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The choice of performance-based fees in the mutual fund industry: the case of Spain

Abstract

This paper analyzes the attributes of a sample of mutual funds that determine the choice of a performance-based fee as opposed to an asset-based fee. According to theoretical literature, performance-based fees are the most appropriate way to solve agency problems between investors and managers; however, only a minority of mutual funds charge management fees tied totally or partially to returns. In this paper we investigate a cross-sectional regression of the type of management fee chosen on a set of fund characteristics including investment objective, fund size, experience in the industry, the type of financial group to which the fund belongs, return-risk profile, fees and expenses for a sample of Spanish mutual funds in 2002-2007. In particular, we find that the likelihood of charging such an incentive fee significantly increases for funds that invest largely in equities and have little experience in the industry. By contrast, funds that manage large volumes of assets and funds owned by banking and financial groups are less likely to establish performance-based fees. These results are robust to very different market scenarios for mutual fund performance.

Keywords: mutual funds, management fees, incentive fees, agency theory.

JEL Classification: G18, G23, K22.

Introduction

Most savers in developed countries do not manage their financial wealth directly but rather through investment management companies. A recent report by International Financial Services, London (IFSL, 2008) states that the volume of assets managed by this industry reached 61.9 trillion Euros by year-end 2007, an increase of 14% on the previous year and more than double the figure for 2002. Mutual funds managed a third of that total at 21.8 trillion Euros.

This impressive growth in the delegated management industry, and especially in the volume of assets managed by mutual funds, has attracted the interest of the financial academic community and practitioners. The professionalism of management companies, the possibilities of portfolio diversification and cost savings for investors are among the reasons most frequently cited as driving this increasing trend towards delegated portfolio management.

The relationship between final investors and managers established by this delegated management can be considered as part of “agency theory”. Conflicts of

interests can clearly arise between the aims of managers and investors: investors usually look for maximum return on investment at minimum risk, whereas managers may try to maximize their own income or that of their management company so as to maintain a good reputation in the industry (Gibbons and Murphy, 1992), and/or to maximize the time that they remain at the company, which does not always line up with the aims of investors (Kempf et al., 2007).

The relationship is also characterized by asymmetry of information between the two parties as regards both the quality of managers (adverse selection) and the effort put into their activities (moral hazard).

This conflict of interests can result in inefficient allocation of resources and, especially, suboptimal investment decisions. As a way of alleviating such agency problems, economic theorists have proposed the establishment of contracts (capable of generating suitable incentives for managers) for the proper management of delegated portfolios¹. In our context, these contracts are the management fees that investors have to pay to managers for portfolio supervision services. These management fees are the focal point of the present article.

From both the theoretical and empirical points of view it is important to distinguish whether management fees are charged as a percentage of the total assets managed (henceforth referred as an *asset-based fee*), tied to the returns obtained by management (*performance-based fee*), or made a mixture of the two. Moreover, per-

© Anna Carmen Díaz Mendoza, Miguel Ángel Martínez Sedano, 2009. The authors would like to thank Comisión Nacional del Mercado de Valores (the Spanish Stock Exchange Commission) for providing them with the data used. They would also like to thank participants at the *IV Quantitative Finances Workshop* (University of Valencia), *XVII Jornadas Hispano-Lusas de Gestión Científica* (University of La Rioja), *X Encuentro de Economía Aplicada* (University of La Rioja) and *XV Foro de Finanzas* (University of the Illes Balears) for their useful comments and suggestions. Anna Carmen Díaz acknowledges research support from Ministerio de Educación y Ciencia grant AP-2004-2296, Gobierno Vasco grant IT-241-07 (MACLAB) and Ministerio de Ciencia e Innovación (ECO2008-00777/ECO); Miguel Ángel Martínez acknowledges support from the Ministerio de Educación y Ciencia, grants SEJ2005-05549/ECON and ECO2008-00777/ECON, Fundación BBVA, grant 1/BBVA 00038.16421/2004, Gobierno Vasco grant IT-241-07 (MACLAB) and Ministerio de Ciencia e Innovación (ECO2008-00777/ECO). Any errors or omissions are our own responsibility.

¹ See for instance Bhattacharya and Pfleiderer (1985) and Holmstrom and Milgrom (1987). See also Core et al. (2003) for a comprehensive survey of literature on executive remuneration. Bebchuk and Fried (2004) argue that managerial power is the most relevant determinant of executive remuneration.

formance-based fees can be established according to absolute return or to the excess return on a reference portfolio, symmetrically for positive and negative returns or for positive ones only.

Many academic articles have analyzed the optimality of this type of contract in theory. Grinblatt and Titman (1989), Golec (1992), Roll (1992), Das and Sundaram (1998a, b and 2002) and Palomino and Prat (2003) are some of the most significant. The prevailing conclusion is that performance-based fees seem to be more appropriate. Thus, Das and Sundaram (1998b) conclude that if risk aversion is assumed in the preferences of investors and managers, the optimal contract has to be linear, and must include a base fee for the amount of assets managed and additional remuneration depending on returns above those of a reference portfolio. The reason put forward is that this type of fee best aligns the interests of managers and investors, with managers encouraged to obtain high returns because their remuneration depends on them.

Academic literature has also analyzed a wide range of issues related to performance-based fees. For instance, the convenience of establishing a reference portfolio is analyzed in Admati and Pfleiderer (1997), Basak et al. (2007) and Garvey and Milbourn (2006); Das and Sundaram (2002) and Ross (2004) study the desirability of asymmetry; and Cornel and Roll (2004) and Cuoco and Kaniel (2006) focus on the effect on asset prices¹.

The International Organization of Securities Commissions, IOSCO (2003), gives a comprehensive overview of management fee regulations across its member countries. All of them, except the United Kingdom, allow this type of fee. A great variety of types is observed, ranging from total absence of restrictions on application (Australia, Japan, Mexico, Netherlands and Portugal) to rules affecting the type of mutual funds which can apply fees, the requirement for a reference portfolio, the calculation method and payment frequency.

Although performance-based fees are common in venture capital (Gompers and Lerner, 1999), real estate, private equity, and hedge funds (Agarwal et al., 2007), they are not used so widely by mutual funds. According to Lipper Inc., only 350 American mutual funds (about 4% of all stock funds) had performance-linked fees as of October 31st, 2005, accounting for 12.7% of total investment in stock funds at the time². Furthermore, around 85% of those assets

were managed by just two fund companies, Fidelity Investments and Vanguard Group Inc. Similar figures can be found in other economic areas.

There is currently an interesting debate at practitioner level as to whether or not this type of remuneration for managers is advisable (see Arnott, 2005). Proponents of performance-based fees assert that they best align the interests of managers and investors, reward successful managers more than unsuccessful ones and at the same time reduce the aggregate fees paid by investors, as most managers cannot add value to a portfolio. By contrast, opponents argue that performance-based fees encourage managers to take excessive risks with their portfolios (due to the option-like compensation scheme they suppose), allow managers to gamble with the fee by keeping the fund's beta above that of the benchmark index, are opaque and difficult to design and measure (see Damato, 2005), fail to take into account other desirable components of management, such as portfolio diversification, risk management, stable net asset value and portfolio turnover (see Bines and Thel, 2004) and, more importantly, fail to provide additional incentives to managers paid on increased assets (produced in many cases by good performance).

Taking into account the theoretical results, which present performance-based fees as the most appropriate way to solve agency problems between investors and managers, this article empirically analyzes the reasons behind the worldwide decision to charge asset-based fees. The main objective of the study is therefore to empirically identify the fund attributes that determine the choice of a performance-based fee. To that end we employ a bias-free dataset of Spanish mutual funds supplied by the industry supervisor. In this sample we investigate the cross-sectional regression of the type of management fee chosen on a set of fund characteristics (explanatory variables) including investment objective, fund size, experience in the industry, the type of financial group to which the fund belongs, return-risk profile and fees and expenses for 2002-2007.

Mutual funds which choose to charge management fees on returns are in fact linking the manager's remuneration to his/her effort and to the performance obtained. So, according to agency theory literature, they should be understood as a commitment to the interest of investors. Thus, smaller, younger funds would supposedly be more likely to charge performance-based fees as a way to increase their market share. Also, risky, good-performing funds would seem *a priori* to be more likely to establish management fees of this kind purely to obtain greater remuneration than is forthcoming from fees tied only to volume of assets.

¹ An elaborate review of the most relevant theoretical literature on delegated portfolio management can be found in Stracca (2006).

² Golec (2003) and Golec and Starks (2004) discuss the reasons for the prevalence of asset-based management fees in the US industry.

To the best of our knowledge, this is the first article to analyze this specific issue, and we believe that it provides new empirical evidence in this regard. Since management fees have an economically significant impact on investors' assets over time, this analysis might be interesting from the investor's perspective. Additionally, management fees, as the price investors have to pay, convey valuable information regarding the economic nature of the industry. Finally, management fee studies can improve the regulatory authorities' understanding of price competition in the mutual fund industry.

The paper is related to other strands of literature on mutual fund ownership costs. Thus, Deli (2002), Deli and Varma (2002), Warner and Wu (2006) and Massa and Patgiri (2008) among others, analyze the choice between linear and piecewise-linear management fees on total assets. Size and age, at both fund and family level, are found to be negatively related to the likelihood of adopting a linear management fee. Additionally, Warner and Wu (2006) show that the likelihood of a switch from a linear contract to a concave one increases with fund growth and age.

Also closely related are those papers that analyze the determinants of the (asset-based) management fee amounts¹. Results confirm significant differences in fees across funds with different investment objectives. Also, both fund assets under management and management company assets appear to have a negative impact on mutual fund fees. Finally, funds managed by companies belonging to banking groups seem to be associated with significantly higher fees. Evidence for other explanatory variables, however, is mixed.

Some articles focus on the effects of the choice of management fees on the manager's risk decisions². Performance-based fees may encourage risk-taking by managers as increases in stock return volatility make for bigger fees. However, since they can increase the sensitivity of the manager's portfolio to firm stock price movements, little risk can be assumed (Carpenter, 2000; Ross, 2004).

Finally, Volkman (1999), Elton et al. (2003) and Giambona and Golec (2007) among others, evaluate mutual funds with performance-based fees. Their results coincide in that these funds perform relatively better than other actively managed funds.

¹ Malhotra and McLeod (1997), Tufano and Sevick (1997), Luo (2002) and Gil-Bazo and Martínez (2004) for the Spanish market are illustrative examples of this literature.

² See Brown et al. (1996), Chevalier and Ellison (1997), Elton et al. (2003), Golec and Starks (2004), and Low (2006) among others.

In short, the results presented in this paper indicate that the likelihood of a performance-based fee being charged is significantly greater for equity funds, the youngest funds in the industry and the smallest in terms of assets managed.

The rest of the paper is organized as follows: section 1 describes the data and variables employed in the analysis; the empirical model estimated and the results are discussed in section 2 and the last section concludes.

1. Data and variables

The Spanish mutual fund industry is currently highly significant and continues to grow. According to the Spanish Asset Management Association (*Asociación de Instituciones de Inversión Colectiva y Fondos de Pensiones*, INVERCO (2008)), the volume of assets managed by mutual funds at year-end 2007 was equivalent to 17.5% of total Spanish family savings, compared to 0.4 % in 1985. A record figure of 0.32 trillion Euros managed was reached (compared with just 0.0017 trillion Euros in 1985), equivalent to 274% of GDP. This made Spain the sixth biggest European country in terms of assets managed.

In accordance with current Spanish legislation, management fees can be charged on the basis of the total volume of assets managed, the returns obtained or a combination of the two. In fact only a minority of Spanish mutual funds tie the remuneration of managers to returns: almost all of them combine the two types of fee by charging a base fee proportional to the assets managed plus an additional fee dependent on performance.

It must be emphasized that Spanish legislation only stipulates the annual maximum permissible for each type of fee (see Appendix). It says nothing about the symmetry of the performance-based fee, and establishes no requirement for a reference portfolio. Regarding this point, a detailed reading of the prospectus of a large number of performance-based fee funds reveals that the expression most often found after the fee percentage is "of the positive annual returns of the fund". This, along with private discussions with several asset managers, allows us to conclude that performance-based fees are usually asymmetric in the Spanish fund industry. In addition, very few fund prospectuses describe the management fee as a percentage of the return on the fund in excess of a reference portfolio. In such cases it is expressly indicated that the annual management fee chargeable may not exceed the upper limit of the annual positive returns on the fund.

However, since November 2006 Spanish legislation has required the application of a so-called high-

water mark, under which managers only receive performance fees for returns not previously achieved.

This means that the Spanish mutual fund industry is a highly appropriate testing ground for determining what fund attributes explain the choice of a performance-based management fee. In addition, a year-by-year analysis allows us to check for time differences in this issue, especially since the high-water mark rule came into effect.

The dataset was obtained from Comisión Nacional del Mercado de Valores (CNMV), the body that supervises and inspects Spanish stock markets, and therefore mutual funds. We initially collected information on all the open-end funds that operated in the six-year period from 2002 to 2007. Guaranteed funds were excluded from the analysis because of their specific investor remuneration policy (in fact, only one of them used performance-based fees), and funds less than one year old were also eliminated. This leaves a final sample of 1,638 mutual funds in 2002, rising to 1,832 in 2007, accounting for an average of 65% of the Spanish mutual fund industry. This six-year period covers very different scenarios in the behavior of the Spanish stock market and in the performance of the mutual fund industry, and thus enables us to conduct a very interesting comparative analysis.

As mentioned above, the study is conducted separately for each year, using the information available in the last quarter to capture possible time differences in the results.

Funds are classified into three groups according to the type of management fee charged. We use the term “asset funds” for those that establish a fee on volume of assets alone; funds that tie management fees exclusively to returns are referred to as “performance funds”, and those that combine the two criteria are “mixed funds”. Since the main objective of this study is to analyze the choice of the type of management fee, a binary variable – MFC – is created as the dependent variable in the empirical model. It takes a value of one for funds that tie fees totally or partially to returns (mixed and performance funds) and zero otherwise (asset funds).

We then describe the set of fund attributes considered as explanatory variables in the empirical model characterizing the decision as to what type of management fee to use. Basically, these are the attributes previously considered in empirical literature as determinants of the amounts of mutual fund fees. Since they are available in the dataset, we suggest them also as potential determinants of the decision on the type of management fee.

We first consider the type of financial group to which mutual funds belong. Three associate dummy variables are created for funds managed by companies owned by banks (B), savings banks (S) and independent financial groups (I). This distinction allows us to analyze the possibility that managers of funds belonging to independent financial groups may have more incentive to implement performance-based fees as a way of attracting investors, to counteract the greater marketing capacity of banks and savings banks.

Another potentially interesting characteristic is the investment objective of each fund. Funds are classified into three groups, each associated with a corresponding dummy variable: Equity funds (EFunds), which invest mainly in equities; Bond funds (BFunds), more than 70% of the money in which is invested in fixed-income assets; and finally Global funds (GFunds), a group which contains those funds whose investment policy is not precisely defined and which do not belong to any other category. It seems reasonable to assume that those funds which invest most in equities will be more inclined to charge management fees on performance, given the greater possibility of obtaining high returns.

The number of years since the last modification in the investment objective of the fund (ANTIQ) is also available in the dataset provided by CNMV, and is considered here in order to examine the choice of the type of management fee as a way to compete with longer-established funds. Note that this variable does not therefore represent exactly the number of years since the creation of the fund, which is a more common variable in the relevant literature but is unfortunately not available in this dataset; however, it does capture the same idea of experience in portfolio management.

Volatility of performance (VOLAT) is measured by the standard deviation of the twelve previous monthly returns of the fund, in percentage terms, as supplied by CNMV. The more volatile a fund is, the more likely it is expected to charge a performance-based fee, because of the greater expected return. The asymmetry of the management fee charged by Spanish funds (which encourages managers to take high risks as they do not have to assume responsibilities in case of negative returns) reinforces this argument.

Fund size is another attribute that could well be relevant in deciding what type of management fee to charge. It seems reasonable to assume that the smallest funds (which are the easiest to manage) have more incentives to charge a performance-based fee. To analyze this issue empirically, the total volume of assets managed in thousands of Euros

(ASSETS) is used to measure fund size. In the empirical analysis in section 2 this variable is measured as its naperian logarithm. The number of shareholders in the fund was also considered as a measure of fund size, but results were not affected when this variable was considered instead of ASSETS; in fact the average correlation between them over the sample period is 0.76.

Annual fund returns, net of all expenses, are also considered (NRET). The well-known risk-adjusted return known as the Sharpe ratio (SHARPE) is also calculated: $SHARPE = \frac{NRET - R_f}{VOLAT}$, with R_f being

the risk-free return (the one-year Spanish Treasury bill). Funds with high levels of past performance are expected to be likely to be tempted to link management fees totally or partially to performance.

Finally, fund fees are also considered. Thus, we collect information about management fees, termed ASSETMF or PERFORMF depending on whether they are based on assets or returns, respectively; the custodial fee paid for asset administration and custody, CUSTFEE; the front-end load charged to investors for the purchase of shares in funds, FRONTLOAD; and the redemption fee paid by investors when shares are redeemed, REDFEE. The discount that the management company occasionally applies to the fund is referred to as DISC. In the empirical application in section 2, one-off fees (the front-end load and the redemption fee, net of the discount) are joined together in a non-annual fee termed NONAFEE. As an aggregate measurement of annual fees we also collect information on total expenses borne by the fund (adding in the management fee, custody fees, and other operating costs) as a percentage of the average volume of assets during the year. This is termed EXPENSES.

1.1. Descriptive analysis of the data. For the three fund groups established above according to the type of management fee chosen, the two panels in Table 1 report the number of funds of each type and the average values of their attributes, respectively, for each year in the sample period, and for the entire period.

Panel A highlights that at year-end 2007 only 256 out of the sample of 1,832 Spanish mutual funds (14%) used performance-based fees, and even then they are almost all *mixed*. However, there is a notable increase from year 2002, when just 7% of the funds in the sample tied management fees to performance. It is also confirmed that this market is dominated by funds belonging to banks and savings banks: only an average of 27.97% belong to independent financial groups.

However, independent funds account for a significantly higher average percentage of *mixed* funds than of *asset* funds: of the aggregate of 1,128 files of *mixed* funds in the total sample, 425 (37.7%) correspond to independent funds, while for *asset* funds the figure is just 26.6%¹. These percentages remained essentially constant throughout the sample period. These findings are consistent with the idea that independent funds are the most inclined to charge a performance-based fee. Note moreover that almost all the *performance* funds are independent. By contrast, funds belonging to banking groups only account on average for 29.4% of the *mixed* funds, with a notable decrease from the beginning of the period.

A similar conclusion can be drawn for Global funds, which account for a significant, and fast increasing, average of 42% of the *mixed* fund group but just 10.36% of *asset* funds. It is also remarkable that more than 34% of Global funds charge their management fees totally or partially on returns. These data, along with the fact that 44.965% of *mixed* funds are Equity funds, lead us to confirm that funds which tie management fees to performance invest mainly in equity assets.

Panel B in Table 1 shows very interesting differences between the attributes of *mixed* funds and *asset* funds over the sample period: the former are significantly younger, more volatile and smaller, although a noteworthy increase in assets managed is reported between 2002 and 2007.

Remarkably, average management fees for *mixed* funds are very close to the legal limit at 8.26% of performance (the limit is 9%) and 1.09% of volume of assets (the limit is 1.35%), whereas for *asset* funds they are just 1.38%, with the limit being 2.25%. So average total expenses are significantly higher for *mixed* funds (1.87%) than for *asset* funds (1.57%). In addition, *mixed* funds seem to charge significantly higher front and redemption fees.

In an attempt to explain this higher cost of *mixed* funds, the percentage of assets managed accounted for by total management fees (*TOTALMF*) is calculated. This enables the two types of fund to be fairly compared. Taking into account also that performance-based fees are applied only to positive gross returns (before expenses), *GRET*, we have the following for *asset* funds:

$$TOTALMF_a = ASSETMF_a \quad \text{for all } GRET_a \quad (1)$$

while for *mixed* funds:

¹ The asterisk stands for 5% significance in the test of differences in the proportions of the total number of *asset* funds and *mixed* funds accounted for by each type of fund.

$$TOTALMF_m = ASSETMF_m + PERFORMMF_m \times \frac{GRET_m}{100}$$

for $GRET_m > 0$, (2)

$$TOTALMF_m = ASSETMF_m \quad \text{for } GRET_m \leq 0.$$

Panel B in Table 1 reports that for *mixed* funds total management fees average 1.87%, significantly higher than the 1.38% for *asset* funds. Moreover, note that in 2005 this figure is 2.38%, above the legal maximum for asset-based fees (2.25%), which reveals that managers are able to use performance-based fees as a way to increase earnings from management.

Finally, *mixed* funds obtain significantly higher net and risk-adjusted returns than *asset* funds, so they seem to have offset their higher cost and greater volatility¹. It should be noticed that net fund returns range from -16.67% in 2002 to 13.14% in 2005, embracing very different market conditions, thus enhancing the scope of the analysis and, at the same time, increasing the reliability of findings.

To sum up, during the period from 2002 to 2007 Spanish *mixed* funds invested for the most part in equity assets, a significant percentage of them belonged to independent financial groups and, on average, they were more volatile, younger, smaller and more expensive to investors than *asset* funds. In spite of this higher cost they obtained higher returns.

1.2. Selection of variables. Clearly, fund attributes related to management fees charged (ASSETMF, PERFORMMF and TOTALMF) should not be considered as explanatory variables in the choice of the type of management fee. The same goes for the variable EXPENSES, given that it basically depends on that choice.

Even so, to avoid collinearity problems that could affect the precision of parameter estimates, we now select the set of potential explanatory variables.

To that end, we obtain the correlation coefficients between all variables for each sample year. Not surprisingly, net returns, volatility and the dummy variable associated with Equity funds are highly correlated, except for 2002, when the most profitable funds were the less volatile Bond funds.

We also use the variance-inflation-factor (VIF) collinearity test. VIF_j is computed as $(1-R_j^2)^{-1}$ where R_j^2 is the determination coefficient from the regression of x_j on the rest of the explanatory variables. A high VIF corresponds to a high R_j^2 , and is a sign of collinearity. Fox (1991) considers that the precision of coefficient

estimates suffers from collinearity when VIFs exceed 4. As in the correlation matrix, the results of this test confirm collinearity problems for net returns and volatility, especially in 2002 and 2005. We therefore decided to remove net returns (NRET) from the analysis of these two years, leaving the risk-adjusted returns, SHARPE, as the fund's performance measurement. The new VIF test indicates that collinearity is no longer a serious problem.

For the sake of brevity the correlation matrix and the VIF test are not reported, but they are available to interested readers on request.

2. The empirical model

In this section a probit model is estimated in order to examine the main determinants of the type of management fee charged by Spanish mutual funds. The analysis is carried out separately for each year in the 2002-2007 period, and also for the complete period. As mentioned above, the endogenous variable is the binary variable MFC, which takes a value of one for *mixed* and *performance* funds and zero for *asset* funds, while the fund attributes selected in the previous section are considered as explanatory variables².

For the estimation, we assume the existence of an unobserved latent variable, y_i^* , which determines the value of the binary variable that we observe. Formally:

$$y_i = 1, \text{ if } y_i^* = X_i \beta + u_i > 0 \quad (3)$$

$$y_i = 0, \text{ otherwise}$$

where β is the vector of the parameters, X_i is the matrix of the explanatory variables, and u_i is the residuals, which we assume to have mean zero and standard deviation one.

We apply the maximum likelihood estimation via the iterative scoring algorithm. The percentage of correct predictions and the so-called pseudo R^2 are used as the adjustment kindness of the model. In probit models the coefficients of the variables are not directly interpretable, so we take the partial effects of the explanatory variables, which represent their marginal impact on the likelihood of observing a value of one in the dependent variable when the fund charges management fees on returns.

Estimation results are reported in Table 2. The six first columns report the results for each year separately, and the last that of the entire period. The control group

¹ A quite large number of funds with negative excess returns and low volatility explain the negative average Sharpe ratios.

² Pure *performance* funds, which establish management fees exclusively on the basis of returns obtained, are removed from the empirical analysis because of their limited presence in the sample.

included in the constant term comprises Bond funds belonging to a savings bank financial group.

The table shows that, jointly for the whole period, the likelihood of the management fee being charged partially on returns (*mixed* funds) is significantly greater for Equity (EFunds) and Global funds (GFunds), for the youngest funds (ANTIQ), for the most profitable (NRET) and for the most expensive in terms of custodial and non-annual fees (CUSTFEE and NONAFEE, respectively). By contrast, it is lower for funds belonging to banking financial groups (BANKS). Focusing on the yearly regressions, it must be highlighted that the negative effect of this last variable is only found at the end of the sample period. On the other hand, it is also interesting to observe that a higher volume of assets managed (ASSETS) significantly reduces the probability of management fees being on performance at the very beginning of the period, but that effect disappears with time (when mixed funds are larger in size). All these results confirm the main ideas derived from the descriptive analysis in section 1.

The lack of explanatory power of the fund risk (VOLAT) may seem surprising. However, although the VIF test fails to identify collinearity problems, the high correlation between this variable and EFunds (0.65) could cause the risk effect picked up by this investment objective. Finally, the variable representing the independent funds does not significantly affect the choice of the management fee type, once the effect of the other variables is considered.

From these results, it seems reasonable to conclude that managers who charge their management fees partially on performance are more involved in finding high future returns (through greater knowledge or effort). From previous results, these are funds that invest mainly in risky assets (EFunds and GFunds), and have less experience (ANTIQ) and a smaller market share (ASSETS) in the industry. Thus, the choice of a performance-based fee could to some extent be understood as a sign of commitment to the interests of investors, through the incentives that it generates in portfolio managers. In addition, this sort of fund charges higher one-off fees (front and redemption fees), which reinforces the argument of commitment and permanence in the manager-investor relationship.

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Finally, regarding the effects that the introduction in November 2006 of the high water mark could have on the decision whether to charge management fees on performance, Table 2 reports no relevant changes in results between regressions in 2006 and 2007 except for the net return variable. The number of *mixed* funds increased from 242 to 252 (see Table 1, Panel A), but the management fee choice seems to be driven by the same set of explanatory variables.

Conclusions

This paper studies the fund attributes which determine the decision as to what type of management fee is implemented, on the basis of assets managed (asset-based fee), returns (performance-based fee), or both. While academic literature tends to conclude that the performance-based fee best aligns the interests of managers and investors, in practice the industry tends for the most part to favor asset fee schemes.

Our findings allow us to conclude that from 2002-2007 the likelihood of the management fee for a sample of Spanish funds being charged on returns is significantly greater for equity-oriented funds and for the youngest funds. By contrast, it is lower for funds owned by banking financial groups and those that manage large volumes of assets. These results are confirmed in very different economic scenarios for the market and mutual funds over the period of 2002-2007. Thus, Spanish funds implementing performance-based fees seem to be the most dynamic and the most involved in good management, as might be expected.

The predominant practice in the fund industry of establishing asset-based management fees could be interpreted as a consequence of the lack of competition; the usual asset-based scheme might therefore be understood as merely a way of guaranteeing a fixed amount of earnings on the part of asset management services, with no commitment to investors' interests.

In our opinion, funds implementing performance-based fees are a very interesting sub-group which deserves more attention from academics. Preliminary findings in this paper suggest that many topics related to the mutual fund industry (the risk-return profile, efficiency, competition in the sector, etc.) should be re-examined for performance fee funds.

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Appendix. Legal maximum fees in Spain

The table shows the upper limits set by Spanish regulations for management fees, custodial fees, front-end, and redemption charges.

Fund type	Management fee	Custodial fee	Front-end and redemption charges
Mutual funds	If based on assets managed: 2.25%	0.2% of custodial assets	5% of assets purchased or redeemed
	If based on fund performance: 18%		
	If based on assets and performance: 1.35% of assets and 9% of performance		
Money market funds	If based on assets managed: 1%	0.15% of custodial assets	1% of assets purchased or redeemed
	If based on fund performance: 10%		
	If based on assets and performance: 0.67% of assets and 3.33% of performance		

Table 1. Descriptive statistics of the Spanish fund sample

Panel A								
		2002	2003	2004	2005	2006	2007	total
		1,638	1,643	1,682	1,747	1,712	1,832	10,254
I	Mixed	39*	39	62*	95*	101*	89*	425*
	Asset	387	386	406	428	409	411	2,427
	Performance	1	1	4	4	3	3	16
S	Mixed	24*	39	58	74	80	96	371
	Asset	497	521	537	540	526	602	3,223
	Performance	0	0	0	0	0	0	0
B	Mixed	48	59	46*	51*	61*	67*	332*
	Asset	639	598	569	555	531	563	3,455
	Performance	3	0	0	0	1	1	5
EFunds	Mixed	66*	83*	83*	98	91	85*	506
	Asset	697	640	608	607	644	650	3,846
	Performance	1	0	0	0	0	0	1
BFunds	Mixed	20*	23*	22*	25*	29*	30*	149*
	Asset	757	772	772	748	602	665	4,316
	Performance	1	0	1	0	0	0	2
GFunds	Mixed	25*	31*	61*	97*	122*	137*	473*
	Asset	69	93	132	168	220	261	943
	Performance	2	1	3	4	4	4	18

Table 1 (cont.). Descriptive statistics of the Spanish fund sample

Panel B								
		2002	2003	2004	2005	2006	2007	panel
ANTIO	Mixed	2,49*	3,06*	3,48*	3,86*	4,18*	4,45*	3,78*
	Asset	3,01	3,71	4,42	5,09	5,45	5,81	4,59
	Performance	3,24	2,99	2,74	2,99	2,99	3,99	3,18
VOLAT	Mixed	4,71*	2,90*	1,64*	1,87*	1,65*	1,62	2,14*
	Asset	3,06	1,92	1,05	1,39	1,41	1,49	1,72
	Performance	1,95	0,44	0,64	2,00	0,91	1,26	1,31
ASSETS	Mixed	18,897,90*	25,354,97*	71,278,53	77,172,20	84,463,40	79,498,91	66,361,07*
	Asset	83,729,74	94,738,69	99,481,62	110,100,80	94,251,54	84,157,59	94,344,53
	Performance	12,185,75	6,197,00	13,817,25	7,616,00	17,721,25	13,444,25	12,635,00
NRET	Mixed	-16,67*	10,01	5,08	13,14*	8,54	3,07*	5,40*
	Asset	-11,60	8,60	4,89	10,14	8,42	2,07	3,70
	Performance	-7,11	3,05	1,47	5,09	6,85	3,41	1,99
SHARPE	Mixed	-5,75	1,52*	0,54*	1,47*	0,37*	-4,34*	-0,91*
	Asset	-9,60	-1,00	-8,53	-9,56	-2,28	-7,51	-6,45
	Performance	-4,54	1,91	-0,83	1,75	2,75	-0,75	-0,22
ASSETMF	Mixed	1,13*	1,14*	1,10*	1,05*	1,09*	1,03*	1,08*
	Asset	1,43	1,40	1,36	1,35	1,39	1,36	1,38
	Performance	0,00	0,00	0,00	0,00	0,00	0,00	0,00
PERFORMF	Mixed	8,27*	8,36*	8,42*	8,35*	8,27*	8,00*	8,26*
	Asset	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Performance	11,25	18,00	12,75	16,00	15,25	15,25	14,29
TOTALMF	Mixed	1,24*	2,20*	1,74*	2,38	2,00	1,49*	1,87*
	Asset	1,44	1,40	1,36	1,35	1,39	1,35	1,38
	Performance	0,22	0,70	0,29	1,05	1,37	0,51	0,69
CUSTFEE	Mixed	0,13	0,12	0,12	0,12	0,12	0,11	0,12
	Asset	0,12	0,12	0,11	0,11	0,11	0,11	0,11
	Performance	0,05	0,20	0,14	0,17	0,14	0,14	0,13
FRONTLOAD	Mixed	0,07	0,08	0,12*	0,26*	0,45*	0,41*	0,27*
	Asset	0,03	0,03	0,03	0,03	0,06	0,06	0,04
	Performance	0,00	0,00	0,00	0,00	0,00	0,00	0,00
REDFEE	Mixed	0,42	0,47	0,38*	0,33	0,45*	0,41*	0,27*
	Asset	0,38	0,36	0,29	0,3	0,31	0,30	0,32
	Performance	0,03	0,00	0,25	0,13	0,38	0,38	0,22
DISC	Mixed	0,00	0,01	0,01	0,01	0,02	0,01	0,01
	Asset	0,01	0,01	0,01	0,01	0,02	0,01	0,01
	Performance	0,00	0,00	0,00	0,00	0,00	0,00	0,00
EXPENSES	Mixed	1,79	2,29*	1,69*	2,26*	1,83*	1,48	1,87*
	Asset	1,65	1,58	1,54	1,51	1,60	1,53	1,57
	Performance	0,88	0,83	0,59	1,21	1,36	0,80	0,96

Notes: 1. Panel A shows the distribution of the Spanish fund sample for each year in the 2002-2007 period, grouped according to the type of management fee charged. *Asset* funds charge management fees on the basis of the total assets managed, *Performance* funds on the returns obtained and *mixed* funds on a combination of the two. Funds are classified depending on the financial group to which they belong: Independent, I; Savings Banks, S; and Banks, B; and their investment objectives: equities, EFunds; fixed-income assets, BFunds; and global, GFunds. The number of funds of each type is reported. An asterisk stands for 5% significance in the dif-

ferences in proportions test between *asset* funds and *mixed* funds. 2. Panel B shows the average age of the investment objective (ANTIQ), volatility (VOLAT), assets managed in thousands of Euros (ASSETS), net return (NRET), Sharpe ratio (SHARPE), management fee on assets (ASSETMF), on performance (PERFORMF), total management fee (TOTALMF), custodial fee (CUSTFEE), front-end loads (FRONTLOAD), redemption fee (REDFEE), discount (DISC) and total expenses over assets (EXPENSES). In this case, an asterisk stands for 5% significance in the differences in averages test between *asset* funds and *mixed* funds.

Table 2. Probit estimation

	2002	2003	2004	2005	2006	2007	panel
I	0,0247	0,0068	-0,0131	0,0010	0,0189	0,0131	0,0052
B	0,0194	0,0166	-0,0267*	-0,0416*	-0,0478*	-0,0384*	-0,0231*
EFunds	0,0254	0,0602*	0,0675*	0,0895*	0,0767*	0,1055*	0,0822*
GFunds	0,2128*	0,2344*	0,2698*	0,3036*	0,2854*	0,2937*	0,3158*
ANTIQ	-0,0084	-0,0095*	-0,0140*	-0,0151*	-0,0135*	-0,0149*	-0,0089*
VOLAT	0,0034	0,0089*	0,0072	0,0049	0,0098	-0,080	0,003
ASSETS	-0,0089*	-0,0139*	-0,0058	-0,0095*	-0,0019	0,0009	-0,0068*
NRET		-0,0019*	-0,0006		-0,0009	0,0028*	0,0008*
SHARPE	0,0001	0,0001	0,0009*	0,0001	0,0001	0,0006	0,0002
CUSTFEE	0,1574	0,0829	0,1503	0,2092	0,3617*	0,1654*	0,1782*
NONAFEE	0,0024	0,0060	0,0025	0,0146*	0,0133	0,0146*	0,0107*
%	93,20	91,70	90,00	87,60	86,20	86,70	88,90
R ²	0,10	0,11	0,15	0,16	0,14	0,15	0,14

Notes: The table shows the results of the probit estimation separately for each year and for the whole period of 2002-2007:

$$y_i = 1 \text{ if } y_i^* = X_i \beta + u_i > 0$$

$$y_i = 0 \text{ otherwise}$$

with β being the vector of the parameters, X_i the matrix of the explanatory variables, and u_i the residuals, which we assume to have mean zero and standard deviation one. The explanatory variables are the financial group to which the funds belong (Independent, I and Banks, B), investment objective (equities, EFunds and global, GFunds), average age of the investment objective (ANTIQ), volatility (VOLAT), neperian logarithm of assets managed in thousands of Euros (ASSETS), net return (NRET), Sharpe ratio (SHARPE), custodial fee (CUSTFEE), and non-annual fee (NONAFEE). The asterisk stands for 5% significance. The two last rows exhibit the percentage of cases correctly predicted by the model and the pseudo R², respectively.