# The Dynamic of Management Fees in the Mutual Fund Industry

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Very preliminary. Do not quote

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# ABSTRACT

The aim of this paper is to analyse dynamic price-setting (through changes in management fees) in the Spanish mutual fund industry. The study is applied to a sample of Spanish mutual funds from 2002 to 2007. Management fee changes account for only 4% of observations, but they are economically significant. A substantial 29% of the total number of funds undergo management fee changes during the sample period, with the average change being more than 50 base points. Results seem to reveal that small and poor-performing funds (and also management companies) have decreased asset-based management fees as a way to become more competitive in the industry. However, no significant subsequent effects of such changes are found in the paper. Small funds with low excess returns and high quarterly returns which are owned by good-performing management companies have decreased performance-based management fees. These performance-based management fee decreases seem to have had a negative effect on subsequent returns and on net excess returns and a positive impact on the market share of the funds in question. It seems that the decrease in performance-based fees causes the manager to make some slight effort, because a performance-based fee is an explicit incentive for a manager.

# 1. Introduction

According to a recent report by International Financial Services, London (IFSL, 2008), total asset volume in the global fund management industry increased 15% in 2006 to nearly double the figure for 2002, reaching a record $61.9 trillion at year-end 2006, with a further $21.8 trillion invested in mutual funds. The Investment Company Institute, ICI, (2008) reports an additional 20% increase in total worldwide mutual fund assets in the course of 2007.

This impressive growth in the delegated fund management industry, and especially in the volume of assets under management 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 some of the most frequently cited reasons driving this increasing trend towards delegated portfolio management.

Since the pioneering paper of Jensen (1968), mostly devoted to analysing and evaluating performance or the manager's ability to outperform the market, academic literature on mutual funds has recently redirected its attention towards the price that investors have to pay for the services that they receive, i.e. mutual fund fees or expenses. Firstly, since some of these expenses are deducted from returns before performance is assessed, the conclusions could be affected by the level of these fees. In particular, Grinblatt and Titman (1989), Droms and Walker (1996) and Cesari and Panetta (2002), among others, find that mutual funds do not underperform the market when gross returns (before expenses) are considered. A similar result is found by Martínez (2003) for the Spanish market.

Second, considering mutual fund fees as the price that investors have to pay to participate in this industry, management fee studies point to price-setting here. In addition, these studies could throw some light on competition in this sector. Coates and Hubbard (2007) draw up an excellent analysis of that issue. Gil-Bazo and Ruiz-Verdú (2008) present another recent theoretical contribution to the relevant literature.

Third, the mutual fund management industry accounts nowadays for a non negligible share of national financial statements. For instant, ICI (2008) reports $12 trillion managed by US mutual funds, and an asset-weighted average 0.86% of fees and

expenses at the end of 2007, representing more than 0.75% of US GDP. Moreover, more than 44% of US households own mutual funds.

Finally, investors have recently become much more cost-conscious than previously. Thus, a survey conducted by ICI in 2006 found that 74% of investors reviewed or asked questions about fund fees and expenses before purchasing, even over and above the historical performance of the fund. Recent studies also show that individual investors are paying attention to fund expenses and that net fund flows are influenced by fund costs. See Sirri and Tufano (1998), Khorana and Servaes (2004), Barber, Odean, and Zheng (2005) and Woodrow (2007).

Although investors have to pay different fees (the custody fee, paid for asset administration and custody; the front-end load, charged to investors at the time of the share purchase; and the redemption fee, paid by investors when fund shares are redeemed), this paper focuses on the fees that investors have to pay to managers for portfolio supervision services, i.e. management fees. The main reason is that management fees are the largest component of fund operating expenses[1]. Thus in our sample management fees account for 90% of total average fund expenses. So the price-setting policy of management companies is implemented through changes in management fees.

A considerable number of topics have been analysed by academic literature on management fees[2]. Following the initial paper by Bhattacharya and Pfleiderer (1985), several authors have studied the optimal structure of management fees both theoretically and empirically, either as a simple percentage of the total assets managed or tied to the returns obtained by the management. Modigliani and Pogue (1975), Starks (1987), Grinblatt and Titman (1989), Golec (1992), Roll (1992), Das and Sundaram (1998a, b and 2002), Ou-Yang (2003), Palomino and Prat (2003) and Dybvig *et al* (2004) are some of the most significant.[3]

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[1] Khorana *et al* (2008) report the level of management fees, total expense ratios and total shareholder costs (adding annualised loads) for 18 countries in December 2002. With substantial differences across countries and fund investment objectives, management fees account for an average of 70% of total expense ratios.

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

[3] The choice between linear and piecewise-linear management fees is analysed in Coles *et al* (2000), Deli (2002), Deli and Varma (2002), Warner and Wu (2006) and Massa and Patgiri (2007) among others. Academic literature has also analysed a wide range of issues related to performance-based fees. For instance, the convenience of establishing a reference portfolio is analysed in Admati and Pfleiderer (1997), Basak *et al* (2007) and Garvey and Milbourn (2006); Starks (1987), Das and Sundaram (2002) and Ross (2004) study the desirability of asymmetry; and Brennan (1993), Cornel and Roll (2004) and Cuoco and Kaniel (2006) focus on the effect on asset prices.

Other empirical papers focus on the determinants of management fees. Ferris and Chance (1987), Malhotra and McLeod (1997), Tufano and Sevick (1997), Luo (2002), an more recently Prather *et al* (2004) and Malhotra *et al* (2007) are illustrative examples of this literature[4].

Another related issue analysed in the relevant literature is the relationship between management fees and fund performance (a non-exhaustive list includes Ippolito (1989), Golec (1996), Gruber (1996), Carhart (1997), Chevallier and Edison (1999), Elton *et al* (2003)), volatility (Chevallier and Edison (1999), Cremers and Petajisto (2007) and Kaniel and Hugonnier (2008) among others) and flows, (Sirri and Tufano (1998), Khorana and Servaes (2004) and Barber *et al* (2005)).

In a recent paper Khorana *et al* (2008) provide extensive research on the differences in mutual fund fees worldwide, focusing on funds themselves, management companies and national characteristics.

This paper extends this literature by investigating empirically the variations in the management fees applied by management companies to fund shareholders. Since management fees have an economically significant impact on investment performance, this analysis is clearly in the interest of the large community of mutual fund shareholders. It is also of interest to management companies, in making them aware of the extent of the competitive environment and the price policy of competitors in the mutual fund industry, since this directly affects their profitability. Finally, regulators could also gain from a better understanding of the fee policy implemented in the industry.

In particular, we analyse how management fees change over time, focusing on the causes and effects (on performance and market share) of those changes. The typical management fee in the Spanish mutual fund industry is a fixed percentage of the assets managed, with no explicit performance component. Only 9% of mutual funds sponsors use performance-based fee contracts with their management firms. One distinguishing characteristic of Spanish mutual fund regulation is that it relies on caps or maximum fees. Appendix 1 shows the maximum fees allowed by Spanish regulations according to the way in which they are determined and the type of fund. We collect data on the changes in the fixed percentages charged in both asset-based and in performance-based management fees.

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[4] See Gil-Bazo and Martínez (2004) for the Spanish market**.**

To the best of our knowledge, the only two studies focused on management fee changes are those of Warner and Wu (2006) and Kunhen (2005), who analyse advisory contracts. So we believe that this paper can provide new empirical evidence in the field of management fees. As indicated by Warner and Wu (2006) we find that the number of fee changes is limited but economically significant. Only 5% of the fund-time observations are variations in management fees. However, more than 29% of the sample funds are affected by management fee changes over the course of the period of analysis. Moreover, the average changes are very large, equivalent in the case of the increases in asset-based management fees for 66% of the fees previously charged.

We find that in the Spanish fund industry there have been few asset-based management fee changes, but those that have taken place are economically significant and their aggregate effect is offset. Successful funds and management companies in terms of asset volume and performance have implemented price increasing policies, while unsuccessful ones have decreased management fees as a way of becoming more competitive in the industry. However, no significant effects are found in the paper in connection with such purposes.

In regard to performance-based management fee changes, we find that small funds, with low excess returns, high quarterly returns and owned by good-performing management companies have decreased performance-based management fees. The price policy implemented by Spanish funds through performance-based management fee decreases seems to have had a negative effect on subsequent returns and on net excess returns and a positive impact on the market share of funds. Decreases in performance fees seem to induce the manager to make some slight effort because performance-based fees are an explicit incentive for managers.

The rest of this paper is organized as follows. Section 2 describes the data and variables employed in the analysis. The results of the empirical model estimating determinants and consequences of the management fee changes are discussed in Section 3, separately for increases and decreases in the asset-based and performance-based management fees. Finally, Section 4 concludes and summarizes the main findings of the paper.

## 2. Data and Variables

The Spanish mutual fund industry is 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 under management by mutual funds at year-end 2007 was equivalent to 11.5% of total Spanish family financial savings, compared to 0.4 % in 1985. At that time a record figure of 0.32 trillion Euros managed was reached (compared with just 0.0017 trillion Euros in 1985), equivalent to 26.7% of GDP. This made Spain the sixth biggest European country in terms of assets under management. 49% of Spanish families (a total of 9.69 million shareholders) are involved to some degree in mutual fund investments.

The dataset was obtained from the body that supervises and inspects Spanish Stock Markets, and therefore mutual funds: Comisión Nacional del Mercado de Valores (CNMV). This institution publishes a quarterly data sheet that includes all the information used in this study. The data set available initially comprised all the existing open-end funds from the second quarter of 2002 to the second quarter of 2007. The quarterly average number of funds is 2,644, ranging from 2,508 in the third quarter of 2003 to 2,923 in the second quarter of 2007. The total asset volume managed increased from 0.18 to 0.28 trillion Euros in the course of the sample period.

Guaranteed funds were excluded from the analysis (because of their specific investor remuneration policy[5]) as were funds less than one year old. In order to perform a time series analysis we only consider mutual funds with complete information throughout the period analysed. This leaves a final sample of 710 mutual funds, which represent 27.0% of the average number of existing funds and 31.7% of the average total asset volume. It must be stressed that the fund sample characteristics very closely match those of the full available data. In particular, the dynamic pattern of the management fees that we are interested in is almost identical. Thus, we are very confident that the sample chosen is representative of the industry as a whole in Spain.

The analysis is conducted on a semi-annual basis, and data referring the two first quarters need to be used for lagged explanatory variables. So the total number of items

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[5] At the end of the guarantee period, guaranteed funds usually extend (and modify) the initial guarantee but charge a different management fee. However, the new management fee responds to the characteristics of the guarantee rather than to any change in the price policy of the fund.

in the data set is 6,390 (710 funds, analysed in 9 quarters). Changes in management fees are considered separately for increases and decreases.

In accordance with current Spanish legislation, management fees are charged at fund level on the basis of the total volume of assets managed, the returns obtained or a combination of the two. In fact, as in the mutual fund industry worldwide, 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. In our sample there are no funds that charge management fees only on returns. It interesting to highlight that Spanish legislation establishes the annual maximum permissible for each type of fee (see Appendix). Management fees charged by Spanish mutual funds differ substantially across investment objectives. The equally-weighted average management fee in the sample period is 1.43% of assets and 0.76% of performance[6], ranging from 0 to the maximum allowed.

Time variations in the fixed percentages charged on assets and/or performance are considered as changes in the price policy of the fund, and constitute the key point of the paper.

Over the period and for the sample considered, a total of 177 decreases in management fees occurred (143 of them are in asset-based management fees and 34 in returns-based fees). On the other hand there were 138 management fee increases, 102 of them in asset-based and 36 in returns-based fees. These figures account, respectively, for 2.8% and 2.2% of the total number of items. See Table 1.

These changes affected 204 funds, 29% of the total. In particular only 27 out of the 191 changing funds varied asset-based management fees in both directions during the sample period. For the performance-based management fee changes, 9 out of 55 funds made changes in opposite directions. We also found simultaneous opposite variations in asset-based and performance-based management fees, mainly related to a transformation in the benchmark used for the management fee.

The level of changes is surprisingly high. In particular, the average increase in the asset-based management fee is 59 base points, which is equivalent to 66% of the fee charged two quarters before the change (0.9%). Similarly, the average drop is 47 base

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[6] Although there are large differences between value-weighted and equally-weighted mean fees (as reported in Khorana *et al* (2008 and ICI (2008)), we decided to report the latter because the paper focuses on the individual fees charged.

points, 1.45% of the mean value two quarters before the change. With respect to performance-based fees, the average increase is 803 base points and the average decrease is 816.

However, the levels of increases and decreases seem to offset each other, and the time-series of the equally-weighted average management fees exhibits a very stable pattern.

To sum up, the sample of management fees from Spanish funds analysed is characterised by a very small number of management fee changes, but those changes are economically significant  relevance and their aggregate effect is offset.

Since the main objective of this study is to analyse increases and decreases in management fees, two dummy variables, INC and DEC, are created as the dependent variables for the empirical model which studies the decision to change the management fee. INC (DEC) takes a value of one for quarter-fund observations that increase (decrease) management fees, and zero if no change occurs.

Next we describe the set of fund attributes considered as explanatory variables in the empirical model characterising the decision to change management fees.

Basically, these are the fund characteristics considered previously 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 to change management fees.

We first consider the investment objective of the 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), in which more than 70% is invested in fixed income assets; and finally Global funds (GFunds), which have no precisely defined investment policy and do not belong to any other category.

Funds are also classified into two groups according to the type of management fee charged. We use the term "asset funds" (with AFunds as the associated dummy variable) for those which set fees exclusively on volume of assets, and "mixed funds" (MFunds) for funds that tie a fraction of the management fee to the returns obtained.

The number of years since the last modification in the investment objective of the fund (ANTIQ) is also considered, so as to examine the likelihood of changes in management fees[7].

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[7] Note that this variable does not therefore represent exactly the years from the creation of the fund, but it does capture the same idea of experience in portfolio management.

Volatility of performance (VOLAT) is measured by the standard deviation of the twelve monthly returns, in percentage terms, as supplied by CNMV.

Fund size is another potentially relevant attribute in deciding whether to change management fees. To empirically analyse this issue, the volume of assets managed in thousands of Euros (ASSETS) and the number of shareholders (SHAREH) are used to assess fund size. Additionally, the market share of the relevant funds (out of the total assets managed by all funds with the same investment objective) is computed and termed MSASSETS.

Quarterly and annual fund returns, net of all expenses, are also available in the dataset (QNRET and ANRET, respectively). We also computed the quarterly fund excess returns over the average in the same investment objective, EXCQNRET.

Finally, fund fees are also considered. Thus, we collect information about management fees, referred to here as asset-based management fees (AMF) or performance-based management fees (PMF), depending on the variable on which they are based; the custody fee paid for asset administration and custody, CUSTFEE; the front-end load charged to investors for the purchase of fund shares, FRONTLOAD; and the redemption fee paid by investors when fund shares are redeemed, REDFEE. The discount that the management company occasionally applies to the fund is referred to as DISC. In the empirical application, one-time 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 all 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 quarter. This variable is referred to as EXPENSES.

Given the evidence in Warner *et al* (2006) that the fund price policy is implemented at family level, some additional information for the fund management company is also collected. Thus, the total volume of assets under management (MC-ASSETS), equally-weighted quarterly fund returns (MC-QNRET), annual fund returns (MC-ANRET) and market share (MC-MSASSETS) are computed and used in the empirical analysis. Subsequent versions of the paper will investigate this issue in more depth.

Appendix 2 lists and defines all the variables considered in the paper.

### 2.1 Descriptive analysis of the data

This section briefly describes the main characteristics of the sample analysed in this study. 710 mutual funds are studied on a semi-annual basis from the 2nd quarter of 2003 to the 2nd quarter of 2007, which provides a total of 6,390 fund-semester items. Around 50% of the funds in the sample are Equity funds, 10% Global funds and the remaining 40% Bond funds. Only around 9% are mixed funds[8].

Table 1 characterizes the time-series distribution of the number of management fee changes according to the fund investment objective and the type of management fee charged. Panel A reports information on changes in asset-based fees and panel B in performance-based fees.

The number of changes in asset-based management fees ranges from 50 in the first semester of 2003 to 12 in the second of 2005. In the course of the period considered there are 143 decreases and 102 increases in all, accounting for 2.24% and 1.6%, respectively, of the total number of observations.[9] No clear time pattern in the number of this kind of management fee changes is observed in the sample, although a slight increase can be observed in the last part. Only 38% of the changes affect Equity funds, although those funds account for 50% of the sample. More interestingly, almost 61% of those changes are increases in management fees. By contrast, 74% of the changes affecting Bond funds are decreases. Global funds seem (relatively) to change asset-based management fees twice as often as other funds, with a slight preference for decreases. Mixed funds also show a relatively high proportion of management fee changes (17%) given their limited presence in the sample, with those changes being slightly dominated by decreases.

The distribution of the number of changes in performance-based management fees is reported in Panel B. It is obvious that, unlike asset-based management fees, performance-based fees are charged only by mixed funds, which on average account for just 9% of the sample. Thus, Panel B reinforces the idea that mixed funds change management fees more often than others. The total number of changes is 70: 34 decreases and 36 increases. These changes affect 6% and 6.3%, respectively, of mixed

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[8] Since the sample includes only funds with complete information for the whole period analysed, the time-series variations in the number of funds, according to the investment objective and the type of management fee charged, can only be explained by changes in the fund characteristics.
[9] These figures are slightly higher than those in Warner and Wu (2006) for the advisory contract changes in the US market for 1995-2001.

fund items, roughly above the changes in asset-based fees. Surprisingly, Equity mixed funds decreased management fees more often than they increased them, whereas the contrary was the case for the funds with other investment objectives.

Table 2 describes the number of funds involved in management fee increases and decreases from the second quarter of 2003 to the second quarter of 2007. 143 decreases in asset-based management fees were made by 121 different funds, with eighteen of them changing fees twice during the sample period and two funds decreasing them three times. There were 102 increases, affecting 97 funds, five of which changed fees twice. Regarding price policy, 27 funds varied their fees in opposite directions during the period considered.

Changes in performance-based management fees affected 55 funds: 30 decreased their fees (with two funds making three changes) and 34 funds increased them (two of them changing twice), with 9 funds varying fees in opposite directions.

Also in terms of pricing policy, we have found simultaneous opposite variations in asset-based and performance-based management fees. 23 of the 36 performance-based fee increases coincided with simultaneous decreases in asset-based fees; all these increases actually result in the introduction of performance-based fees, turning the relevant funds into mixed funds. Also, 15 out of the 34 performance-based fee decreases coincided with an opposite variation in asset-based fees, all but one of which entailed conversion to asset funds.

The time-series distribution for the amounts of management fees changes (variation in management fees) are reported in Table 3. For asset-based management fees (Panel A), the average increase was a remarkable 59 base points. With a 0.9% average fee on assets managed before the change, this makes for an average increase of 66%. Notice the exceptional increase in the first semester of 2006. The average decrease is smaller but still significant at 47 base points. Although there are no major differences across the fund groups considered, Equity funds seem to be responsible for a significant fraction of large asset-based management fee changes. Panel B shows the information for performance-based management fee changes. It can be deduced that almost all changes in these fees are in funds which introduce or eliminate performance-based fees in their management fee structures[10]. In practice, these changes result in a modification in the type of fund from asset fund to mixed fund or viceversa. Obviously, such a

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[10] An evident example of that fact is the data for the first semester of 2007, when 12 funds eliminated performance-based management fees and one fund introduced such a fee.

modification in the structure of the management fees charged might be sparked by reasons other than merely changing fee amounts, so this point deserves additional research. Empirical analysis should carefully consider this point.

In spite of these considerable activities in the price policy, the average aggregate cost to investors does not change much. Table 4 and the figures below report the changes over time in equally-weighted average management fees. Bond and Global funds experienced a slight decrease in asset-based fees over the four-year period analysed, accounting for 5% and 10%, respectively. However, Equity funds actually underwent a 4% increase. In regard to performance-based fees, Global funds underwent a substantial 34% increase, whereas a 31% decrease was experienced by Equity funds.

Table 5 reports summary statistics of the variables for the sample selected. Panel A is for the first quarter considered, i.e. the second quarter of 2003; Panel B reports data for the second quarter of 2007, the last quarter considered; and, finally, Panel C shows the time-series average for the total period. As can be deduced from the table, economically significant time-series differences over the four-year period are observed in the cross-sectional means of some of the most significant variables: volatility and returns. By contrast, management fees and expenses seem to be very stable throughout the period analysed, as previously reported.

Most interestingly, Table 6 shows the cross-sectional average behaviour of relevant variables from four quarters before to four quarters after management fee variations. In order to shed some light on the subject considered in this paper, items corresponding to management fee increases (INC), decreases (DEC) and non-changing funds (NOCHANG) are reported separately from the total. Panel A shows the results for changes in asset-based management fees and Panel B for performance-based fees. We perform a differences in average test between changing (INC / DEC) and non-changing (NOCHANG) funds.

From Panel A in Table 6 it is clear that before the changes those funds which increased asset-based management fees were cheaper in terms of the associated fees, but more expensive in terms of performance-based fees. Not surprisingly, after the change those funds increasing (decreasing) fees became more expensive (cheaper), but at the same time drastically reduced (increased) their performance-based management fees. So it appears that a combined (and opposite) price-setting policy regarding asset-based and performance-based management fees was implemented, as reported previously.

Regardless of market conditions, funds decreasing their asset-based management fees performed worse before the change in terms of quarterly, annual and excess returns. Thus, one might think that their relatively low performance encouraged these funds to reduce their management fees. After the changes, these funds significantly improved their relative returns, but continued to perform more poorly except in terms of excess returns. However, funds which increased their asset-based fees did not obtain exceptional returns before the change that could justify that decision. Nor did their relative performance worsen after the increase. So no clear positive relationship between previous returns and asset based-management fee increases seems to be found in the data.

The smallest funds seem to have been more inclined to increase asset-based management fees. Rather surprisingly, these funds increased their average number of shareholders and the volume of assets that they managed after the changes. Funds which reduced fees were also able subsequently to capture a relevant fraction of assets, especially in their target investment groups, as evidenced by the remarkable rise in their market share: they became the funds with the biggest market share.

Low-volatility funds seem to have been more inclined to decrease asset-based management fees, although that change has not modified their asset allocation policy. Some quarters after the fee decrease the risk assumed by these funds continues to be half that of the others. Moreover, younger funds seem to have increased asset-based management fees more often than more established funds.

No significant differences are found in the size of management companies before the fee changes; however, after the changes those companies managing funds which increase fees gained market share. By contrast, companies managing funds which decreased asset-based management fees obtained significantly lower quarterly and annual returns than the others before the changes, while no clear pattern is observed after the changes.

Panel B in Table 6 illustrates that the funds which decreased their performance-based management fees had the smallest asset-based fees and the largest performance fees before the change. Afterwards, the latter remained above average, while the asset-based fee increased. Clear simultaneity and opposite decisions in the two management fees appear in funds which increased their performance-based management fees.

As for asset-based fees, funds which increased performance-based fees did not obtain exceptional returns before the change. What is more interesting is that the best

past performers (for quarterly and annual returns, but not for excess returns) decreased these fees. After the change, these funds obtained worse returns and indeed became the worst performers. However, those funds which increased the fraction of their management fees tied to returns improved their returns after the change. The incentives that this kind of fee create for managers seem to have worked correctly, because the managers of these funds put in more effort and obtained better returns.

Funds which increased (decreased) performance-based fees were larger (smaller) in size before the change; they experienced a significant reduction in asset volume and market share, but a surprising rise in the number of shareholders three quarters after the increase. It should be highlighted that risky funds and funds belonging to small management companies were notably the most inclined to reduce performance-based fees.

# 3. Econometric approach and results

After the description of the management fee changes in the previous section, we now go on to provide an empirical analysis of their determinants and consequences. In order to investigate differences between changes in asset-based management fees and performance-based fees, we analyse each type separately. In addition, alternative price policies (e.g. management fee increases and decreases) are independently analysed.

In this empirical application, we sort funds in each quarter into terciles based on the variables ANRET, MC-ASSETS, MC-QNRET and MC-ANRET, denoted as large, medium and small. We also transform the total volume of assets managed by each fund and by each management company by its neperian logarithm.

## 3.1 Determinants of management fee changes

Firstly, we estimate the main determinants of the changes in the management fees charged by the funds in our Spanish fund sample. As mentioned above, in this analysis the endogenous variables are the dummy variables INC and DEC, which take a value of one for quarter-fund observations in which fees increase or decrease and zero when no change occurs. The one-semester lagged fund attributes selected in the previous section are considered as explanatory variables, along with the current investment objective.

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

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

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

where $\beta$ is 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.

We apply the maximum likelihood estimation the iterative scoring algorithm. The pseudo $R^2$ is used as the adjustment kindness of the model. In logit 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.

The results of our estimation are reported in Table 7; Panel A is for the changes in the asset-based management fees and Panel B for performance-based funds. The control group included in the constant term is Bond funds.

### 3.1.1 Asset-based management fees

As can be deduced from the table, an increase in asset-based management fees is significantly more likely for funds with high annual returns which are Global funds and for those belonging to large, profitable management companies. By contrast, it is lesser for big funds.

By contrast, fee decreases are more likely to occur in small, secure, poor-performing funds (in terms of EXCQNRET) which are managed by management companies with low volumes of assets and annual returns, as can be deduced from the table. Moreover, Global funds are relatively more inclined to decrease that kind of fee.

To sum up, it appears that successful funds and management companies have been able to exploit that advantage to go through with a high-price policy, while unsuccessful ones have decreased management fees as a way to become more competitive in the industry.

### 3.1.2 Performance-based management fees

As regards as the results for performance-based management fees, Table 7 illustrates that the likelihood of a fee increase is significantly greater for cheap, small,

Global funds and for those belonging to management companies with low quarter return. Readers should remember that such changes are usually simultaneous with others in the opposite direction for asset-based management fees.

Performance-based management fee decreases are inversely related to size and fund return. Thus, small funds with low excess returns were more inclined to decrease these fees. Rather surprisingly, funds with high quarterly returns owned by good-performing management companies also decreased performance-based management fees more often.

### 3.2 Determinants of the magnitudes of management fee changes

Additionally, we analysed the factors that determined the amounts by which management fees changed. To that end we ran OLS with heteroscedasticity correction regressions only for the changing observations, using as dependent variables the levels of the changes (variation variable).

The results in Table 8 show that greater decreases in asset-based management fees are related to the most expensive and the smallest funds. No significant differences are found as to the fund investment objectives. Indeed, the cheapest funds seem to be involved in large management fee increases.

Performance-based management fee decreases are greater for expensive funds and funds with low quarterly-return, while young, secure, small funds experience the most significant increases.

### 3.3 Effects of management fee changes

This section analyses the effects of management fee changes on relevant fund characteristics. In particular, the consequences of these fee variations for quarterly returns, excess quarterly returns and market shares are estimated in the quarter when funds change their management fees and in the four quarters thereafter. Thus, the variables QNRET, EXCQNRET and MSASSETS are used respectively as dependent variables in OLS with heteroscedasticity correction regressions, while the dummies INC and DEC (and others used as control variables) aim to capture the effects of management fee increases and decreases on the former. Table 9 shows the results; Panel A is for the changes in the asset-based management fees and Panel B for those in performance-based fees.

### 3.3.1. Asset-based management fees

Increases are expected to have an obviously negative effect on quarterly net returns. This is the case, in Panel A, only for fee increases (INC) associated with returns in the third subsequent quarter. Surprisingly, fee decreases seem to significantly decrease returns in the fourth subsequent quarter. When we focus on quarterly net excess returns, similar effects are found, but of less economic and statistical significance. Only the negative incentives that fee reduction may provoke in the manager activity seem capable of explaining these findings.

Fund market share is not significantly affected by asset-based fee changes.

To conclude, the price policy implemented by Spanish funds through asset-based management fee variations does not seem to have been as effective as anticipated, at least in terms of fund performance and market share.

### 3.3.2. Performance-based management fees

Panel B shows that a fee decrease has a significant, negative effect on a funds´s quarterly returns in the quarter when the change happens and in the third subsequent quarter. In the same way, the decreasing of fees has a significant, negative impact on a fund's quarterly net excess returns in the quarter when the change happens.

In contrast with this, market share is significantly positively affected by decreases in performance-based management fees in the quarter when the change happens and in the two subsequent ones.

Increases in performance-based fees do not significantly affect the returns or market share of funds.

In conclusion, the price policy implemented by Spanish funds through performance-based management fee decreases seem to have had a negative effect on subsequent returns and on net excess returns and a positive impact on the market share of funds, as anticipated above in the hypothesis. Decreasing performance fees seems to make managers put in some slight effort because performance-based fees are an explicit incentive for managers.

## 4. Concluding Remarks

The mutual fund industry is one of the most prominent in the financial area. Its recent trend worldwide is towards increases in volume of assets and number of shareholders. A comprehensive analysis of the price policy in this sector is clearly of

interest to investors, management companies and regulators. This paper empirically analyses the determinants and consequences of changes in management fees in a sample of Spanish mutual funds for 2003-2007.

The average equally-weighted management fee remained in the same range of magnitude over the sample period. However, price-setting affected a significant proportion - 29% - of funds, with the average change being greater than 50 basis points.

Results seem to reveal that small, poor-performing funds (and management companies) decreased asset-based management fees in an attempt to become more competitive in the industry. Nevertheless, after the variations there was no significant enhancement of performance or market share.

Small funds with low excess returns and high quarterly returns, owned by good-performing management companies decreased performance-based management fees. These decreases seem to have had a negative effect on subsequent returns and on net excess returns and a positive impact on the market share of funds. Decreasing performance fees seems to make managers put in some slight effort because performance-based fees are an explicit incentive for managers.

**Appendix 1: Legal maximum fees in Spain**

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

| Fund type | Management fee | Custody fee | Front-end and Redemption loads |
|---|---|---|---|
| **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 | | |

## Appendix 2: Variable definitions

We study contract changes twice per year, in the second and last quarters of the year (semi-annual frequency).
Contract change: measured relative to two previous quarters.

*Fund level variables:*
**INC (DEC):** a binary variable which takes a value of one for quarter-fund observations in which there is an increase (decrease) in management fees, and zero when no change occurs.
**AMF/PMF Variation:** the amount of changes in management fees.
**BFunds:** a binary variable which takes a value of one if funds invest more than 70% in fixed income assets, and zero otherwise.
**Efunds:** a binary variable which takes a value of one if funds invest mainly in equities, and zero otherwise.
**GFunds:** a binary variable which takes a value of one if a fund is global (i.e. a fund with no precise definition of investment policy which does not belong to any other category) and zero otherwise.
**AFunds:** asset funds, those which set their management fees exclusively on volume of assets.
**Mfunds:** mixed funds, those which tie a fraction of their management fees to the returns obtained.
**nBFunds:** number of Bond funds, expressed as a percentage (%).
**nEFunds**: number of Equity funds, expressed as a percentage (%).
**nGFunds:** number of Global funds, expressed as a percentage (%).
**nAFunds:** number of asset funds, expressed as a percentage (%).
**nMFunds**: number of mixed funds, expressed as a percentage (%).
**ANTIQ:** number of years since the last modification in the investment objective of the fund.
**VOLAT:** Volatility of performance measured by the standard deviation of the twelve monthly returns, in percentage terms, as supplied by CNMV.
**ASSETS:** volume of assets managed in thousands of euros.
**SHAREH:** number of shareholders.
**MSASSETS:** market share of the fund (out of the assets managed by all the funds with the same investment objective).
**QNRET:** quarterly fund returns, net of all expenses.
**ANRET:** annual fund returns, net of all expenses.
**EXCQNRET:** quarterly excess return of the fund, over the average for the same investment objective
**AMF:** asset-based management fees.
**PMF**: performance-based management fees.
**CUSTFEE**: custody fee paid for asset administration and custody.
**FRONTLOAD:** front-end load charged to investors for the purchase of fund shares.
**REDFEE:** fee paid by investors when fund shares are redeemed.
**DISC:** discount occasionally applied by some management companies.
**NONAFEE:** sum of all one-off fees (front-end load and redemption fee, net of discount) because they are all non-annual fees.
**EXPENSES:** quarterly total expenses borne by the fund.

*Management company level variables:*
**MC-ASSETS:** total volume of assets managed by the same management company.
**MC-QNRET:** equally-weighted quarterly fund returns by the same management company.
**MC-ANRET:** equally-weighted annual fund returns by the same management company.
**MC-MSASSETS:** management company fund market share.

This table shows the semi-annual time-series distribution of the number of changes in asset-based (Panel A) and performance-based management fees (Panel B), separately for increases and decreases (INC and DEC, respectively), according to fund investment objectives (equities, Efunds; fixed-income assets, BFunds; and global, GFunds), and the type of management fee charged (asset funds, AFunds, if based exclusively on assets under management, and mixed funds, Mfunds, if also charged on returns obtained).

Panel A: Asset-based management fees

| | 2º -2003 | | 4º -2003 | | 2º -2004 | | 4º -2004 | | 2º -2005 | | 4º -2005 | | 2º -2006 | | 4º -2006 | | 2º -2007 | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC |
| | 33 | 17 | 13 | 12 | 13 | 13 | 9 | 4 | 16 | 9 | 4 | 8 | 17 | 13 | 22 | 12 | 16 | 14 | 143 | 102 |
| BFunds | 21 | 7 | 7 | 5 | 7 | 3 | 3 | 1 | 5 | 4 | 3 | 1 | 8 | 3 | 17 | 1 | 7 | 3 | 78 | 28 |
| EFunds | 7 | 9 | 3 | 7 | 4 | 6 | 5 | 2 | 3 | 2 | 0 | 5 | 6 | 10 | 3 | 7 | 6 | 9 | 37 | 57 |
| GFunds | 5 | 1 | 3 | 0 | 2 | 4 | 1 | 1 | 8 | 3 | 1 | 2 | 3 | 0 | 2 | 4 | 3 | 2 | 28 | 17 |
| MFunds | 2 | 1 | 2 | 1 | 1 | 5 | 4 | 1 | 7 | 2 | 1 | 1 | 3 | 3 | 5 | 2 | 1 | 0 | 26 | 16 |
| AFunds | 31 | 16 | 11 | 11 | 12 | 8 | 5 | 3 | 9 | 7 | 3 | 7 | 14 | 10 | 17 | 10 | 15 | 14 | 117 | 86 |

Panel B: Performance-based management fees

| | 2º -2003 | | 4º -2003 | | 2º -2004 | | 4º -2004 | | 2º -2005 | | 4º -2005 | | 2º -2006 | | 4º -2006 | | 2º -2007 | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC |
| | 1 | 2 | 0 | 3 | 8 | 3 | 0 | 6 | 1 | 8 | 0 | 3 | 10 | 2 | 2 | 8 | 12 | 1 | 34 | 36 |
| BFunds | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 5 |
| EFunds | 1 | 0 | 0 | 2 | 8 | 1 | 0 | 6 | 1 | 2 | 0 | 2 | 8 | 1 | 2 | 2 | 9 | 0 | 29 | 16 |
| GFunds | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 6 | 0 | 0 | 1 | 1 | 0 | 4 | 3 | 1 | 4 | 15 |
| MFunds | 0 | 2 | 0 | 3 | 1 | 3 | 0 | 6 | 0 | 8 | 0 | 3 | 1 | 2 | 0 | 8 | 0 | 1 | 2 | 36 |
| AFunds | 1 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 9 | 0 | 2 | 0 | 12 | 0 | 32 | 0 |

**Table 2: Number of funds involved in management fee changes**

This table reports the number of funds involved in management fee increases and decreases from 2-2003 to 2-2007; Panel A is for asset-based management fees and Panel B for performance-based fees.

Panel A: Asset-based management fees

| Nº of increases\ Nº of decreases | 0 | 1 | 2 | 3 | Total |
|---|---|---|---|---|---|
| **0** | 519 | 78 | 16 | 0 | 613 |
| **1** | 66 | 23 | 2 | 1 | 92 |
| **2** | 4 | 0 | 0 | 1 | 5 |
| **Total** | 589 | 101 | 18 | 2 | 710 |

Panel B: Performance-based management fees

| Nº of increases\ Nº of decreases | 0 | 1 | 2 | 3 | Total |
|---|---|---|---|---|---|
| **0** | 655 | 21 | 0 | 0 | 676 |
| **1** | 25 | 7 | 0 | 0 | 32 |
| **2** | 0 | 0 | 0 | 2 | 2 |
| **Total** | 680 | 28 | 0 | 2 | 710 |

**Table 3: Distribution of the amounts of management fees changes**

This table shows the semi-annual time-series distribution of the average management fees and the average amount of changes (variation) in asset-based management fees, AMF, (Panel A) and performance-based management fees, PMF, (Panel B), separately for increases and decreases (INC and DEC, respectively), according to the investment objectives of funds (Efunds, BFunds and GFunds), and the type of management fee charged (AFunds and Mfunds). Row three of the table shows the number of decreases and increases in each quarter and in the total period.

Panel A: Asset-based management fees (AMF)

| | | 2º -2003 | | 4º -2003 | | 2º -2004 | | 4º -2004 | | 2º -2005 | | 4º -2005 | | 2º -2006 | | 4º -2006 | | 2º -2007 | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC |
| | | 33 | 17 | 13 | 12 | 13 | 13 | 9 | 4 | 16 | 9 | 4 | 8 | 17 | 13 | 22 | 12 | 16 | 14 | 143 | 102 |
| AMF(t-2) | | 1.50 | 1.19 | 1.26 | 0.79 | 1.50 | 0.84 | 1.22 | 0.81 | 1.45 | 1.24 | 1.09 | 0.72 | 1.54 | 0.65 | 1.35 | 0.58 | 1.69 | 1.10 | 1.45 | 0.90 |
| variation | | -0.51 | 0.45 | -0.59 | 0.74 | -0.25 | 0.47 | -0.69 | 0.34 | -0.58 | 0.42 | -0.30 | 0.52 | -0.68 | 1.06 | -0.26 | 0.64 | -0.30 | 0.49 | -0.47 | 0.59 |
| AMF(t-2) | BFunds | 1.50 | 0.62 | 1.24 | 0.49 | 1.48 | 0.63 | 0.92 | 1.25 | 1.55 | 1.21 | 1.12 | 0.00 | 1.42 | 0.43 | 1.29 | 0.40 | 1.63 | 0.63 | 1.40 | 0.66 |
| variation | | -0.46 | 0.52 | -0.47 | 0.80 | -0.31 | 0.34 | -0.60 | 0.10 | -0.53 | 0.54 | -0.22 | 0.33 | -0.72 | 0.85 | -0.21 | 0.10 | -0.27 | 0.52 | -0.40 | 0.55 |
| AMF(t-2) | EFunds | 1.51 | 1.69 | 1.65 | 1.01 | 1.81 | 1.01 | 1.35 | 0.75 | 1.38 | 1.75 | | 0.65 | 1.90 | 0.71 | 1.80 | 0.60 | 1.79 | 1.27 | 1.65 | 1.04 |
| variation | | -0.77 | 0.39 | -1.32 | 0.69 | -0.20 | 0.67 | -0.85 | 0.39 | -0.92 | 0.25 | | 0.64 | -0.75 | 1.13 | -0.42 | 0.72 | -0.30 | 0.56 | -0.67 | 0.67 |
| AMF(t-2) | GFunds | 1.47 | 0.60 | 0.93 | | 0.92 | 0.73 | 1.50 | 0.50 | 1.42 | 0.95 | 1.00 | 1.25 | 1.17 | | 1.25 | 0.59 | 1.65 | 1.00 | 1.31 | 0.81 |
| variation | | -0.39 | 0.40 | -0.13 | | -0.14 | 0.28 | -0.20 | 0.50 | -0.49 | 0.37 | -0.55 | 0.30 | -0.43 | | -0.41 | 0.63 | -0.37 | 0.15 | -0.38 | 0.38 |
| AMF(t-2) | MFunds | 1.68 | 0.00 | 1.50 | 0.00 | 1.75 | 0.83 | 1.44 | 0.50 | 1.58 | 1.13 | 0.80 | 0.00 | 1.08 | 0.50 | 1.26 | 0.45 | 2.25 | 0.00 | 1.44 | 0.58 |
| variation | | -0.80 | 1.25 | -0.65 | 0.40 | -0.40 | 0.24 | -1.06 | 0.50 | -0.86 | 0.20 | -0.20 | 0.33 | -0.19 | 0.50 | -0.35 | 0.30 | -0.90 | 0.00 | -0.65 | 0.39 |
| AMF(t-2) | AFunds | 1.49 | 1.26 | 1.22 | 0.86 | 1.47 | 0.84 | 1.05 | 0.92 | 1.35 | 1.28 | 1.18 | 0.82 | 1.64 | 0.69 | 1.38 | 0.61 | 1.66 | 14.00 | 1.45 | 0.96 |
| variation | | -0.50 | 0.40 | -0.58 | 0.77 | -0.24 | 0.62 | -0.40 | 0.29 | -0.37 | 0.48 | -0.33 | 0.54 | -0.79 | 1.23 | -0.23 | 0.71 | -0.26 | 14.00 | -0.43 | 0.63 |

Panel B: Performance-based management fees (PMF)

| | | 2º -2003 | | 4º -2003 | | 2º -2004 | | 4º -2004 | | 2º -2005 | | 4º -2005 | | 2º -2006 | | 4º -2006 | | 2º -2007 | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC | DEC | INC |
| | | 1 | 2 | 0 | 3 | 8 | 3 | 0 | 6 | 1 | 8 | 0 | 3 | 10 | 2 | 2 | 8 | 12 | 1 | 34 | 36 |
| PMF(t-2) variation | | 9.00 -9.00 | 0.00 9.00 | | 0.00 6.02 | 7.32 -6.45 | 0.00 9.00 | | 0.00 9.00 | 9.00 -9.00 | 0.00 8.38 | | 0.00 9.00 | 9.00 -8.17 | 0.00 9.00 | 9.00 -9.00 | 1.03 6.38 | 9.00 -9.00 | 0.00 9.00 | 8.61 -8.16 | 0.23 8.03 |
| PMF(t-2) variation | BFunds | | 0.00 9.00 | | | | | | | | | | | 0.00 9.00 | 9.00 -9.00 | | 0.00 5.17 | | | 9.00 -9.00 | 0.00 7.47 |
| PMF(t-2) variation | EFunds | 9.00 -9.00 | | | 0.00 4.54 | 7.32 -6.45 | 0.00 9.00 | | 0.00 9.00 | 9.00 -9.00 | 0.00 9.00 | | 0.00 9.00 | 9.00 -9.00 | 0.00 9.00 | 9.00 -9.00 | 0.00 8.50 | 9.00 -9.00 | | 8.54 -8.30 | 0.00 8.38 |
| PMF(t-2) variation | GFunds | | | | 0.00 9.00 | | 0.00 9.00 | | | | 0.00 8.17 | | | 9.00 -0.74 | 0.00 9.00 | | 2.07 5.94 | 9.00 -9.00 | 0.00 9.00 | 9.00 -6.94 | 0.55 7.85 |
| PMF(t-2) variation | MFunds | | 0.00 9.00 | | 0.00 6.02 | 9.00 -2.00 | 0.00 9.00 | | 0.00 9.00 | | 0.00 8.38 | | 0.00 9.00 | 9.00 -0.74 | 0.00 9.00 | | 1.03 6.38 | | 0.00 9.00 | 9.00 -1.37 | 0.23 8.03 |
| PMF(t-2) variation | AFunds | 9.00 -9.00 | | | | 7.08 -7.08 | | | | 9.00 -9.00 | | | | 9.00 -9.00 | | 9.00 -9.00 | | 9.00 -9.00 | | 8.58 -8.58 | |

**Table 4: Changes over time in management fees, by investment objective**

This table shows the trend in the semi-annual time-series of equally-weighted average asset-based management fees, AMF, (Panel A) and performance-based management fees, PMF, (Panel B), according to the investment objectives of funds (equities, Efunds; fixed-income assets, BFunds; and global, GFunds) and for the complete sample.

Panel A: Asset-based management fees (AMF)

| QUARTER | BFunds | EFunds | GFunds | total |
|---------|--------|--------|--------|-------|
| 2º -2003 | 1.17 | 1.66 | 1.35 | 1.43 |
| 4º -2003 | 1.17 | 1.67 | 1.33 | 1.43 |
| 2º -2004 | 1.17 | 1.69 | 1.28 | 1.44 |
| 4º -2004 | 1.16 | 1.68 | 1.27 | 1.43 |
| 2º -2005 | 1.15 | 1.68 | 1.25 | 1.42 |
| 4º -2005 | 1.15 | 1.70 | 1.20 | 1.43 |
| 2º -2006 | 1.14 | 1.72 | 1.16 | 1.43 |
| 4º -2006 | 1.13 | 1.73 | 1.18 | 1.43 |
| 2º -2007 | 1.12 | 1.73 | 1.21 | 1.44 |

Panel B: Performance-based management fees (PMF)

| QUARTER | BFunds | EFunds | GFunds | total |
|---------|--------|--------|--------|-------|
| 2º -2003 | 0.22 | 0.91 | 1.89 | 0.68 |
| 4º -2003 | 0.22 | 0.96 | 1.86 | 0.71 |
| 2º -2004 | 0.19 | 0.81 | 2.20 | 0.67 |
| 4º -2004 | 0.19 | 0.97 | 2.09 | 0.75 |
| 2º -2005 | 0.16 | 1.03 | 2.61 | 0.83 |
| 4º -2005 | 0.20 | 1.08 | 2.51 | 0.87 |
| 2º -2006 | 0.20 | 0.86 | 2.62 | 0.78 |
| 4º -2006 | 0.24 | 0.86 | 2.87 | 0.83 |
| 2º -2007 | 0.24 | 0.63 | 2.53 | 0.69 |



AMF BY INVESTMENT OBJECTIVE



PMF BY INVESTMENT OBJECTIVE
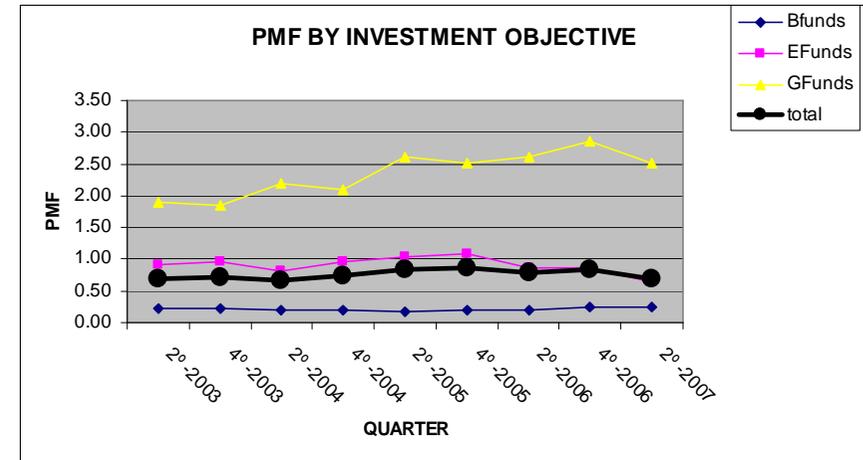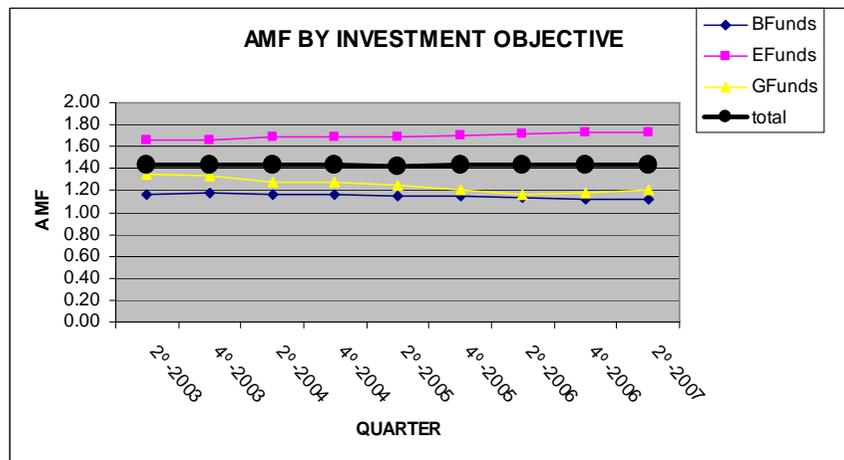
## Table 5: Descriptive statistics for the sample considered

The table reports summary statistics for all the variables in the sample. Panel A is for the 2nd quarter of 2003; Panel B is for the 2nd quarter of 2007 and Panel C shows the time-series average. Variables are defined in Appendix 2.

| | Panel A | | | | Panel B | | | | Panel C | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2º -2003 | | | | 2º -2007 | | | | TOTAL PERIOD | | | |
| Variable | Mean | Std. Dev. | Min | Max | Mean | Std. Dev. | Min | Max | Mean | Std. Dev. | Min | Max |
| VOLAT | 3.49 | 3.10 | 0.03 | 15.86 | 1.21 | 0.99 | 0.02 | 4.75 | 1.80 | 1.77 | 0.00 | 15.86 |
| QNRET | 7.25 | 6.53 | -5.45 | 29.97 | 2.42 | 3.26 | -13.15 | 17.43 | 2.62 | 4.67 | -14.13 | 29.97 |
| ANRET | -2.91 | 8.86 | -32.37 | 18.54 | 11.48 | 10.54 | -6.74 | 46.67 | 7.57 | 10.18 | -32.37 | 68.41 |
| AMF | 1.43 | 0.60 | 0.00 | 2.25 | 1.44 | 0.59 | 0.00 | 2.25 | 1.43 | 0.60 | 0.00 | 2.25 |
| PMF | 0.68 | 2.34 | 0.00 | 9.00 | 0.69 | 2.32 | 0.00 | 9.00 | 0.76 | 2.45 | 0.00 | 9.00 |
| CUSTFEE | 0.11 | 0.06 | 0.00 | 0.40 | 0.12 | 0.06 | 0.00 | 0.20 | 0.12 | 0.06 | 0.00 | 0.40 |
| FRONTLOAD | 0.06 | 0.45 | 0.00 | 5.00 | 0.04 | 0.38 | 0.00 | 5.00 | 0.05 | 0.38 | 0.00 | 5.00 |
| REDFEE | 0.41 | 0.64 | 0.00 | 5.00 | 0.30 | 0.59 | 0.00 | 5.00 | 0.36 | 0.61 | 0.00 | 5.00 |
| DISC | 0.01 | 0.09 | 0.00 | 1.50 | 0.01 | 0.11 | 0.00 | 1.50 | 0.01 | 0.18 | 0.00 | 5.00 |
| MSASSETS | 0.00 | 0.01 | 0.00 | 0.22 | 0.00 | 0.01 | 0.00 | 0.15 | 0.00 | 0.01 | 0.00 | 0.36 |
| ASSETS | 64,636 | 178,913 | 24 | 2,542,678 | 80,780 | 200,285 | 132 | 2,520,665 | 76,485 | 190,956 | 24 | 3,107,156 |
| SHAREH | 2,334 | 6,105 | 1 | 88,408 | 2,422 | 5,392 | 1 | 71,211 | 2,426 | 5,415 | 1 | 88,408 |
| MC-ASSETS | 2,104,860 | 3,707,934 | 410 | 13,000,000 | 2,681,301 | 4,556,362 | 3,058 | 16,000,000 | 2,519,185 | 4,294,849 | 189 | 16,200,000 |
| NONAFEE | 0.47 | 0.83 | -1.00 | 10.00 | 0.34 | 0.75 | -1.00 | 10.00 | 0.39 | 0.77 | -4.50 | 10.00 |
| MC-QNRET | 7.25 | 2.65 | 0.17 | 18.23 | 2.42 | 0.98 | -1.96 | 5.57 | 2.62 | 2.96 | -7.85 | 18.23 |
| variation AMF | -0.01 | 0.18 | -2.00 | 1.25 | 0.00 | 0.10 | -0.90 | 1.20 | 0.00 | 0.14 | -2.00 | 2.25 |
| variation PMF | 0.01 | 0.59 | -9.00 | 9.00 | -0.14 | 1.21 | -9.00 | 9.00 | 0.00 | 0.88 | -9.00 | 9.00 |
| EXCQNRET | -0.81 | 5.03 | -17.31 | 25.41 | -0.36 | 2.84 | -18.40 | 12.18 | -0.29 | 3.22 | -18.40 | 25.41 |
| MC-ANRET | -2.91 | 3.04 | -14.84 | 7.28 | 11.48 | 3.32 | 1.49 | 32.87 | 7.57 | 5.27 | -14.84 | 32.87 |
| ANTIQ | 3.28 | 1.20 | 1.48 | 4.48 | 7.28 | 1.20 | 5.48 | 8.48 | 5.28 | 1.76 | 1.48 | 8.48 |
| EXPENSES | 0.44 | 0.24 | -0.08 | 2.28 | 0.43 | 0.22 | -2.42 | 1.40 | 0.44 | 0.40 | -4.05 | 19.72 |
| MC-MSASSETS | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| nBFunds | 42.25% | | | | 39.30% | | | | 40% | | | |
| nEFunds | 51.13% | | | | 49.72% | | | | 50% | | | |
| nGFunds | 6.62% | | | | 10.99% | | | | 10% | | | |
| nMFunds | 8.16% | | | | 8.45% | | | | 9.06% | | | |
| nAFunds | 91.84% | | | | 91.55% | | | | 90.94% | | | |

# Table 6: Changes over time in relevant variables before and after management fee changes

The table shows the cross-sectional average behaviour of relevant variables from four quarters before to four quarters after management fee changes (the quarter of the change is T), separately for increases (INC), decreases (DEC), non-changing funds (NOCHANG) and the complete sample. Panel A is for the changes in asset-based management fees and Panel B for performance-based fees. An asterisk stands for 5% significance in the differences in averages test between changing and non-changing funds. Variables are defined in Appendix 2.

Panel A: Asset-based management fee changes

| QUARTER | | N | AMF | PMF | QNRET | ANRET | EXCQNRET | SHAREH | ASSETS | MSASSETS | VOLAT | EXPENSES | ANTIQ | MC-ASSETS | MC-MSASSETS | MC-QNRET | MC-ANRET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T-4 | INC | 102 | 1.00 | 2.15 | -0.16 | 0.67 | -0.84 | 1,383.83 | 41,366.95 | 0.27% | 2.45 | 0.38 * | 4.03 | 2,151,033 | 0.16% | 0.55 | 1.26 |
| | DEC | 143 | 1.45 | 0.17 * | -0.22 * | 0.85 * | -0.56 | 2,020.43 | 63,302.36 | 0.39% | 1.29 * | 0.44 | 4.26 | 2,132,131 | 0.15% | -0.25 * | 0.99 * |
| | NOCHANG | 6,145 | 1.44 | 0.73 | 1.49 | 3.00 | -0.13 | 2,414.46 | 71,726.69 | 0.43% | 2.21 | 0.47 | 4.28 | 2,305,069 | 0.14% | 1.46 | 2.85 |
| | total | 6,390 | 1.43 | 0.74 | 1.42 | 2.92 | -0.15 | 2,389.19 | 71,053.55 | 0.42% | 2.20 | 0.47 | 4.28 | 2,298,740 | 0.14% | 1.41 | 2.79 |
| T-3 | INC | 102 | 0.96 * | 2.15 * | 0.59 | 3.65 | 0.64 * | 1,360.51 * | 41,285.90 * | 0.27% | 2.33 | 0.42 | 4.28 | 2,179,646 | 0.16% | 0.18 | 3.38 |
| | DEC | 143 | 1.43 | 0.17 * | -0.19 | 1.79 * | -0.30 | 1,971.66 | 62,162.22 | 0.38% | 1.22 * | 0.39 * | 4.51 | 2,148,467 | 0.15% | -0.80 * | 2.70 * |
| | NOCHANG | 6,145 | 1.44 | 0.73 | 0.54 | 5.21 | -0.02 | 2,451.54 | 73,485.20 | 0.43% | 2.09 | 0.42 | 4.54 | 2,357,497 | 0.14% | 0.56 | 5.08 |
| | total | 6,390 | 1.43 | 0.74 | 0.52 | 5.11 | -0.01 | 2,423.39 | 72,717.83 | 0.42% | 2.07 | 0.42 | 4.29 | 2,349,980 | 0.14% | 0.52 | 5.00 |
| T-2 | INC | 102 | 0.90 * | 2.15 * | 2.58 | 3.57 | -0.59 | 1,349.97 * | 41,562.89 * | 0.26% | 2.38 | 0.52 | 4.53 | 2,386,680 | 0.16% | 2.94 | 3.67 |
| | DEC | 143 | 1.45 | 0.10 * | 1.23 * | 1.31 * | -0.88 * | 1,892.21 | 57,976.39 | 0.40% | 1.22 * | 0.38 * | 4.76 | 2,297,013 | 0.15% | 2.05 * | 1.45 * |
| | NOCHANG | 6,145 | 1.44 | 0.75 | 2.70 | 5.02 | -0.27 | 2,438.15 | 74,806.89 | 0.43% | 2.05 | 0.44 | 4.79 | 2,425,411 | 0.14% | 2.67 | 4.96 |
| | total | 6,390 | 1.43 | 0.75 | 2.66 | 4.92 | -0.29 | 2,408.56 | 73,899.59 | 0.42% | 2.04 | 0.44 | 4.54 | 2,421,919 | 0.14% | 2.66 | 4.86 |
| T-1 | INC | 102 | 1.22 * | 0.91 | 1.68 | 5.50 | -0.32 | 1,808.72 | 46,656.15 | 0.32% | 2.23 * | 0.41 | 4.78 | 2,498,701 | 0.16% | 1.39 | 5.55 |
| | DEC | 143 | 1.19 * | 0.88 | 0.52 * | 1.61 * | -0.32 | 1,890.02 | 57,007.66 | 0.43% | 1.19 * | 0.36 * | 5.01 | 2,335,776 | 0.15% | 0.78 * | 2.24 * |
| | NOCHANG | 6,145 | 1.43 | 0.74 | 1.65 | 6.95 | -0.15 | 2,474.28 | 76,686.83 | 0.42% | 1.90 | 0.42 | 5.04 | 2,487,620 | 0.14% | 1.65 | 6.90 |
| | total | 6,390 | 1.43 | 0.75 | 1.63 | 6.81 | -0.15 | 2,450.58 | 75,767.07 | 0.42% | 1.89 | 0.42 | 4.79 | 2,484,399 | 0.14% | 1.63 | 6.77 |
| T (quarter of the change) | INC | 102 | 1.49 | 1.21 * | 2.73 | 7.68 | -0.31 | 2,385.69 | 48,120.80 | 0.32% | 2.14 * | 0.50 | 5.03 | 2,680,595 | 0.16% | 2.89 | 7.40 |
| | DEC | 143 | 0.98 * | 1.47 * | 1.83 * | 3.36 * | -0.13 | 1,899.90 | 59,886.29 | 0.67% * | 1.15 * | 0.38 * | 5.26 | 2,465,836 | 0.15% | 3.19 * | 5.06 * |
| | NOCHANG | 6,145 | 1.44 | 0.73 | 2.63 | 7.66 | -0.30 | 2,439.31 | 77,342.14 | 0.42% | 1.80 | 0.44 | 5.29 | 2,517,747 | 0.14% | 2.60 | 7.63 |
| | total | 6,390 | 1.43 | 0.76 | 2.62 | 7.57 | -0.29 | 2,426.38 | 76,485.06 | 0.42% | 1.80 | 0.44 | 5.04 | 2,519,185 | 0.14% | 2.62 | 7.57 |
| T+1 | INC | 88 | 1.47 | 1.40 * | 2.24 | 8.92 | -0.19 | 2,803.94 | 55,474.47 | 0.38% | 2.11 * | 0.43 * | 5.28 | 3,066,952 | 0.18% | 1.92 | 9.34 |
| | DEC | 127 | 0.98 * | 1.58 * | 1.27 * | 5.05 * | -0.09 | 2,123.33 | 68,889.72 | 0.84% * | 1.09 * | 0.32 * | 5.51 | 2,769,361 | 0.16% | 1.85 * | 8.13 * |
| | NOCHANG | 5,465 | 1.44 | 0.72 | 2.24 | 9.66 | -0.24 | 2,481.49 | 78,361.74 | 0.41% | 1.72 | 0.42 | 5.54 | 2,549,737 | 0.14% | 2.23 | 9.59 |
| | total | 5,680 | 1.43 | 0.75 | 2.22 | 9.55 | -0.23 | 2,478.48 | 77,795.36 | 0.42% | 1.71 | 0.42 | 5.29 | 2,562,661 | 0.14% | 2.22 | 9.55 |
| T+2 | INC | 88 | 1.47 | 1.40 * | 2.81 * | 9.67 | 0.07 | 2,912.65 | 58,885.69 | 0.40% | 1.84 | 0.51 | 5.53 | 3,141,593 | 0.18% | 2.43 | 9.04 |
| | DEC | 127 | 0.97 * | 1.58 * | 1.57 | 5.37 * | -0.24 | 2,188.70 | 72,426.44 | 0.89% * | 0.95 * | 0.33 | 5.76 * | 2,786,350 | 0.16% | 2.68 * | 8.86 |
| | NOCHANG | 5,465 | 1.44 | 0.74 | 2.04 | 8.94 | -0.23 | 2,436.09 | 78,378.53 | 0.41% | 1.59 | 0.44 | 5.79 | 2,556,782 | 0.14% | 2.02 | 8.87 |
| | total | 5,680 | 1.43 | 0.77 | 2.04 | 8.88 | -0.23 | 2,437.94 | 77,943.45 | 0.42% | 1.58 | 0.44 | 5.54 | 2,570,975 | 0.14% | 2.04 | 8.88 |
| T+3 | INC | 76 | 1.52 | 1.34 * | 1.73 | 9.44 | -0.59 | 3,839.58 * | 64,364.61 | 0.46% | 1.76 | 0.45 | 5.78 * | 3,602,150 * | 0.21% * | 1.84 * | 9.37 |
| | DEC | 105 | 0.95 * | 1.59 | 1.61 * | 7.30 | -0.09 | 2,147.84 | 76,848.13 | 0.95% | 0.96 * | 0.32 | 6.01 * | 2,748,392 | 0.16% | 2.00 | 10.70 |
| | NOCHANG | 4,789 | 1.43 | 0.73 | 2.39 | 9.82 | -0.25 | 2,483.81 | 79,700.86 | 0.41% | 1.55 | 0.42 | 6.04 | 2,594,750 | 0.14% | 2.38 | 9.75 |
| | total | 4,970 | 1.42 | 0.76 | 2.36 | 9.76 | -0.25 | 2,497.44 | 79,406.07 | 0.42% | 1.54 | 0.42 | 5.79 | 2,613,401 | 0.14% | 2.36 | 9.76 |
| T+4 | INC | 76 | 1.51 | 1.34 * | 1.72 | 8.81 | -0.50 | 3,221.17 | 62,941.14 | 0.44% | 1.71 | 0.47 | 6.03 | 3,616,765 * | 0.20% * | 1.80 | 8.34 |
| | DEC | 105 | 0.96 * | 1.59 * | 0.58 * | 5.57 * | -0.37 | 2,118.60 | 77,948.54 | 0.87% | 0.93 * | 0.33 * | 6.26 | 2,770,335 | 0.16% | 1.11 * | 8.16 |
| | NOCHANG | 4,789 | 1.44 | 0.75 | 1.73 | 8.83 | -0.18 | 2,447.49 | 79,702.91 | 0.41% | 1.51 | 0.43 | 6.29 | 2,595,615 | 0.14% | 1.72 | 8.78 |
| | total | 4,970 | 1.43 | 0.77 | 1.70 | 8.76 | -0.19 | 2,452.38 | 79,409.53 | 0.42% | 1.50 | 0.43 | 6.04 | 2,614,922 | 0.14% | 1.70 | 8.76 |

Panel B: Performance-based management fee changes

| QUARTER | | N | AMF | PMF | QNRET | ANRET | EXCQNRET | SHAREH | ASSETS | MSASSETS | VOLAT | EXPENSES | ANTIQ | MC-ASSETS | MC-MSASSETS | MC-QNRET | MC-ANRET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T-4 | INC | 36 | 1.40 | 1.50 * | 0.52 | 3.78 | -2.79 * | 2,878.11 | 85,656.06 | 0.82% * | 2.23 | 0.45 | 4.04 | 2,130,427 | 0.14% | 1.26 | 5.47 |
| | DEC | 34 | 1.16 * | 7.81 * | 3.73 * | 4.60 | 0.47 | 1,269.00 | 16,343.18 * | 0.20% | 3.52 * | 0.42 | 4.22 | 490,700 * | 0.03% | 2.50 | 4.93 |
| | NOCHANG | 6,320 | 1.43 | 0.69 | 1.42 | 2.90 | -0.14 | 2,392.43 | 71,264.70 | 0.42% | 2.19 | 0.47 | 4.28 | 2,309,425 | 0.14% | 1.41 | 2.76 |
| | total | 6,390 | 1.43 | 0.74 | 1.42 | 2.92 | -0.15 | 2,389.19 | 71,053.55 | 0.42% | 2.20 | 0.47 | 4.28 | 2,298,740 | 0.14% | 1.41 | 2.79 |
| T-3 | INC | 36 | 1.39 | 1.50 * | 1.71 | 6.39 | 0.77 | 2,812.58 | 81,633.50 | 0.84% * | 2.00 | 0.49 * | 4.29 | 2,133,784 | 0.13% | 1.28 | 8.20 |
| | DEC | 34 | 1.17 * | 8.07 * | 4.79 * | 13.15 * | -0.03 | 1,241.85 | 17,793.68 * | 0.20% | 3.30 * | 0.92 * | 4.47 | 517,947 * | 0.03% * | 3.67 * | 9.82 * |
| | NOCHANG | 6,320 | 1.43 | 0.70 | 0.50 | 5.06 | -0.02 | 2,427.53 | 72,962.52 | 0.42% | 2.06 | 0.42 | 4.53 | 2,361,068 | 0.14% | 0.50 | 4.95 |
| | total | 6,390 | 1.43 | 0.74 | 0.52 | 5.11 | -0.01 | 2,423.39 | 72,717.83 | 0.42% | 2.07 | 0.42 | 4.53 | 2,349,980 | 0.14% | 0.52 | 5.00 |
| T-2 | INC | 36 | 1.39 | 0.23 | 1.39 | 4.70 | -1.28 * | 2,675.19 | 70,419.22 | 0.85% * | 1.86 | 0.36 | 4.54 | 2,195,688 | 0.13% | 1.52 * | 5.66 |
| | DEC | 34 | 1.17 * | 8.61 * | 4.34 * | 14.47 * | -0.61 | 1,171.06 | 17,338.09 * | 0.17% | 3.08 * | 0.62 * | 4.72 | 499,610 * | 0.03% * | 2.71 | 10.53 * |
| | NOCHANG | 6,320 | 1.43 | 0.72 | 2.66 | 4.87 | -0.28 | 2,413.70 | 74,223.70 | 0.42% | 2.03 | 0.44 | 4.78 | 2,433,550 | 0.14% | 2.67 | 4.82 |
| | total | 6,390 | 1.43 | 0.75 | 2.66 | 4.92 | -0.29 | 2,408.56 | 73,899.59 | 0.42% | 2.04 | 0.44 | 4.78 | 2,421,919 | 0.14% | 2.66 | 4.86 |
| T-1 | INC | 36 | 1.20 * | 4.31 * | 1.86 | 5.56 | 0.07 | 2,630.19 | 70,689.78 | 0.88% * | 1.79 | 0.41 | 4.79 | 2,263,042 | 0.13% | 1.67 | 6.08 |
| | DEC | 34 | 1.44 * | 2.06 * | 3.16 * | 17.17 * | -0.54 | 1,277.00 | 19,760.68 * | 0.16% | 2.90 * | 0.54 * | 4.97 | 752,513 * | 0.04% * | 2.25 | 11.80 * |
| | NOCHANG | 6,320 | 1.43 | 0.72 | 1.62 | 6.76 | -0.15 | 2,455.87 | 76,097.29 | 0.42% | 1.88 | 0.42 | 5.03 | 2,494,977 | 0.14% | 1.62 | 6.75 |
| | total | 6,390 | 1.43 | 0.75 | 1.63 | 6.81 | -0.15 | 2,450.58 | 75,767.07 | 0.42% | 1.89 | 0.42 | 5.03 | 2,484,399 | 0.14% | 1.63 | 6.77 |
| T (quarter of the change) | INC | 36 | 0.97 * | 8.26 * | 3.00 | 8.19 | 0.22 | 2,645.89 | 67,627.58 | 0.82% * | 1.62 | 0.43 | 5.04 | 2,307,790 | 0.13% | 2.91 | 7.56 |
| | DEC | 34 | 1.44 * | 0.45 | -1.02 * | 11.55 * | -2.29 * | 1,212.29 | 18,060.24 * | 0.13% | 2.64 * | 0.48 | 5.22 | 689,069 * | 0.04% * | -0.61 * | 8.10 |
| | NOCHANG | 6,320 | 1.43 | 0.72 | 2.63 | 7.54 | -0.28 | 2,431.66 | 76,849.82 | 0.42% | 1.79 | 0.44 | 5.28 | 2,530,234 | 0.14% | 2.63 | 7.56 |
| | total | 6,390 | 1.43 | 0.76 | 2.62 | 7.57 | -0.29 | 2,426.38 | 76,485.06 | 0.42% | 1.80 | 0.44 | 5.28 | 2,519,185 | 0.14% | 2.62 | 7.57 |
| T+1 | INC | 35 | 0.96 * | 7.98 * | 3.06 | 9.54 | 0.75 * | 2,660.94 | 67,168.60 | 0.80% * | 1.63 | 0.52 * | 5.29 | 2,406,857 | 0.13% | 2.56 | 9.08 |
| | DEC | 22 | 1.30 | 1.95 * | 1.93 | 5.30 * | -0.88 | 829.77 | 15,809.32 | 0.14% | 2.95 * | 0.44 * | 4.99 | 532,977 * | 0.03% * | 1.40 * | 3.38 * |
| | NOCHANG | 5,623 | 1.43 | 0.70 | 2.21 | 9.57 | -0.24 | 2,483.79 | 78,104.03 | 0.42% | 1.71 | 0.42 | 5.53 | 2,571,572 | 0.14% | 2.22 | 9.58 |
| | total | 5,680 | 1.43 | 0.75 | 2.22 | 9.55 | -0.23 | 2,478.48 | 77,795.36 | 0.42% | 1.71 | 0.42 | 5.53 | 2,562,661 | 0.14% | 2.22 | 9.55 |
| T+2 | INC | 35 | 0.96 * | 7.47 * | 1.59 | 9.88 | -0.34 | 2,586.29 | 64,649.46 | 0.73% | 1.59 | 0.39 | 5.54 | 2,365,470 | 0.13% | 2.22 | 9.83 |
| | DEC | 22 | 1.30 | 2.77 * | 4.63 * | 6.41 | -1.48 * | 784.09 | 15,649.50 | 0.13% | 2.54 * | 0.50 | 5.09 | 507,755 * | 0.03% * | 3.21 * | 4.73 * |
| | NOCHANG | 5,623 | 1.43 | 0.72 | 2.03 | 8.88 | -0.22 | 2,443.49 | 78,269.92 | 0.42% | 1.58 | 0.44 | 5.78 | 2,580,327 | 0.14% | 2.03 | 8.89 |
| | total | 5,680 | 1.43 | 0.77 | 2.04 | 8.88 | -0.23 | 2,437.94 | 77,943.45 | 0.42% | 1.58 | 0.44 | 5.78 | 2,570,975 | 0.14% | 2.04 | 8.88 |
| T+3 | INC | 27 | 0.98 * | 7.48 * | 3.10 | 11.39 | -0.52 | 4,122.96 | 48,618.15 | 0.57% | 1.52 | 0.51 * | 5.79 | 2,949,569 | 0.16% | 2.87 | 11.58 |
| | DEC | 20 | 1.23 | 3.05 * | 1.71 | 3.81 * | -1.00 | 844.55 | 16,047.75 | 0.13% | 2.48 * | 0.53 * | 5.34 | 510,332 * | 0.03% * | 1.25 * | 2.85 * |
| | NOCHANG | 4,923 | 1.43 | 0.71 | 2.36 | 9.78 | -0.25 | 2,495.24 | 79,832.32 | 0.42% | 1.54 | 0.42 | 6.03 | 2,620,101 | 0.14% | 2.37 | 9.78 |
| | total | 4,970 | 1.42 | 0.76 | 2.36 | 9.76 | -0.25 | 2,497.44 | 79,406.07 | 0.42% | 1.54 | 0.42 | 6.03 | 2,613,401 | 0.14% | 2.36 | 9.76 |
| T+4 | INC | 27 | 0.98 * | 8.15 * | 1.30 | 9.38 | -0.23 | 4,402.00 * | 48,949.78 | 0.52% | 1.66 | 0.48 | 6.04 | 2,896,162 | 0.16% | 1.06 | 9.35 |
| | DEC | 20 | 1.23 | 2.15 * | 3.68 * | 12.51 * | -0.76 | 812.25 | 16,137.55 | 0.13% | 2.37 * | 0.45 | 5.59 | 511,613 * | 0.03% * | 2.39 | 8.70 |
| | NOCHANG | 4,923 | 1.43 | 0.73 | 1.70 | 8.74 | -0.18 | 2,448.35 | 79,833.63 | 0.42% | 1.49 | 0.43 | 6.28 | 2,621,924 | 0.14% | 1.70 | 8.75 |
| | total | 4,970 | 1.43 | 0.77 | 1.70 | 8.76 | -0.19 | 2,452.38 | 79,409.53 | 0.42% | 1.50 | 0.43 | 6.28 | 2,614,922 | 0.14% | 1.70 | 8.76 |

Panel A is for asset-based management fees changes and Panel B is for performance-based management fees changes. The sample in the first column of Panel A has 6,288 items (6,145 with variation =0, 143 with variation<0) and the second column of Panel A is based on 6,247 items (6,145 with variation =0, 102 with variation>0). The sample in the first column of Panel B has 6,354 items (6,320 with variation =0, 34 with variation<0) and the second column of Panel B is based on 6,356 items (6,320 with variation =0, 36 with variation>0). lnASSETS and lnMC-ASSETS are the neperian logarithm of assets managed by the fund and the management company, respectively. The remaining variables are defined in Appendix 2. Coefficients and marginal effects are given for each variable. The asterisk stands for 5% significance. The last two files of the table show the unconditional probability and the pseudo $R^2$ of Logit model, respectively.

| | Panel A: Asset-based management fees | | | | Panel B: Performancet-based management fees | | | |
|---|---|---|---|---|---|---|---|---|
| | decrease | | increase | | decrease | | increase | |
| **dependent variable** | Y= 1 if decrease AMF Y= 0 if no changing AMF | | Y= 1 if increase AMF Y= 0 if no changing AMF | | Y= 1 if decrease PMF Y= 0 if no changing PMF | | Y= 1 if increase PMF Y= 0 if no changing PMF | |
| | coefficient | marginal effect | coefficient | marginal effect | coefficient | marginal effect | coefficient | marginal effect |
| MC-ANRET(t-2) | -0.062 * | -0.09% | -0.026 | -0.04% | 0.128 * | 0.01% | 0.017 | 0.00% |
| EXPENSES(t-2) | -0.227 | -0.33% | 0.123 | 0.17% | 0.140 | 0.01% | -0.742 * | -0.21% |
| ANTIQ(t-2) | 0.065 | 0.09% | 0.003 | 0.00% | 0.155 | 0.01% | -0.097 | -0.03% |
| EXCQNRET(t-2) | -0.103 * | -0.15% | -0.014 | -0.02% | -0.150 * | -0.01% | -0.104 | -0.03% |
| MC-QNRET(t-2) | -0.111 * | -0.16% | | | -0.240 | -0.02% | -0.207 * | -0.06% |
| VOLAT(t-2) | -0.368 * | -0.53% | -0.021 | -0.03% | 0.166 | 0.01% | -0.214 | -0.06% |
| QNRET(t-2) | 0.081 | 0.12% | -0.027 | -0.04% | 0.190 * | 0.01% | 0.089 | 0.02% |
| ANRET(t-2) | -0.016 | -0.02% | 0.002 * | 0.00% | 0.014 | 0.00% | -0.005 | 0.00% |
| lnASSETS(t-2) | -0.130 * | -0.19% | -0.225 * | -0.31% | -0.727 * | -0.06% | -0.432 * | -0.12% |
| smallMC-ASSETS(t-2) | -0.270 | -0.37% | | | -0.128 | -0.01% | -0.572 | -0.15% |
| largeMC-ASSETS(t-2) | -0.418 * | -0.56% | | | -1.505 | -0.10% | 0.255 | 0.08% |
| EFunds | -0.468 | -0.68% | 0.472 | 0.66% | 0.047 | 0.00% | | |
| GFunds | 0.894 * | 1.88% | 0.992 * | 2.12% | | | 1.565 * | 0.91% |
| BFunds | | | | | -1.602 | -0.12% | -0.981 | -0.26% |
| smallMC-QNRET(t-2) | | | -0.136 | -0.19% | | | | |
| largeMC-QNRET(t-2) | | | 0.542 * | 0.84% | | | | |
| lnMC-ASSETS(t-2) | | | 0.148 * | 0.21% | | | | |
| constant | -1.557 | | -4.244 | | -0.438 | | 0.304 | |
| N | 6288 | | 6247 | | 6354 | | 6356 | |
| Y=1 | 143 | | 102 | | 34 | | 36 | |
| uncondicional probability | 2.24% | | 1.60% | | 0.53% | | 0.56% | |
| pseudo-$R^2$ | 8.17% | | 3.15% | | 21.00% | | 12.73% | |

# Table 8: OLS estimation for the determinants of the size of changes in management fees

This table shows the OLS with heteroscedasticity correction estimations:

$$Y = \alpha + b*X + e$$

X is the matrix of the explanatory variables which are defined in Appendix 2 and e the residuals. Panel A is for asset-based management fees changes and Panel B is for performance-based management fees changes. The sample first column of Panel A has 143 items with variation<0 and the second column of Panel A is based on 102 items with variation>0). The sample first column of Panel B has 34 items with variation<0 and the second column of Panel B is based on 36 items with variation>0. lnASSETS is the neperian logarithm of a fund's assets. Coefficients are given for each variable. The asterisk stands for 5% significance. The last row of the table shows the $R^2$ of OLS model.

| dependent variable | Panel A: AMF Asset-based management fees | | Panel B: PMF Performancet-based management fees | |
|---|---|---|---|---|
| | decrease | increase | decrease | increase |
| | Y= variation of AMF for decrease | Y= variation of AMF for increase | Y= variation of PMF for decrease | Y= variation of PMF for increase |
| | coefficient | coefficient | coefficient | coefficient |
| MC-ANRET(t-2) | -0.003 | 0.003 | 0.121 | 0.105 |
| EXPENSES(t-2) | 0.551 * | -0.079 * | 3.271 * | 0.810 |
| ANTIQ(t-2) | -0.008 | -0.005 | -0.170 | -0.703 * |
| EXCQNRET(t-2) | 0.012 | 0.015 | 0.169 | -0.043 |
| MC-QNRET(t-2) | -0.001 | -0.164 | 0.363 | -0.234 |
| VOLAT(t-2) | 0.072 | 0.019 | -0.321 | -0.662 * |
| QNRET(t-2) | 0.027 | 0.088 | -0.532 * | 0.114 |
| ANRET(t-2) | 0.009 | -0.007 | 0.021 | 0.010 |
| lnASSETS(t-2) | -0.056 * | 0.011 | -0.649 | -0.495 * |
| smallMC-ASSETS(t-2) | -0.108 | 0.024 | 1.716 | 0.767 |
| largeMC-ASSETS(t-2) | -0.143 | 0.012 | 2.523 | 1.589 |
| EFunds | -0.071 | -0.085 | 2.639 | -0.057 |
| GFunds | -0.137 | -0.218 | 1.879 | -0.691 |
| constant | 0.852 * | 0.151 | 10.110 * | 15.821 * |
| N | 143 | 102 | 34 | 36 |
| $R^2$ | 20.00% | 20.00% | 64.00% | 65.00% |

The sample in Panel A is for asset-based management fee changes and has 6,390 items (6,145 with variation =0, 143 with variation<0 and 102 with variation<0). The sample in Panel B is for performance-based management fee changes and has 6,390 items (6,320 with variation =0, 34 with variation<0 and 36 with variation>0). INC (DEC) is a binary variable which takes a value of one for quarter-fund observations when there is an increase (decrease) in management fees and zero when no change occurs. lnASSETS and lnMC-ASSETS are the neperian logarithm of assets managed by the fund and management company, respectively, both expressed in thousands of Euros. Variables are defined in Appendix 2. Coefficients are given for each variable. The asterisk stands for 5% significance. The last row of the table shows the $R^2$ of OLS model.

Panel A: Asset-based management fee changes

| dependent variable | QNRET | | | | | EXCQNRET | | | | | MSASSETS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QUARTER | T | T+1 | T+2 | T+3 | T+4 | T | T+1 | T+2 | T+3 | T+4 | T | T+1 | T+2 | T+3 | T+4 |
| QNRET(t-2) | 0.128 * | 0.128 * | 0.128 * | 0.128 * | 0.210 * | 0.135 * | 0.028 * | 0.093 * | 0.032 | 0.098 * | 0.000 * | 0.000 * | 0.000 | 0.000 * | 0.000 * |
| smallANRET(t-2) | 1.155 * | 0.006 | -0.014 | -0.682 * | -0.642 * | -0.082 | 0.014 | -0.002 | -0.107 | -0.402 * | 0.000 | 0.000 | -0.001 | 0.000 | 0.000 |
| largeANRET(t-2) | -0.502 * | 1.527 * | 0.495 * | 2.340 * | 0.515 * | 0.599 * | 1.326 * | 0.741 * | 1.289 * | 0.626 * | -0.002 * | -0.001 * | -0.002 * | -0.001 * | -0.001 * |
| AMF(t-2) | 0.182 | -0.001 | 0.138 | 0.200 * | -0.097 | 0.163 | 0.045 | -0.015 | 0.049 | -0.132 | 0.000 * | -0.001 | -0.001 | -0.001 * | -0.001 * |
| DEC | -0.044 | -0.320 | 0.084 | -0.486 | -0.661 * | -0.044 | -0.215 | -0.268 | -0.274 | -0.511 * | 0.002 | 0.003 | 0.004 | 0.004 | 0.004 |
| INC | -0.225 | -0.183 | 0.440 | -0.902 * | -0.032 | -0.027 | -0.105 | 0.289 | -0.422 | -0.313 | -0.001 | -0.001 | 0.000 | 0.000 | 0.000 |
| lnASSETS(t-2) | 0.105 * | -0.096 * | 0.130 * | -0.007 | -0.032 | 0.055 | -0.066 | 0.030 | -0.038 | -0.010 | 0.004 * | 0.004 * | 0.004 * | 0.004 * | 0.004 * |
| lnMC-ASSETS(t-2) | -0.055 | 0.052 * | -0.022 | 0.021 | 0.056 | 0.009 * | 0.032 * | 0.018 | 0.014 | 0.035 | 0.000 | 0.000 * | 0.000 * | 0.000 * | 0.000 * |
| EFunds | 3.231 * | 2.253 * | 2.824 * | 3.137 * | 1.166 * | -1.575 * | -1.305 * | -1.151 * | -1.286 * | -1.217 * | 0.002 * | 0.002 * | 0.002 * | 0.002 * | 0.002 * |
| GFunds | 1.611 * | 1.471 * | 1.504 * | 1.971 * | 0.786 * | 1.676 * | 1.519 * | 1.332 * | 1.696 * | 0.936 * | 0.015 * | 0.015 * | 0.014 * | 0.014 * | 0.013 * |
| ANTIQ(t-2) | -0.489 * | 0.300 * | -0.292 * | 0.133 * | 0.073 * | 0.115 * | -0.049 | 0.085 * | -0.010 | -0.005 | -0.001 * | -0.001 * | -0.001 * | -0.001 * | -0.001 * |
| constant | 2.293 * | -0.988 * | 0.828 | -0.329 | -0.211 | -1.710 * | 0.193 | -1.207 * | -0.075 | -0.190 | -0.042 * | -0.040 * | -0.039 * | -0.038 * | -0.037 * |
| $R^2$ | 21% | 18% | 13% | 30% | 15% | 11% | 10% | 8% | 11% | 9% | 31% | 30% | 29% | 29% | 29% |

Panel B: Performance-based management fee changes

| dependent variable | QNRET | | | | | EXCQNRET | | | | | MSASSETS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QUARTER | T | T+1 | T+2 | T+3 | T+4 | T | T+1 | T+2 | T+3 | T+4 | T | T+1 | T+2 | T+3 | T+4 |
| QNRET(t-2) | 0.130 * | 0.082 * | -0.098 * | -0.214 * | 0.210 * | 0.135 * | 0.029 * | 0.092 * | 0.032 | 0.097 * | 0.000 * | 0.000 * | 0.000 | 0.000 * | 0.000 * |
| smallANRET(t-2) | 1.143 * | -0.002 | -0.008 | -0.697 * | -0.632 * | -0.089 | 0.010 | 0.000 | -0.111 | -0.396 * | 0.000 | 0.000 | -0.001 | 0.000 | 0.000 |
| largeANRET(t-2) | -0.487 * | 1.530 * | 0.491 * | 2.335 * | 0.516 * | 0.605 * | 1.327 * | 0.746 * | 1.287 * | 0.632 * | -0.002 * | -0.002 * | -0.002 * | -0.001 * | -0.001 * |
| PMF(t-2) | -0.030 | 0.044 | -0.059 | 0.008 | 0.003 | -0.003 | 0.010 | -0.020 | -0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| DEC | -4.718 * | -1.528 | 1.416 | -2.317 * | 0.986 | -1.860 * | -0.506 | -0.924 | -0.658 | -0.428 | 0.002 * | 0.003 * | 0.003 * | 0.002 | 0.002 |
| INC | 0.355 | 0.280 | -0.444 | -0.145 | -0.540 | 0.124 | 0.416 | -0.285 | -0.749 | -0.234 | 0.002 | 0.002 | 0.002 | 0.001 | 0.001 |
| lnASSETS(t-2) | 0.082 * | -0.095 * | 0.119 * | -0.019 | -0.023 | 0.040 | -0.067 * | 0.028 | -0.042 | -0.001 | 0.004 * | 0.004 * | 0.004 * | 0.004 * | 0.004 * |
| lnMC-ASSETS(t-2) | -0.056 | 0.050 | -0.015 * | 0.022 | 0.053 | 0.012 | 0.032 | 0.018 | 0.015 | 0.030 | 0.000 * | 0.000 * | 0.000 * | 0.000 * | 0.000 * |
| EFunds | 3.370 * | 2.232 * | 2.932 * | 3.244 * | 1.125 * | -1.480 * | -1.285 * | -1.133 * | -1.251 * | -1.271 * | 0.002 * | 0.002 * | 0.002 * | 0.002 * | 0.002 * |
| GFunds | 1.690 * | 1.361 * | 1.659 * | 1.947 * | 0.771 * | 1.693 * | 1.484 * | 1.379 * | 1.708 * | 0.918 * | 0.015 * | 0.015 * | 0.014 * | 0.014 * | 0.013 * |
| ANTIQ(t-2) | -0.481 * | 0.305 * | -0.294 * | 0.144 * | 0.072 | 0.122 * | -0.046 | 0.083 * | -0.007 | -0.007 | -0.001 * | -0.001 * | -0.001 * | -0.001 * | -0.001 * |
| constant | 2.712 * | -1.016 * | 1.044 * | -0.057 | -0.402 | -1.437 * | 0.234 | -1.183 * | 0.001 | -0.380 | -0.042 * | -0.041 * | -0.040 * | -0.039 * | -0.038 * |
| $R^2$ | 21% | 18% | 13% | 30% | 15% | 11% | 10% | 9% | 11% | 8% | 31% | 30% | 29% | 28% | 28% |

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