The Black Box of Mutual Fund Fees*

Javier Gil-Bazo**
Universidad Carlos III de Madrid

Miguel A. Martínez
Universidad del País Vasco

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**Corresponding author; Universidad Carlos III. Tel.: (34) 916245844, FAX: (34) 916249608, E-mail: javier.gil.bazo@uc3m.es.

Abstract

This paper re-examines the determinants of mutual fund fees paid by mutual fund shareholders for management costs and other expenses. There are two novelties with respect to previous studies. First, each type of fee is explained separately. Second, the paper employs a new dataset consisting of Spanish mutual funds, making it the second paper to study mutual fund fees outside the US market. Furthermore, the Spanish market has three interesting characteristics: (i) both distribution and management are highly dominated by banks and savings banks, which points towards potential conflicts of interest; (ii) Spanish mutual fund law imposes caps on all types of fees; and (iii) Spain ranks first in terms of average mutual fund fees among similar countries. We find significant differences in mutual fund fees not explained by the fund's investment objective. For instance, investors in older non-guaranteed funds and non-guaranteed funds with a lower average investment are more likely to end up paying higher management fees. Moreover, there is clear evidence that some mutual funds enjoy better conditions from custodian institutions than others. In contrast to evidence from the US market, larger funds are not associated with lower fees, but with higher front-end loads for guaranteed funds. Finally, fee levels are not related to fund before-fee risk-adjusted performance.

Keywords: Mutual fund; fee caps; censored data

JEL classification: G18; G23; K22

1. Introduction

After more than a decade of steady growth in mutual fund ownership worldwide, mutual funds now account for a sizeable proportion of all investors' savings: 6,391 billion dollars[1] in the United States and 3,304 billion euros[2] in Europe[3] by year-end 2002. With average annual ownership costs exceeding 1.5% of assets under management,[4] the business of managing and selling mutual funds contributed in 2002 to more than 0.9% of US GDP and 0.5% of Europe's GDP. For the US, this is larger than the contribution of many industries such as air transportation, radio and television, or oil and gas extraction.[5] Yet, the market forces that drive mutual fund fees are still not fully understood by investors, regulators or academics.

A better understanding of mutual fund fees is important, in the first place, from the investor's perspective. Mutual fund fees have an economically significant impact on investors' assets over time. Furthermore, in contrast with future market trends or the investment adviser's skill, fees are the only fully predictable component of fund returns. It is therefore worth exploring whether differences in fees across mutual funds respond exclusively to differences in the quality of the services provided to investors.

Second, mutual fund fees are the price that investors pay to have access to collective investments and to benefit from the professional management of those investments. Fees are therefore determined by supply and demand and convey potentially valuable information regarding the economic nature of this market. For instance, through the supply function it is possible to learn about the cost function faced by mutual fund management companies. Also, the demand function reflects investors' marginal valuation of the services provided by mutual funds.

Finally, recent reports in the US by the General Accounting Office (GAO) (2000), SEC (2000) or FEFSI (2002) indicate the concern that regulatory authorities have about price competition in the mutual fund industry. The competitive

[1] According to the Investment Company Institute.
[2] According to Fédération Européenne des Fonds et Sociétés d'Investissement (FEFSI).
[3] Europe is defined as grouping Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom.
[4] In the US, according to the Securities and Exchange Commission (SEC).
[5] According to 2001 data from the Bureau of Economic Analysis.

environment in which mutual funds operate is characterized by frictions such as asymmetric information regarding product quality, non-negligible search and switching costs, and potential abuses of dominant positions by financial groups. Mutual fund fee studies can therefore shed light on regulators' concerns.

In this paper, we investigate empirically the determinants of mutual fund fees. Two novel aspects distinguish our work from previous research.

First, we study mutual fund fees in a market where they have not been studied before: Spain. To our knowledge, the only study of mutual fund fees outside the US is Korkeamaki and Smythe (2004), which applies to the relatively small Finnish mutual fund market. In contrast, the Spanish mutual fund industry ranks 6th in the world in number of funds and 12th in terms of assets under management. Moreover, the Spanish market displays three features that make it especially interesting.

First, credit institutions heavily dominate the Spanish mutual fund industry: banks and savings banks.[6] In fact, 91% of mutual funds are distributed through banks (63%) and savings banks (28%), and 91% of mutual fund assets are managed by companies belonging to banks (66%) and savings banks (25%). The reason for this predominance is perhaps the traditional universal banking model, which has provided credit institutions with a vast base of clients for their mutual funds. In fact, the business of mutual fund management accounts for a non-negligible part of Spanish banks' revenues. If we take only the three most important management companies (belonging to credit institutions) that manage 52% of all assets (as of December 2001), we find that their sales revenues contribute to 1.71% (the largest company), 2.15% (the second largest), and 3.22% (the smallest) of their respective group's total ordinary revenues. Clearly, this situation gives rise to a number of potential conflicts of interest. For instance, bank customers could be more vulnerable to marketing or advice from their bank and therefore more likely to invest in bank-managed mutual funds than to shop for better quality or cheaper funds. Also, fund managers could be biased towards investing in financial assets issued by companies belonging to their own financial group. Finally, the fact that only credit institutions can become custodian institutions

[6] Savings banks in Spain are founded, owned and managed by local or regional governments. They are not-for-profit and, with few exceptions, enjoy high market shares in their region of origin.

of the assets held by the mutual funds gives banks and savings banks an advantage over independent management companies. The extent to which such potential conflicts of interest translate into agency costs in delegated portfolio management remains an open empirical question.

Second, the Spanish mutual fund law is one of the few of its kind that imposes maximum levels on all kinds of mutual fund fees,[7] including management fees. For mutual funds charging a management fee on assets under management, the maximum annual fee is 2.25% of assets under management. Annual custody fees may not exceed 0.40% of a fund's assets. Finally, the maximum one-time sales charge, which includes front-end loads and redemption fees, is 5% of the amount bought or redeemed. Our analysis of fee determinants will help answer the question of whether the regulator's concern about the degree of competition in the industry is justified.

Third, Spanish mutual funds charge the highest average expenses to investors[8] in a sample of countries that includes Austria, Belgium, France, Germany, Ireland, Italy, Luxembourg, Sweden, Switzerland, and the UK. In particular, the average total expense ratio (which includes management, custody, and audit expenses) amounts to 2.09% of fund assets. The average total expense ratio across the rest of countries is only 1.57%. An analysis of fund fee determinants in Spain may shed light on the reason behind such high fees in Spain.

Our second contribution to the literature is that we attempt to explain all four main types of fees. The traditional approach in the relevant literature, by contrast, has been to explain management fees or to aggregate different fees in a single quantity such as the expense ratio (total annual expenses as a fraction of assets under management) or total mutual fund ownership cost (including one-time fees). Although this may be convenient, there are no a priori reasons to believe that management fees, custody fees, front-end loads and redemption fees are determined in the same way.

[7] In Spain, mutual fund shareholders face four different types of fees, mirrored in most countries. First, investors sometimes pay a sales charge on purchases, or front-end load, when they purchase fund shares as a fraction of the total amount invested. When investors redeem fund shares, they may have to pay a deferred sales charge, or redemption fee, which is computed as a percentage of the shares' net asset value. Apart from one-time loads, investors also pay annual management (to the management company) and custody fees (to the custodian bank). These fees are calculated as a fraction of the mutual fund's assets and paid by the mutual fund on a daily basis.

[8] According to Fitzrovia International, data referring to December 2001.

Differences may arise for a variety of reasons. First, the impact of one-time sales charges and the impact of annual fees on total fund ownership costs is different for investors with different investment horizons. Second, since management fees or redemption fees are computed as a fraction of assets under management or assets redeemed, they depend positively on the fund's performance. Front-end loads however are a fraction of the amount the client wishes to invest. Finally, investors' perception can be different for different types of fees since annual management and custody fees are implicit in the fund's reported net-of-fees return.

We employ a dataset consisting of 1,000 open-end mutual funds for which monthly data for the full June 1999-December 2001 period are available. The source of our data is the Comisión Nacional del Mercado de Valores (CNMV), the industry's supervisor and regulator. We set the date on December 2001 and investigate the cross-sectional regression of different fees on a set of explanatory variables including the fund's before-fee risk-adjusted performance over the sample period, as well as fund attributes such as investment objective, fund size, management company size, age, market share, or whether the management company belongs to a bank, a savings bank or is independent. Our findings point to the existence of statistically significant differences in fees between mutual funds that are not explained by fund investment category, or before-fee risk-adjusted performance. Some of these differences can hardly be justified by differences in services provided to investors. Results therefore indicate that investors find it costly to compare among mutual funds or to exit a particular fund. Taken together, the results of this paper support the case for more effective regulation in order to protect investors' interests.

The rest of the paper is organised as follows: section 2 summarizes the related literature; section 3 explains the data set and the variables employed in the analysis; section 4 discusses the econometric model and presents the results; section 5 checks the stability of the findings across fund categories and time periods; and, finally, section 6 concludes.

2. Related literature

In response to the quantitative and qualitative significance of mutual funds as financial investment vehicles and of the fees charged to investors for services provided, theoretical and empirical financial literature has devoted increasing attention to mutual fund expenses and fees. A brief survey of the extant literature on this issue is presented below.

Most of the empirical studies on mutual fund performance evaluation conclude that mutual funds, on average, underperform the appropriate benchmark return. For the Spanish market, a number of authors have confirmed this result. See, for instance, Rubio (1993), Matallín and Fernández (1999), or Menéndez and Álvarez (2000). However, since the pioneering article of Jensen (1968), somehow different conclusions have been found when gross fund returns (i.e., returns calculated adding expenses back to fund returns) are used. In particular, Grinblatt and Titman (1989a), Droms and Walker (1996) and Cesari and Panetta (2002), among others, find that mutual funds do not underperform the market before expenses are deducted from returns. Similarly, Gruber (1996) and Carhart (1997) have documented a negative relationship between after-fee fund performance and expense ratios. A similar result has been found by Martínez (2003) for the Spanish market. Put together, this evidence suggests that mutual funds do not generate enough returns to cover expense ratios. As Gruber (1996) points out, this raises the question of why investors keep investing in funds with high expenses. An explanation may perhaps be found in Sirri and Tufano (1998) and Barber, Odean and Zheng (2001), who find some degree of inelasticity in the demand for mutual funds which leads investors not to desert underperforming funds. Gruber (1996) suggests that at least a fraction of investors are unsophisticated or locked in worst performing funds.

More closely related to this paper, one strand of the mutual fund literature has focused on the determinants of mutual fund ownership costs. Early references include Ferris and Chance (1987), Chance and Ferris (1991), Malhotra and McLeod (1997), Tufano and Sevick (1997) and Dellva and Olson (1998). More recent analyses are Lesseig *et al*. (2002) and Golec (2003). Table 1 summarises the main results found in

the literature regarding this point. Employing different data sets and different proxies for fees, these papers coincide in a number of findings. First, there are significant differences in fees across funds with different investment objectives. Second, both fund's assets under management and management companies' assets appear to impact negatively mutual fund fees. Finally, with a single exception, funds managed by companies belonging to banking groups seem to be associated with significantly higher fees. Evidence for other explanatory variables, however, is mixed.

Contrary to previous studies that have either considered management fees individually or have aggregated management fees with custody fees and other annual expenses, we dissect fund ownership costs in the two most important annual fees, i.e. management fees and custody fees, as well as one-time fees: front-end loads and redemption fees. Moreover, we do not implicitly assume zero mark-ups in mutual fund fees[9] which would enable us to study the cost function associated with mutual fund management by looking at fees. Instead, we consider a wider set of variables to account for factors other than those affecting costs.

Finally, the choice of the optimal fee structure and the risk incentives induced by fee schemes has been analysed in Grinblatt and Titman (1989b), Chordia (1996), Admati and Pfleiderer (1997), and Das and Sundaram (2002). In this paper, however, we examine the determinants of the level of fees for exogenously determined fee schemes, rather than the suitability of different fee schemes.

3. Data and variables

Monthly data on Spanish non-money-market open-end mutual fund characteristics were obtained from the Spanish regulatory and supervisory authority covering the June 1999-December 2001 period.

For our purposes, we consider only mutual funds for which complete data in the whole sample are available. The reason for this is twofold. First, we focus the analysis on well-established funds. Second, in order to include proper measures of fund return and risk, we require a minimum length to the series.

[9] See for instance Chordia (1996) and Luo (2002) for discussions on this issue.

Also, funds with a number of shareholders in December 2001 inferior to 100 and with a volume of assets below 1,000 euros are eliminated from the sample. This way we exclude funds involved in liquidation processes.

Finally, we focus our attention on funds whose management fee is established exclusively upon total assets. Although mutual funds are allowed to base management fees on performance, only 5.37% have chosen not to base them exclusively upon the volume of managed assets. We believe that inferences drawn from such a small number of observations may be imprecise.

Our purpose is to identify patterns in mutual fund fee determination from the cross-sectional data on December 2001. Sample selection criteria resulted in a final sample of 1,000 funds. Empirical results in section 4 are reported separately for non-guaranteed (743) and guaranteed (257) funds.

Tables 2, 3 and 4 report summary statistics for the final sample. The first Table shows the number of funds, average volume of assets under management (in thousands of euros) per fund, shareholders, and age, according to the investment objective of the fund.[10] All data correspond to the final date, i.e., December 2001. Large differences in size, measured as volume of assets managed or as number of shareholders can be observed across funds. With average assets under management for the whole sample of 64,866.76 thousands of euros, the range across fund investment objective goes from the 25,337.156 of Global funds (OBJ13) to the 146,227.69 of International mixed fixed-income (OBJ7), which is almost six times bigger. Similar conclusions can be drawn from the average number of shareholders per fund. Differences between Domestic fixed-income funds (OBJ1, OBJ2 and OBJ3) and Domestic equity funds (OBJ4 and OBJ5) appear to be more significant in the volume of assets than in the number of shareholders. Also there is wide diversity in the average age of funds, ranging from 3.98 to 9.55 years.

Table 3 shows the percentage number of funds, assets and shareholders charging custody fees, front-end loads and redemption fees. While almost all funds in the sample charge a custody fee, only 24% (46.5%) of them use front-end loads (redemption fees). Larger funds in terms of assets under management and especially in

[10] See Appendix for a description of the investment objectives.

terms of number of shareholders seem to charge higher redemption fees. Wide differences arise between guaranteed and non-guaranteed funds as far as front-end loads -and to a lesser extent redemption fees- are concerned, with guaranteed funds being more likely to charge such fees.

Finally, Table 4 reports average fees and standard deviation of fees (in parentheses) for each fund category according to investment objectives on the final date. For those funds that charge different levels of management fees, front-end loads or redemption fees, we only have data on the maximum and minimum value of each type of fee. In those cases, we have used the average of the maximum and minimum fee. The most striking difference can be found for front-end loads, with guaranteed funds (OBJ11 and OBJ12) charging the highest mean front-end loads, which reflects the fact that the rest of funds very rarely charge any front-end load.

Next, we present the explanatory variables considered as potential determinants of mutual fund fees.

International empirical studies have usually found significant differences in portfolio management costs regarding the investment objective of the fund. The costs of research, market analysis and management heavily depend on the kind of assets the fund invests in. Thus, we group funds by the type of assets they manage. We expect to find significant differences between fixed-income and equity funds, and between domestic and international funds. In addition to differences in costs of management, heterogeneity in the particular risk profile of these funds results in a lack of perfect substitutability and hence in different prices depending on investors' demands. Also, funds are classified as INDEX if they try to track a national or international stock market index. Differences in fund fees may arise for exactly the same reasons.

Another potentially significant determinant of fund expenses is fund size, measured as the logarithm of the total assets under management, ASSETS. The hypothetic presence of economies of scale associated with the volume of managed assets would lead us to expect a negative relation between fees and size, and this seems to be the most common empirical finding (see Table 1). However, whether competition in the Spanish industry forces large funds to transfer such cost advantages to investors remains an empirical issue. Similarly, we consider as an explanatory

variable the total assets managed by the management company to which the fund belongs, MCASSETS. The existence of economies of scale should be captured by the coefficient associated with this variable.

In order to take into account differences in costs associated with the number of shareholders or differences in fees due to the type of shareholders, we use a relative measure of size: average investment per shareholder (AVINVESTMENT*)* measured as the natural logarithm of a fund's assets divided by the number of shareholders. Funds with a high value of this variable are the most likely to be owned by institutions. In Spain, institutional funds are not regulated differently from retail funds, and therefore cannot be unambiguously distinguished. The corresponding variable for the management company is termed MCAVINVESTMENT.

A related measure is the fund's market share, MKTSHARE, measured as the fund's assets as a proportion of the total volume of assets within funds with the same investment objective. A fund with a higher market share may possibly enjoy a competitive advantage and set higher fees for its investors or negotiate lower custody fees for its own fund.

Regarding reputation issues and operating efficiency related to learning by experience, it makes sense to expect more established funds to charge lower fees than newly created ones. We use the natural logarithm of the number of years since fund inception, AGE, to investigate whether such effect is present in the data.

It is usually believed that funds belonging to a banking financial group have marketing and other scope economies, advantages that will allow them to charge lower fees.[11] On the other hand, it could be the case that banks exploit their captive clients, which would result in higher fees. The associated dummy variable is BANK. Given the particularities of the Spanish banking system, we further distinguish funds managed by companies owned by savings banks. The associated dummy variable is termed SAVINGS BANK.

We can think of fund fees as the price paid by investors for a given net risk-adjusted expected return. If all investors maximize net-of-fee risk-adjusted expected

[11] Koppenhaver (2000) and Frye (2001) show that bank-affiliated mutual funds have significantly lower management fees than other funds.

returns, then all existing funds should offer the same net-of-fee performance. We should therefore observe a positive relation between fees and before-fee performance. In order to explore this relationship, we obtain average before-fee returns[12] over the 31 previous months, and the standard deviation of these returns. We then compute a measure of risk-adjusted performance: the SHARPE ratio (Sharpe, 1966), i.e., average before-fee returns in excess of the risk-free interest rate[13] divided by the standard deviation of returns. We chose the Sharpe ratio over Jensen's alpha (i.e. mean returns in excess of those explained by the portfolio's exposure to market risk) because series are too short for performing time series regressions and because of the difficulty in choosing the appropriate market benchmark for funds with very different investment objectives. Note however that because the Sharpe ratio does not require information on the fund's exposure to different market risks, it must be interpreted with caution when funds have very different investment objectives.

Finally, the other types of fees charged by the fund are considered in every regression as control variables. We term the management, custody, front-end load and redemption fee as MANAGFEE, CUSTFEE, FRONTLOAD and REDFEE, respectively.

Table 6 shows correlation coefficients between all variables (excluding fund objectives). For non-guaranteed funds, the fund's assets and the fund's average investment are positively correlated with the corresponding variables for the fund's management company, with coefficients above 0.5. Also, fund assets are correlated with the market share, with a similar coefficient. Finally, the correlation between dummy variables BANK and SAVINGSBANK is negative and above 0.5 in absolute value, reflecting the fact that few funds are managed by independent companies. Similar correlations hold for guaranteed funds, although the correlation coefficient between BANK and SAVINGSBANK is stronger and close to –1.

Given that some of the correlation coefficients shown in table 6 are relatively large, we examine the extent to which collinearity might affect the precision of

[12] Because Net Asset Values are net of management and custody fees, we add these costs (monthly adjusted) back to quoted returns.
[13] We proxied the risk-free interest rate as the average 3-month rate on Spanish Treasuries, during the period May 1999 to November 2001: 3.90% in annual terms.

parameter estimates when regressing fees on the set of explanatory variables. If we denote by x_j the j-th explanatory variable and by b_j the associated coefficient in the linear regression model, then sampling variance of the least-square estimate for b_j is proportional to the variable's variance-inflation factor[14] (VIF_j). 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 explanatory variables. A high VIF corresponds to a high R_j^2, and is indicative of collinearity. Fox (1991) considers that the precision of coefficient estimates suffer from collinearity when VIFs exceed 4, since the length of the confidence interval doubles for VIF = 4 with respect to the case of no collinearity.

Table 7 reports VIFs for all explanatory variables considered. Inspection of table 7 indicates that collinearity does not appear to be serious problem when considering non-guaranteed funds. No VIF exceeds 2.60, with the three highest VIFs corresponding to variables OBJ4, SAVINGSBANK, and ASSETS. With respect to guaranteed funds, however, VIFs for BANK and SAVINGSBANK are close to 8. We therefore choose to omit SAVINGSBANK as an explanatory variable when examining fee determinants for guaranteed funds. The estimated coefficient associated with BANK will therefore be reinterpreted as the difference between average fees for funds managed by bank-owned companies as opposed to funds owned by non-bank management companies. VIFs for MKTSHARE and ASSETS are close to 3.75 and 3.71, respectively. Although these values are moderately large, they are below 4, so we choose to keep both variables in the regressions.

4. Econometric approach and results

4.1 Management fees

Management fees are the largest component of a fund's expenses. It is the fee a mutual fund pays to its adviser or manager for supervising and rebalancing its portfolio, and administering its operations. Annual management fees are contracted

[14] See, for instance, Fox (1991) or Belsey et al. (1980).

upon as a fixed fraction of assets under management, and paid on a daily basis to the management company from the fund's assets.

Like all previous studies of fee determinants (see section 2), we choose to model mean management fees as a linear function of the explanatory variables. However, because there is a maximum legal management fee, the observed dependent variable is censored. The natural way to deal with this problem is to fit a Tobit model to the data with lower censoring at zero and upper censoring at the fee cap: 2.25%. In our sample, 10.9% of all funds charged the maximum management fee.

We therefore assume that observed management fees are set according to the model:

$$
\begin{aligned}
y_i &= \alpha + \beta' x_i + u_i \qquad \text{if} \quad \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y} \\
y_i &= \underline{y} \qquad\qquad\qquad\quad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y} \\
y_i &= \bar{y} \qquad\qquad\qquad\quad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}
\end{aligned}
$$

where y_i is the management fee decision; $\underline{y}$ is the minimum possible fee: zero; $\bar{y}$ is the maximum legal fee; β is k$\times$1 vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables of the management fee decision. Model parameters are estimated by maximum likelihood assuming that u_i are normally distributed residuals with mean zero and constant standard deviation. However, the Huber/White/sandwich estimator has been used to compute heteroskedasticity robust standard errors for coefficient estimated.

The variable y_i can be interpreted as the equilibrium price of fund management consistent with some theoretical model. We are therefore assuming that equilibrium prices depend on mutual fund characteristics summarized by x_i. The Tobit model further captures two special cases: the decision to charge no fee, and the choice of the maximum legal fee.

Estimation results are shown on Table 8, Panel A, for non-guaranteed mutual funds and Panel B for the guaranteed ones.[15] In addition to presenting estimated coefficients and associated robust p-values, we test for the overall significance of the

[15] Because a constant is included in the regressions, the dummy variable OBJ1 (OBJ12) is omitted for non-guaranteed (guaranteed) funds in order to avoid perfect linearity.

model's k variables by computing the Wald statistic, which is asymptotically distributed as χ^2 with k degrees of freedom.

For non-guaranteed funds, we find that risk-adjusted performance over the previous 31 months, as proxied by the Sharpe ratio, does not have a significant effect on management fees. This result suggests that higher management fees in this market are not associated with higher before-fee performance, and is closely related to previous findings for the US market by Gruber (1996) or Carhart (1997) and Martínez (2003) for the Spanish market, that funds with highest expense ratios have shown the lowest after-fee performance. This finding is consistent with Gruber's (1996) hypothesis that at least a fraction of all investors do not switch funds as a response to poor net-of-fee performance.

On the other hand, we find significant differences in average management fees across different investment objectives, consistently with Table 4. All else being equal, the management of fixed-income funds is cheaper to investors than that of equity funds. Euro equity and International equity funds are as much as 95 and 90 basis points more expensive than otherwise equal short-term fixed-income funds, respectively. These results are consistent with findings for the US. Significant differences between funds with different investment objectives are the result not just of management companies incurring different marginal costs to manage funds of different categories but also of lack of perfect substitutability between investment categories, since otherwise investors would flee to low-cost categories. Additionally, index funds -that are usually considered as cheaper to manage- appear to charge lower management fees, consistently with evidence for the US.

When we include both the fund's assets and the number of shareholders as explanatory variables (not shown in the paper), we find that both variables are highly significant. In particular, fund assets are associated with lower management fees, whereas fees increase with the number of fund shareholders. This suggests that as the fund's average investment per shareholder increases, the management fee diminishes. In order to check whether larger funds charge lower fees irrespectively of the fund's average investment, we choose to include ASSETS and AVINVESTMENT in the regression. In this case, we find that an increase in fund assets does not have a

significant impact on the fund's management fee, although a significant negative relationship is found at the management company level (MCASSETS). In any case, AVINVESTMENT has a negative and highly significant impact on the management fee. This result suggests that either companies managing funds with more shareholders (holding assets constant) incur higher costs (which translate in higher fees) or that investors with smaller investments in the fund are less sensitive to fees and hence face higher fees. In either case, from an investor's perspective there are significant savings from investing in funds with higher average investments. Alternatively, given that we are unable to distinguish between retail and institutional funds, this result could capture the fact that management companies charge lower fees to their institutional investors.

Another apparent source of inefficient investment is related to fund age. We find that investors pay significantly higher management fees for funds with more years since inception. This evidence contradicts the learning curve hypothesis, for which studies in the US market have shown mixed evidence. It could be the case that investors prefer to invest in older funds with longer records. On the other hand, investors that have accumulated capital gains over time face tax payments when redeeming their shares. This implies that management companies of older funds could in principle benefit from their captive clientele by charging higher fees.[16]

Management companies owned by banks and by savings banks charge higher fees, although the difference is only slightly significant for banks. Hence, we do not find strong evidence that management companies owned by banks and savings banks are more associated with high management fees than independent management companies. It should be noted that Christoffersen (2001) finds a positive and significant relationship between funds distributed by banks and contracted management fees for the US market.

Turning now to guaranteed funds, Panel B in Table 8 confirms the negative relationship between management fees and the fund average investment (AVINVESTMENT). We also find that fixed-income guaranteed funds (OBJ11)

[16] As of 2003, Spanish investors may withdraw their investment free of tax obligations as long as the money is transferred to another mutual fund. Further studies could address the question of whether well established funds have decreased fees in response to this change in regulation.

charge a lower management fee, too. However, some relevant differences appear which justify the separate analysis. First, variables MCASSETS and AGE are no longer significant in explaining management fees. Second, both the fund's risk-adjusted performance and the fund's market share seem to have a significant positive effect on the management fee. These differences suggest that management fees are determined quite differently for non-guaranteed and guaranteed funds.

4.2 Custody fees

Custody fees are charged by the custodian institution (a bank) and, like management fees, they are deducted on a daily basis from the fund's assets. We shall assume that observed custody fees are set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \quad \text{if} \quad \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y}$$

$$y_i = \underline{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the custody fee decision; $\underline{y}$ is the minimum possible fee: zero (8.40% of all funds do not charge a custody fee); $\bar{y}$ is the maximum legal fee (in our sample, only 1% of all funds charged the maximum legal custody fee), 0.40%; β is a $k \times 1$ vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables of the custody fee decision. Again, parameter estimates are presented along heteroskedasticity robust p-values.

Table 9, Panel A, shows estimation results for non-guaranteed funds. Estimated coefficients and associated robust p-values suggest that older funds and funds managed by management companies with more assets under management pay significantly higher custody fees.

On the other hand, management companies within banking groups and management companies owned by savings banks obtain significant discounts in custody costs for their investors. This finding seriously questions whether the necessary independence is maintained between management companies and custodian

institutions in Spain. This issue is in fact currently under debate at both the European and Spanish levels.

Finally, we find that when investors in funds within the fund's family have higher average investments, custody fees drop significantly. This result suggests that management companies with larger average investments per shareholder negotiate lower custody fees.

As for guaranteed funds, management companies serving wealthier investors are associated with lower custody fees. On the other hand, investors in guaranteed funds pay significantly higher custody fees the higher the fund's average investment, and the higher the amount of assets under the company's management.

4.3 Total annual fees

Given that management fees and custody fees have the same impact on the fund's return, investors could be interested in the net annual cost of owning mutual fund shares. Moreover, in many situations management fees and custody fees are likely to be jointly determined by management companies and custody banks belonging to the same group. In this case, we are interested in modelling the sum of the management and custody fees. As with separate fees, we assume the sum of fees to set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \quad \text{if} \quad \underline{y} \leq \alpha + \beta' x_i + u_i \leq \bar{y}$$

$$y_i = \underline{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the management plus custody fee; $\underline{y}$ is the minimum possible fee, $\bar{y}$ is the maximum total fee (2.65% of assets under management); β is a $k \times 1$ vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables of the total fee decision. As in the previous cases, heteroskedasticity robust standard errors are used to compute p-values.

Estimation results for non-guaranteed funds (Table 10, Panel A) confirm that differences in the annual cost of mutual fund ownership are not justified by differences

in before-fee risk-adjusted performance. Instead, funds with a higher average investment per investor are significantly cheaper, while older funds are significantly more expensive.

Despite charging significantly lower custody fees, total annual costs for funds managed by companies belong to banks and savings banks are not significantly lower.

Contrary to most evidence from the US market for retail funds, larger funds are not associated with lower fees, implying that potential economies of scale in the management of mutual funds do not translate into lower cost for investors.

Guaranteed funds (Table 10, Panel B) appear to be more expensive -in terms of annual cost- the higher the Sharpe ratio and the higher the market share. They are less expensive the higher the fund's average investment.

4.4 Front-end loads

Front-end loads are paid upon purchase of shares in a fund and are contracted as a percent of the amount invested. They can be employed by the management company to pay for distribution expenses. In our sample, as shown on Table 3, only 1.47% of non-guaranteed funds charged a front-end load, which sum up to only 11 funds. Guaranteed funds (OBJ11 and OBJ12) are therefore almost the only categories charging a front-end load (89.10% of them charge a front-end load). Spanish fund managers justify the need to charge a front-end load by this type of funds as a means of limiting the size of guaranteed funds. This is how the typical guaranteed fund works. First, fund shares are actively distributed without a front-end load for one month. Immediately after that period, the management company hedges the options sold to investors by buying the appropriate hedge portfolio from a third party (an investment bank), which is specifically engineered to match the outflows at the guarantee's maturity as closely as possible: mismatches are the management company's responsibility. Therefore, if new money comes into the fund, the management company is taking an unhedged position, and would be forced to either bear the risk or buy a new hedge portfolio (at a considerable cost) from the investment bank. Since all mutual funds in Spain are open-end by law, the management company

cannot simply close the fund to new investors. High front-end loads are hence a means of deterring new investors from coming into the guaranteed fund. On the other hand, management companies in non-guaranteed funds appear to reject the use of front-end loads. This seems to support the hypothesis that investors are sensitive to the most visible fees.

Given the small fraction of non-guaranteed funds that charged a front-end load, there is not much we can infer from observed loads. Consequently, we are interested in modelling the decision to charge a front-end load rather than the actual front-end load level if the load is charged to investors. We therefore model the determinants to charge a front-end load as the following Probit specification:

$$y_i = 1 \qquad \text{if} \qquad y_i^* = \alpha + \beta' x_i + u_i > 0$$

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

where $y_i = 1$ corresponds to the choice to charge a front-end load; y_i^* is an unobserved latent variable; β is a kx1 vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables. Inference is conducted under robust standard errors.

As for guaranteed funds, we shall assume that observed front-end loads are set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \qquad \text{if} \quad \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y}$$

$$y_i = \underline{y} \qquad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \qquad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the front-end load; $\underline{y}$ is the minimum possible load: zero; $\bar{y}$ is the maximum legal fee, 5% of investment; β is a kx1 vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables of the front-end load decision.

Panel A in Table 11 suggests that the probability of a non-guaranteed fund charging a front-end load increases significantly with the fund's market share and

redemption fees. On the other hand, the decision to charge a front-end load is negatively associated with the level of management fees.

Panel B in Table 11 shows that front-end loads charged by guaranteed funds decrease significantly with the fund's market share and with fund's age; and increase with fund assets and redemption fees.

4.5 Redemption fees

Redemption fees are computed as a fraction of the value of redeemed fund shares. As seen on Table 3, 53.5% of all funds in our sample -accounting for 48.23% of all assets- did not charge a redemption fee. Of the funds that do charge a redemption fee, 14.19% charge the maximum legal fee. Again, guaranteed funds are more likely to charge a redemption fee than non-guaranteed funds: 80.15% of the former type as opposed to 34.81% of the latter. For both types of funds, the observed redemption fee on December 2001 is assumed to be set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \quad \text{if} \quad \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y}$$

$$y_i = \underline{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the redemption fee; $\underline{y}$ is the minimum redemption fee (0); $\bar{y}$ is the maximum legal fee (5% of investment); β is a kx1 vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables. Robust p-values are presented along with parameter estimates.

According to results displayed on Table 12, Panel A, redemption fees charged by non-guaranteed funds increase with the management company's assets, and with the fact that the management company either belongs to a bank or a savings bank. Redemption fees, however, are lower the higher the average investment in the fund.

Finally, Table 12, Panel B, displays the results corresponding to guaranteed funds. Risk-adjusted performance and MCAVINVESTMENT are associated with lower redemption fees. On the other hand, redemption fees tend to be higher the higher

the fund's age and the fund's average investment. Bank owned management companies are associated with significantly higher redemption fees.

5. Robustness of results

The main purpose of this paper is to provide a comprehensive and static snapshot of fund fee determinants in the Spanish market. However, it might be of interest to examine the extent to which results can be extended to different periods or subsamples. Thus, this section analyses the robustness of the results previously presented along two alternative lines.

First, we examine whether the relationships between explanatory variables and fees documented in the previous section hold when different investment objectives are considered separately. We have, consequently, repeated the same regressions for each fund category.[17] Although, low sample sizes for some fund categories may result in low power to reject the null hypothesis, results are largely consistent with the analysis for the whole sample. The effect of the variable AVINVESTMENT on management fees, for instance, is always negative with a single exception (euro equities), and highly significant for ten categories. Also, banks charge lower custody fees for nine investment objectives. This effect is found to be significant for five categories. However, some particular differences may be highlighted. First of all, the effect of the fund size (ASSETS) on annual fees is significantly positive for mixed equities and global funds, but negative for long term fixed-income and euro equities funds. Also, largest funds seem to charge higher redemption fees for fixed-income funds, both domestic and international. Second, a positive effect of the risk-adjusted performance measure, SHARPE, on annual fees is found for some international funds (especially OBJ7 and OBJ10); although this effect is reversed for Spanish equities funds. Three, short and long-term domestic fixed-income are found to charge significantly higher annual fees when they are managed by companies belonging to banking groups, whereas the opposite is true for mixed equities. To sum up, a number of contrasting

[17] Although results are not shown in the paper, they are available from the authors upon request.

patterns regarding fund fee setting are found across investment objectives; however, a more in-depth analysis deserve additional research beyond the scope of this article.

Second, in order to assess whether the relationship between fund characteristics and fees is stable over time, we have repeated the analysis for June 1999. The total number of funds meeting the sample selection criteria is 1,581, of which 967 were also analysed on December 2001. It must be noted that we no longer observe past risk-adjusted performance, so, comparisons of results should be taken with care. Even so, the main results found on the final date seem to be confirmed for June 1999. Thus, for instance, total annual fees for non-guaranteed funds appear to be significantly higher for older funds and for funds with lower average investment. AVINVESTMENT also has a significant negative effect on redemption fees. In contrast to results for the end of the sample period, however, a significant positive effect is found for the fund size on both management and custody (and total) fees for non-guaranteed and guaranteed funds. In addition to that, non-guaranteed funds managed by companies belonging to banks or savings banks seem to charge significant higher custody fees at the beginning of the period. This finding suggests that price competition in the mutual fund industry may have changed in particular aspects in the period under examination.

6. Summary and conclusions

We have documented significant differences in the pricing of mutual funds according to fund characteristics, other than the fund's investment objective. However, we have found no significant relationship between before-fee risk-adjusted performance and fund fees for non-guaranteed funds, suggesting that consistently with other countries, Spanish mutual fund investors are not being compensated with extra performance when paying higher fees (see, for instance, Gruber 1996). On the other hand, larger funds are not cheaper in terms of management or custody fees, contrary to findings in the U.S.

We have also identified an important fee determinant: the size of the average investment in the fund, which we have found to be associated with significantly lower total annual expenses both for non-guaranteed and guaranteed funds. There are two

possible explanations for this finding, which is consistent across fund investment objectives and stable over time: (i) larger clients benefit from more bargaining power and hence lower fees; and (ii) funds with many shareholders are more costly to manage.

No strong evidence can be found supporting the hypothesis that funds managed by companies belonging to banks and savings banks, are more expensive in terms of annual expenses or front-end loads. Such funds, however, are associated with significantly higher redemption fees. Interestingly, management companies belonging to banks and savings banks obtain significantly lower custody fees for non-guaranteed funds.

Put together, these results suggest that observable fund characteristics have a significant effect on fund fees, and hence on fund net-of-fee performance. Some differences may possibly be attributed to product differentiation. Other differences, however, are not justifiable from the investor's viewpoint. For instance, investors in older non-guaranteed funds and funds with lower average investment per shareholder face significantly higher than average annual costs, while they can hardly benefit from these funds more than from investing in the average fund.

We conclude that fee caps in Spain do not prevent management companies and custodian institutions from charging fees different from those consistent with a competitive industry. However, the recent domestic reform permitting tax-exempt transfers between funds, together with an international trend towards more disclosure and transparency regarding fund fees and expenses, will hopefully increase price competition and eliminate inefficiencies in investors' decision making processes.

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Appendix

According to Spanish Mutual Fund Association (INVERCO) and supervisory authority (CNMV) fund investment objectives are classified as follows:

OBJ1 (Short-term fixed-income): 100% fixed income, maximum 2 years term and maximum 5% non-euro currencies.

OBJ2 (Long-term fixed-income): 100% fixed income, over 2 years term and maximum 5% non-euro currencies.

OBJ3 (Mixed fixed-income): Maximum 30% in equities and 5% non-euro currencies.

OBJ4 (Mixed equities): 30%-75% in equities and maximum 30% non-euro currencies.

OBJ5 (Spanish equities): Over 75% in equities listed on Spanish markets (including assets of Spanish issuers listed on other markets) and maximum 30% non-euro currencies.

OBJ6 (International fixed-income): 100% fixed income and over 5% non-euro currencies.

OBJ7 (International mixed fixed-income): Maximum 30% in equities and over 5% non-euro currencies.

OBJ8 (International mixed equities): 30%-75% in equities and over 30% non-euro currencies.

OBJ9 (Euro equities): Over 75% in equities, maximum 75% of it in national equities and maximum 30% non-euro currencies.

OBJ10 (International equities): Over 75% in equities and over 30% non-euro currencies.

OBJ11 (Guaranteed fixed-income): Third-party guarantee funds, which ensure only a fixed return.

OBJ12 (Guaranteed equity): Third-party guarantee funds ensuring a sum totally or partially linked to development of an equity or currency.

OBJ13 (Global funds): Funds whose investment policies are not precisely defined and funds that do not belong in any other category.

Table 1
Summary of previous findings

In this Table, we summarize results from previous empirical research on mutual fund determinants. The Table captures information about authors, datasets, dependent variables, explanatory variables and adjusted R-squared. POS indicates that the explanatory variable has a positive effect on the dependent variable. NEG indicates that the explanatory variable has a negative effect on the dependent variable. An asterisk indicates that the effect is statistically significant.

	Country (nº funds)	Sample period	Dependent variable	Investment objetive	Fund assets	Management company's size	Fund's age	Banking group	Fund's risk-adjusted return	Adjusted R-squared
Ferris-Chance (1987)	US (292-306)	1984-85	Expense Ratio (ER)	*	NEG*		NEG*			0.23-0.49
Chance-Ferris (1991)	US (286-306)	1985-88	ER	*	NEG*		NEG			0.42-0.50
Tufano-Sevick (1997)	US (1,402)	1992	Non-mark.fees	*	NEG*	NEG	POS*		POS	0.50
			Marketing fees		NEG	NEG*	POS		POS	0.70
Malhotra-McLeod (1997)	US Equity (464-468)	1992-93	ER		NEG*	NEG*	NEG*		NEG*	0.46-0.54
	US Bond (656-779)		ER		NEG*	POS	POS*		POS*	0.27-0.35
Dellva-Olson (1998)	US (614-1,300)	1987-92	ER	*	NEG*		NEG*			0.44-0.51
SEC (2000)	US (1,000)	1999	Manag. Expenses	*	NEG	NEG*	NEG*			0.47
	US (8,901)		Total Expenses		NEG*	NEG*	POS*			0.56
Christoffersen (2001)	US Ret. MMF	1990-95	Manag. Expenses		NEG*	POS	POS*	POS*	NEG	
	US Inst. MMF		Manag. Expenses		POS	POS	NEG	POS*	POS*	
Berkowitz-Kotowitz (2002)	US H-perf (673)	1996	ER	*	NEG*	NEG*			POS*	0.61
	US L-perf (342)		ER		NEG*	NEG*			NEG*	0.71
Lesseig *et al*. (2002)	US (3,861)	1997	Admin. fees	*	NEG*	NEG*	NEG	NEG*	NEG	0.67
			Manag. fees		POS*	NEG*	NEG*	POS*	POS*	0.96
Luo (2002)	US (2,398)	1997	Total fees		NEG*		NEG*		POS*	0.74
Korkeamaki-Smythe (2004)	FINLAND (93)	1993-98	ER	*	POS	NEG*	POS*	POS*		0.72
Golec (2003)	US (120)	1969-70	Manag. fees		NEG*		NEG			0.20
		1982-84			NEG*		NEG			0.24

Table 2
Descriptive statistics

Monthly data from 1,000 Spanish non-money-market open-end mutual funds have been collected from the industry regulator's database covering the period June 1999-December 2001. The Table shows the number of funds, the average assets per fund (in thousands of euros), the average number of shareholders per fund, the average fund's age, the average fund's mean monthly return for the whole period, and the average fund's standard deviation of monthly returns, where funds are grouped by investment objective (see Appendix for a description of investment objectives).

	Number of funds	**Average assets**	**Average number of shareholders**	**Average age**
OBJ1	103	80,546.078	3,388.563	8.09
OBJ2	102	96,728.402	2,474.020	9.55
OBJ3	112	56,897.071	2,604.643	7.05
OBJ4	135	58,917.289	2,648.148	7.02
OBJ5	66	54,152.470	2,727.212	7.33
OBJ6	23	38,918.304	1,134.087	7.70
OBJ7	29	146,227.690	4,678.379	7.51
OBJ8	30	45,668.300	2,238.533	5.80
OBJ9	45	81,653.444	4,471.333	5.45
OBJ10	66	54,360.470	3,310.545	4.66
OBJ11	82	44,930.415	1,882.671	5.14
OBJ12	175	60,225.806	2,879.869	3.98
OBJ13	32	25,377.156	996.438	5.87
TOTAL	1,000	64,866.760	2,769.449	6.46

Table 3
Types of fee

Monthly data from 1,000 Spanish non-money-market open-end mutual funds have been collected from the industry regulator's database covering the period June 1999-December 2001. The Table shows the fraction of all funds, assets and shareholders for funds that: (i) charge a custody fee; (ii) charge a front-end load; and (iii) charge a redemption fee, on the final date.

	Custody fee	**Front-end load**	**Redemption fee**
Percent of total funds	91.60%	24.00%	46.50%
Percent of non-guaranteed funds	92.06%	1.47%	34.81%
Percent of guaranteed funds	90.27%	89.10%	80.15%
Percent of total assets	86.86%	22.54%	51.77%
Percent of total shareholders	89.10%	22.79%	62.02%

Table 4
Fees and investment objectives

Monthly data from 1,000 Spanish non-money-market open-end mutual funds have been collected from the industry regulator's database covering the period June 1999-December 2001. The Table shows average fees and standard deviation of fees (in parentheses) for each fund category according to investment objectives (see Appendix for a description of variables) on the final date.

	Management Fee	**Custody Fee**	**Front Load**	**Redemption Fee**
OBJ1	1.06	0.12	0.02	0.09
	(0.46)	(0.06)	(0.25)	(0.19)
OBJ2	1.34	0.14	0.11	0.22
	(0.42)	(0.06)	(0.70)	(0.37)
OBJ3	1.48	0.14	0.00	0.27
	(0.36)	(0.06)	(0.00)	(0.47)
OBJ4	1.58	0.13	0.06	0.38
	(0.53)	(0.06)	(0.46)	(0.61)
OBJ5	1.84	0.13	0.00	0.45
	(0.45)	(0.06)	(0.00)	(0.62)
OBJ6	1.40	0.15	0.00	0.71
	(0.48)	(0.07)	(0.00)	(1.16)
OBJ7	1.28	0.13	0.04	0.53
	(0.48)	(0.06)	(0.23)	(1.24)
OBJ8	1.73	0.13	0.00	0.78
	(0.45)	(0.08)	(0.00)	(1.00)
OBJ9	1.95	0.13	0.01	0.44
	(0.47)	(0.09)	(0.07)	(0.63)
OBJ10	1.93	0.15	0.02	0.63
	(0.44)	(0.10)	(0.12)	(0.68)
OBJ11	0.94	0.15	2.33	1.48
	(0.29)	(0.09)	(1.58)	(1.31)
OBJ12	1.24	0.11	3.61	2.90
	(0.32)	(0.06)	(1.78)	(1.87)
OBJ13	1.31	0.11	0.09	0.10
	(0.57)	(0.06)	(0.53)	(0.22)
TOTAL	1.42	0.13	0.85	0.89
	(0.52)	(0.07)	(1.69)	(1.41)

Table 5
Glossary of variables

MANAGFEE:	Annual management fee, in percentage of fund assets.
CUSTFEE:	Annual custody fee, in percentage of fund assets.
FRONTLOAD:	Front fee, in percentage of fund assets purchased.
REDFEE:	Redemption fee, in percentage of fund assets redeemed.
OBJK:	An indicator variable that equals 1 if the fund's investment objective is K and 0 otherwise.[18]
ASSETS:	The natural logarithm of total assets (in thousands of euros) managed by the fund.
MCASSETS:	The natural logarithm of total assets (in thousands of euros) managed by the management company to which the fund belongs.
AVINVESTMENT:	Natural logarithm of the fund's assets (in thousands of euros) minus the natural logarithm of the fund's number of investors.
MCAVINVESTMENT:	Natural logarithm of the management company's assets minus the natural logarithm of the number of investors in all funds managed by the management company to which the fund belongs.
MKTSHARE:	The fund's share of all assets managed by funds with the same investment objective.
AGE:	The natural logarithm of years since the fund's inception.
INDEX:	A dummy variable set at one if the fund is an indexed fund.
BANK:	A dummy variable set at one if the fund's management company is owned by a bank.
SAVINGS BANK:	A dummy variable set at one if the fund's management company is owned by a savings bank.
SHARPE:	The Sharpe ratio. Computed as the fund's average monthly before-fee return, in excess of the average monthly interest rate on short term Treasuries, divided by the standard deviation of monthly before-fee returns.

[18] See Appendix for a description of investment objectives.

Table 6. Correlation Matrix for Non-guaranteed and Guaranteed Funds on December 2001

Panel A. Non-guaranteed Funds

	SHARPE	ASSETS	AVINV.	MCASSETS	MCAVINV.	MKTSHARE	AGE	INDEX	BANK	SAVINGS.	MANAGFEE	CUSTFEE	FRONTL.
SHARPE	1.0000												
ASSETS	0.1321	1.0000											
AVINVESTMENT	0.0864	0.1720	1.0000										
MCASSETS	0.0646	0.4767	-0.1311	1.0000									
MCAVINVESTMENT	-0.0383	-0.0607	0.5606	-0.3282	1.0000								
MKTSHARE	0.0749	0.5607	0.0679	0.3231	-0.0030	1.0000							
AGE	-0.0207	0.2915	0.0576	-0.0263	0.0703	0.1246	1.0000						
INDEX	-0.0780	-0.0131	0.0172	-0.0098	0.0166	0.0140	-0.0051	1.0000					
BANK	-0.0207	0.2273	0.0709	0.2539	0.0531	0.1433	-0.0053	0.0148	1.0000				
SAVINGSBANK	0.0350	0.0466	-0.2340	0.2525	-0.3884	-0.0280	-0.0725	-0.0397	-0.5865	1.0000			
MANAGFEE	-0.1214	-0.0137	-0.5241	0.0086	-0.2029	0.0549	0.0182	-0.0009	0.0222	0.0423	1.0000		
CUSTFEE	-0.0016	0.0087	-0.1841	0.0662	-0.1606	-0.0266	0.1359	-0.0055	-0.0623	0.0489	0.2009	1.0000	
FRONTLOAD	0.0339	-0.0240	0.1099	-0.0495	0.0837	-0.0209	-0.0105	-0.0157	0.0045	-0.0521	-0.1783	-0.0594	1.0000
REDFEE	-0.0024	0.1596	-0.2850	0.3048	-0.1889	0.1835	-0.0462	0.0019	0.0547	0.1688	0.2556	0.1228	0.0209

Panel B. Guaranteed Funds

	SHARPE	ASSETS	AVINV.	MCASSETS	MCAVINV.	MKTSHARE	AGE	INDEX	BANK	SAVINGS.	MANAGFEE	CUSTFEE	FRONTL.
SHARPE	1.0000												
ASSETS	-0.1306	1.0000											
AVINVESTMENT	0.0856	0.1266	1.0000										
MCASSETS	-0.1111	0.4214	0.1260	1.0000									
MCAVINVESTMENT	0.0697	-0.1083	0.5428	-0.1517	1.0000								
MKTSHARE	-0.0322	0.7470	0.1971	0.4090	-0.1448	1.0000							
AGE	0.1454	0.0321	0.2103	-0.0458	0.0256	0.2626	1.0000						
INDEX	-0.0317	-0.1688	-0.0549	-0.1170	-0.0058	-0.1814	-0.1037	1.0000					
BANK	-0.0692	0.0989	0.3469	0.2735	0.4185	0.1110	-0.1040	0.0030	1.0000				
SAVINGSBANK	0.0740	-0.0687	-0.3611	-0.2230	-0.4762	-0.0775	0.1227	0.0248	-0.9251	1.0000			
MANAGFEE	0.0320	0.2323	-0.2856	-0.0105	-0.0857	0.0723	-0.1641	0.0433	-0.0155	0.0493	1.0000		
CUSTFEE	-0.1187	0.1010	0.0478	0.4281	-0.2539	0.1692	0.0171	0.0333	0.0452	-0.0730	-0.1144	1.0000	
FRONTLOAD	0.0675	0.2557	-0.0567	0.0831	0.1881	0.0144	-0.1725	-0.1758	-0.0472	0.0881	0.2091	-0.1189	1.0000
REDFEE	0.0023	0.2414	0.0388	0.0593	0.1852	-0.0128	-0.0907	-0.0773	0.0732	-0.0540	0.2921	-0.1771	0.6737

Table 7
Variance Inflation Factors (VIFs)

All variables are measured on December 2001. Variance inflation factors are computed as $(1-R_j^2)^{-1}$, where R_j^2 is the determination coefficient from regressing each variable on the rest of variables.

	Non-guaranteed funds	Guaranteed funds
SHARPE	1.30	1.13
OBJ2	1.87	
OBJ3	2.27	
OBJ4	2.60	
OBJ5	2.13	
OBJ6	1.44	
OBJ7	1.38	
OBJ8	1.62	
OBJ9	1.96	
OBJ10	2.31	
OBJ11		2.41
OBJ13	1.52	
ASSETS	2.45	3.71
AVINVESTMENT	2.28	2.08
MCASSETS	1.98	1.76
MCAVINVESTMENT	1.92	2.56
MKTSHARE	1.81	3.75
AGE	1.54	1.39
INDEX	1.05	1.24
BANK	2.29	7.89
SAVINGS BANK	2.58	8.67
MANAGFEE	2.01	1.47
CUSTFEE	1.13	1.46
FRONTLOAD	1.06	2.47
REDFEE	1.35	2.18

Table 8
Management Fees

Monthly data from 1,000 Spanish non-money-market open-end mutual funds have been collected from the industry regulator's database covering the period June 1999-December 2001. Observed fund management fees on December 2001 are assumed to be set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \quad \text{if} \quad \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y}$$

$$y_i = \underline{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the management fee decision; $\underline{y}$ is the minimum fee (0), $\bar{y}$ is the maximum legal fee (2.25% of assets under management); β is k-dimension vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables of the management fee decision; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \sigma$. Panel A is for non-guaranteed mutual funds and Panel B for guaranteed funds. The first column contains the name of the explanatory variable in x_i, and the second and third columns in each Panel, the corresponding estimated coefficient and the p-value robust to heteroskedasticity, respectively. The Table also reports the Wald test for the null hypothesis that the model variables are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
CONSTANT	1.6327	0.000	1.5858	0.000
SHARPE	0.0835	0.469	0.0782	0.000
OBJ2	0.2320	0.000		
OBJ3	0.3852	0.000		
OBJ4	0.5491	0.000		
OBJ5	0.8329	0.000		
OBJ6	0.3178	0.001		
OBJ7	0.3130	0.000		
OBJ8	0.6961	0.000		
OBJ9	0.9589	0.000		
OBJ10	0.9092	0.000		
OBJ11			-0.2540	0.000
OBJ13	0.4124	0.000		
ASSETS	0.0144	0.403	0.0336	0.313
AVINVESTMENT	-0.2389	0.000	-0.2312	0.000
MCASSETS	-0.0226	0.056	-0.0068	0.601
MCAVINVESTMENT	-0.0173	0.652	0.0241	0.762
MKTSHARE	0.0040	0.493	0.0768	0.023
AGE	0.1951	0.000	-0.0522	0.433
INDEX	-0.2293	0.072	-0.0135	0.853
BANK	0.0989	0.079	0.0428	0.347
SAVINGS BANK	0.0808	0.144		
CUSTFEE	0.4414	0.071	-0.0363	0.906
FRONTLOAD	-0.1664	0.000	-0.0216	0.175
REDFEE	0.0407	0.218	0.0408	0.006
Model Test	942.19	0.000	182.70	0.000
Number of Observations	*743*		*257*	

Table 9
Custody Fees

Monthly data from 1,000 Spanish non-money-market open-end mutual funds have been collected from the industry's regulator database covering the period June 1999-December 2001. Observed fund custody fees on December 2001 are assumed to be set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \quad \text{if} \quad \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y}$$

$$y_i = \underline{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the custody fee; $\underline{y}$ is the minimum fee (0), $\bar{y}$ is the maximum legal fee (0.40% of assets under management); β is k-dimension vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \sigma$. Panel A is for non-guaranteed mutual funds and Panel B for the guaranteed ones. The first column contains the name of the explanatory variable in x_i, and the second and third columns in each Panel, the corresponding estimated coefficient and p-value robust to heteroskedasticity, respectively. The Table also reports Wald test for the null hypothesis that the model variables are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
CONSTANT	0.0830	0.035	-0.0192	0.845
SHARPE	-0.0009	0.957	-0.0322	0.170
OBJ2	0.0237	0.018		
OBJ3	0.0196	0.063		
OBJ4	0.0104	0.330		
OBJ5	0.0044	0.731		
OBJ6	0.0356	0.038		
OBJ7	0.0240	0.068		
OBJ8	0.0168	0.353		
OBJ9	0.0179	0.332		
OBJ10	0.0350	0.041		
OBJ11			0.0099	0.466
OBJ13	0.0092	0.501		
ASSETS	-0.0015	0.626	-0.0061	0.441
AVINVESTMENT	-0.0077	0.834	0.0253	0.049
MCASSETS	0.0044	0.028	0.0203	0.000
MCAVINVESTMENT	-0.0182	0.001	-0.0567	0.001
MKTSHARE	-0.0020	0.233	-0.0019	0.809
AGE	0.0231	0.000	0.0087	0.613
INDEX	-0.0002	0.991	0.0192	0.228
BANK	-0.0260	0.000	-0.0031	0.787
SAVINGS BANK	-0.0205	0.022		
MANAGFEE	0.0170	0.016	-0.0021	0.895
FRONTLOAD	-0.0042	0.159	0.0045	0.221
REDFEE	0.0072	0.141	-0.0069	0.058
Model Test	110.21	0.000	97.52	0.000
Number of Observations	*743*		*257*	

Table 10
Total annual Fees

Monthly data from 1,000 Spanish non-money-market open-end mutual funds have been collected from the industry's regulator database covering the period June 1999-December 2001. Observed total annual fees (management plus custody fees) on December 2001 are assumed to be set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \quad \text{if} \quad \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y}$$

$$y_i = \underline{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the management plus custody fee; $\underline{y}$ is the minimum fee (0), $\bar{y}$ is the maximum legal fee (2.65% of assets under management); β is k-dimension vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \sigma$. Panel A is for non-guaranteed mutual funds and Panel B for the guaranteed ones. The first column contains the name of the explanatory variable in x_i, and the second and third columns in each Panel, the corresponding estimated coefficient and p-value robust to heteroskedasticity, respectively. The Table also reports Wald test for the null hypothesis that the model variables are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
CONSTANT	1.7720	0.000	1.4686	0.000
SHARPE	0.0966	0.396	0.0667	0.000
OBJ2	0.2808	0.000		
OBJ3	0.4139	0.000		
OBJ4	0.5376	0.000		
OBJ5	0.7496	0.000		
OBJ6	0.3714	0.000		
OBJ7	0.3468	0.000		
OBJ8	0.6917	0.000		
OBJ9	0.8635	0.000		
OBJ10	0.8558	0.000		
OBJ11			-0.2425	0.000
OBJ13	0.4091	0.000		
ASSETS	0.0113	0.479	0.0288	0.387
AVINVESTMENT	-0.2348	0.000	-0.2050	0.000
MCASSETS	-0.0150	0.161	0.0106	0.428
MCAVINVESTMENT	-0.0279	0.471	-0.0336	0.649
MKTSHARE	0.0011	0.839	0.0744	0.027
AGE	0.1957	0.000	-0.0477	0.471
INDEX	-0.1914	0.103	0.0067	0.929
BANK	0.0457	0.372	0.0445	0.343
SAVINGS BANK	0.0630	0.210		
FRONTLOAD	-0.1769	0.000	-0.0185	0.240
REDFEE	0.0364	0.180	0.0345	0.019
Model Test	1075.49	0.000	168.42	0.000
Number of Observations	*743*		*257*	

Table 11
Front-end loads

Monthly data from 1,000 Spanish non-money-market open-end mutual funds have been collected from the industry regulator's database covering the period June 1999-December 2001.

The observed choice to charge a front-end load by non-guaranteed funds is assumed to be set according to the Probit model:

$$y_i = 1 \quad \text{if } y_i^* = \alpha + \beta' x_i + u_i > 0$$

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

where $y_i = 1$ corresponds to the choice to charge a front-end load; y_i^* is an unobserved latent variable; β is k-dimension vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = 1$.

Observed front-end loads charged by guaranteed funds are assumed to be set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \quad \text{if } \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y}$$

$$y_i = \underline{y} \quad \text{if } \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \quad \text{if } \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the front-end load; $\underline{y}$ is the minimum front-end load (0); $\bar{y}$ is the maximum legal fee (5% of investment); β is k-dimension vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \sigma$. Panel A is for non-guaranteed mutual funds and Panel B for the guaranteed ones. The first column contains the name of the explanatory variable in x_i, and the second and third columns in each Panel, the corresponding estimated coefficient and p-value robust to heteroskedasticity, respectively. The Table also reports Wald test for the null hypothesis that the model variables are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
CONSTANT	0.7498	0.597	-3.7519	0.333
SHARPE	0.3887	0.345	0.1580	0.203
OBJ11			0.7125	0.116
ASSETS	0.0865	0.535	0.7329	0.010
AVINVESTMENT	0.2243	0.313	0.0016	0.997
MCASSETS	-0.1608	0.161	0.0798	0.474
MCAVINVESTMENT	-0.5216	0.143	-0.5853	0.405
MKTSHARE	0.0397	0.013	-0.6173	0.036
AGE	0.4150	0.124	-1.4759	0.031
INDEX			-0.6311	0.138
BANK	0.2396	0.512	-0.0099	0.973
SAVINGS BANK	-0.8622	0.084		
MANAGFEE	-1.2806	0.000	-0.3802	0.425
CUSTFEE	-3.0076	0.122	0.9200	0.675
REDFEE	0.5440	0.011	0.8217	0.000
Model Test	64.10	0.000	49.29	0.000
Number of Observations	*743*		*257*	

Table 12
Redemption Fees

Monthly data from 1,000 Spanish non-money-market open-end mutual funds have been collected from the industry regulator's database covering the period June 1999-December 2001. The observed redemption fee on December 2001 is assumed to be set according to the Tobit model:

$$y_i = \alpha + \beta' x_i + u_i \quad \text{if} \quad \underline{y} \le \alpha + \beta' x_i + u_i \le \bar{y}$$

$$y_i = \underline{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i < \underline{y}$$

$$y_i = \bar{y} \quad \text{if} \quad \alpha + \beta' x_i + u_i > \bar{y}$$

where y_i is the redemption fee; $\underline{y}$ is the minimum redemption fee (0); $\bar{y}$ is the maximum legal fee (5% of investment); β is k-dimension vector of unknown parameters; x_i is a vector of the same size containing all explanatory variables; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \sigma$. Panel A is for non-guaranteed mutual funds and Panel B for the guaranteed ones. The first column contains the name of the explanatory variable in x_i, and the second and third columns in each Panel, the corresponding estimated coefficient and p-value robust to heteroskedasticity, respectively. The Table also reports Wald test for the null hypothesis that the model variables are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
CONSTANT	-3.8217	0.000	-7.2948	0.079
SHARPE	0.5049	0.251	-0.2237	0.022
OBJ2	0.4936	0.028		
OBJ3	0.7737	0.001		
OBJ4	0.9688	0.000		
OBJ5	1.2293	0.000		
OBJ6	1.3397	0.001		
OBJ7	1.1518	0.004		
OBJ8	1.5720	0.000		
OBJ9	0.9712	0.005		
OBJ10	1.1327	0.000		
OBJ11			-0.3629	0.461
OBJ13	0.6357	0.086		
ASSETS	0.0786	0.168	0.4282	0.158
AVINVESTMENT	-0.3748	0.000	1.4391	0.003
MCASSETS	0.1778	0.000	0.0172	0.902
MCAVINVESTMENT	-0.1798	0.224	-1.7566	0.008
MKTSHARE	-0.0061	0.795	-0.6568	0.040
AGE	0.0368	0.777	0.9414	0.080
INDEX	-0.0680	0.854	-0.0714	0.892
BANK	0.6306	0.001	1.0618	0.007
SAVINGS BANK	0.8910	0.000		
MANAGFEE	0.2308	0.157	1.4495	0.006
CUSTFEE	1.3666	0.038	-2.4048	0.302
FRONTLOAD	0.4403	0.008	1.0724	0.000
Model Test	248.31	0.000	185.28	0.000
Number of Observations	*743*		*257*	