The Black Box of Mutual Fund Fees*

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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, management companies owned by banks and savings banks charge higher management fees and redemption fees to non-guaranteed funds. Also, 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 custodial institutions than others. In contrast to evidence from the US market, larger funds are not associated with lower fees, but with higher custody fees for guaranteed funds and higher redemption fees for both types of funds. Finally, fee-setting by mutual funds is not related to fund before-fee 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 (2003), 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 are 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 custodial institutions of

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

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[8]. 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 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[9] 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

[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 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 custodial 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] In the U.S. mutual fund sector, for instance, the maximum sales charge on shares purchases is 8.5% of the investment. Also the 12b-1 fee cannot exceed 1% of a fund's average net assets per year. However, no cap is imposed on management fees.

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

this may be convenient, there are no a priori reasons to believe that management fees, custody fees, front loads and redemption fees are determined in the same way. 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 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 investigate the cross-sectional regression of different fees on a set of explanatory variables including the fund's mean return and standard deviation of returns 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, average return or risk. 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. Another interesting finding suggests that front loads serve the specific purpose of limiting a fund's assets whenever this is desirable for the management company. Taken together, the results of this paper supports 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; and section 5 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 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. 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 loads and redemption fees. Moreover, we do not implicitly assume zero mark-ups in mutual fund fees[10] 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.

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

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

volume of managed assets. We believe that inferences drawn from such a small number of observations may be imprecise.

These 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, age, monthly net return and standard deviation of returns, according to the investment objective of the fund[11]. All data, except for performance related variables, correspond to the final date. 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. However, the most significant differences exhibited across fund investment objectives refer to return and especially to risk. As expected, the average standard deviation of monthly variable-income fund returns is clearly bigger than that of fixed-income funds. The values for the domestic variable-income, domestic mixed equities, international equities and euro equities are 5.79, 3.26, 6.08 and 5.48 respectively, all above the overall average. To sum up, large differences in size, age and return-risk pattern are exhibited across funds with different investment objectives.

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

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

fees). Larger funds in terms of assets under management and especially in terms of number of shareholders seem to charge higher redemption fees. Wide differences arise between guaranteed and non-guaranteed funds as far as front 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 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 loads, with guaranteed funds (OBJ11 and OBJ12) charging the highest mean front loads, which reflects the fact that the rest of funds very rarely charge any front 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[12]. 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.

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

We can think of fund fees as the price paid by investors for a given net risk-adjusted expected return. If investors react to differences in expected performance, then we would expect a positive relation between costs (fees) and services (returns), so all existing funds offer the same net-of-fee performance. In order to explore this relationship, we obtain average gross returns[13] over the 31 previous months, AVRETURN. The standard deviation of these returns, VOLATILITY, is also considered as an explanatory variable. We chose to use return and risk separately instead of an aggregate performance measure as the Jensen alpha because there is no reason to believe that investors do not consider mean returns and risk as separate elements of a fund's attributes. Moreover, the series are too short for a time series regression.

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

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 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 previous studies, 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

[13] Because Net Asset Values are net of management and custody fees, we add these costs (monthly adjusted) back to quoted returns.

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:

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

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

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

where y_i is the management fee decision; $\underline{y}$ is the minimum 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; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance.

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.

We have first estimated the model with all explanatory variables included in the variance specification. We have then chosen only those variables with a significant effect on the conditional heteroscedasticity and have proceeded to re-estimate the model. Although we do not report estimated coefficients for the variance, we have included the variables AGE, SAVINGS BANK, FRONTLOAD and CUSTFEE for non-guaranteed funds and VOLATILITY, OBJ11, AVINVESTMENT, MCASSETS, MCAVINVESTMENT, BANK, SAVINGS BANK and CUSTFEE for the guaranteed ones.

Estimation results are shown on Table 6, Panel A, for non-guaranteed mutual funds and Panel B for the guaranteed ones. In addition to estimated coefficients and associated p-values, we test for the overall significance of the model variables as well as for the significance of variables in the variance. In each case, we compute the likelihood ratio test:

$$LR = -2 (LL_R - LL_U)$$

where LL_R is the log-likelihood function associated to the restricted model, i.e., the true model under the null hypothesis that k variables can be omitted from the regression, and LL_U is the log-likelihood function of the unrestricted model. Under the null hypothesis, LR is asymptotically distributed as a χ^2 with k degrees of freedom.

As for non-guaranteed funds, we find that average before-fee monthly returns over the previous 31 months do 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.

The standard deviation of monthly fund returns, on the other hand, is positively and significantly related to mutual fund management fees, which means that more aggressive mutual funds managers are charging higher fees. This is striking since for well-diversified portfolios all risk is market risk, so higher risk means lower risk-adjusted performance. The finding is consistent with Luo (2002).

We also 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. International equity funds are as much as 79 basis points more expensive than short-term fixed-income funds, and also than domestic equities funds. 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- do appear to charge significantly 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 contradicts the learning curve hypothesis. Studies for 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[14].

[14] 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.

Management companies owned by banks and by savings banks charge significantly higher fees. Although it could well be that investors receive more services associated with their mutual fund investment from banks and savings banks than from independent management companies, it is unclear what the nature and true value of such services is. Alternatively, as discussed in the introduction, credit institutions in Spain control the management and distribution of 9 out of 10 funds or euros invested in mutual funds. Our results suggest that such market power could translate into higher management fees. However, it should be noted that Christoffersen (2001) also 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 6 confirms the negative relationship between management fees and the fund average investment (AVINVESTMENT). We also find that fixed-income guaranteed funds (OBJ11) also charge a lower management fee. However, some relevant differences appear which justify the separate analysis. First, the variables MCASSETS, AGE and are no longer significant in explaining the management fees paid by guaranteed funds. Second, guaranteed funds managed by companies owned by banks or savings banks do not charge significantly higher management fees. And finally, the fund market share (MKTSHARE) seems to have a 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 custodial 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×1 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 $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. Following the same procedure as with management fees, we choose the variables AVRETURN, OBJ6, OBJ7, MKTSHARE, BANK, SAVINGS BANK and FRONTLOAD for non-guaranteed funds, and ASSETS, MCASSETS, MKTSHARE, BANK, SAVINGS BANK and MANAGFEE for guaranteed funds.

Table 7, Panel A, shows estimation results for non-guaranteed funds. The fund average investment has a positive effect on custody fees. Also, funds managed by management companies with more assets under management pay significantly higher custody fees. A possible explanation could be that management and custody fees are jointly determined for such funds, so higher custody fees offset lower management fees.

On the other hand, management companies within banking groups obtain significant discounts in custody costs for their investors. This finding seriously questions whether the necessary independence is maintained between management companies and custodial institutions in Spain. This issue is in fact currently under debate at both the European and Spanish levels. Investors in funds managed by companies belonging to savings banks, however, do not benefit from lower custody fees. Furthermore, we compute a likelihood ratio test for the null hypothesis that custody fees charged to mutual funds associated with banks and savings banks are the same. The null hypothesis is rejected.

Taken together, these results indicate that lower (higher) management fees for some funds are offset by higher (lower) custody fees, which suggests that the sum of the two should be analysed.

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. A similar effect is found for the fund's market share, reflecting the fact that funds with high market power can negotiate lower custody fees.

As for guaranteed funds, investors in fixed-income funds enjoy lower custody fees on top of lower management fees. Also, more volatile funds, management companies serving wealthier investors, and funds with higher market share are associated with lower custody fees. On the other hand, investors in guaranteed funds pay significantly higher custody fees the higher the fund's assets, the higher the fund's average investment, and the higher the amount of assets under the company's management.

Results further indicate that older funds charge higher custody fees, suggesting that the first investors to buy shares of this type of funds had to pay higher custody fees that have not diminished with increasing competition in this segment of the market.

Guaranteed funds whose name includes the term "Index" are also associated with higher custody fees. Note however that management of these funds cannot be considered passive as opposed to actively managed funds. The term "Index" in this case means that investor's return is linked to some index appreciating above some specific level. The management company in this case buys an option to hedge its commitment with fund investors.

Finally, both banks and savings banks charge lower custody fees to funds managed by companies within their groups.

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:

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

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

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

where y_i is the management plus custody fee; $\underline{y}$ is the minimum 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 management fee decision; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. In this case z_i includes the variables MCAVINVESTMENT and SAVINGS BANK for non-guaranteed funds, and VOLATILITY, OBJ11, AVINVESTMENT, MCAVINVESTMENT, BANK, and SAVINGS BANK for guaranteed funds.

Estimation results for non-guaranteed funds (Table 8, Panel A) confirm that differences in the annual cost of mutual fund ownership are not justified by differences in before-fee return or risk. Instead, funds with a higher average investment per investor and index funds are significantly cheaper, while older funds, funds managed by companies belonging to banks, and especially funds managed by companies linked to savings banks are significantly more expensive.

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 8, Panel B) appear to be cheaper -in terms of annual cost- when fund returns are more volatile and when average investment per fund shareholder is higher. They are more expensive the larger the assets under the company's management and the larger the fund's market share.

4.4 Front loads

Front 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 load, which sum up to only 11 funds. Guaranteed funds (OBJ11 and OBJ12) are therefore almost the only categories charging a front load (89.10% of them charge a front load). Spanish fund managers justify the need to charge a front 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 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 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 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 load, there is not much we can infer from observed loads. Consequently, we are interested in modelling the decision to charge a front load rather than the actual front load level if the load is charged to investors. We therefore model the determinants to charge a front 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 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; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance, although in this case, no variable is found to be significant in the variance specification.

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

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

where y_i is the front 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 management fee decision; u_i are normally distributed residuals with mean zero and standard deviation $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. In this case z_i includes the variables OBJ11, MCAVINVESTMENT, AGE, INDEX, CUSTFEE, and REDFEE.

Panel A in Table 9 suggests that the probability of a non-guaranteed fund charging a front load decreases significantly if the management fee is high or if the management company has relatively many assets under management per fund shareholder. On the other hand, the decision to charge a front load is positively associated with the level of redemption fees.

Panel B in Table 9 shows that front loads charged by guaranteed funds decrease with the fund's average investment size, with the management company's assets under management, and with the fund's age. On the other hand, front loads charged by guaranteed funds, increase significantly with the fund's market share and with the fact that the management company is owned by a bank.

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 $k\times 1$ 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 $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. In particular, z_i contains ASSETS, AVINVESTMENT, MCAVINVESTMENT, MKTSHARE, and CUSTFEE for non-guaranteed funds, and VOLATILITY, AVINVESTMENT, MCASSETS, MCAVINVESTMENT, AGE, and FRONTLOAD for guaranteed funds.

According to results displayed on Table 10, Panel A, redemption fees charged by non-guaranteed funds increase with the fund's assets, 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 or in the management companies' funds, and the higher the fund's share of the market.

Finally, Table 10, Panel B, displays the results corresponding to guaranteed funds. Higher return and lower risk are associated with higher redemption fees. The penalty for redeeming shares also increases with the fund's assets, which is consistent

with the reason why this type of fees are present in most guaranteed funds. Finally, higher redemption fees are also more likely the higher the fund's average investment.

On the other hand, investors in fixed-income guaranteed funds face significantly lower redemption fees. This is possibly due to the fact that hedging the option implicit in equity guaranteed funds is more expensive, and hence the incentive to deter investors from redeeming shares is higher.

Finally, redemption fees tend to be less frequent and/or lower the higher the fund's market share, and the higher the average investment in the management company's funds.

5. 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 average before-fee returns and fund fees, suggesting that investors are not being compensated with extra returns for paying higher fees.

An interesting result is that larger funds are not cheaper in terms of management or custody fees, but in fact appear to be associated with higher redemption fees both for guaranteed and non-guaranteed funds, and with higher custody fees for guaranteed funds.

Another important fee determinant is the size of the fund's average investment, which is associated with lower total annual expenses (despite higher custody fees) for non-guaranteed and guaranteed funds, with lower front loads for guaranteed funds, and with lower redemption fees for non-guaranteed funds. Also, companies managing funds with higher average investments appear to be associated with lower custody fees and lower redemption fees for both non-guaranteed and guaranteed funds.

We have also found strong evidence supporting the hypothesis that non-guaranteed funds managed by companies belonging to banks and savings banks, are more expensive in terms of annual expenses and redemption fees, while management

companies belonging to banks obtain lower custody fees (this is also true for guaranteed funds).

Other variables have a less clear effect on fund ownership cost. For instance, the fund's age affects positively management fees charged by non-guaranteed funds and custody fees charged by guaranteed funds, although older guaranteed funds are associated with lower front loads. Also, the fund's market share has a positive effect on management fees and front loads charged by guaranteed funds, but decreases custody fees and redemption fees for both types of funds.

Put together, these results suggest that there are significant differences in mutual fund fees across funds with different characteristics. Some differences could possibly be attributed to better services. Such is the case, perhaps, of savings banks and bank-affiliated management companies. Other differences, however, are not justifiable from the investor's viewpoint. For instance, investors in older non-guaranteed funds and non-guaranteed funds with lower average investment per shareholder face higher annual costs. Another example is found in large funds which face higher redemption fees, or those managed by large companies, which pay higher custody fees.

We conclude that fee caps in Spain do not prevent management companies and custodial institutions from charging fees different from those consistent with increased competition in the industry. The recent reform permitting tax-exempt transfers between funds together with the trend towards more disclosure and transparency regarding fund fees and expenses may perhaps increase price competition in the industry 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 risk	Fund's 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*	POS*	0.74
Korkeamaki-Smythe (2003)	FINLAND (93)	1993-98	ER	*	POS	NEG*	POS*	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).

	Nº funds	**Average assets**	**Average number of shareholders**	**Average age**	**Average mean return**	**Average standard deviation of returns**
OBJ1	103	80,546.078	3,388.563	8.09	0.3266	0.2165
OBJ2	102	96,728.402	2,474.020	9.55	0.3205	0.4811
OBJ3	112	56,897.071	2,604.643	7.05	0.2228	1.3136
OBJ4	135	58,917.289	2,648.148	7.02	0.0547	3.2648
OBJ5	66	54,152.470	2,727.212	7.33	-0.1068	5.7867
OBJ6	23	38,918.304	1,134.087	7.70	0.6504	1.3953
OBJ7	29	146,227.690	4,678.379	7.51	0.2430	1.3127
OBJ8	30	45,668.300	2,238.533	5.80	0.1143	3.4268
OBJ9	45	81,653.444	4,471.333	5.45	0.0204	5.4815
OBJ10	66	54,360.470	3,310.545	4.66	0.0787	6.0763
OBJ11	82	44,930.415	1,882.671	5.14	0.3059	0.4434
OBJ12	175	60,225.806	2,879.869	3.98	0.2251	1.5497
OBJ13	32	25,377.156	996.438	5.87	0.0306	3.7835
TOTAL	1,000	64,866.760	2,769.449	6.46	0.1886	2.2904

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 load; and (iii) charge a redemption fee, on the final date.

	Custody fee	**Front 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.[15]
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.
AVRETURN:	Average monthly before-fee return over the 31 previous months.
VOLATILITY:	Standard deviation of monthly before-fee fund returns.

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

Table 6
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 $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. 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 p-value respectively. Although estimated coefficients for the variance specification are not reported in the Table, z_i includes the variables AGE, SAVINGS BANK, FRONTLOAD and CUSTFEE for non-guaranteed funds and VOLATILITY, OBJ11, AVINVESTMENT, MCASSETS, MCAVINVESTMENT, BANK, SAVINGS BANK and CUSTFEE for guaranteed funds. The Table also reports the likelihood ratio test for the null hypothesis that the model variables are not significant, as well as the likelihood ratio test for the null hypothesis that variables in the conditional variance are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
AVRETURN	0.0359	0.5337	0.1473	0.3141
VOLATILITY	0.0246	0.0786	-0.0391	0.2310
OBJ2	0.1984	0.0026		
OBJ3	0.3568	0.0000		
OBJ4	0.4769	0.0000		
OBJ5	0.6798	0.0000		
OBJ6	0.2330	0.0244		
OBJ7	0.2845	0.0082		
OBJ8	0.6437	0.0000		
OBJ9	0.8369	0.0000		
OBJ10	0.7944	0.0000		
OBJ11			-0.3266	0.0000
OBJ13	0.3583	0.0005		
ASSETS	0.0014	0.9375	-0.0239	0.4896
AVINVESTMENT	-0.1963	0.0000	-0.1819	0.0021
MCASSETS	-0.0246	0.0347	0.0138	0.4366
MCAVINVESTMENT	-0.0303	0.3221	-0.0659	0.5447
MKTSHARE	0.0067	0.4440	0.1075	0.0007
AGE	0.1943	0.0000	-0.0138	0.8795
INDEX	-0.1919	0.0673	0.0379	0.5545
BANK	0.1182	0.0167	0.0943	0.1881
SAVINGS BANK	0.1060	0.0413	0.0533	0.4839
CUSTFEE	0.3164	0.2188	-0.2867	0.3368
FRONTLOAD	-0.1561	0.0000	-0.0050	0.7608
REDFEE	0.0345	0.1443	0.0275	0.0782
Model Test	551.6572	0.0000	138.0879	0.0000
Heteroscedasticity Test	43.1560	0.0000	43.6009	0.0000
Number of Observations	*743*		*257*	

Table 7
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 $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. 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 respectively. Although estimated coefficients for the variance specification are not reported in the Table, z_i includes the variables AVRETURN, OBJ6, OBJ7, MKTSHARE, BANK, SAVINGS BANK and FRONTLOAD for non-guaranteed funds, and ASSETS, MCASSETS, MKTSHARE, BANK, SAVINGS BANK and MANAGFEE for guaranteed funds. The Table also reports likelihood ratio test for the null hypothesis that the model variables are not significant, as well as the likelihood ratio test for the null hypothesis that variables in the conditional variance are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
AVRETURN	0.0078	0.3386	0.0081	0.6906
VOLATILITY	0.0011	0.6198	-0.0138	0.0001
OBJ2	-0.0127	0.1530		
OBJ3	-0.0070	0.4843		
OBJ4	-0.0226	0.0455		
OBJ5	-0.0205	0.1894		
OBJ6	0.0160	0.3396		
OBJ7	-0.0263	0.0386		
OBJ8	-0.0195	0.3626		
OBJ9	-0.0301	0.0578		
OBJ10	-0.0029	0.8529		
OBJ11			-0.0429	0.0000
OBJ13	-0.0044	0.6793		
ASSETS	0.0041	0.1807	0.0159	0.0019
AVINVESTMENT	0.0103	0.0000	0.0278	0.0004
MCASSETS	0.0033	0.0477	0.0067	0.0541
MCAVINVESTMENT	-0.0168	0.0000	-0.1624	0.0000
MKTSHARE	-0.0034	0.0507	-0.0166	0.0004
AGE	0.0055	0.3046	0.0178	0.0942
INDEX	0.0177	0.3264	0.0379	0.0272
BANK	-0.0422	0.0000	-0.0223	0.0580
SAVINGS BANK	-0.0089	0.2287	-0.0976	0.0000
MANAGFEE	0.0360	0.0000	-0.0723	0.0000
FRONTLOAD	-0.0009	0.5362	-0.0011	0.6375
REDFEE	0.0041	0.1876	0.0015	0.4654
Model Test	255.4580	0.0000	166.4266	0.0000
Heteroscedasticity Test	167.8478	0.0000	76.6878	0.0000
Number of Observations	*743*		*257*	

Table 8
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 $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. 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 respectively. Although estimated coefficients for the variance specification are not reported in the Table, z_i includes the variables MCAVINVESTMENT and SAVINGS BANK for non-guaranteed funds, and VOLATILITY, OBJ11, AVINVESTMENT, MCAVINVESTMENT, BANK, and SAVINGS BANK for guaranteed funds. The Table also reports likelihood ratio test for the null hypothesis that the model variables are not significant, as well as the likelihood ratio test for the null hypothesis that variables in the conditional variance are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
AVRETURN	0.0396	0.4577	0.1843	0.2335
VOLATILITY	0.0201	0.1372	-0.0629	0.0446
OBJ2	0.2581	0.0000		
OBJ3	0.3864	0.0000		
OBJ4	0.4721	0.0000		
OBJ5	0.6358	0.0000		
OBJ6	0.3228	0.0002		
OBJ7	0.3379	0.0012		
OBJ8	0.6395	0.0000		
OBJ9	0.7847	0.0000		
OBJ10	0.7617	0.0000		
OBJ11			-0.3693	0.0000
OBJ13	0.3579	0.0001		
ASSETS	0.0023	0.8806	-0.0322	0.3619
AVINVESTMENT	-0.2247	0.0000	-0.1660	0.0053
MCASSETS	-0.0140	0.1773	0.0254	0.0880
MCAVINVESTMENT	-0.0025	0.9479	-0.1431	0.1661
MKTSHARE	0.0024	0.7199	0.1140	0.0016
AGE	0.2004	0.0000	0.0366	0.6732
INDEX	-0.1642	0.0549	0.0809	0.1809
BANK	0.0758	0.0959	0.0388	0.5271
SAVINGS BANK	0.0943	0.0364	-0.0111	0.8637
FRONTLOAD	-0.1662	0.0289	-0.0055	0.7134
REDFEE	0.0337	0.1594	0.0183	0.2370
Model Test	553.0324	0.0000	119.7996	0.0000
Heteroscedasticity Test	36.3282	0.0000	36.3017	0.0000
Number of Observations	*743*		*257*	

Table 9
Front 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 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 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 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 load; $\underline{y}$ is the minimum front 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 $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. In particular, z_i contains OBJ11, MCAVINVESTMENT, AGE, INDEX, CUSTFEE, and REDFEE. 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 respectively. The Table also reports likelihood ratio test for the null hypothesis that the model variables are not significant, as well as the likelihood ratio test for the null hypothesis that variables in the conditional variance are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
AVRETURN	0.4242	0.4589	1.0743	0.9845
VOLATILITY	0.0828	0.3072	0.3756	0.4682
OBJ11			0.0020	0.2299
ASSETS	0.1096	0.5473	-0.6507	0.9978
AVINVESTMENT	0.2215	0.2590	-1.9597	0.0569
MCASSETS	-0.1621	0.1863	-0.1203	0.0001
MCAVINVESTMENT	-0.5536	0.0298	4.6660	0.3002
MKTSHARE	0.0297	0.5588	1.0790	0.0000
AGE	0.4501	0.1732	-1.0261	0.0186
INDEX			-1.5495	0.2166
BANK	0.1551	0.7091	1.0347	0.0002
SAVINGS BANK	-0.8158	0.2234	2.3704	0.6447
MANAGFEE	-1.3717	0.0018	-0.9139	0.2883
CUSTFEE	-2.5444	0.3531	6.0565	0.0640
REDFEE	0.5162	0.0331	1.2307	0.0112
Model Test	36.8458	0.0004	277.6910	0.0000
Heteroscedasticity Test	---	---	52.4242	0.0000
Number of Observations	*743*		*257*	

Table 10
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 $\sigma_i = \sigma\exp(\gamma' z_i)$, where z_i is a vector of variables affecting the conditional variance. In particular, z_i contains ASSETS, AVINVESTMENT, MCAVINVESTMENT, MKTSHARE, and CUSTFEE for non-guaranteed funds, and VOLATILITY, AVINVESTMENT, MCASSETS, MCAVINVESTMENT, AGE, and FRONTLOAD 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 p-value respectively. The Table also reports likelihood ratio test for the null hypothesis that the model variables are not significant, as well as the likelihood ratio test for the null hypothesis that variables in the conditional variance are not significant.

	Panel A Non-guaranteed funds		**Panel B Guaranteed funds**	
	Estimated coefficient	P-value	Estimated coefficient	P-value
AVRETURN	-0.0039	0.9850	1.9517	0.0690
VOLATILITY	-0.0290	0.6507	-0.7307	0.0090
OBJ2	0.4608	0.0073		
OBJ3	0.6798	0.0007		
OBJ4	0.9604	0.0002		
OBJ5	1.3489	0.0023		
OBJ6	1.4712	0.0000		
OBJ7	0.8022	0.0205		
OBJ8	1.6545	0.0001		
OBJ9	0.9023	0.0415		
OBJ10	1.1983	0.0070		
OBJ11			-0.9140	0.0599
OBJ13	0.5751	0.3483		
ASSETS	0.1888	0.0090	0.6128	0.0121
AVINVESTMENT	-0.2065	0.0315	0.8162	0.0529
MCASSETS	0.1905	0.0000	0.0893	0.3875
MCAVINVESTMENT	-0.6072	0.0016	-0.9766	0.0875
MKTSHARE	-0.0729	0.0717	-0.5092	0.0664
AGE	0.0043	0.9709	-0.0361	0.9400
INDEX	-0.2125	0.5057	0.0454	0.8925
BANK	0.6567	0.0003	0.4575	0.6272
SAVINGS BANK	0.7701	0.0000	0.4942	0.5944
MANAGFEE	0.2931	0.0500	0.8185	0.0014
CUSTFEE	1.7713	0.0144	-3.2171	0.0390
FRONTLOAD	0.4604	0.0006	0.7269	0.0000
Model Test	327.1754	0.0000	280.4164	0.0000
Heteroscedasticity Test	46.1540	0.0000	100.6196	0.0000
Number of Observations	*743*		*257*	