio are reported in the row labelled Male vs. Female. Interestingly, we do not detect any evidence of significant over- or under- portfolio performance, which reinforces the evidence that male and female managers perform similarly.

-Insert Table 2 here-

-Insert Table 3 here-

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[3] For the comparison of the portfolio medians we have employed the Wilcoxon/Mann-Whitney non-parametric test while an F-test has been carried out for the variance comparison.

3. Methodology

Accurate performance evaluation is crucial in the fund management industry. There is an ongoing debate in the literature on whether mutual fund managers should be evaluated against the benchmark reported in their prospectus or with respect to a broad market-based passive portfolio of comparable risk (see, inter alia, Cremers and Petajisto, 2009, Sensoy, 2009, Hsu et al., 2010, Cremers, et al., 2010, Angelidis et al. 2012). Benchmark mismatches may result in severe misconceptions regarding funds' risk exposures or funds' superior skills at generating abnormal returns. In the context of the present study, we address this issue by relying on the benchmarks officially assigned by Morningstar to each fund category, which are presented in Table 4.

-Insert Table 4 here-

3.1 Security selection models

3.1.1. Single factor model

The first performance measure employed here is the well-known Jensen's alpha (1968), that is rooted in the CAPM theory. It measures the additional return generated by a fund over and above that justified by market risk, thereby conveying information on security selection or selectivity skills of a fund manager. Formally, the single factor performance measure is the intercept ($_p$) in the regression of the fund excess

passive investment products such as index funds or exchange traded funds. This allows for direct comparisons of active fund managers with comparable passive strategies. Specifically, we opt for a multi-factor performance evaluation model that includes the STOXX Size and Style Indices tracking equity investments in Europe and the Eurozone respectively. We also employ the Barclays Corporate & Government Total Return fixed income index in order to account for European funds' non-stock holdings. Fund overperfomance (underperformance) manifests itself as a significantly positive (negative) intercept (α_p) in the four-factor model that compares the realized returns of the fund against the returns of risk-bearing, passive investment strategies as follows:

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_{p,1}(R_{m,t} - R_{f,t}) + \beta_{p,2}SMB_t + \beta_{p,3}HML_t + \beta_{p,4}(R_{B,t} - R_{f,t}) + \varepsilon_{p,t}$$

(2)

where $\beta_{p,1}$, $\beta_{p,2}$, $\beta_{p,3}$ and $\beta_{p,4}$ are funds' exposures to the relevant risk factors; $R_{p,t}$ is the return of fund p in period t; $R_{f,t}$ is the short term risk-free rate in period t; $R_{m,t}$ is the

3.2. Factor timing models

Market timing manifests itself as the ability of a fund manager to shift successfully its portfolio systematic risk in response to market movements. Traditional market timing models hypothesize that a skilled fund manager increases (decreases) its average market exposure when the market experiences positive (negative) returns, and therefore assume that fund returns are a convex function of benchmark returns in an

Equation (8) shows that the quantile regression estimator is obtained by minimizing the weighted sum of the absolute errors, where the relative weights depend on the specified quantile.

4. Results

4.1 Fund by fund analysis

We first explore fund managers' skills in terms of selectivity and timing employing the entire fund universe descri

to the SMB factor, whereas a substantial portion of female managers (36%) favour a growth-oriented strategy. Again, the best performance is found for the funds belonging to the Eurozone Large-Cap category.

-Insert Table 5 here-

Market timing abilities of fund managers are investigated using the classical market timing model of Treynor & Mazuy (1966). The results of the favourable and unfavourable values for the estimated parameters are reported in Table 6. Panel A shows that only a small number (13) of managers possess significant market timing

& Spain Equity). This finding may be related to the recent Eurozone debt crisis and the subsequent response of fixed income markets.

Table 11 reports the estimated coefficients of Eq. (3) for the two equally-weighted portfolios. Overall, the results at portfolio level confirm the poor market timing abilities documented earlier at fund level. In particular, perverse market timing characterizes both female and male managers for six of the fourteen investment styles, especially in the case of the former. For example, in the Europe Large-Cap Blend category the estimated negative value of the timing coefficient for female managers is twice as big as that for male managers and strongly significant (at the 1% significance level). Finally, Table 12 reports the estimated coefficients of Eq. (4) for the case of the two equally-weighted portfolios. The results indicate differences in timing behaviour for the two genders: there is weak evidence of size and growth timing ability of male managers for four investment categories (Eurozone Small Cap, Europe Mid-Cap, Europe Small Cap, France Small/Mid Cap), whilst female managers appear to have adopted a perverse growth timing strategy in the case of two investment styles (Europe Mid Cap, Europe Large-Cap Value).

4.3 Quantile regression results

Given the non-Gaussian nature of portfolio returns for male and female managers documented earlier we also investigate how the conditional dependence between fund returns and benchmark returns may vary across the entire range of their conditional distributions. Tables 13 and 14 report the estimation results for models (2) and (3) respectively employing the quantile regression approach. The multi-factor estimates of the alphas in the former are negative and statistically significant in the lower part of the conditional return distribution, i.e. for quantiles 0.05 and 0.25, for all investment categories. On the other hand, they are positive and statistically significant in the right tail of the distribution. This implies that fund performance is highly dependent on the selection of a specific regi

As for gender analysis, we have documented the absence of significant differences in the performance of male and female fund managers. The multi-factor model estimates shed light on the security selection skills of fund managers. In particular, at fund level we detect statistically and economically significant alphas mainly in the Eurozone Large-Cap investment category. Female managers appear to be only slightly superior to their male counterparts in terms of their alphas but to possess perverse market timing skills. As for investment strategies, male managers seem to favour small size stocks whereas female managers prefer more growth-oriented strategies. Related to the above, there is weak evidence of positive size and growth timing for male managers whereas female managers generally fail to predict the movements of the growth factor.

Finally, given the skewness of the fund returns distributions we take a quantile regression approach to deal with the possible bias resulting from heterogeneity in returns. Fund performance indeed appears heavily sensitive to the choice of the distribution quantile, with the results being qualitatively the same for male and female managers, both categories displaying a persistent lack of market timing skills, especially for lower returns.

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APPENDIX

Table 1

Female fund managers

Category	Male	Female	Number of Funds	Percentage of female
Eurozone Small Cap	8	1	9	11.11%
Eurozone Mid Cap	9		9	0.00%
Eurozone Large Cap	78	18	96	18.75%
Europe Small Cap	2		2	0.00%
Europe Mid Cap	10	2	12	16.67%
Europe Large Cap Value	30	7	37	18.92%
Europe Large Cap Growth	2	4	6	66.67%
Europe Large Cap Blend	52	10	62	16.13%
France Large Cap	49	5	54	9.26%
France Small/Mid Cap	33	8	41	19.51%
Germany Large Cap	7		7	0.00%
Germany Small/Mid Cap	1		1	0.00%
Italy Equity	4	1	5	20.00%
Spain Equity	14	3	17	17.65%
Total	299	59	358	16.48%

Note: This table shows the allocation of funds that are managed by female managers as a percentage of the total funds by Morningstar investment category. Funds are classified by Morningstar into investment categories on the basis of the underlying portfolio holdings.

Table 2

SMB	0.25%	2.42%	0.71		SMB	0.50%	2.72%	0.06
HML	0.35%	2.66%	0.00		HML	0.35%	2.16%	0.00
R_B	0.06%	1.05%	0.35		R_B	0.06%	1.05%	0.35

Eurozone Large Cap				Europe Large Cap Blend			
Male	0.24%	5.27%	0.05	Male	0.19%	4.81%	0.02
Female	0.09%	5.14%	0.05	Female	0.57%	4.77%	0.00
Male vs. Female	0.03%	0.47%	0.00	Male vs. Female	0.15%	0.66%	0.51

HML	0.35%	2.66%	0.00		HML	0.35%	2.66%	0.00
R_B	0.06%	1.05%	0.35		R_B	0.06%	1.05%	0.35

Italy Equity					Spain Equity			
Male	0.79%	5.74%	0.41		Male	0.18%	5.58%	0.31
Female	0.64%	5.94%	0.55		Female	0.20%	5.70%	0.29
Male vs. Female	0.04%	0.51%	0.72		Male vs. Female	0.16%	1.21%	0.48
R_m	1.04%	6.25%	0.60		R_m	0.03%	6.36%	0.31
SMB	0.25%	2.42%	0.71		SMB	0.25%	2.42%	0.71
HML	0.35%	2.66%	0.00		HML	0.35%	2.66%	0.00
R_B	0.06%	1.05%	0.35		R_B	0.06%	1.05%	0.35

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Table 5

Single factor model regression estimates

Panel A: Number of significant 1 factor alphas		
No. of significantly positive	120	
No. of significantly negative	9	
Panel B: Analysis by gender		
No. of significantly positive 1 factor alphas		No. of funds in the category
Male	98	299 (33%)
Female	22	59 (37%)
No. of significantly negative 1 factor alphas		
Male	6	299 (2%)
Female	3	59 (5%)
Panel C: Analysis by investment objective		
No. of significantly positive 1 factor alphas	120	

Eurozone Mid Cap	4	9

Table 6

Timing model I regression estimates

Panel A: Number of significant timing coefficients		
No. of significantly positive	13	
No. of significantly negative	123	
Panel B: Analysis by gender		
No. of significantly positive timing coefficients		**No. of funds in the category**
Male	12	299 (4%)
Female	1	59 (2%)

Note:

Note: This table reports overall OLS estimation results from the four factor securities selection model in Eq. (2) employing the Newey West (1987) method for robust standard errors. Panel A of the table reports the number of significant positive and negative four factor alphas whereas Panel B presents the results grouped by manager gender. Panel C reports the significant multi factor alphas broken down by investment category.

Table 8

Fund exposures to risk factors

Panel A:

Table 9

Securities selection model I

Category	Intercept	$_{p,1}$	Adj. R^2	Category	Intercept	$_{p,1}$	Adj. R^2

Category	Intercept	$_{p,1}$	Adj. R^2	Category	Intercept	$_{p,1}$	Adj. R^2
Europe Large Cap Value				**Italy Equity**			
Male	0.22%**	0.84***	0.96	Male	0.31%**	0.90***	0.96
Female	0.24%*	0.80***	0.93	Female	0.28%*	0.93***	0.96
Europe Large Cap Growth				**Spain Equity**			
Male	0.27%						

Table 10

Securities selection model II

Category	Intercept	p,1	p,2	p,3	p,4	Adj.R^2	Category	Intercept	p,1	p,2	p,3	p,4	Adj.R^2
Eurozone Small Cap							**Europe Large Cap Blend**						
Male	0.37%	0.57***	0.19	0.02	0.28	0.80	Male	0.11%*	0.95***	0.10***	0.02	0.06	0.98
Female	0.13%	0.59***	0.10	0.13	0.37	0.77	Female	0.17%*	0.93***	0.14***	0.08	0.11	0.95
Eurozone Mid Cap							**France Large Cap**						
Male	0.21%*	0.87***	0.11**	0.09**	0.17	0.96	Male	0.14%**	0.92***	0.15	0.07**	0.07	0.98
Female	–	–	–	–	–	–	Female	0.17%**	0.99***	0.10*	0.06	0.11	0.98
Eurozone Large Cap							**France Small/Mid Cap**						
Male	0.13%**	0.93***	0.05*	0.04*	0.03	0.99	Male	0.05%	0.83***	0.13	0.04	0.11	0.95
Female	0.19%***	0.92***	0.05	0.08***	0.08	0.98	Female	0.01%	0.88***	0.10	0.02	0.15	0.97
Europe Small Cap							**Germany Large Cap**						

Category	Intercept	p,1	p,2	p,3	p,4	Adj. R^2	Category	Intercept	p,1	p,2	p,3	p,4	Adj. R^2
Europe Large Cap Value							Italy Equity						
Male	0.12%	0.92***											

Table 11

Timing model I

Category	Intercept	p	c_p	Adj. R^2	Category	Intercept	p	c_p	Adj. R^2

Table 11 (Continued)

Timing model I

Category	Intercept	p	c_p	Adj R2	Category	Intercept	p	c_p	Adj R2
Europe Large Cap Value					**Italy Equity**				

Category	Intercept	$p,1$	$p,2$	$p,3$	$c_{p,1}$	$c_{p,2}$	$c_{p,3}$	Adj. R^2	Category	Intercept	$p,1$	$p,2$	$p,3$	$c_{p,1}$	$c_{p,2}$	$c_{p,3}$	Adj. R^2
Eurozone Small Cap									Europe Large Cap Blend								

Timing model II

Category	Intercept	$p,1$	$p,2$	$p,3$	$c_{p,1}$	$c_{p,2}$	$c_{p,3}$	Adj. R^2	Category	Intercept	$p,1$	$p,2$	$p,3$	$c_{p,1}$	$c_{p,2}$	$c_{p,3}$	Adj. R^2
Europe Large																	

q75	0.42%***	0.93***	0.00	0.03	0.10
q95	1.23%***	0.96***	0.13*	0.01	0.39

q

	0.03	0.35***	0.16		
	0.06	0.37***	0.07		
q75	0.58%***	0.88***	0.02	0.29***	0.10
q95	1.82%***	0.77***	0.01	0.32	

q05	2.92%***	0.96***	0.43	0.12	0.59
q25	1.33%***	0.96***	0.35***	0.23	0.07

Male

Europe Large Cap Growth

q05	1.88%***	0.92***	0.09	0.01	0.44*
q25	0.73%**	0.81***	0.14	0.00	0.17

Male

France Small/Mid Cap
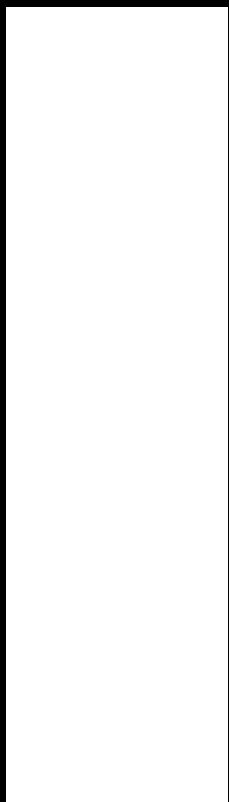
Table 14

Market timing model:Quantile regression

Intercept p

Eurozone Large Cap		q				Europe Large Cap Value		q			
		q75	–	–	–			q75	0.94%***	0.93***	0.40**
		q95	–	–	–			q95	2.61%***	0.93***	0.87
	Male	q05	0.57%**	0.91***	0.24		Male	q05	0.68%	0.79***	1.24*
		q25	0.09%	0.93***	0.32**			q25	0.04%	0.83***	1.05**
		q50	0.18%***	0.94***	0.22*			q50	0.39%***	0.87***	0.83**
		q75	0.46%***	0.92***	0.19			q75	0.99%***	0.80***	0.62
		q95	1.42%***	0.86***	0.22			q95	2.06%***	0.85***	0.98
	Female	q05	0.68%***	0.88***	0.53**		Female	q05	1.26%*	0.75***	1.30
		q25	0.12%	0.90***	0.52***			q25	0.03%			

q95   2.91%***

q25	0.31%**	0.99***	0.16		q25	–	–	–
q50	0.27%**	0.97***	0.29		q50	–	–	–
q75	0.94%***	0.96***	0.54		q75	–	–	–