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# Italian Open End Mutual Fund Costs\*

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This draft: January 30, 2008

## Abstract

We investigate the costs investors incur when they hold shares of Italian open end mutual funds. The overall explicit cost can range from less than 50 to well over 250 basis points in terms of assets under management. Nevertheless, mutual funds investors seem to be almost unaware of the importance of costs and tend to focus mainly on the net return when making their investment decisions. We measure the overall costs of a large sample of mutual funds managed by Italian intermediaries in the period 2000-2003 and also evaluate the determinants of cost efficiencies for the period 2000-2003.

*Keywords:* mutual fund expenses, total expense ratio, mutual fund transaction costs, economies of scale.

*JEL Classification:* G230; G240

*EFM Classification:* 370; 530

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# Italian Open End Mutual Fund Costs

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## **Abstract**

We investigate the costs investors incur when they hold shares of Italian open end mutual funds. The overall explicit cost can range from less than 50 to well over 250 basis points in terms of assets under management. Nevertheless, mutual funds investors seem to be almost unaware of the importance of costs and tend to focus mainly on the net return when making their investment decisions. We measure the overall costs of a large sample of mutual funds managed by Italian intermediaries in the period 2000-2003 and also evaluate the determinants of cost efficiencies for the period 2000-2003.

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Mutual fund investors incur fees and expenses when they buy and hold mutual fund shares: these costs pay for the expenses that mutual fund managers sustain when providing sales services, investment advice, portfolio management services, fund administration, fund shares subscription and reimbursement services and other costs directly related to the management of a mutual fund.

The Italian mutual fund industry managed at year end 2003 roughly € 500 billion: each basis point of cost charged over the asset managed accounts for € 50 million of revenues for the industry. At the same time, it represents a drag of the same amount over the return received by investors; the effect of this drag is particularly noticeable in periods of low interest rates and when stock markets perform poorly (as it was the case during the period under investigation). Moreover, fund expenses are largely predictable for investors and management companies, which cannot be said for fund returns; lastly, if the market of investment management services is not perfectly competitive, fund expenses are also rather manageable by the mutual fund industry and economies of scale are expected.

The purpose of the paper is twofold: i) to measure various cost aggregation and their composition and ii) to study the relationship of total costs with different factors (mainly endogenous to the fund management process) that can affect them and their effect in terms of cost efficiencies.

There are many reasons for further examining the costs charged on mutual funds in the Italian market, further than their absolute size:

- many analyses found little evidence of superior performance by more expensive funds. To the extent that these analysis are correct, a sensible way to select mutual funds would be choosing the less expensive ones;

- returns are more volatile than costs and so they can be a better predictor of future net performance. It is much easier to predict expensive funds than better performers;
- costs represent a significant drag over the gross performance, especially in markets characterized by low returns and for investments characterized by long time horizons such as mutual fund are;
- mutual fund investors tend to underestimate the importance of costs and to overestimate the importance of past returns and mutual funds return rankings in their investment selection decisions; a better information over mutual fund costs could at least partially correct the aforementioned bias;
- many of the components of mutual fund costs are under the direct control of the management company (mainly the management fee) and so a big portion of mutual fund expenses is subject to the free pricing decisions of the management company;
- mutual funds are prone to some potentiality for the exploitation of the agency relationship implied in the management relationship. Mutual fund managers have the incentive to give the least transparency over the costs generated by their decisions in order to benefit from the greatest freedom to exploit the conflicts at their advantage;
- economies of scale give a measure of the excess of supply in the market and provide information about the management ability to reduce costs.

We collected and analysed data concerning the costs of a large sample of Italian mutual funds in order to provide some important descriptive measures that are both relevant and to a large extent lacking (due to the difficulty of collecting data on Italian mutual fund costs for which there are no accessible databases). Then we developed and tested some hypotheses regarding the determinants of Italian mutual funds costs and efficiencies.

We give different contributions to the existing body of knowledge and provide some important descriptive statistics on the level, composition and trend in the costs of Italian mutual funds (and, conversely, in the gross return

from managing mutual funds for the Italian mutual fund industry). Furthermore, we investigate the main factors (i.e. size, age, specialization of the fund etc.) affecting the difference in the levels of the expenses that are charged to mutual fund investors. We aim also at establishing a standard framework for analysing mutual fund costs, at least in the Italian institutional framework, trying to overcome the limits of most of the cost measures commonly used, which fail to account for the whole range of expenses incurred by mutual fund investors. We treat explicitly the problem of trading costs generated by the management of mutual funds and investigate the economies of scale of the industry using a translog cost function.

## **PREVIOUS STUDIES**

In this Section we provide a summary of selected previous studies on mutual fund costs.

Ferris and Chance (1987) model the expense ratio of a sample (around 300 observations) of mutual funds regressing it against size, management style (growth, income), age, and type of distribution agreement (load/no load, presence of 12b-1 distribution agreements). They find that costs are negatively and significantly related to size, style (both growth and income) and age (the latter not in all the years under investigation).

Malhotra and McLeod (1997) in a paper on mutual fund expenses study a large sample of equity and bond funds for the years 1992 and 1993 and find that the total expense ratio for equity funds is negatively and significantly related to fund size, to portfolio turnover, to previous year's yield, to fund age, to the style dummy growth and to the number of funds in a fund complex, while the relationship is positive with the growth in assets, with the style dummy income, with the cash ratio of the fund and with the distribution variable 12b-1. For bond funds the total expense ratio is negatively and significantly related to fund size, the growth in assets, the weighted average maturity, while the

relationship is positive with the sales charge, with the distribution variable 12b-1, with age, with the beta of the fund, and with the past year's yield.

Using a large sample of U.S. equity and bond funds in 1996, Siggelkow (1999) finds that the expense ratio is negatively and significantly related to fund size and age (both in log transformation), to past performance, to the cash ratio and positively related to return volatility and to fund portfolio turnover.

Sec (2000), studies US mutual funds fees and expenses in order to provide summary statistics, to describe the evolution of mutual fund fees over time and to identify some of the factors that may affect the fees charged by mutual funds managers.

The data were collected at end of years 1979, 1992, 1995, 1996, 1997, 1998 and 1999 with regard to all open end mutual funds other than money market mutual funds (due to the different cost structure of the latter). The descriptive statistics provided in the SEC study show that both the unweighted and the weighted average of the expense ratio rose from 1979 to 1999; that international funds and specialty funds were significantly more expensive than other less specialized funds categories; that younger funds tended to have higher costs than fund that are in existence for more than 5 years; that bigger funds have lower expense ratios than smaller funds. Employing data of 8901 funds for the year 1999, Sec (200) found: an inverse and statistically significant relationship between expenses and fund assets, fund family size and fund family number, fund age, and categorical variables of specialization (domestic equity, hybrid funds, international equity, specialty fund) while the relationship with expenses was positive and statistically significant for the number of holdings, the turnover ratio, the categorical variable index fund and institutional fund.

McLeod and Malhotra (2001) regress the expense ratio of a sample of funds ranging from 658 in 1989 to 927 in 1991 over the following variables: size, age and a set of dummy variables identifying growth and income funds, load-funds and other dummy variables of particular interest in the US institutional framework. They find a negative and statistically significant

impact of size (both in absolute value and in log transformation) and age, and positive and statistically significant impact for growth, load-funds.

LaPlante (2001) finds that expense ratios for equity funds are negatively related to size and age of the fund; institutional and index funds are less expensive than retail and actively managed funds. For bond funds, size is no longer a significant regressor, except when employed in interaction with the investment objective. Fund age has a positive (and significant) impact on the expense ratio.

The consideration of the impact of trading costs on mutual fund expenses became apparent with the seminal paper of Livingston and O' Neal (1996) who studied mutual fund brokerage commission on a sample of 240 mutual funds for the period 1989-1993.

The brokerage commissions paid by mutual fund managers appear to be negatively and significantly correlated with fund size and positively and significantly correlated with the fund portfolio turnover and with the overall expense ratio. The relatively high size of the percentage commission paid is consistent with the hypothesis of soft dollars agreements (that is the inclusion in the brokerage commission of the payment of services other than trade execution – i.e. research, access to information providers, computer equipment, security analysis etc.). Conversely, since percentage commissions are positively correlated with the expense ratio, the hypothesis that fund managers who pay high commissions receive more services in the form of soft dollars and thus have lower direct cost is not confirmed (or at least they have lower costs but these are not passed along to fund investors in the form of lower management fees).

Also Fortin and Michelson (1998) examine the problem of trading costs for mutual funds. Costs induced by the trading activity of mutual funds managers can be relevant and can reduce the performance of the investment activity; nevertheless, they are not reported or, which is worse, are disguised in the reporting of mutual funds. Moreover, they are not included in the calculation of the expense ratio, the measure of cost most widely recognized by mutual fund investors. Over a total of 3790 fund-year observations they find a



percentage brokerage cost of 31 basis points, equal to 22% of the average reported expense ratio in the corresponding time period. Brokerage costs are the highest for international equity funds and the lowest for government and municipal bond funds. The brokerage costs appear to be significantly and positively related to the turnover of the fund, to the annual expense ratio (which is surprising if one considers the soft dollar hypothesis but not if the hypothesis is that managers who are not good at controlling transaction costs tend to treat recklessly also other cost categories) and to a dummy variable for load-funds. They are negatively related to the size (measured in absolute or log terms) of the fund.

In a recent working paper, Karcescki, Livingstone and O' Neal (2004) study trading costs for a sample of US equity mutual funds and find an average annual explicit brokerage commissions of 38 basis points and an average annual implicit trading cost of 58 basis points. In some cases, the sum of explicit and implicit trading costs is higher than the published expense ratio, but mutual fund investors are mostly unaware of those costs because of the difficulty in obtaining information on explicit trading costs, and the unavailability of implicit trading costs. They find that the most important brokerage commissions determinants are the turnover ratio, expense ratios, the dummy variables international equity, small firms and index fund, while specialty funds pay lower commissions (this result is quite puzzling and it is explained by the authors with the greater focus of specialty fund managers on a small group of securities). Fund size does not exert any significant influence on the brokerage commissions.

As for the Italian mutual fund industry, the paper of Cesari and Panetta (1998) studies style, fees and performance of Italian equity funds. In the section dedicated to mutual fund costs, they find that mutual fund management fees are negatively related to fund size, to fund age and positively related to the presence of incentive fees. When a bank controls the fund management company, management fees tend to be lower.

The rapid expansion of mutual fund industry produced an increase in the number of mutual funds in the market. So the issue of the economies of scale

in the mutual fund industry has become very important. If economies of scale exist, then fund expenses will decrease with every increase in the fund size.

A lot studies, such as those of Sirri and Tufano (1998), Siggelkow (1998, 2003) Nanda, Wang and Zheng (2004), find that the impact of fund expenses on net flows is negative.

In recent times mergers among mutual funds are fast emerging as a new phenomenon. As argued by Jamayraman, Khorana and Nelling (2002), with mergers, mutual funds can reduce the excess supply in the market and also gain from lower management costs due to economies of scale.

Analysis of the existing literature suggests three main considerations and lines for further analysis:

- there is a wide consensus and empirical proofs that some factors (size, age, turnover, management style etc.) affect mutual fund costs;
- transaction costs are an important component of total costs borne by mutual funds but they are quite difficult to measure and to analyse;
- the Italian market is underinvestigated.

Our purpose is to extend the analysis to the Italian context with particular attention to the impact of transaction costs.

## **DATA DESCRIPTION AND METHODOLOGY**

Italian open end mutual fund management companies are required to produce and to deliver (upon request) to mutual fund investors two main documents: the prospectus and the annual statement of information. The structure of both documents is mandatory (following both national and UE regulations) and, as far as the purposes of our analysis are concerned, they can be the source of the following information:

- from the prospectus, the total expense ratio (in percentage of the average assets under management of each year) and its composition (in terms of cost items that are included in its calculation);
- from the annual statement of information (again on annual basis) the total operating costs charged on the fund's assets, and from the

statement of additional information the breakdown of operating expenses (Part C, section IV) and the value of purchases and sales of securities.

We collected data from prospectuses for the years 2000-2003 and from statements of annual information for the years 2001-2003. Our database allows for changes in the denomination of the fund (since the ISIN code remains unchanged), but it does not take into account changes in the investment policy as long as the ISIN code of the fund and its Assogestioni<sup>1</sup> investment category are unchanged.

Because of the difficulties encountered in collecting and manually inputting data, the object of our study is a selected group of funds . The coverage of our database is acceptable: it ranges from 54% (Equity Pacific) to 90% (Money Market) in terms of yearly average assets under management.

We first analyzed the total expense ratio (Ter) as it is drawn from the prospectus and defined as ratio between operating costs borne by the fund net assets (and so ultimately by the mutual fund investors) and yearly average asset under management<sup>2</sup> (Aaum). The operating costs charged on the fund assets are the management fee, (also called investment advisory fee), the administrative costs, the bank depository fee, the distribution fees and other operating expenses.

Summary statistics on the Ter for our sample are provided in table 1. Fund expenses are directly related to the fund management complexity (equity funds are more expensive than bond funds and than money market funds) and indirectly related with fund size (the average weighted by the asset under management is lower than the simple average). There is no clear time trend in fund expenses over the period under investigation.

(insert table 1 about here)

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<sup>1</sup> Assogestioni (Associazione dell'Industria del Risparmio Gestito) is the body representing Italian fund management companies (Società di Gestione del Risparmio); it produces and distributes statistics on industry data (assets under management, subscriptions and redemptions of mutual fund shares etc.).

<sup>2</sup>The average is calculated on the basis of end of month data.

Transaction costs are an important cost item in the determination of total costs incurred by mutual fund investors. They are clearly linked to the frequency and relevance of transactions decided by mutual fund managers and are composed of explicit costs (brokerage commissions) and of implicit costs (both in the form of execution and in the form of non-execution costs<sup>3</sup>) directly caused by the trading activity<sup>4</sup>.

Italian mutual funds report information on explicit transaction costs<sup>5</sup> (brokerage commissions paid, Part D) in the statement of additional information. In order to investigate the transaction cost impact on the costs borne by equity mutual fund investors we built a detailed database spanning on the last three years of our sampling period. The number of funds in our sample and other descriptive statistics of relevance are exposed in table 2. We decided to limit the analysis of explicit transaction costs only to equity funds for two reasons: the amount of secondary market transactions of money market mutual funds is negligible when compared to their assets under management due to the short average maturity of their assets and usually bonds are traded on dealer markets, where it is not possible to obtain the transaction cost paid from the accounting documents, since it is embedded in the gross purchase or sale price.

Data about explicit transaction costs were used to calculate the Total Expense and Commission Ratio<sup>6</sup> (Tecr) defined as the ratio of the sum of operating costs plus brokerage commissions not included in operating costs to the yearly average asset under management. Summary statistics on the Tecr and

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<sup>3</sup> The reader is referred to the vast literature on transaction costs; for example Keim and Madhavan (1998), Perold (1988), Wayne and Edwards (1993).

<sup>4</sup> There is one more subtle cost indirectly linked to the transaction activity and it comes from the diversion of portfolio manager time and attention when she actively engages in frequent transactions and so under-allocates her time to other core asset management activities (Cassidy 2004).

<sup>5</sup> The cost of trading is defined as the sum of all costs directly associated with trading and includes explicit costs (the only that are directly accounted for in the information provided by mutual fund companies, like commissions and taxes), implicit costs (given by the adverse impact that trades might have on market prices) and missed trade opportunity costs. For further details refer to Harris (2003).

<sup>6</sup> We drew the denomination of the aggregate under investigation from (Cassidy 2004).

on the incidence of explicit transaction cost on average yearly assets under management (Tcaum<sup>7</sup>) are reported in table 2.

(insert table 2 about here)

Three aspects are noticeable:

- there is a remarkable lack of homogeneity in the treatment of brokerage commissions. The funds in the sample are almost evenly divided as far as the inclusion of brokerage commissions in "operating costs" and in "other costs";
- brokerage commissions represent a sizeable portion of the total costs charged on the mutual fund investor; on average they represent 44 basis points in terms of asset under management for equity funds in the sample with little variation from year to year and a slightly declining trend;
- a high variability emerges. It remains to be explained whether the latter form of variability comes from true differences in the transaction behaviour (for example, some managers might be keener than other to negotiate hard for commission rebates or might be more active in their transaction style than others) or in differences in the reporting of brokerage commissions.

14% of equity funds in our sample<sup>8</sup> report no transaction costs<sup>9</sup>. Since we can expect that no equity fund has in a given year a zero portfolio turnover, there must be clearly not infrequent problems of reporting opacity. This is confirmed by the fact that, along with many fund management companies reporting brokerage commissions for all the funds managed, other do not report

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<sup>7</sup> The Tcaum statistic is not simply the difference between the total expense and commission ratio and the total expense ratio, because in some cases the brokerage commissions are included in the operating costs and in some cases they are not.

<sup>8</sup> When data are drawn from the annual statement of information data are limited to the three year period 2001-2003.

<sup>9</sup> There is no significant difference in the transparency among different equity fund categories. Equity funds specialized in market where securities are mostly traded in order driven markets (like the ones specialized in domestic equities) show no appreciable difference from funds specialized securities mostly traded in quote driven markets (like US equity).

explicit transaction costs for any of the fund managed by them or only for a fraction of the funds managed.

The main cost component (table 3) is given by commission fees, followed, for equity funds, by brokerage fees and for bond and money market funds by bank depository fees.

(insert table 3 about here)

We noticed a remarkable tendency of commission fees to cluster around a few focal points that account, especially for equity funds, for most of the frequency distribution (table 4). Fund management companies appear to follow a not very competitive stance towards the pricing of the management service they provide to investors.

(insert table 4 about here)

For the issue of economies of scale, we first estimate a translog cost function to determine which factors contribute to economies of scale and their degree of importance. Then we estimate the cost elasticity with respect to assets taking the first derivative of the translog function. We create subsets in order to measure cost elasticity for different groups according to the size of funds<sup>10</sup> and the category (bond, money market and equity). Panel data analysis shows that on average there are no economies of scale over the period under investigation.

## **MODEL SPECIFICATION AND RESULTS**

Next we examined some factor affecting the total expense ratio and the total expense and commission ratio to address the issue of the determinants of mutual fund expenses ( according both to the fund prospectus definition and to our proposed methodology).

The variables under scrutiny are reported in table 5. Their rationale is the following:

- average yearly assets under management (SIZE) of the fund. It is expected to capture the effect of scale economies in the portfolio management process and the market power exerted by bigger funds on

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<sup>10</sup> Size categories are defined as percentiles of yearly average asset under management: (1)  $\leq$  €50million; (2) €50m.-€250m.; (3) €250m.-€500m.; (4) €500m.-€750m.; (5)  $>$ €750m.

external services providers (i.e. depository banks, brokerage firms, etc.). Greater assets under management should thus translate into lower unitary costs;

- average yearly assets under management of the fund management company (SIZECOMP) could account for the possibility of economies of scope and for the market power of the management company. If a fund is managed by a big management company, all other things being equal, it could have lower expenses since it could benefit from common costs that can be spread over a larger base;
- degree of activism of fund investors (ACTIV), given by the sum of fund underwritings and reimbursements divided by the average yearly assets under management. The ordinary way in which Italian mutual fund investors buy and sell open end mutual fund shares is not via secondary market transactions but via underwriting of new shares and reimbursement of shares held. This can be expected to induce a strain over the cash management of the fund and to enhance transaction costs (and total costs) that the fund has to face in order to meet the reimbursement requests;
- the age (AGE) of the fund, measured in number of months since the creation of the fund. Older funds are likely to be larger than younger funds and the latter are normally created in a process of product differentiation in which the management companies identify some new and more expensive product (i.e. hyper-specialized funds). Finally, younger funds might be managed by less experienced money managers, who are at the earlier stages of their learning curve. Thus older funds could be expected to be less expensive than younger ones;
- $R^2$  (RSQ), the coefficient of determination (goodness of fit of the fund returns to the fund's benchmark returns). It identifies the management style of the fund, discriminating passively managed funds (the ones with high  $R^2$ ) from actively managed funds (the ones with low  $R^2$ ); the rationale behind that distinction is that the cost of the two different

styles should differ because active management absorbs more resources than passive management;

- similarly, the  $\beta$  (BETA) of the fund (calculated by the ordinary market model with respect to the fund's benchmark) measures the degree of aggressiveness of the management style. Funds with higher  $\beta$  are likely to be more expensive to run in terms of research and amount of information needed than more conservative funds;
- the turnover (TURN) of the portfolio, measured by the sum of purchases and sales of securities divided by the average yearly assets under management, distinguishes funds that engage in an intense trading activity from the others. A more intense trading activity should translate in higher transaction costs;
- a dummy variable (DDEQ) separates funds that are specialized in Italian equities from others, under the hypothesis that investment in domestic equity are likely to be less expensive in terms of research, transaction costs and settlement and depository costs than international equity funds;
- a dummy variable (IND) separates funds that are managed by companies owned by a bank from others. When a fund management company belongs to a bank conglomerate, on one side, we can expect lower transaction costs due to scope and scale economies at the conglomerate level. Conversely, when a management company is part of a bank conglomerate, costs might be higher due to both its higher market power in the distribution phase towards the bank customers and to some form of transfer pricing within the conglomerate. In the latter case, if the fund management industry is relatively less competitive than other markets served by the bank conglomerate, we can expect higher costs because of a rent exploiting behaviour.

(insert table 5 about here)

The regression models were tested for equity funds and for the following dependent variables: total expense ratio, total expense and commission ratio and transaction costs over assets under management.



$$\begin{aligned} \text{Ter} = & a + b1 \text{ SIZE} + b2 \text{ SIZECONG} + b3 \text{ ACTIV} + b4 \text{ AGE} + b5 \text{ RSQ} + \\ & + b6 \text{ BETA} + b7 \text{ TURN} + b8 \text{ DDEQ} + b9 \text{ IND} + e \end{aligned}$$

[1]

$$\begin{aligned} \text{Tecr} = & a + b1 \text{ SIZE} + b2 \text{ SIZECONG} + b3 \text{ ACTIV} + b4 \text{ AGE} + b5 \text{ RSQ} + \\ & + b6 \text{ BETA} + b7 \text{ TURN} + b8 \text{ DDEQ} + b9 \text{ IND} + e \end{aligned}$$

[2]

$$\begin{aligned} \text{Tcaum} = & a + b1 \text{ SIZE} + b2 \text{ SIZECONG} + b3 \text{ ACTIV} + b4 \text{ AGE} + b5 \text{ RSQ} + \\ & + b6 \text{ BETA} + b7 \text{ TURN} + b8 \text{ DDEQ} + b9 \text{ IND} + e \end{aligned}$$

[3]

(insert table 6 about here)

The results, shown in table 6, suggest that:

- size of the managed fund (SIZE) has a statistically significant and negative impact on mutual fund costs. Bigger equity funds tend to show lower expenses, after controlling for the other independent variables, than smaller funds both when measured against Ter and against Tecr (the definition of expenses including explicit transaction costs). This is an indication of the existence of scale economies in the production process of mutual fund management. The influence of size is no more significant when the dependent variable are the transaction costs only; the sign remains negative, but the coefficient is not significantly different from zero;
- the size of the management company (SIZECOMP) exhibits a statistically significant and negative impact on costs for all the dependent variables under investigation, indicating the existence of scope economies. Funds that are managed by a company characterized by a higher amount of total assets under management have lower expenses than others because they can benefit from common costs sharing and company wide learning curve effects;

- the management style of the fund (measured by its  $R^2$  - RSQ) has the expected effect on mutual fund expenses. Funds with higher  $R^2$  are less costly than fund more actively managed and thus with lower  $R^2$ ;
- the turnover of the fund portfolio (TURNOVER) is directly related to mutual fund costs – funds engaging in a greater portfolio turnover pay higher transaction costs - only when these are measured with the definitions that include the explicit transaction costs (Tocr) or are focused on them (Tcaum), while the coefficient is not statistically significant when its impact is measured against the Ter;
- a similar effect is observed with reference to the dummy variable domestic equity (DDEQ). The cost advantage coming from investing in domestic equities is apparent only when its effect is measured with reference to the Tocr and the Tcaum: trading domestic shares (on the domestic market where the vast majority of domestic equities are listed) is less expensive than trading foreign shares (on foreign markets);
- independent management companies (DIND) tend to have lower costs when these are measured in term of the simple Ter, while the effect is more straightforward when costs are defined as inclusive of transaction costs (Tocr) or limited only to transaction costs (Tcaum);
- the degree of fund shares underwriters' activism (ACTIV), the age of the fund (AGE) and the beta (BETA) of the fund do not show any significant impact over the different cost definitions.

In financial economics, the translog model is the most pervasive approach for investigating economies of scale. It implicitly implies an U - shaped average cost function and is useful to measure the economies of scale according to different level of fund assets. The translog function requires cost and output measures. The output of mutual funds is total asset under management. Total cost for each fund is defined as the total expenses, including the management fee. Fund's total expenses are modelled as function of total assets and of control variables that affect the level of expenses (see Eq. [4]). OLS regression is used to find coefficients for the independent variables.

$$\text{Ln Cost} = \beta_0 + \beta_1 \ln \text{SIZE} + \frac{1}{2} \beta_2 (\ln \text{SIZE})^2 + \sum_j \beta_j X_j + e \quad [4]$$

Ln Cost is the natural logarithm of the amount of total expenses, SIZE represents the yearly average asset under management of each fund, and  $X_j$  includes control factors that affect the costs.

(Insert table 7 about here)

We run separate regression for each year and for the period 2000-2003. The results are shown in table 8

(Insert table 8 about here)

Some of these results are expected. Adjusted RSQ is large for all four years, which means that the translog function is well specified for explaining economies of scale. The translog function explains 92%-94% of the variability of funds' costs for each of the four years. The natural logarithm of SIZE has positive coefficient estimates, as expected because the level of assets directly affects funds' costs. But the effect is more than proportional, because the value is greater than 1 and statistically significant for all the years. The ACTIV coefficients are statistically significant and negative related to the economies of scale for all four years. It implies economies of scale for the funds with higher number of operations.

Three coefficients of LnSIZECOMP are positive and one is negative; they are small values and not statistically significant for three years (2001, 2002 and 2003), which means that there is no clear evidence of relationship between economies of scale and the size of the company. AGE effect is small and not statistically significant. The negative sign means that older funds can reduce costs better than younger funds. The coefficients of the BETA are not statistically significant, while the degree of activism RSQ has a positive and statistically significant impact for all four years, as expected because of the higher management costs. The number of funds NF has a small relation with respect to the costs; its coefficients change the sign over the four year period and are not statistically significant.

The most common measure of operating efficiency in economies of scale is the elasticity of cost with respect to the output. Taking the first derivative of translog function with respect to the asset, we obtain this measure:

$$\frac{\partial(\text{Ln}COST)}{\partial(\text{Ln}SIZE)} = \beta_1 + \beta_2(\ln SIZE) \quad [5]$$

When the rate of increase in output exceeds the rate of increase in cost in an industry, then economies of scale characterize that industry. For mutual fund industry, if expenses increase less than proportionately with changes in fund assets then economies of scale exist. Cost elasticity is computed for the whole panel, for fund size and fund category, using the model in Equation 5.

The main results are:

- average cost elasticity for the whole panel shows no economies of scale over the period 2000-2003;
- there is a positive relation between economies of scale exist and fund size;
- average cost elasticity of equity funds and bond funds show diseconomies of scale over the period 2000-2003.

(Insert table 9 about here)

## **SUMMARY AND CONCLUSIONS**

In this paper we analysed Italian open end mutual fund costs with the objectives of collecting some new pieces of information on the Italian market and of investigating the determinants of mutual fund costs in the Italian context.

Our analysis showed a quite composite landscape, characterized both by a low level of transparency from mutual fund management companies and by an insufficient awareness of the importance of costs from mutual fund investors. The collection of the data needed for the realization of our analysis was an extremely time consuming task, mainly because of the lack of an accessible database.

We found that mutual fund costs are sizeable and show no sign of decline over time. Management fees are the main cost component.

Transaction costs are an important component of the total cost borne by the mutual fund investors, but, differently from the Ter and the percentage management fee, they are not reported in an accessible manner to the investors (i.e. in the prospectus).

The prospectus is normally seen as an instrument for first time investors and the annual report is the natural source of information for existing shareholders (Cassidy, 2004). We deem to be advisable that the management companies report them in due light both in the prospectus and in the annual report.

When selecting equity funds, the cost aware investor should select the ones characterized by big size, managed by a large management company, with a passive management style, specialized in Italian equity. Other factors examined seemed to be, in our sample, less influential.

Mutual fund management companies show a very mild degree of competition on the management commissions that are clustered around a few focal points.

A higher level of transparency would help investors to select lower-cost funds; the resulting harsher competition would drive actions by mutual fund companies to lower fees and expenses in order to attract cost aware investors.

We looked at economies of scale over a four year period, from 2000 to 2003. Cost elasticity has been variable over the years. Average cost elasticity of the Italian mutual fund industry does not show economies of scale over the period 2000-2003. On an average, funds with larger size show greater economies of scale. Equity funds and bond funds show an average elasticity value greater than 1 over the period 2000-2003. For equity funds, this is particularly due to the diseconomies of scale encountered in year 2000. A reason may be referred to the increase of equity fund supply in 2000, thanks to the introduction of specialised equity funds. Bond funds show no noticeable changes in cost elasticity, notwithstanding the decreasing of yearly average

asset under management. Money market funds' average cost elasticity is less than 1 over the 4 years and their size increased over the period 2000-2003.

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**Table 1 - Total Expense Ratio**

This table presents summary statistics for the Total Expense Ratio (Ter) of a sample of open end mutual funds managed by Italian management companies. In panel B we present the evolution of the Ter for a closed subsample of funds with observations for the complete period of four years.

**Panel A**

<u>Equity</u>						
<i>Whole sample</i>		full period	2000	2001	2002	2003
Mean		0,0224	0,0227	0,0209	0,0214	0,0246
Median		0,0204	0,0200	0,0195	0,0201	0,0224
St. Dev.		0,0072	0,0084	0,0066	0,0053	0,0078
Weighted Average		0,0223	0,0245	0,0202	0,0209	0,0226
N. obs		1251	259	312	332	348
<u>Money market</u>						
Mean		0,0073	0,0079	0,0077	0,0071	0,0067
Median		0,0071	0,0076	0,0075	0,0071	0,0066
St. Dev.		0,0025	0,0029	0,0026	0,0022	0,0021
Weighted Average		0,0070	0,0080	0,0072	0,0069	0,0068
N. obs.		142	31	35	36	40
<u>Bond</u>						
Mean		0,0124	0,0118	0,0125	0,0124	0,0128
Median		0,0118	0,0115	0,0117	0,0118	0,0119
St. Dev.		0,0032	0,0030	0,0030	0,0031	0,0037
Weighted Average		0,0112	0,0115	0,0116	0,0113	0,0107
N. obs.		453	97	113	122	121

**Panel B**

<u>Equity</u>					
<i>Closed sample</i>		2000	2001	2002	2003
Mean		0,0228	0,0204	0,0211	0,0242
Median		0,0200	0,0193	0,0202	0,0223
St. Dev.		0,0084	0,0053	0,0044	0,0066
N. obs.		247	247	247	247
<u>Money market</u>					
Mean		0,0079	0,0073	0,0070	0,0068
Median		0,0079	0,0072	0,0069	0,0066
St. Dev.		0,0030	0,0025	0,0022	0,0022
N. obs.		30	30	30	30
<u>Bond</u>					
Mean		0,0120	0,0126	0,0125	0,0129
Median		0,0118	0,0118	0,0120	0,0120
St. Dev.		0,0029	0,0030	0,0028	0,0036
N. obs.		92	92	92	92

**Table 2 - Total Expense and Commission Ratio**

This table presents summary statistics for the Total Expense and Commission Ratio (Tocr) and of the incidence of explicit transaction cost over average yearly assets under management (Tcaum) for a sample of equity open end mutual funds managed by Italian management companies.

Tocr	Full period	2001	2002	2003
Mean	0,0253	0,0243	0,0242	0,0271
Median	0,0237	0,0224	0,0228	0,0253
St. Dev.	0,0068	0,0071	0,0061	0,0068
Weighted Average	0,0242	0,0235	0,0241	0,0252
N. obs.	739	210	262	267
Tcaum	Full period	2001	2002	2003
Mean	0,00438	0,00498	0,00426	0,00402
Median	0,00289	0,00304	0,00271	0,00294
St. Dev.	0,00452	0,00521	0,00453	0,00386
Weighted Average	0,00360	0,00429	0,00313	0,00326
N. obs.	647	181	232	234

### Table 3 - Cost components

This table presents the weight of the main components of the Total Expense and Commission Ratio (Tecr).

#### Management fees

	Full period	2001	2002	2003
Equity	0,8043	0,7796	0,8114	0,8295
Money market	0,8829	0,8682	0,8928	0,8833
Bond	0,9060	0,9036	0,9090	0,9058
Overall	0,8371	0,8129	0,8425	0,8575

#### Bank depository Fees

Equity	0,0485	0,0506	0,0482	0,0461
Money market	0,1119	0,1233	0,1007	0,1133
Bond	0,0809	0,0813	0,0781	0,0836
Overall	0,0649	0,0631	0,0613	0,0702

#### Brokerage commissions

Equity	0,1314	0,1570	0,1146	0,1155
Money market	0,0009	0,0006	0,0004	0,0013
Bond	0,0062	0,0063	0,0064	0,0059
Overall	0,0858	0,1125	0,0770	0,0659

**Table 4 - Focal points in management fees**

This table presents the focal points at which the percentage management fees tend to cluster. The source is the prospectus.

Equity		Money market		Bond	
Mode	1,80%	Mode	0,60%	Mode	1,00%
Commission	Freq. %	Commission	Freq. %	Commission	Freq. %
1,50%	16,3	0,50%	8,8	0,80%	9,9
1,60%	9,3	0,60%	21,9	0,90%	7,7
1,70%	4,3	0,70%	6,9	1,00%	27,4
1,80%	24,5	other	62,5	1,10%	5,7
1,90%	6,9			1,20%	9,6
2,00%	5,7			other	39,7
other	33,0				

**Table 5 - Variables and measures**

This table lists the variables employed in the regression analysis, their measures and their expected effect on the dependent variables under scrutiny.

Variable	Measure	Expected sign on Ter	Expected sign on Tecr	Expected sign on Tcaum
SIZE	Average yearly assets under management	-	-	-
SIZECONG	Average yearly assets under management of the fund management company	-	-	-
ACTIV	turnover of the asset under management of the fund, given by the sum of yearly subscriptions and redemptions divided by the yearly average assets under management	+	+	+
AGE	number of months since the creation of the fund	-	-	-
RSQ	goodness of fit of the fund returns to the fund's benchmark returns	-	-	-
BETA	coefficient of the ordinary market model with respect to the fund's benchmark	+	+	+
TURN	sum of purchases and sales of securities divided by the average yearly assets under management	+	+	+
DDEQ	dummy variable, equal to 1 for funds specialized in Italian equities domestic equity	-	-	-
DIND	dummy variable, equal to 1 if the fund is not managed by a company controlled by a bank	?	?	?

**Table 6 - Regression analysis**

This table shows the regressions results for the model

$$\text{Ter} = a + b_1 \text{SIZE} + b_2 \text{SIZECONG} + b_3 \text{ACTIV} + b_4 \text{AGE} + b_5 \text{RSQ} + b_6 \text{BETA} + b_7 \text{TURN} + b_8 \text{DDEQ} + b_9 \text{IND} + e$$

The same model is employed for the dependent variables Tecr and Tcaum

Dependent variable	Ter	Tecr	Tcaum
<b>Independent Variables:</b>			
<i>Intercept</i>	0,042	0,046	0,010
t	13,575	13,935	4,380
prob.	0,000	0,000	0,000
<i>SIZE</i>	-0,0000023	-0,0000021	-0,0000023
t	-3,286	-3,670	-0,406
prob.	0,001	0,000	0,685
<i>SIZECOMP</i>	-0,0000009	-0,0000015	-0,0000018
t	-2,396	-3,670	-6,319
prob.	0,017	0,000	0,000
<i>ACTIV</i>	0,00054	0,00050	0,00057
t	1,707	1,427	2,315
prob.	0,088	0,154	0,021
<i>AGE</i>	-0,000011	-0,0000048	-0,0000036
t	-2,378	-0,925	-0,989
prob.	0,018	0,356	0,323
<i>RSQ</i>	-0,016	-0,021	-0,008
t	-5,912	-6,979	-3,773
prob.	0,000	0,000	0,000
<i>BETA</i>	-0,0024	-0,0010	0,00084
t	-1,225	-0,486	0,556
prob.	0,221	0,627	0,578
<i>TURN</i>	0,000011	0,00041	0,00041
t	0,236	8,093	9,768
prob.	0,813	0,000	0,000
<i>DDEQ</i>	-0,0014	-0,0035	-0,0024
t	-1,994	-4,675	-4,459
prob.	0,047	0,000	0,000
<i>DIND</i>	-0,0042	-0,0020	0,0022
t	-4,262	-1,842	2,637
prob.	0,000	0,066	0,009
F-Test	12,153	20,060	20,683
Prob>F	0,000	0,000	0,000
Adj.RSQ	0,121	0,186	0,210
OBS	729	751	667

**Table 7 - Translog function: variables and measures**

This table lists the variables employed in the translog function, their measures and their expected effect on the dependent variables under scrutiny.

Variable	Measure	Expected sign
SIZE	Average yearly assets under management	-
Ln SIZECOMP	Natural logarithm of the average yearly assets under management of the fund management company	?
ACTIV	turnover of the asset under management of the fund, given by the sum of yearly subscriptions and redemptions divided by the yearly average assets under management	+
AGE	number of months since the creation of the fund	-
RSQ	goodness of fit of the fund returns to the fund's benchmark returns	-
BETA	coefficient of the ordinary market model with respect to the fund's benchmark	+
NF	number of funds family	-



**Table 8 – Translog function: regression analysis**

This table shows the regressions results for the model:

$$\text{Ln Cost} = \beta_0 + \beta_1 \text{Ln SIZE} + \frac{1}{2} \beta_2 (\text{Ln SIZE})^2 + \sum_j \beta_j X_j + e$$

Panel data results are based on the 1203 observations formed by pooling the cross sectional and time series data for the period 2000-2003

Dependent variable	2000	2001	2002	2003	Panel data model 2000 - 2003
<u>Independent Variables:</u>	Ln Cost				
<i>Intercept</i>	-4,6874	-4,2967	-4,5817	-4,7953	-4,6453
t	-14,7912	-18,4726	-23,8453	-24,3533	-41,6704
prob.	0,0000	0,0000	0,0000	0,0000	0,0000
<i>Ln SIZE</i>	1,4134	1,0167	1,0530	1,0976	1,0764
t	12,3028	17,9820	20,6131	21,8861	35,6537
prob.	0,0000	0,0000	0,0000	0,0000	0,0000
<i>(Ln SIZE)<sup>2</sup></i>	-0,0320	-0,0098	-0,0146	-0,0231	-0,0153
t	-2,9491	-1,6010	-2,6582	-4,4283	-4,8913
prob.	0,0035	0,1105	0,0083	0,0000	0,0000
<i>ACTIV</i>	-0,1159	-0,1226	-0,1026	-0,0507	-0,0948
t	-3,8349	-3,7649	-4,1978	-1,6492	-6,5627
prob.	0,0002	0,0002	0,0000	0,1001	0,0000
<i>Ln SIZECOMP</i>	-0,1163	0,0094	0,0244	0,0565	0,0197
t	-3,0561	0,3473	1,0767	2,4774	1,4919
prob.	0,0025	0,7286	0,2824	0,0137	0,1360
<i>AGE</i>	-0,0006	-0,0004	0,0001	-0,0004	-0,0003
t	-0,8760	-0,7919	0,1580	-0,9403	-1,1177
prob.	0,3819	0,4291	0,8746	0,3478	0,2639
<i>BETA</i>	-0,0019	-0,0620	-0,0475	-0,0932	-0,0536
t	-0,0375	-1,4558	-1,1963	-2,0373	-2,3520
prob.	0,9701	0,1466	0,2325	0,0424	0,0188
<i>RSQ</i>	0,5673	0,6816	0,7268	0,7795	0,7945
t	3,5399	4,9713	6,0779	5,6619	11,6750
prob.	0,0005	0,0000	0,0000	0,0000	0,0000
<i>NF</i>	0,0076	0,0013	-0,0008	0,0017	0,0014
t	1,8036	0,3806	-0,2499	0,5002	0,7912
prob.	0,0725	0,7038	0,8028	0,6173	0,4290
F-Test	384	507	632	516	1952
Prob. > F	0,0000	0,0000	0,0000	0,0000	0,0000
Adj. RSQ	0,9242	0,9341	0,9401	0,9237	0,9285
OBS	252	287	323	341	1203

**Table 9 – Cost elasticity**

This table shows the summary statistics for the cost elasticity measure.

**Average cost elasticity**

	2000	2001	2002	2003	panel data
Number of funds	252	287	323	341	1203
<i>Cost elasticity</i>	1,237	0,965	0,945	0,986	0,998

**Elasticity by fund size**

	Panel data	Group 1	Group 2	Group 3	Group 4	Group 5
Mean	0,998	1,062	1,031	0,999	0,973	0,952
Median	0,996	1,056	1,030	0,998	0,973	0,954
Min.	0,928	1,050	1,019	0,983	0,961	0,928
Max	1,097	1,097	1,050	1,018	0,983	0,960
St. dev..	0,026	0,014	0,008	0,009	0,006	0,007
Skewness	0,476	1,197	0,390	0,308	-0,194	-1,214
Kurtosis	0,383	0,074	-0,903	-0,852	-1,136	1,539
N. obs.	1203	44	204	618	264	72

**Elasticity by fund category**

	Panel data	Money Market	Equity	Bond
Mean	0,998	0,915	1,030	1,047
Median	0,996	0,914	0,976	1,046
Min.	0,928	0,768	0,914	0,980
Max	1,097	0,996	1,333	1,140
St. dev.	0,026	0,044	0,113	0,032
Skewness	0,476	-0,094	1,381	0,353
Kurtosis	0,383	0,237	0,296	-0,167
N. obs.	1203	129	803	271

**Yearly average elasticity by fund category**

	Average	2000	2001	2002	2003
<i>Panel data</i>	0,998	1,237	0,965	0,945	0,986
<i>Money Market</i>	0,915	0,982	0,865	0,913	0,913
<i>Equity</i>	1,030	1,246	0,943	0,970	1,006
<i>Bond</i>	1,047	1,080	1,019	1,043	1,049

**Average asset under management by category**

AUMM	Equity	Monetary	Bond
2000	526,407	690,124	785,073
2001	356,341	991,886	709,146
2002	240,851	1.788,201	564,587
2003	191,528	2.478,601	593,556