Learning about individual managers' performance in UK pension funds: The importance of specialization

Abstract

This study examines the performance of managers over time, as well as its persistence, taking into account both manager characteristics and market conditions. Applying parametric and non-parametric methodologies, we examine a sample of UK equity pension fund managers. Our results help to understand the importance of manager assignments in the industry and reveal the importance and benefits of management specialization. We find certain manager performance persistence, revealing that some managers are better than others and possess superior investment skills. Additionally, we find that managers achieve better results when they run a single fund or one investment-objective funds, which allows managers to focus on specific tasks. Nonetheless, manager performance varies with market conditions and highlights managers' different skills. Specialist managers perform better in bullish markets, and generalists perform better in bearish periods.

Keywords: generalist managers, pension funds, performance, persistence, specialist managers

JEL classification: G10, G23

1. Introduction.

Much financial literature addresses the role and importance of pension fund management; however, few studies analyze the performance of individual managers. Pension funds have become the main financial vehicle to cover the retirement contingency; therefore, a proper management of these financial vehicles is crucial and may affect the future retirement incomes of many savers. If management companies are able to identify the best performing managers throughout their professional career and understand their behavior over time, they may re-allocate managers in different positions to improve fund performance and, consequently, attract investment flows to this industry.

The empirical evidence suggests that, in general, mutual and pension fund managers do not exhibit superior performance and usually underperform. This evidence is mainly found in US mutual and pension funds (Lakonishok et al. 1992; Grinblatt et al. 1995; Daniel et al. 1997; Carhart 1997; Chevalier and Ellison 1999; Wermers 2000; Pastor and Stambaugh 2002). Some UK mutual and pension fund studies also support these results (Blake and Timmermann 1998; Blake et al. 1999; Thomas and Tonks 2001; Blake and Timmermann 2005). Nonetheless, these results are generally based on fund data rather than on mutual fund managers. Among the few studies focusing on managers, Baks et al. (2001) analyze manager performance in US mutual funds; however, these authors do not provide a complete picture about the manager performance as in our paper, because they only analyze the last manager in charge of the fund.

An analysis based on fund data over several years may have several drawbacks. First, funds can experience manager replacement; hence, fund performance cannot be attributed to a specific manager (Clare et al. 2014). Whether managers move frequently,

manager performance is lost when the analysis is performed at the fund level. A performance analysis at the manager level can answer the common questions raised in financial literature, such as whether the ability resides in the management company or in the portfolio manager, and whether some managers are indeed better than others.

Whether some managers are better than others, they should present performance persistence over time. The pension fund literature shows mixed evidence about fund performance persistence and primarily reveals persistence in the short-term. Christopherson et al. (1998) find persistent performance in poor prior-period performance in US pension funds. Tonks (2005) find strong persistence in UK pension funds from 1983 to 1997, over one-year time horizons. Clare et al. (2010) find little evidence of positive performance persistence in UK defined benefit pension funds investing in Pacific Basin equities.

According to Berk and Green (2004), the lack of performance persistence in the long term seems to imply that superior performance is derived from luck rather than skill. However, this finding may also be explained because most of the existing works analyze this topic using fund data instead of manager data. Among this scarce evidence is the study carried out by Pojarliev and Levich (2010), who analyze the performance of 15 currency fund managers over three years and find absence of alpha persistence but evidence of currency style persistence. This work is the first study, as far as we are aware, that analyzes performance and persistence in regard to managers.

The lack of long-term persistence may also be because managers are not able to outperform both in crises and expansions periods. Therefore, we study manager performance and its persistence over time. Prior studies find different fund performance with business cycles (Ferson and Schadt 1996; Christopherson et al. 1998; Moskowitz 2000; Glode 2011). Moskowitz (2000) finds that active mutual fund managers obtain

higher performance in recessions because investors are willing to pay more for assets negatively correlated with consumption when they have more needs of profitability; that is, in recessions (Cochrane 2001). Kosowski (2011) argues that managers vary their portfolio decisions according to their forecasts of market movements. Specifically, Kosowski (2011) finds that US mutual funds present superior skills in crises because the higher information dispersion during recessions produces that some managers are better informed and, thus, outperform. Furthermore, this author points out that time-varying performance is asymmetric for funds with different characteristics, which might also be expected at a manager level. Kacperczyk et al. (2011) find higher performance in recessions because skilled managers have a larger informational advantage over unskilled managers during a recession, which generates higher return for informed managers in these periods. Later, Kacperczyk et al. (2014) explain that cyclical outperformance results are due to time-varying strategies because managers focus on different tasks at different time periods to adapt the portfolios to market movements and economic conditions.

In view of these results, we would expect different managerial performance with market conditions, as previously documented in US mutual funds (Ferson and Schadt 1996; Christopherson et al. 1998; Moskowitz 2000; Glode 2011; Kosowski 2011; Kackperczyk et al. 2011, 2014; among others).

Additionally, we examine whether managers with specific characteristics (managerial attributes) outperform their competitors. Different works relate fund performance with managerial attributes, such as tenure and age (Korniotis and Kumar 2011), gender (Dwyer et al. 2002; Watson and McNaughton 2007; Babalos et al. 2015), fund type under management (Custodio et al. 2013; Zambrana and Zapatero 2016), or a variety of these (Gottestman and Morey 2006; Fang and Wang 2015). These previous

works find that performance is affected by managerial traits, but the relation between them is not clear. Possible explanations for these diverse results may lie on the fact that manager features change over time (managers learn with experience, start/stop simultaneously managing several funds…). However, these studies examine the relation between performance and manager characteristics from a fund perspective and do not follow the manager record over time.

In this work, we first study the performance of UK equity pension fund managers over time, taking into account that managers can simultaneously manage different funds and can move from one management company to another. Undertaking parametric and non-parametric methods, we analyze manager's performance persistence to examine whether the worst (best) managers in the past will be the worst (best) performers in the future. This is especially important because management companies may identify the worst and best managers, independently of the fund that they were/are/will be managing. Choosing the adequate manager has important implications for management companies. Better outcomes may translate into higher company size, larger income and better reputation, which may lead to attract more investors and increase company's market position. Therefore, management companies should possess mechanisms to retain talent, such as special retribution to best performers.

Our persistence analysis shows the existence of managers with superior skills; however, the best managers have problems adapting to bearish markets. In line with our prior argument, our results show that the scarce long-term persistence found in prior literature (Goetzman and Ibbotson 1994; Brown and Goetzmann 1995; Blake and Morey 2000) can be due to time-varying market conditions. This result reveals that some managers are not able to adapt correctly their managerial strategies to market movements, especially in bear markets.

Afterwards we explore whether certain managerial characteristics are associated with better or worse manager performance. Our results show differential skills among managers and market conditions. The manager performance is more affected by the level of specialization than by personal characteristics, such as gender. In general, we find that specialized managers (those who run funds in one investment vocation) report better performance than those managers who run funds in different investment vocations. Nonetheless, generalist managers achieve better performance in bearish markets, whereas specialists outperform in bullish periods.

Although no prior works have analyzed the specialization behavior in the economic cycles, our results are line with some related works that study one of these aspects, i.e. performance in economic cycles or performance according to the level of specialization. Zambrana and Zapatero (2016) find differential skills between specialist and generalist managers; specifically, the fund performance is higher when market timers are allocated to generalist tasks and stock pickers are allocated to specialist tasks, hence market-timing (stock-picking) managers should be assigned to generalist (specialist) responsibilities. Similarly, Göricke (2016), from a family perspective, find that specialist funds, which focus on stocks from a narrow selection of sectors, present stock-picking skills, versus the generalist funds that invest in stocks from a wider sector range. Moreover, Kacperczyk et al. (2014) observe differential skills over time and find stock picking in booms and market timing in recessions.

Therefore, the higher stock picking abilities in booms (Kacperzyk et al. 2014) along with the evidence that specialist managers present stock-picking skills (Zambrana and Zapatero 2016; Göricke 2016) are consistent with the better performance of specialist managers in bullish periods found in this paper. Furthermore, we find that generalist managers perform better in bearish periods, which is consistent with

Kacperzyk et al. (2014), who find higher evidence of market timing in bearish markets, and Zambrana and Zapatero (2016), who find that better market timers are usually generalist managers.

Our results support the existence of different performance level according to the type of managers and diverse results in booms and crises, which may help management companies to allocate UK domestic equity pension fund managers in appropriate positions. Management firms may identify the managers that create value in each market phase taking less time in the manager selection decision-making.

The rest of the paper proceeds as follows. Section 2 presents our methodology. In Section 3, we describe the UK pension industry and the data used. Section 4 contains our empirical results, and Section 5 concludes.

2. Methodology.

2.1. Performance analysis.

To determine a manager's performance, we first estimate the monthly fund performance of each portfolio managed by a given manager or a management team in which the names of the team were known. We then obtain the average manager performance per month as the monthly average performance of all funds managed by a manager each month. The performance measures used are the Jensen (1968) alpha and the four-factor Carhart (1997) alpha. The monthly fund alphas are estimated with the daily fund returns of each month[1]. The Jensen (1968) alpha is obtained from the Capital Asset Pricing Model (CAPM):

$$r_{i,t} = \alpha_{it} + \beta_{1,it} r_{mt} + e_{it} \quad (1)$$

where r_{it} is the net excess return of fund *i* in period *t* over the risk-free asset, r_{mt} is the excess return of market benchmark in period *t* over the risk-free asset, α_{it} is the

[1]The daily observations by month vary between 19 and 23 observations.

Jensen's alpha and shows the fund performance, β_{it} is the fund beta to the market benchmark, and e_{it} is a random error term.

The four-factor model of Carhart (1997) allows us to determine the fund performance considering the investment styles followed by a fund manager, adding the momentum factor to the three-factor model of Fama and French (1993):

$$r_{i,t} = \alpha_{it} + \beta_{1,it} r_{mt} + \beta_{2,it} SMB_t + \beta_{3,it} HML_t + \beta_{4,it} PR1YR_t + e_{it} \quad (2)$$

where : r_{it} is the net excess return of fund *i* at time *t* over the risk-free asset; r_{mt} is the excess return of the market benchmark over the risk-free asset at time *t*; SMB_t is the return on factor-mimicking portfolios for size, defined as the return difference between small stocks and large stocks, HML_t is the returns on factor-mimicking portfolios for value, defined as the return difference between high and low book-to-market ratio stocks, $PR1YR_t$ refers to the 1-year momentum factor and captures the return difference of past winner stocks and past loser stocks, and e_{it} is the error term.[2]

Once the monthly alphas of each pension fund are calculated, we calculate the monthly alphas of each manager by assigning the monthly fund alpha to the specific manager/s of the fund in each month. If a manager is managing several funds at the same time, we allocate to the manager the average performance of that month. As a result, we obtain the performance of each manager over time and can therefore rank fund managers according to their performance, as well as examine their performance persistence over time.

2.2. Performance persistence analysis.

We evaluate whether UK domestic equity pension fund managers present performance persistence with two complementary methodologies (non-parametric and

[2] We use the risk factors (market, -r_m-, size –SMB-, book-to-market –HML-, and momentum –PR1YR) developed by Gregory et al. (2013) for the UK market, which are obtained from the Xfi Centre for Finance and Investment, University of Exeter:
http://business-school.exeter.ac.uk/research/areas/centres/xfi/research/famafrench/disclaimer/

parametric) in order to provide a robust analysis. Some authors indicate that non-parametric methods, based on contingency tables, present some limitations. Cortez et al. (1999) indicate that the results of contingency tables for small samples should be interpreted with caution. Cuthbertson et al. (2010) point out that contingency tables are not easy for investors to interpret. Matallín-Sáez et al. (2016) find that this methodology usually finds persistence too easily, and these authors use the parametric method in a second stage to overcome this problem. Matallín-Sáez et al. (2016) find that both methods are important to estimate persistence, given their complementarity. Therefore, following these authors, we apply both parametric and non-parametric methods to verify the robustness of our persistence results.

The non-parametric method is based on the analysis of contingency tables, as in Brown and Goetzmann (1995), Malkiel (1995), Kahn and Rudd (1995), Silva et al. (2005), Elyasiani and Jia (2011), and Matallín-Sáez et al. (2016), among others. This methodology compares performance rankings in two consecutive periods and identifies two sub-sets, “winners” (W) and “losers” (L), on the basis of the median criterion. A manager can be allocated to one of these four categories: Winner in both periods (WW), Winner in the first period and Loser in the second period (WL), Loser in the first period and Winner in the second period (LW), or Loser in both periods (LL). If there is evidence of positive persistence, we would expect to observe more managers in either the WW or LL categories.

We test the statistical significance of this phenomenon using several statistical methods: the Z-test of Malkiel (1995), the odds ratio of Brown and Goetzmann (1995), and the chi-square statistic of Kahn and Rudd (1995).

The Z-test of Malkiel (1995) is collected in the following expression:

$$Z = (Y - np) / \sqrt{np(1 - p)} \qquad (3)$$

where Z is the statistical variable and follows a normal distribution (0,1), Y is the number of winner managers in two consecutive periods, n is the sum of the winners (WW) and losers (LL) in two consecutive periods, and *p* is the theoretical percentage when there is no persistence; that is, 0.5.

The odds ratio, defined by Brown and Goetzmann (1995), is as follows:

$$OR = \frac{WWxLL}{WLxLW} \tag{4}$$

Under the null hypothesis of no persistence, the odds ratio will equal one. A significantly positive odds ratio provides evidence of persistence in performance, and a significantly negative odds ratio provides evidence of reversal in persistence performance. The null hypothesis can be tested by the Z-test, which follows a standard normal distribution:

$$Z = \frac{\ln(OR)}{\sigma_{\ln(OR)}} \tag{5}$$

where $\sigma_{\ln(OR)} = \sqrt{(1/WW) + (1/WL) + (1/LW) + (1+LL)}$.

Finally, the Kahn and Rudd (1995) chi-square statistic is as follows:

$$\chi^2 = \sum_{i=1}^{n}\sum_{j=1}^{n}\frac{(O_{ij} - E_{ij})^2}{E_{ij}} \tag{6}$$

Where O_{ij} is the actual frequency of the i^{th} row and j^{th} column, and E_{ij} is the expected frequency of the i^{th} row and j^{th} column of the contingency table.

On the other hand, the parametric methodology, initially proposed by Carhart (1997), is also called the recursive portfolio approach, and is one of the most commonly methodologies used in the financial literature (see, e.g., Bollen and Busse 2005; Kosowski et al. 2006; Busse et al. 2010; Fama and French 2010, and Matallín-Sáez et al. 2016). This method is based on comparing current and past performance and analyzing if managers are able to reach similar results over time. Consequently, if there

is persistence, managers investing in the worst (best) funds in the past should show worse (better) performance in the future.

As in previously literature, at the beginning of each year we form five equal-weighted portfolios of pension fund managers, using the lagged one-year manager performance (quintiles 5 and 1 show the best and worst performers, respectively). The holding period of the portfolios is one year; therefore, we repeat this process each year. This produces a time series of annual performance on each quintile portfolio from 2001 to 2014; that is, each portfolio is a dynamic strategy that rebalances managers according to their prior performance. Finally, we test the differential performance between the top and bottom managers.

2.3. Relationship between manager performance and manager characteristics.

To analyze the importance of manager characteristics for manager performance, in this section we study the influence of several manager attributes (gender, tenure, number of non-domestic equity funds managed, and number of domestic equity funds managed) on three performance measures (CAPM alpha, four-factor alpha and net excess return). Financial literature shows diverse influence of the aforementioned managerial attributes on fund performance. Prior studies (Hinz et al. 1997, Dwyer et al. 2002, Watson and Robinson 2003) find gender differences in investing attitudes, although Powell and Ansic (1997) and Niessen-Ruenzi and Ruenzi (2015) find that gender does not influence on the ability to perform. On the other hand, several authors, like Golec (1996) and Ding and Wermers (2012), show that, in general, longer tenure is associated with better performance. Nonetheless, Ding and Wermers (2012) find that managers with longer tenure outperform (underperform) in large (small) funds. Moreover, the distinction between the number of UK domestic equity funds managed versus the number of non-UK domestic equity funds managed allows us to study the

level of specialization of our managers. Zambrana and Zapatero (2016) identify distinct manager skills based on manager responsibilities. These authors show that those managers with market timing abilities should be assigned to generalist responsibilities, that is, they are competent to run funds of several investment vocations, while managers with stock-picking abilities should handle specialist responsibilities running funds with one investment objective.

To analyze the impact of manager characteristics on fund performance, we propose the following panel data regression.

$$Manager\_Performance_{it} = \alpha_0 + \beta_1 Gender_{it} + \beta_2 Tenure_{it} + \beta_3 \#\ funds\ ex-UK_{it} + \\ + \beta_4 \#UK\ \ funds_{it} + \beta_5 Fund\ age_{it} + \varepsilon_{it} \quad (7)$$

where *Manager_Performance*$_{it}$ is the CAPM alpha, four-factor alpha or net excess return of manager *i* in year *t*; *Gender*$_{it}$ is a dummy variable that indicates the gender of manager *i* in year *t* and takes the value of one when the funds are managed by a female and zero otherwise; *Tenure* indicates the number of years of experience of manager *i* in year *t; #funds ex-UK*$_{it}$ indicates the number of non-domestic equity funds managed by manager *i* in year *t*: that is, the number of funds managed except those funds that invest in UK domestic equity; *#UK funds*$_{it}$ indicates the number of domestic equity funds managed by manager *i* in year *t*; *Fund age* is a fund control variable that indicates the average age of the funds managed by manager *i* in year *t*; and ε_{it} is the error term.

When a manager handles several funds and all of them are UK domestic equity pension funds (the category studied), this manager is defined as a *specialist* because he/she focuses on just the investment category analyzed in this paper; consequently, the *#funds ex-UK*$_{it}$ variable takes a value of zero. A manager is defined as a *generalist* when the number of funds managed is not the same as the number of UK domestic equity

funds managed, that is, the manager is responsible for funds of different investment categories (Custodio et al. 2013; Zambrana and Zapatero 2016).

We further study the influence of market conditions on the prior model. Prior literature finds distinctive fund performance in bull and bear markets. Capocci et al. (2005) find that US hedge funds outperform the market during bullish periods and do not underperform in bearish periods. On the contrary, Kosowski (2011) finds better mutual fund performance in recessions than in booms. In booms, information (generally positive news) is fairly symmetrically distributed in the market; however, in recessions, the information asymmetry increases because some firms reveal biased information in case of bad news. Additionally, skilled managers, usually better informed than the average investor, may be even better informed in crises and, hence, take advantage of this information to outperform. Glode (2011) justifies outperformance of mutual funds in recessions because the consumption marginal utility of investors is higher in such periods.

We develop model (8) from model (7) by including an annual dummy variable that equals one in a bull market and zero otherwise. We classify the sampled years into bear and bull years when the annual market return is negative and positive, respectively.[3]

$$Manager\_Performance_{it} = \alpha_0 + \beta_1 Gender_{it} + \beta_2 Tenure_{it} + \beta_3 \#\ funds\ ex-UK_{it} + \\ + \beta_4 \#UK\ \ funds_{it} + \beta_5 Fund\ age_{it} + \beta_6 D_{bull\,it} + \varepsilon_{it} \quad (8)$$

where D_{bull} is a dummy variable that equals one in a bull market and zero otherwise. The rest of the variables are as defined in model (7).

[3] Specifically, 2001, 2002, 2008 and 2011 are considered as bear years, whereas the rest of the sampled years are bull years.

2.4. Robustness analysis: managers' specialization.

We further focus on the specialization importance and develop a robustness analysis to examine whether the specialist and generalist managers perform differently. Managers vary the management strategies among the funds with different investment vocations; however, among the funds with one investment vocation (UK equity), the management strategy should also differ according to the fund style (value versus growth UK equity funds). Monitoring funds of several investment styles also requires additional attention and time than monitoring funds of the same investment style; as a result, manager's performance may be affected.

To study the effect of handling funds of one/several investment styles, we redefine the meaning of specialist and generalist variables in models (7) and (8) to analyze in more detail the consequences, in terms of performance, of assigning specific responsibilities to these managers.

Specifically, specialist managers are those running funds of one equity style and generalist managers are those running funds of several investment styles. The equity styles are obtained from the equity style box variable included in the Morningstar Direct database. This variable classifies funds into the following nine categories: Large Blend, Large Value, Large Growth, Mid Blend, Mid Value, Mid Growth, Small Blend, Small Value and Small Growth.

Accordingly, we replace the generalist and specialist variables of models (7) and (8) by these two new variables: $\#UKfunds\_different\ styles_{it}$, which indicates the number of UK equity funds with different investment styles managed by manager i in year t, and $\#UKfunds\_same\ style_{it}$, which indicates the number of UK equity funds managed by manager i in year t with the same investment style. If this variable takes the value of

zero, the manager will be considered a generalist manager and otherwise a specialist manager.

Hence, we develop the following models:

$$Manager\_Performance_{it} = \alpha_0 + \beta_1 Gender_{it} + \beta_2 Tenure_{it} + \beta_3 \#UKfunds\_different\ styles_{it} + \\ + \beta_4 \#UKfunds\_same\ style_{it} + \beta_5 Fund\ age_{it} + \varepsilon_{it} \quad (9)$$

$$Manager\_Performance_{it} = \alpha_0 + \beta_1 Gender_{it} + \beta_2 Tenure_{it} + \beta_3 \#UKfunds\_different\ styles_{it} + \\ + \beta_4 \#UKfunds\_same\ style_{it} + \beta_5 Fund\ age_{it} + \beta_6 D_{bull\ it} + \varepsilon_{it} \quad (10)$$

Therefore, when a manager handles funds of several styles, the manager is considered a *generalist*, and when a manager only handles UK domestic equity pension funds of the same investment style, this manager is defined as a *specialist* because he/she focuses on one investment style; consequently, in this last case, the *#UKfunds_different styles*$_{it}$ variable takes a value of zero. The remaining variables of models (9) and (10) are defined as in models (7) and (8), respectively.

3. UK pension fund market and data sample.

The worldwide pension fund industry has grown remarkably over the past decades. Global pension fund investment reached USD 25.2 trillion of assets under management at the end of 2014 (OECD 2015), with USD 14.146 trillion invested in the United States and USD 2.684 trillion in the United Kingdom.

The UK pension fund industry deserves scholars' and practitioners' attention because it is the second largest pension fund market in the world, representing 96% of the British GDP. One reason for this expansion is the low level of state pensions until the mid-1990s. Although state pensions increased from then on, investment in private pensions continues to experience strong growth. Pension funds are currently the main investment vehicle for household savings, and 49.8% of household savings were invested in pension funds and insurance in 2014 (INVERCO 2015). It is remarkable that the foreign investment of pension funds was only 27.7% of the total investment in 2014

(OECD 2015); the equity pension fund investment category represented 21.8% of total investment (OECD 2015), and the domestic equity pension funds were close to 38% of the equity pension funds.

Our database comprises all UK domestic equity pension funds. The data are obtained from Morningstar Direct database, which provides comprehensive information about fund returns and fund characteristics, such as inception date and manager history. For pension funds with different share classes, we aggregate share classes on portfolio level because they have the same portfolio composition and manager. We keep the observation of the oldest share class for the funds' qualitative attributes (name, objective and inception date).[4] We exclude all pension funds that belong to the index fund category to remove passively managed funds from our analysis, examining only actively managed funds. Our sample is free of survivorship bias because it includes all UK domestic equity pension funds existing in a certain month during the time period analyzed. The final sample is composed of 287 pension funds, which are managed by 269 different managers from January 2000 to September 2014.

Some descriptive statistics of the sample are shown in Tables 1 and 2. Table 1 shows statistics of return and performance of UK pension fund managers (panel A) and the risk factors used (panel B). Panel A shows that the monthly average manager net return is 0.65% during the period studied. The performance measures (monthly CAPM and four-factor alphas) are also positive over the period studied, showing monthly manager alphas of 0.34% and 0.58%, respectively. Similarly, the Sharpe ratio is, on average, positive (0.0259). Panel B shows the risk factor statistics. We observe positive returns, on average, in all risk factors, except in the momentum factor.

[4] The oldest share class in the fund is usually the first established by the fund company.

Table 1. Descriptive statistics.

Table 1 shows descriptive statistics (average, standard deviation, minimum, maximum, 10% and 90% percentiles) of manager net return and manager performance variables (panel A) and the risk factors used (panel B) from 2000 to 2014.

Panel A: Manager return and performance statistics						
	Average	Std. Dev.	Minimum	Maximum	10% percentile	90% percentile
Manager return	0.65%	0.74%	-2.43%	6.37%	-0.05%	1.32%
Manager CAPM alpha	0.34%	0.49%	-3.13%	2.02%	-1.12%	1.66%
Manager 4-factor alpha	0.58%	0.62%	-1.26%	4.11%	-0.74%	2.55%
Sharpe ratio	0.0259	0.0210	-0.0988	0.093	0.0086	0.0524
Panel B: Risk factor return statistics						
	Average	Std. Dev.	Minimum	Maximum	10% percentile	90% percentile
Risk-free asset	0.0001	0.0001	0.0000	0.0002	0.00002	0.0002
Market factor	0.0001	0.0117	-0.0836	0.0920	-0.0125	0.0123
Size factor	0.0001	0.0079	-0.0630	0.0356	-0.0084	0.0087
Book-to-market factor	0.0001	0.0069	-0.0402	0.0578	-0.0068	0.0075
Momentum factor	-0.0005	0.0092	-0.0813	0.0599	-0.0099	0.0084

Table 2 shows the distribution of the managers and funds over the years analyzed. Our sample is based on a total number of 269 distinct managers and a total number of 287 distinct funds.[5] The maximum (minimum) number of funds is 260 (69) in 2013 (2000). The maximum (minimum) number of managers analyzed is 168 (60) in 2013 (2000). The average number of funds managed by a manager is 1.74 funds.[6] As can be seen in Table 2, the majority of managers run between 1 and 3 funds, some of them run between 4 and 6 funds, and a minority run more than 7 funds. Additionally, the sample is formed by more male managers (a total of 244 male managers versus a total of 25 female managers), and specialist managers (a total of 126 specialist managers versus 143 generalist managers). The average manager tenure in a fund is over 7 years, and the fund age is, on average, 8 years.

[5] Our database is free of survivorship bias; therefore, the funds and managers vary over the years, appearing and disappearing over the sample period.
[6] Note that the mutual funds of the sample can be single-managed or team-managed.

Table 2. Distribution of managers and funds by year.

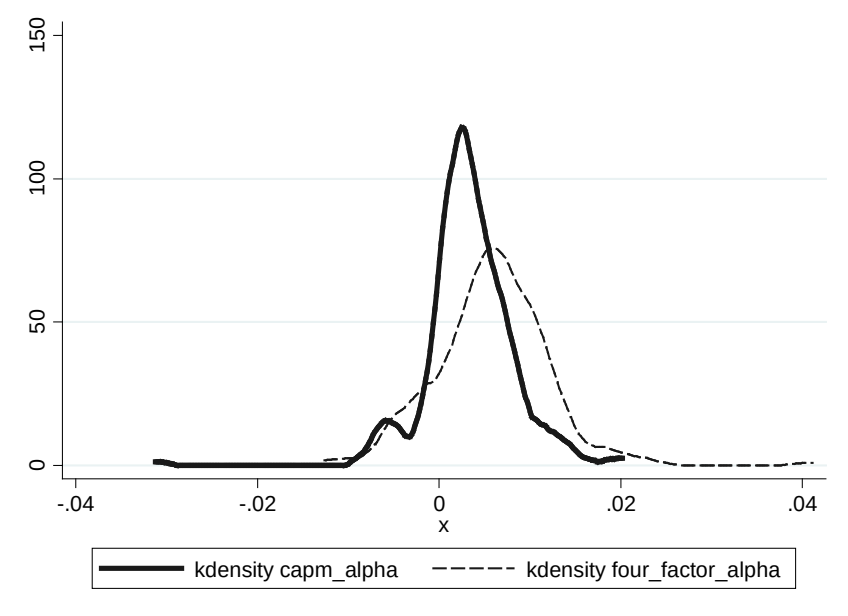
Table 2 shows the distribution of several variables analyzed by year; specifically, the number of funds (# funds), the number of managers (# managers), the average number of funds managed by a manager (average of # funds by manager), the number of managers running 3 funds or less funds, between 4 and 6 funds, between 7 and 9 funds, and more than 10 funds, the number of male and female managers, the number of generalist and specialist managers according to the fund investment category, the manager tenure (in years), and the fund age (in years). The last row shows if the market is considered bullish or bearish.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Average
# funds	69	79	113	116	128	147	172	195	197	233	226	227	236	260	251	176.6
# managers	60	68	91	95	107	120	139	153	155	175	163	162	161	168	158	132
Average of # funds by manager	1.28	1.44	1.63	1.62	1.60	1.64	1.62	1.73	1.72	1.78	1.86	1.91	2.03	2.11	2.22	1.74
# managers running =< 3 funds	59	66	86	89	101	111	130	140	142	161	149	147	142	148	135	120
# managers running 4-6 funds	1	2	4	5	5	8	8	12	11	12	11	12	14	16	18	9
# managers running 7-9 funds	0	0	1	1	1	1	1	1	2	2	3	3	4	3	4	2
# managers running >=10 funds	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
# male	54	61	84	88	95	104	122	135	135	154	142	142	143	152	141	117
# female	6	7	7	7	12	16	17	18	20	21	21	20	18	16	17	15
# generalist (inv. category)	7	16	23	25	27	28	32	39	36	41	44	43	43	47	46	33
# specialist (inv. category)	53	52	68	70	80	92	107	114	119	134	119	119	118	121	112	99
Manager tenure (years)	7	7	6	6	6	6	7	7	7	8	8	9	9	10	11	7.6
Fund age (years)	3	3	4	4	5	6	6	7	8	9	10	10	11	12	13	8
Bull/Bear	Bull	Bear	Bear	Bull	Bull	Bull	Bull	Bull	Bear	Bull	Bull	Bear	Bull	Bull	Bull	

Figure 1 shows the non-parametric kernel estimation of the performance (CAPM and four-factor alphas) distributions. This figure shows that the average performance and most part of both distributions display positive performance. The CAPM and four-factor alpha distributions are centered on 0.003 and 0.006, respectively. Nonetheless, the distributions show that some managers present negative performance.

Figure 1. Non-parametric kernel performance estimation.

Figure 1shows the non-parametric (kernel) estimation of the performance distribution using as performance measure the CAPM alpha (solid line) and the four-factor alpha (dash line) from 2000 to 2014.



4. Results.

4.1. Manager performance persistence.

The non-parametric results of the manager performance persistence are shown in Table 3. Table 3 is divided into two panels. Panels A and B show contingency tables considering the persistence in CAPM alphas and four-factor alphas, respectively. In the contingency tables, winner and loser managers are defined as greater (lower) than the median annual performance across all managers in a specific time period. The Malkiel (1995), Brown and Goetzmann (1995) and Kahn and Rudd (1995) annual statistical tests are also displayed.

Table 3. Non-parametric performance persistence results.

Table 3 shows the performance persistence results of the non-parametric analysis. Panels A and B show the annual contingency tables and the persistence statistics tests (the Z-test of Malkiel, the Z-test of Brown and Goetzmann and the chi-square of Kahn and Rudd) from 2000 to 2014. WW represents winner managers in both periods, WL shows Winner in the first period and Loser in the second period, LW shows Loser in the first period and Winner in the second period, and LL means Loser in both periods. Panels A and B show the persistence considered as a performance measure the CAPM alpha and the four-factor alpha, respectively. *,**, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Performance persistence (CAPM alpha)							
	WW	WL	LW	LL	Malkiel Z-test	B&G Z-test	K&R χ^2-test
2000-2001	22	8	8	21	2.56**	3.37***	12.39***
2001-2002	22	12	13	20	1.71*	2.05**	4.46**
2002-2003	10	21	21	9	-1.98**	-2.87***	8.70***
2003-2004	33	14	14	33	2.77***	3.80***	15.36***
2004-2005	36	18	14	31	2.45**	3.44***	13.20***
2005-2006	40	18	23	34	2.89***	3.04***	10.53***
2006-2007	28	48	38	17	-2.29**	-3.57***	16.21***
2007-2008	53	17	17	53	4.30***	5.77***	37.03***
2008-2009	29	55	45	18	-2.84***	-4.31***	22.12***
2009-2010	49	28	30	46	2.39**	2.96***	9.12***
2010-2011	40	46	35	29	-0.65	-0.99	4.19**
2011-2012	36	42	43	34	-0.68	-1.20	1.52
2012-2013	60	16	16	60	5.05***	6.64***	50.95***
2013-2014	41	37	37	40	0.45	0.56	0.33
Panel B. Performance persistence (four-factor alpha)							
	WW	WL	LW	LL	Malkiel Z-test	B&G Z-test	K&R χ^2-test
2000-2001	15	15	15	14	0.00	-0.13	0.05
2001-2002	27	9	7	24	3.00***	4.04***	18.67***
2002-2003	22	20	20	21	0.31	0.33	0.13
2003-2004	37	10	10	37	3.94***	5.19***	31.02***
2004-2005	38	12	13	36	3.68***	4.69***	24.35***
2005-2006	40	18	18	39	2.89***	3.91***	16.10***
2006-2007	31	39	35	26	-0.96	-1.49	2.83*
2007-2008	36	34	35	35	0.24	0.17	0.06
2008-2009	27	47	48	25	-2.32**	-3.50***	12.65***
2009-2010	43	34	34	42	1.03	1.37	1.90
2010-2011	34	41	41	34	-0.81	-1.14	1.31
2011-2012	27	51	51	27	-2.72***	-3.78***	14.77***
2012-2013	62	14	14	62	5.51***	7.11***	60.63***
2013-2014	28	50	50	27	-2.49**	-3.56***	13.08***

Panel A shows significant positive persistence in the manager rankings for 8 of the 15 annual periods and is especially concentrated in the bullish period from 2003 to 2006. Managers repeating as winners or losers are higher than the number of managers that change their status.[7] Negative persistence appears in 2002–2003, 2006–2007 and 2008–2009; that is, managers significantly change from winners to losers, or vice versa, in trend reversals. Lack of persistence is found in 2011–2012 and 2013–2014. Panel B shows persistence in a lower number of periods and is mainly clustered from 2003–2006 and 2012–2013.

These persistence results are not conclusive, as prior financial literature. However, both panels show persistence patterns affected by market conditions. Positive persistence is mainly displayed in bull periods (2003-2006 and 2012-2013) and negative persistence or absence of it appears in bear periods (2008-2009 and 2011-2012). Hence, some managers present superior skills, and their positive performance is not due to luck; nevertheless, these managers have trouble adapting to market recessions and the past positive performance persistence ceases.

The persistence results of the parametric methodology are shown in Table 4 (CAPM alphas in Panel A and four-factor alphas in Panel B). Panel A shows that the top managers in a given year present the highest performance in the next year (quintile 5) in 7 of the 15 years analyzed (2001, 2004, 2005, 2006, 2008, 2010 and 2013). This result shows evidence of certain persistence in the performance of the best managers. Similarly, bottom managers in a given year present the worst performance in the subsequent year in 9 of the 15 years analyzed (quintile 1), showing persistence in loser managers, too. The mean difference test between top and bottom managers is

[7] We observe some disparity between the number of winners and losers in several years; for example, in the years 2004–2005, 2005–2006, 2006–2007, 2008–2009 and 2010–2011 of Panel A, Table 3. These results are due to the fact that the median performance is achieved by several managers, as they are managing the same fund at the same time.

significantly positive from 2000–2014, which confirms that the higher performance of the best managers is not likely to be result of luck. Panel B also shows some degree of persistence, but to a lesser extent than in Panel A. Top (bottom) managers are the best (worst) performers in seven (seven) years, and the average mean difference between top and bottom managers is significantly positive.

Comparing the persistence results of both methods, we note that the negative persistence found in Table 3 is attributable to a generalized negative manager performance (Table 4) in bearish periods, especially when considering CAPM alpha as performance measure (panel A of Tables 3 and 4). Consistent with this, Matallín-Sáez et al. (2016) find lower persistence in US mutual funds from 2008 to 2015, period in which funds achieve the worst performance. In short, our results show the existence of superior managers, in line with prior literature in the UK (Brown et al. 1997) and US pension fund markets (Christopherson et al. 1998). However, manager performance and persistence vary over time, which may explain the lack of medium and long term persistence found in prior fund-level analyses.

Table 4. Parametric performance persistence results.

Table 4 shows the performance persistence results of the parametric analysis. Panels A and B show the average CAPM and four-factor alphas (%) from 2000 to 2014, respectively, taking into account the quintile manager ranking of the prior year. Quintiles 5 and 1 show the highest and lowest performance, respectively. The last two rows show the average performance in each quintile and the average difference between top and bottom quintiles. The significance levels of the difference in means are based on t-tests. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Performance persistence (CAPM alpha, %)					
	Quintile 5	Quintile 4	Quintile 3	Quintile 2	Quintile 1
2001	-0.24	-0.50	-0.24	-1.06	-1.67
2002	-0.99	-0.56	-0.86	-0.96	-1.58
2003	0.98	1.30	1.46	1.14	2.21
2004	1.19	0.84	0.57	0.40	0.11
2005	1.27	0.94	0.46	0.64	0.30
2006	1.16	1.01	0.31	0.39	0.24
2007	-0.88	-0.52	-0.30	-0.42	-0.21
2008	-1.23	-0.130	-1.58	-2.24	-2.52
2009	0.90	1.00	0.98	1.04	2.95
2010	1.87	0.92	0.49	0.60	0.25
2011	-0.39	-0.41	-0.02	-0.20	-0.01
2012	0.66	1.03	0.71	0.97	1.32
2013	2.09	1.59	1.27	0.80	0.60
2014	-0.14	0.01	0.27	0.09	0.03
Average	0.45	0.38	0.25	0.08	0.14
Q5-Q1	0.30*				
Panel B. Performance persistence (four-factor alpha, %)					
	Quintile 5	Quintile 4	Quintile 3	Quintile 2	Quintile 1
2001	0.67	1.41	0.74	1.11	0.58
2002	1.96	1.39	1.07	0.29	-0.24
2003	0.08	0.27	0.24	0.06	0.75
2004	0.80	0.38	-0.13	-0.31	-0.21
2005	0.84	0.09	-0.48	-0.39	-0.69
2006	1.31	0.57	0.05	0.02	-0.08
2007	0.19	0.48	0.16	0.34	0.46
2008	-0.40	-0.08	-0.47	0.03	-0.70
2009	-0.65	-0.71	-0.92	-0.55	2.06
2010	1.88	0.92	0.53	0.59	0.25
2011	3.39	3.44	3.87	3.89	3.87
2012	-0.19	0.06	-0.15	0.46	0.36
2013	1.34	0.44	0.27	-0.17	-0.25
2014	0.14	0.64	0.65	0.73	0.70
Average	0.81	0.67	0.39	0.43	0.49
Q5-Q1	0.32**				

4.2. Relationship between manager performance and manager characteristics.

4.2.1. Parametric results.

In this section, we show the influence of manager characteristics on manager performance. Table 5 shows the results of models (7) and (8) in panels A and B, respectively, using different manager performance measures: CAPM alpha in estimation (1), four-factor alpha in estimation (2), and net excess return in estimation (3). Models are estimated by OLS with robust standard errors clustered by manager from 2000 to 2014.[8] T-statistics are in parentheses.

Panel A shows that gender does not significantly influence manager outcomes, consistent with prior works (Powell and Ansic 1997; Niessen-Ruenzi and Ruenzi 2015) that find no gender differences in performance. The coefficient of the *#funds ex-UK* variable is significantly negative in estimations (1) and (2); that is, manager performance is damaged when managers develop generalist responsibilities. As a consequence, manager specialization reports better performance. Managers that only run funds with one investment objective (domestic equity in our study) are able to focus on certain securities, extrapolating their knowledge to funds of the same investment objective. On the other hand, whether generalist managers do not devote enough time and energy to manage funds with multiple investment objectives, they may fail in the multi-tasking management. Estimation (2) also shows an inverse and statistically significant relationship between tenure and performance, indicating that greater experience has negative repercussions on performance. Porter and Trifts (1998) suggest that experienced managers become complacent, leading to a negative effect on performance because, as Kempf et al. (2014) note, managers with longer tenure have different standing within the organization. Kostovetsky (2010) indicates that the best

[8] We have also controlled for possible time-fixed effects, and the results are not affected.

managers often leave funds to work for hedge funds; thus, as Kempf et al. (2014) argue, a negative relation between experience and performance would exist among the remaining managers.

In addition, estimations (1) and (2) show performance improvement with fund age, indicating that older funds have better managers. Pastor et al. (2015) find performance deterioration over the fund's lifetime; however, this negative relation disappears by controlling for industry size and it turns marginally positive, which suggests that performance may improve as the fund age increases.

Table 5. Relationship between manager performance and manager characteristics considering the investment vocation specialization.

Table 5 shows the results of models (7) and (8) with different dependent variables: CAPM alpha (estimation 1), four-factor alpha (estimation 2), and net excess return (estimation 3). Specifically, panel A shows the results of model (7) and panel B shows the results of model (8). Models are estimated by OLS with robust standard errors clustered by manager from 2000 to 2014. The regression also includes style fixed-effects as indicated in the last row of the Table. T-statistics are in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Manager characteristics-performance relationship				Panel B: Manager characteristics-performance and market conditions		
	(1)	(2)	(3)	(1)	(2)	(3)
Gender	-0.00002	0.0001	-0.0003	0.0002	-0.0001	-0.0002
	(-0.03)	(0.08)	(-0.41)	(0.23)	(-0.07)	(-0.34)
Tenure	-0.0001	-0.0002***	0.0000	-0.0001	-0.0002***	0.0000
	(-1.29)	(-2.69)	(0.73)	(-1.23)	(-2.75)	(0.7)
#funds ex-UK	-0.0003*	-0.0003*	-0.0002	-0.0003**	-0.0003	-0.0002
	(-1.96)	(-1.7)	(-1.59)	(-2.19)	(-1.57)	(-1.46)
#UK funds	0.0004	0.0002	0.0000	0.0002	0.0003	0.0000
	(0.9)	(0.37)	(0.15)	(0.49)	(0.64)	(-0.08)
Fund age	0.0003***	0.0003***	-0.0001	0.0001	0.0005***	-0.0001**
	(3.92)	(3.31)	(-1.39)	(0.75)	(5.34)	(-1.98)
D_{bull}				0.0169***	-0.0133***	0.0028***
				(21.88)	(-11.2)	(5.06)
Constant	0.0018*	0.0059***	0.0001	-0.0088***	0.0142***	-0.0007
	(1.9)	(5.71)	(1.4)	(-10.66)	(11.24)	(-0.85)
R-squared	0.0184	0.0131	0.0152	0.3109	0.1426	0.0372
Style effects	Yes	Yes	Yes	Yes	Yes	Yes

To examine whether manager performance is influenced by market conditions, panel B shows the results of model (8) and displays similar results to Panel A, revealing that market conditions affect manager performance. The market-condition dummy is significantly positive in estimations (1) and (3); that is, managers obtain better CAPM alphas and excess returns in bullish markets. This result is in line with Capocci et al. (2005), who find outperformance of hedge funds during bullish periods. However, this variable turns negative when four-factor model style strategies (estimation 2) are considered; therefore, the prior higher performance in bull markets may be because managers take advantage of style strategies based on size, book-to-market and/or momentum strategies in bullish markets. Additionally, the better results in bear periods are consistent with Glode (2011) and Kosowski (2011) and may suggest that it is easy to beat the market in bear periods by reducing the market exposure. Silva and Cortez (2016) finds higher performance of green funds in crisis periods compared to non-crisis periods as their market exposure changes over time. Accordingly, manager characteristics influence to a lesser extent than the fund type managed on manager performance.

We apply a robustness analysis to further examine the differences in performance between specialists and generalists. We redefine when a fund manager can be considered a specialist manager, based on the investment style of the funds managed. Table 6 shows the results of models (9) and (10). Both panels confirm the conclusions reached on Table 5 with regard to gender, tenure and fund age. Furthermore, both panels of Table 6 show significant and negative coefficients on the generalist-manager variable (*#UKfunds_different styles*$_{it}$), and positive and significant coefficients on the specialist-manager variable (*#UKfunds_same style*$_{it}$), except in estimation (2) of panel A, which confirms the better performance of specialists.

Table 6. Relationship between manager performance and manager characteristics considering the fund style specialization.

Table 6 shows the results of models (9) and (10) with different dependent variables: CAPM alpha (estimation 1), four-factor alpha (estimation 2), and net excess return (estimation 3). Specifically, panel A shows the results of model (9) and panel B shows the results of model (10). Models are estimated by OLS with robust standard errors clustered by manager from 2000 to 2014. The regression also includes style fixed-effects as indicated in the last row of the Table. T-statistics are in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Manager characteristics-performance relationship				Panel B: Manager characteristics-performance and market conditions		
	(1)	(2)	(3)	(1)	(2)	(3)
Gender	-0.0005	-0.0004	-0.0007	-0.0003	-0.0006	-0.0007
	(-0.66)	(-0.36)	(-1.25)	(-0.37)	(-0.54)	(-1.15)
Tenure	-0.0001	-0.0002***	0.0000	-0.0001	-0.0002***	0.0000
	(-1.25)	(-2.65)	(0.8)	(-1.17)	(-2.7)	(0.78)
#UKfunds_different $styles_{it}$	-0.0005***	-0.0005***	-0.0004***	-0.0005***	-0.0005**	-0.0004***
	(-2.76)	(-2.6)	(-2.75)	(-2.99)	(-2.47)	(-2.77)
#UKfunds_same $style_{it}$,	0.0006**	0.0005	0.0006**	0.0004*	0.0006*	0.0005**
	(2.24)	(1.42)	(2.5)	(1.71)	(1.84)	(2.41)
Fund age	0.0003***	0.0003***	-0.0001	0.0000	0.0005***	-0.0001**
	(3.94)	(3.28)	(-1.64)	(0.66)	(5.34)	(-2.25)
D_{bull}				0.0169***	-0.0134***	0.0028***
				(21.84)	(-11.21)	(5.04)
Constant	0.0027***	0.0065***	0.0016**	-0.0082***	0.0151***	-0.0002
	(2.8)	(6.72)	(2.17)	(-9.61)	(11.93)	(-0.25)
R-squared	0.0214	0.0149	0.0222	0.3132	0.1448	0.044
Style effects	Yes	Yes	Yes	Yes	Yes	Yes

4.2.2. Non-parametric results.

The prior section shows that some manager characteristics affect manager performance. We further apply a non-parametric analysis in this section to detect possible performance differences among each category of the manager characteristics analyzed.

Table 7 shows the manager performance (CAPM alpha, four-factor alpha and net excess return), distinguishing among each category of gender —male or female— (panel A), experience —high or low— (panel B), number of funds managed —one or several— (panel C), investment objective of the funds managed —specialist or

generalist— (panel D), and style of the funds managed —specialist or generalist— (panel E). To determine the categories of manager experience and the number of funds managed, we obtain the median of all manager observations. In the case of experience, a manager with low experience has been managing a fund for six years or less, and a manager with high experience has been handling a fund more than six years. The number of funds managed by a manager is divided between one and several funds, as the average is 1.7 funds (see Table 2).

Table 7 shows that the differences in performance are not economically significant between men and women (panel A), between managers with less and more experience (panel B), and between managers running one or more funds (panel C). The statistically significant differences are detected among generalist and specialist managers taking into account the investment category of the funds managed (Panel D) and the style of the funds managed (panel E). Panel D shows that specialist managers obtain better performance (a CAPM alpha of 14 basis points higher), which is consistent with our prior results (Table 5). This finding confirms that manager specialization (running funds with one investment objective) allows managers to better understand the functioning of the funds, and the consequences of their investment strategies, leading to better performance (Zambrana and Zapatero 2016; Göricke 2016). Panel E confirms these conclusions; however, the higher performance of the specialist managers is only significant in the excess return.

Table 7. Non-parametric analysis. Differential performance according to manager characteristics.

Table 7 shows the average performance (CAPM alpha, four-factor alpha and net excess return in percentage) according to manager characteristics (gender, experience, number of funds managed and type of manager, i.e. specialist or generalist, from the period analyzed: 2000–2014). Panel A shows the male and female manager performance and the difference between them. Panel B shows the performance of managers with high and low experience (more and less than six years of management in a fund) and their differences. Panel C shows the performance of managers handling one or several funds and the difference between them. Panel D shows the performance of specialist and generalist managers according to the fund investment category and their differences. Panel E shows the performance of specialist and generalist managers according to the fund style and their differences The significance levels of the differences in means are based on t-tests. * indicates significance at the 10% level.

	CAPM alpha (%)	4-Factor alpha (%)	Net excess return (%)
Panel A: Gender			
Male	0.36	0.56	0.11
Female	0.35	0.55	0.32
Difference	0.01	0.01	-0.21
Panel B: Experience			
High	0.28	0.45	0.05
Low	0.40	0.61	0.17
Difference	-0.13	-0.17	-0.12
Panel C: Number of funds managed			
One	0.41	0.61	0.14
Several	0.26	0.47	0.10
Difference	0.15	0.14	0.04
Panel D: Investment category of the funds managed			
Specialist	0.39	0.59	0.14
Generalist	0.25	0.47	0.03
Difference	0.14*	0.11	0.11
Panel E: Style of the funds managed			
Specialist_style	0.32	0.57	0.01
Generalist_style	0.28	0.54	-0.06
Difference	0.04	0.02	0.07*

We also assess the impact of market conditions in the non-parametric analysis. Table 8 shows the performance by manager characteristic distinguishing between bull and bear periods. The results of Table 8 verify no significant performance differences for the manager gender (panel A) and the manager experience (panel B). Managers running one fund (panel C) obtain 4 basis points more performance (CAPM alpha) than

managers running several funds in bullish periods. Specialist managers, according to the fund investment category (panel D), are able to achieve better performance than generalist managers in bullish markets. The differences are statistically significant in all performance measures. Specialists present a performance between 17 and 10 basis points larger (CAPM and four-factor alphas) than generalists in bull markets. Zambrana and Zapatero (2016) and Göricke (2016) find that pickers are specialists who narrow down their focus into segments in which they have expertise, performing fundamental analysis and achieving better allocation. Additionally, Kacperczyk et al. (2014) find higher stock picking skill in booms. Our results, in line with these works, reveal that specialists outperform in booms. Nevertheless, generalist managers display a non-significant higher performance (less negative CAPM and 4-factor alphas) and a significant higher net excess returns in bear markets. This finding is consistent with Zambrana and Zapatero (2016), who find that generalists are able to develop timing abilities because they possess a more general view of the market and access more information.

In this line, Kacperzyk et al. (2014) also find higher evidence of market timing in bearish markets. The timing skill is especially important in recessions because managers demonstrate that they invest in the correct moment, despite the convulsive conditions. Market-timers intend to anticipate the market, increasing (decreasing) their market exposure in bullish (bearish) markets; consequently, these managers are able to obtain better performance in bearish markets by reducing their market exposure while the market is 100% invested in equities. On the other hand, stock-pickers intend to beat the market in both bullish and bearish markets; however, these managers seem to be able to outperform only in bullish markets. Panel E does not show significant

performance differences between specialists and generalists when considering the investment style of the funds managed.

Table 8. Differential performance according to manager characteristics and market conditions.

Table 8 shows the performance (CAPM alpha, four-factor alpha and net excess return in percentage) by manager characteristic and its difference, by distinguishing between bull and bear periods. Panel A shows the manager performance by gender (male or female). Panel B shows the manager performance according to manager experience (high or low). Panel C shows manager performance in relation to the number of funds managed (one or several). Panel D shows the performance of generalist and specialist managers according to the fund investment category. Panel E shows the performance of generalist and specialist managers according to the fund style. The significance levels of the difference in means are based on t-tests. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

	CAPM alpha (%)		4-Factor alpha (%)		Net excess return (%)	
	Bull	Bear	Bull	Bear	Bull	Bear
Panel A: Performance by gender.						
Male	0.76	-0.99	0.27	1.52	0.07	-0.21
Female	0.75	-0.98	0.28	1.55	0.06	-0.19
Difference	0.01	-0.01	-0.01	-0.02	0.01	-0.02
Panel B: Performance by experience.						
High	0.73	-0.91	0.25	1.64	0.08	-0.20
Low	0.78	-1.03	0.29	1.46	0.05	-0.22
Difference	-0.05	0.12	-0.04	0.18	0.02	0.02
Panel C: Performance by number of funds.						
One	0.75	-1.01	0.25	1.61	0.08	-0.20
Several	0.71	-0.98	0.25	1.53	0.05	-0.21
Difference	0.04*	-0.02	0.00	0.09	0.03	0.01
Panel D: Performance by investment category of the funds managed.						
Specialist	0.75	-1.05	0.28	1.51	0.09	-0.26
Generalist	0.59	-0.80	0.18	1.59	-0.03	-0.08
Difference	0.17***	-0.25	0.1*	-0.08	0.12**	-0.18*
Panel E: Performance according to the style of the funds managed						
Specialist_style	0.72	-0.98	0.24	1.62	0.07	-0.18
Generalist_style	0.69	-1.00	0.29	1.33	0.01	-0.27
Difference	0.03	0.03	-0.05	0.29	0.06	0.08

Our results show that, in general, specialist managers outperform generalists; however, managers' skills vary with market conditions, hence, manager performance persistence is not observed in the long-term. Accordingly, whether management companies want to take advantage of the differential skills among managers, they should identify the managers that create value in each market phase, employing more

specialists in booms and generalists in recessions. Understanding the limitations of multi-tasking employees may help management companies to realize the importance of specialization and allocate managers according to their abilities and the market conditions.

Finally, we analyze whether the change of the funds managed by a manager affect manager performance. We undertake this analysis because this work focuses on managers, instead of funds; therefore, managers may also develop specialization skills handling the same funds over time. In Table 9 we compare the performance of the managers that do not change the funds managed over the sample period (non-fund changes) with the performance of the managers who change the funds handled over our sample period (fund changes). Our results show that 75% (202) of the managers do not change the funds managed over the period studied, revealing fund specialization of the managers analyzed, and 25% (67) of the managers experience some kind of fund change (increase/decrease of the number of funds under responsibility). Furthermore, the results do not reveal significant performance differences between these two groups of managers.

Table 9. Manager performance considering the changes of the funds managed.

Table 9 shows the number of managers and the manager performance and compares the managers that do not change the funds managed over the sample period analyzed (non-fund changes) with the managers that experience some change in the funds managed (fund changes). The significance levels of the difference in means are based on t-tests.

	# managers	CAPM alpha	4-factor alpha
Non-fund changes	202	0.0035	0.0059
Fund changes	67	0.0040	0.0060
Difference		-0.0005	-0.0001

5. Conclusions.

The study and supervision of manager performance is an important issue for the different agents involved (e.g., sponsors, investors, managers, and authorities) in collective investment industries. Nevertheless, most of the existent studies analyze this

aspect from a fund perspective; that is, without considering that funds experience periodic manager substitutions and that the fund performance is the result of different managers over time, not the performance of a specific manager. In this paper, we first analyze the performance of pension fund managers over time. Specifically, we study the persistence of manager performance and the relationship between manager performance, manager characteristics and market conditions in a sample of UK equity pension fund managers.

We find that some managers are persistently superior and add value for investors. Nevertheless, the results vary with market conditions and managers present problems adapting to bearish markets, displaying performance deterioration in these intervals. Our results also show that personal traits (gender and experience) influence on manager performance to a lesser extent than the management strategy (specialization versus non-specialization). Specifically, we support the existence of two types of managers (generalists and specialists). Managers running a single fund or funds with one investment objective (specialists) obtain, in general terms, better performance results. Specialist managers concentrate efforts, time and resources on specific tasks, so they are able to achieve better results. The disadvantage of generalist managers lies in overseeing funds with multiple investment objectives, which supposes that managers may not devote enough time and attention to each fund. Nonetheless, the endeavor of these managers differs with market conditions. Generalist managers achieve better performance in bearish markets, whereas specialists do so in bull periods, evidencing distinct skills among manager types.

These results have important implications for the organization of pension fund management. Management companies may identify those managers who create value over the business cycle, helping in the manager selection decision-making. If fund

management companies allocate their employees considering the benefits and costs of specialization/generalization and the market conditions, manager performance and, thus, the fund performance achieved by investors would be notably improved.

References

Babalos, V., Caporale, G.M., & Philippas, N. (2015). Gender, style diversity, and their effect on fund performance. *Research in International Business and Finance*, 35, 57–74

Baks, K., Metrick, A., & Wachter, J. (2001). Should Investors Avoid All Actively Managed Mutual Funds? A Study in Bayesian Performance Evaluation. *The journal of finance*, LVI(1), 45-85

Berk, J.B., & Green, R.C. (2004) Mutual Fund Flows and Performance in Rational Markets. *Journal of Political Economy*, 112, 1269-1295.

Blake, C.R., & Morey, M.R. (2000). Morningstar ratings and mutual fund performance. *Journal of Quantitative and Financial Analysis*, 35(03), 451–483.

Blake, D., Lehmann, B., & Timmermann, A. (1999). Asset Allocation Dynamics and Pension Fund Performance. *Journal of Business*, 72(4), 429–61.

Blake, D., & Timmermann, A. (1998). Mutual fund performance: evidence from the UK. *European Finance Review*, 2, 57– 77.

Blake, D., & Timmermann, A. (2005). Returns from active management in international equity markets: Evidence from a panel of UK pension funds. *Journal of Asset Management*, 6(1), 5–20

Bollen, N.P.B., & Busse, J.A. (2005). Short-term persistence in mutual fund performance? *Review of Financial Studies*, 18(2), 569–597.

Brown, G., Draper, P.R., & McKenzie, E. (1997). Consistency of UK pension fund performance. *Journal of Business Finance and Accounting*, 24, 155– 178.

Brown, S., & Goetzmann, W. (1995). Performance Persistence. *Journal of Finance*, 50, 679-698.

Busse, J.A., Goyal, A., & Wahal, S. (2010). Performance and persistence in institutional investment management? *Journal of Finance*, 65(2), 765–790.

Capocci, D., Corhav, A., & Hübner, G. (2005). Hedge fund performance and persistence in bull and bear markets. *The European Journal of Finance*, 11(5), 361-392.

Carhart, M.M. (1997). On persistence in mutual fund performance. *Journal of Finance*, 52, 57-82.

Chevalier, J., & Ellison, G. (1999). Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance. *Journal of Finance*, 54, 875–899.

Christopherson, J., Ferson, W., & Glassman, D. (1998). Conditioning manager alphas on economic information: Another look at the persistence of performance. *Review of Financial Studies*, 11, 111–142.

Clare, A., Motsona, N., Sapuric, S., & Todorovic, N. (2014). What impact does a change of fund manager have on mutual fund performance? International *Review of Financial Analysis*, 35, 167–177

Clare, A., Nitzsche, D., & Cuthbertson, K. (2010). An empirical investigation into the performance of UK pension fund managers. *Journal of Pension Economics and Finance*, 9(4), 533 – 547

Cochrane, J. H. (2001). *Asset Pricing*. Princeton University Press: Princeton, New Jersey.

Cortez, M. D. C. R., Paxson, D. A., & Armada, M. J. D. R. (1999). Persistence in portuguese mutual fund performance? *European Journal of Finance*, 5(4), 342–365.

Cuthbertson, K., Nitzsche, D., & O'Sullivan, N. (2010). Mutual fund performance: Measurement and evidence. *Financial Markets, Institutions and Instruments*, 19(2), 95–187.

Custodio, C., Ferreira, M., & Matos, P. (2013). Generalists Versus Specialists: Lifetime Work Experience and Chief Executive Officer Pay. *Journal of Financial Economics*, 108, 471–492.

Daniel, K., Grinblatt, M., Titman, S., & Wermers, R. (1997). Measuring mutual fund performance with characteristic based benchmarks. *The Journal of Finance*, 52(3), 1035-1058.

Ding, B., & Wermers, R. (2012). Mutual fund performance and governance structure: The role of portfolio managers and boards of directors, Working paper. SSRN eLibrary.

Dwyer, P., Gilkeson, H., & List, J. (2002). Gender differences in revealed risk taking: evidence from mutual fund investors. *Economics Letters*, 76, 151–158.

Elyasiani, E., & Jia, J. (2011). Performance persistence of closed-end funds? *Review of Quantitative Finance and Accounting*, 37(3), 381–408.

Fama, E.F., & French, K.R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33, 3–56.

Fama, E.F., & French, K.R. (2010). Luck versus skill in the cross-section of mutual fund returns? *Journal of Finance*, 65(5), 1915–1947.

Fang, Y., & Wang, H. (2015). Fund manager characteristics and performance. *Investment Analysts Journal*, 44(1), 102–116

Ferson, W., & Schadt, R. (1996). Measuring Fund Strategy and Performance in Changing Economic Conditions. *Journal of Finance*, 51, 425-462.

Glode, V. (2011). Why mutual funds underperform? *Journal of Financial Economics*, 99, 546– 559.

Goetzman, W., & Ibbotson, R. (1994). Do winners repeat? *Journal of Portfolio Management*, Winter (20), 9–18.

Golec, J. (1996). The effects of mutual fund managers' characteristics on their portfolio performance, risk and fees. Financial Services Review, 5, 133-148.

Göricke, M-A (2016). Do Generalists Profit from the Fund Families' Specialists? Evidence from Mutual Fund Families Offering Sector Funds. CFR Working Paper Nº 16-09.

Gottesman, A., & Morey, M. (2006). Manager education and mutual fund performance. *Journal of Empirical Finance*, 13, 145– 182

Gregory, A., Tharayan, R,, & Christidis, A. (2013). Constructing and Testing Alternative Versions of the Fama–French and Carhart Models in the UK. *Journal of Business Finance & Accounting*, 40(1-2), 172–214.

Grinblatt, M., Titman, S., & Wemers, R. (1995). Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior. *The American Economic Review*, 85(5), 1088-1105.

Hinz, R.P., McCarthy, D.D. & Turner, J.A. (1997). Are women conservative investors? Gender differences in participant-directed pension investments. In: Gordon, M.S., Mitchel, O.S., Twinney, M.M. (eds.) Positioning Pensions for the Twenty-First Century. Philadelphia, PA: University of Pennsylvania Press.

INVERCO (2015). Las Instituciones De Inversión Colectiva y los Fondos de Pensiones. Informe 2015 y perspectivas 2016. INVERCO.

Jensen, M.C. (1968). The performance of Mutual funds in the period 1945-1964. Journal of Finance, XXIII, 389-416.

Kacperczyk, M., Nieuwerburgh, S., & Veldkam, L. (2011). Rational Attention Allocation over the Business Cycle. Working paper, New York University.

Kacperczyk, M., Van Nieuwerburgh, S., & Veldkamp, L. (2014). Time-Varying Fund Manager Skill. *The Journal of Finance*, LXIX(4), 1455-1484.

Kahn, R.N, & Rudd, A. (1995). Does Historical Performance Predict Future Performance? *Financial Analysts Journal*, 51, 43-52.

Kempf, E., Maconi, A., & Spalt, O. (2014). Learning by Doing: The Value of Experience and the Origins of Skill for Mutual Fund Managers, paper presented at European Finance Association Conference 2014.

Korniotis. G., & Kumar, A. (2011). Do Older Investors Make Better Investment Decisions? *The Review of Economics and Statistics*, 93(1), 244–265

Kosowski, R., Timmermann, A., Wermers, R., & White, H. (2006). Can mutual fund "stars" really pick stocks? New evidence from a bootstrap analysis. *Journal of Finance*, 61(6), 2551–2595.

Kosowski, R. (2011). Do mutual funds perform when it matters most to investors? U.S. mutual fund performance and risk in recessions and expansions. *Quarterly Journal of Finance*, 1, 607–664.

Kostovetsky, L. (2010). Brain drain: Are mutual funds losing their best minds? Working paper, University of Rochester.

Lakonishok, J., Shleifer, A., & Vishny, R.W. (1992). The impact of institutional trading on stock prices. *Journal of Financial Economics*, 32(1), 23-43.

Malkiel, G. (1995). Returns from investing in equity mutual funds 1971 to 1991. *Journal of Finance*, 50, 549–572.

Matallín, J.C., Soler-Domínguez, A., & Tortosa-Ausina, E. (2016). On the robustness of persistence in mutual fund Performance. *North American Journal of Economics and Finance*, 36, 192-231

Moskowitz, T.J. (2000). Discussion of mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses. *Journal of Finance*, 55, 1695– 1704.

Niessen-Ruenzi, A., & Ruenzi, S. (2015). Sex Matters: Gender Bias in the Mutual Fund Industry, paper presented at European Financial Management Symposium 2012, April 12-14, Germany

OECD (2015). Pension markets in focus 2015. OECD, from: http://www.oecd.org

Pastor, L., & Stambaugh, R.F. (2002). Mutual fund performance and seemingly unrelated assets. Journal of Financial Economics, 63, 315–49.

Pastor, L., Stambaugh, R., & Taylor, L. (2015). Scale and Skill in Active Management. *Journal of Financial Economics*, 116, 23-45.

Pojarliev, M., & Levich, R.M. (2010). Trades of the living dead: Style differences, style persistence and performance of currency fund managers. J*ournal of International Money and Finance*, 29, 1752–1775

Porter, G., & Trifts, J. (1998). Performance persistence of experienced mutual fund managers. *Financial Services Review*, 7, 57–68.

Powell, M., & Ansic, D. (1997). Gender differences in risk behaviour in financial decision-making: An experimental analysis. *Journal of Economic Psychology*, 18, 605-628.

Silva, F., Cortez, M., & Armada, M. (2005). The persistence of European bond fund performance: Does conditioning information matter? *International Journal of Business*, 10(4), 341–361.

Silva, F., & Cortez, M.C. (2016). The performance of US and European green funds in different market conditions. *Journal of Cleaner Production*, 135, 558-566

Thomas, A., & Tonks, I. (2001). Equity Performance of Segregated Pension Funds in the UK. *Journal of Asset Management*, 1, 321-343.

Tonks, I. (2005). Performance Persistence of Pension-Fund Managers. Journal of Business, 78(5), 1917-1942.

Watson, J., & McNaughton, M. (2007). Gender Differences in Risk Aversion and Expected Retirement Benefits. *Financial Analysts Journal*, 63(4), 52-61

Watson, J., & Robinson, S. (2003). Adjusting for Risk in Comparing the Performances of Male- and Female-Controlled SMEs. *Journal of Business Venturing*, 18(6), 773-788.

Wermers, R. (2000). Mutual fund performance: An empirical decomposition into stock-picking talent, style, transaction costs, and expenses. *Journal of Finance*, 55, 1655–1695.

Zambrana, R., & Zapatero, F. (2016). A Tale of Two Types: Generalists vs. Specialists in Mutual Funds Asset Management. Working paper. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2672858&rec=1&srcabs=2638658&alg=1&pos=2