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1. INTRODUCTION

The US Investment Advisers Act of 1940 generally prohibited incentive-based performance fees[1], including any compensation based on performance relative to a benchmark index. In 1970, this act was amended allowing investment companies and those advisers whose clients had at least $1 million under management to use performance-based compensation contracts only if symmetric[2]. Some years later the Securities and Exchange Commission revised the threshold level[3] and imposed specific disclosures to be made to clients entering into these contracts. In 1998 the Commission adopted amendments to the above rule providing "*investment advisers great flexibility in structuring performance fee arrangements with clients who are financially sophisticated or have the resources to obtain sophisticated financial advice regarding the terms of these arrangements*"[4]

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1 *"No investment adviser shall make use of mails or any means ..., directly or indirectly, to enter into, extend, or renew any investment advisory contract,...,if such contract: 1) provides for compensation to the investment adviser on the basis of a share of capital gains upon or capital appreciation of the funds or any portion of the funds of the clients; ..."(The Investment Advisers Act, 15 -80b-5).*

2 *These contracts "provide for compensation based on the asset value of the company or fund under management averaged over a specified period and <u>increasing or decreasing proportionately with the investment performance of the company or fund</u> over a specified period in relation to the investment record of an appropriate index of securities prices or such other measure of investment performance as the Security and Exchange Commission by rule, regulation or order may specify" (The Investment Advisers Act, 15 -80b-5).*

3 *In 1985 the Securities and Exchange Commission adopted rule 205-3 permitting performance fee contract only to clients with at least $500.000 under the adviser's management or with a net worth of more than $1.000.000.*

4 *The amendments to rule 205-3 eliminated specific contractual and disclosure requirements and revised client eligibility criteria under the rule [(a)clients with at least $750.000 under management with the adviser or more than $1.500.000 of net worth; (b)clients who are "qualified purchasers" and (3) knowledgeable employees of the*

According to the SEC, the potential for the adviser under a performance fee arrangement is to engage in excessive risk taking. This position has found support in some theoretical works[5].

Nevertheless, unlike the institutional emphasis, much of the recent literature on portfolio management has not been concerned with the form of agency contract, focusing rather on performance measurement questions. Moreover, only few empirical studies have directly analysed the relationship between performance and the fund manager reward schedule. The present study has been conducted in the attempt to provide insights into this field. The aim of the research is to test whether investors pay an equitable compensation to fund managers, that is whether different reward schedules reflect agents' different abilities (i.e., nature and quality of information owned).

This study compares performance of mutual funds to infer information about the influence of managers' incentives on their investment behaviour, in terms of market timing and selectivity, systematic risk level and noise trading. In addition, the dependence between base compensation and assessment of managers' quality was also analysed. Empirical tests were applied to a sample of Italian mutual funds with a large part of their portfolios invested in Italian stocks and bonds.

The context of the research is the investigation of a principal-agent relationship in the investment management industry. In the relationship between mutual fund

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investment adviser] (Securities and Exchange Commission, Release n. IA-1731, File n.S7-29-97).

5 *According to Starks (1987) performance fee schedule, if asymmetric, has a potential for manager divergent behaviour in terms of excessive risk taking with respect to the client's desire and lower amount of research expenditure. Das and Sundaram (1998) show that in absence of leveraging the equilibrium fee is a flat (base) fee with no performance component; when leveraging is permitted the equilibrium fee is an incentive fee with a large performance component.*

managers and investors, as in all agency relationship, problems arise due to the presence of asymmetric information. The investor cannot freely and directly know the information supplied by manager in the portfolio management service. The investor receives only *ex post* information by observing portfolio choice and performance results. From the observed results, the investor can neither distinguish the effects of the manager's action from the effects of the randomly determined state of nature, nor infer the *ex ante* risk level. The manager does not have incentive to intensify his efforts in acquiring information for portfolio selection unless the investor constructs a contract that provides the proper incentives.

In an attempt to investigate this issue, a new approach for performance evaluation was derived from the Merton and Henriksson-Merton model, so as to encompass their theoretical innovation in the agency framework. The indirect result was to design a contract for portfolio management including a risk sharing rule that allows investors to recognise target (or contractual) level of systematic risk from the speculative components based on manager's forecasting ability.

This paper is organised as follows:

in Section 2, the theoretical framework of agency contracting with regard to mutual funds is described and a theoretical connection between market efficiency and the existence of portfolio managers is established. Besides this, a review of the literature on the optimal compensation schemes for fund managers outlining the implications for their investment behaviour is reported; in Section 3, a specification of the managers compensation function and a description of two models for performance evaluation are presented. A new version of the Merton and Henriksson-Merton model is derived for the purpose of the research; and finally, the hypotheses tested in this paper are displayed; Section 4 describes the data and the methodology employed in the empirical investigation; Section 5 details the results of the equations estimated to support the models; Section 6 reports a summary of the results and the findings.

2. THE THEORETICAL FRAMEWORK

2.1 THE NATURE OF AGENCY PROBLEMS

The literature on the principal-agent relationship is very wide and extensively used to explain different situations in many contexts. This section is focused to show the framework of the general theory, appealing to the classic papers by Ross (1973, 1976), Holmstrom (1979) and Shavell (1979).

In the context of mutual funds, the term “agency” refers to the fact that investment decisions are delegated to fund managers (i.e. *agents*) performing on behalf of other parties, the fund-shareholders or investors (i.e. *principals*)[6].

As pointed out by Ross (1973), the basis for an agency relationship is that the agent may possess “better or finer” information about the states of the nature than the principal. Delegation of investment decision-power may give rise to moral hazard problems as long as the agents’ actions are not subject to full monitoring by principals. Unresolved agency problems may lead to Pareto inefficient allocation of resources in terms of the principals’ interests. They can be mitigated by reducing the difference in objectives of the parties through the design of appropriate contracts.

The standard economic theory of agency applied to mutual funds is based on the relationship between fund shareholders, treated as a single principal, who provide capital and consequently possess a right to the end-of-period value of the fund, and fund managers paid to supply efforts in acquiring and processing information for an optimal portfolio selection. Usually, managerial compensation is related to the nature of the claims of the principals to the fund value.

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6 *In general terms, agencies’ problems may arise from conflicting interests among parties within a corporate firm, such as management, security holders and employees, and among these and outsiders, such as customers, suppliers and the government.*

The sharing of risk among principals and agents is a central issue to an agency problem. Since the end-of-period value of the fund is uncertain when contracts are settled, the contractual distribution of this value between the principal and the agent implies a given risk sharing. Enforceable contracts define exactly each party's share in the observed value of the fund.

One fundamental assumption of the theory is that agents and principals have independent utility functions and act to maximise their expected utility related to the level of their end-of-period wealth.

A second crucial assumption is that each party recognises the self-interest motivations of the other, that is agents and principals know each others' utility function. As a consequence, agents use the delegated power to promote their own welfare, regardless of the best interests of the principals, but their divergent behaviour can be prevented by the principals.

Thus, since agents do not supply their best efforts unless these are consistent with their expected utility maximising objective, the principal's problem is reduced to the choice of the "best" compensation scheme for the agent. Naturally, the term "best" refers to the Pareto-optimality. A contract (i.e., a sharing rule) is Pareto-optimal if there is no other contract which would increase the welfare of one party without reducing the welfare of the other. This implies that they find a solution by designing the contract as a result of the bargaining process.

As for the form of the agent compensation scheme, it is clear that it can depend only on variables observable ex post by both parties, so that there should be no ambiguity in the amounts payable to agents for their services.

The immediate variables of interest to agents and principals are:

a. the agents' efforts;

b. the fund end-of-period value (i.e. the outcome);

c. the risk tolerance (or aversion);

d. the state of the nature affecting the performance.

While the outcome and the realised state of the nature are always presumed observable by both parties, the agent's efforts may not be observed by the principal.

"Observability" of the agent's effort introduces the incentive issue to the theory of agency. The incentive problem is related to the existence of moral hazard due to the unobservable efforts of the manager. After contracting is concluded, a moral hazard problem arises when the consequences of the agent's effort cannot be separated, without ambiguity to the results, from the effects of other random events, (that are beyond the control of agent) only by observing the outcome. In this case, managers and principal may seek to employ certain signals or parameters that convey information about the supplied efforts.

In this context, the principal's problem is to design a compensation scheme, that induces the manager (agent) to supply the optimal effort for a given state of the world *s.* Therefore, the objective is to design a contract that is optimal in a utility maximising sense.

2.2 MORAL HAZARD, MARKET EFFICIENCY AND THE RATIONALE FOR FUND MANAGEMENT

In the standard theory of agency, the content of the agent's effort is not specified. In the context of the portfolio management problem, the agent's efforts are often intended as the amount of information supplied by managers (Kihlstrom, 1988; Golec, 1992) or, more precisely, as their skill in acquiring and interpreting information related to the movements in security prices for an optimal portfolio selection (Stoughton, 1993)[7].

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[7] *In the performance evaluation literature there is a fundamental distinction between* <u>*timing ability*</u> *and* <u>*selectivity*</u> *(or selection)* <u>*ability*</u>*. The two terms are related to the*

Since the agent is assumed to possess "better or finer" information about the states of the economy than the principal, we can refer to the fund managers as informed individuals, whereas the fund-shareholders (investors) deem themselves to be uninformed individuals. Moreover, neither the efforts to collect information nor the quality of information itself can directly be monitored by investors.

Thus, in the presence of asymmetric information and moral hazard, investors are concerned with the design of an appropriate compensation scheme for fund managers so that they are motivated to acquire information and to disclose it truthfully through the portfolio choice. This implies that investors believe there to be some degree of exploitable inefficiencies in the financial markets that allow portfolio managers to gain extra-return by applying a costly searching process. Therefore, as known, if prices, at all times, fully and unequivocally reflected publicly available information, there would not be enough incentive for market traders to cover the cost of collecting information. As pointed out by Grossman-Stiglitz (1980), "*there is a fundamental conflict between the efficiency with which market spread information and the incentive to acquire information*".

In the Grossman-Stiglitz model (1980), informed individuals are those who employ resources to obtain information for trading on risky securities and receive compensation from this activity. Nevertheless, since the security price system conveys information from the informed to the uninformed traders, who just observe the prices, an equilibrium in the market does not exist. This occurs since, when prices reflect all the information, each informed trader feels that he does not have incentive to purchase information and "*do as well as a trader who pays nothing for information*". But again, each trader, observing the reduction in the informational role

managerial capacities to respond, respectively, to the economic-wide signals and to the signals on individual securities. For details see Section 3.

of the security prices, presumes that there are “relative benefits” from becoming informed. Therefore, the market never remains in equilibrium.

One of the main conjectures of the Grossman-Stiglitz model, for the purposes of this research, is that the magnitude of noise reduces the informative power of the price system and hence, in turn, lowers the expected utility of the uninformed traders. Thus, it may argue that market noise (as factual expression of uncertainty[8]) to some extent constitutes an economic explanation for the existence of the fund management[9].

Indeed, the rationale is that portfolio managers are perceived by uninformed investors as capable to distinguish variation in price due to a change in the information set from variation which results from a change in aggregate demand and supply of securities.

It is known that in addition to the outcome, other possible relevant variables, observable by both parties, can be used in contracting as a signal of the agent’s efforts to improve the expected utilities of the principal and the agent (Holmstrom, 1979; Shavell, 1979). In the context of this section, we can say that fund managers use signals, apart from the realised performance, to convince investors that they are informed individuals and, hence, to increase the reward for their activities.

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8 *F. Black (1986) (page 529) states: “Noise is information that hasn’t arrived yet. It is simply uncertainty about future demand and supply conditions...”.*

9 *This point of view is derived from F. Black (1986) (page 534) (“Noise creates the opportunity to trade profitably, but at the same time makes it difficult to trade profitably”) and from Grossman-Stiglitz (1980) (page 399) (“An increase in noise increases the proportion of informed traders,...,reduces the informativeness of the price system; but it increases the returns to information and leads more individuals to become informed”).*

As shown by Truemann (1988), managers of investment funds might have an incentive to carry out noise trading[10] "*even though it is not expected to result in positive returns*"[11]. The basic argument is that the manager's compensation is related to the investor's belief in his ability to collect private information concerning current and potential investments. But, in turn, this ability depends either on the precision of the information owned or on the frequency with which he purchases and trades on such private information. However, since investors cannot infer whether the manager receives private information by observing the total amount of trading, managers will attempt to induce investors to believe that a positive correlation exists between the owned information and trading. Thus, fund portfolio managers will have an incentive to trade more than is justified on the basis of private information alone. Actually, the absence of trading on risky assets would strongly indicate to investors that the managers did not seek private (i.e., not publicly available) information to gain abnormal returns.

From this main thesis Trueman derives an important corollary: an uninformed manager will have a greater incentive to trade in riskier assets, that is the amount of noise trading will increase with the riskiness of the fund's investments. In fact, because the prices of riskier assets present a greater volatility, it is more likely that only informed traders take positions on those, but, by doing this, uninformed traders can conceal their condition.

Finally, we can now establish some useful connections between the thesis of the Grossman-Stiglitz model and Trueman's theory. Given the presence of adverse selection and moral hazard, noise trading can be considered not only as a means used by portfolio managers to signal to investors that they are informed, but also the

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10 Noise trading can be defined as "trading on noise", that is without any informational base.

11 Trueman (1988) page 83.

result of a rational strategy undertaken to reduce the capacity of the market prices to reveal possible future movements[12] and thus to increase the returns on information. In this sense, portfolio managers can maintain that they employ resources to search for private information and they trade on that, without risk of disclosing their true informative state. In this framework, when information is costly, there is a trade-off between market efficiency conditions and the incentive to acquire information and, hence, the demand for fund shares.

Given the difficulties of evaluating the managerial ability to collect information or to carry out precise forecasts, the contract structure (that is the manager's compensation scheme) has a serious role to play.

2.3 THE CONTRACT DESIGN FOR FUND MANAGER: A BRIEF REVIEW OF THE LITERATURE

In this sub-section, the special features of economic research on agency problems with regard to delegated portfolio management are reviewed to account for the alternative solutions to the contract form for portfolio managers.

The main concerns of theoretical modelling for the fund manager-investors relationship have been the shape of the contract under asymmetric information and the potential implications in terms of the agent's undesirable behaviour. Thus, models explicitly take into account the fact that the manager's behaviour is endogenously determined by the evaluation and reward schemes employed.

Two different approaches have been followed in the construction of models: the "signalling" and the "performance" approaches.

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12 *Trueman (1988, page 92) himself concludes "noise trading will still prevent prices from fully revealing all private information" and (page 93) "While some trading based on private information will occur, it is expected that there will also be some noise trading generated by those who want to mimic the action of informed investors".*

In signalling models, since the opportunity to observe historical performance may have little value, the principal's goal is to attract agents with a high level of prediction precision on risky asset returns and to cut out agents with lower precision levels. The compensation scheme is designed to encourage the hired portfolio manager to reveal truthfully his information state either directly to the investors (Bhattacharya and Pfeiderer, 1985; Stoughton, 1993) or indirectly through his portfolio choice (Kihlstrom, 1988; Huberman and Kandel, 1993). Linear and non-linear contract forms are compared with the first-best solution (Bhattacharya and Pfeiderer, 1985; Stoughton, 1993). These schemes have very different implications for the manager's motivation to acquire information and to transfer the benefits of such information to investors. Although the quadratic contract leads to sub-optimal risk-sharing, Stoughton (1993) shows that this negative aspect is economically less significant when the investor is a large (risk-tolerant) principal.

In performance models, fund managers and investors are assumed to believe that assets are priced according to a linear return generating process (i.e. single index model, CAPM or APT). Thus, the fee schedule is designed as a linear function of systematic and unsystematic risk components (Ramakrishnan and Thakor, 1984; Golec, 1992; Starks 1987).

2.3.1 THE SIGNALLING APPROACH

In the general signalling models, since effort is unobservable, the only enforceable contracts are those relating the manager's compensation to the prediction of the return on risky assets. Nevertheless, investors cannot directly observe the portfolio managers' forecasting abilities; they can only observe the portfolio chosen. Actually, the portfolio choice will act as an informative signal of the prediction. In this situation, manager's compensation is made dependent on the portfolio choice and the return actually paid by the risky security.

Bhattacharya and Pfeiderer (1985) provide further development about the appropriate fee scheme. Each time the agent adjusts the portfolio position for the principal after having announced the precision of predictions. Ex post, the investors assess the goodness of the precision by examining the portfolio composition and reward the agent on that basis[13]. This contract works by imposing a risk of prediction error so that the manager has the incentive to report his private information accurately.

In Huberman and Kandel's model, the remuneration of the fund managers is affected by both their ability to trade and their reputation based on the market's frequent evaluation of their performance and the portfolio composition. A manager's reward is a proportion of the wealth he manages. The amount of wealth he manages depends on his reputation. The reputation is subject to the quality of his forecast for the risky asset return. The more accurate the manager's perceived prediction, the more money the clients allow him to manage.

The relationship between the manager and market fits into a signalling model:

- the manager signals his type (high or low) using the portfolio choice;
- the market receives the signal and derives additional information from the realised return on the risk investment.

In this adverse selection environment, the better manager will try to signal his quality and the bad manager will try to hide his poor quality. Since the only instrument available to them is the choice of portfolio weights, this choice will be influenced by the competition among the managers.

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13 *Actually, this model embodies the possibility that the portfolio policy might be implemented directly by the principal.*

The manager of the lower type chooses his optimal portfolio, and the manager of the higher type exaggerates his position for the risky asset relative to his optimal level. In this model the undesirable behaviour of the manager with high precision (i.e. the exaggeration on taking a riskier position) is undertaken to prevent the lower type from imitating him.

In Trueman's model, the investment manager's compensation is assumed to be a linearly increasing function of the funds' portfolio end-of-period market value. The total amount invested in the fund by investors at the beginning of the period of investment is set as function of the investors' perception of the manager's ability to generate positive returns on their investment, that, in turn, depends on their assessment of the probability that the manager receives private information for each period. In the Trueman's model, the fund manager signals to the investor that he is informed by increasing the trading volume.

2.3.2 THE PERFORMANCE APPROACH

In the context of the performance models, Ramakrishnan-Thakor (1984) assume that a managerial linear incentive contract consists of three components:

i) a constant;

ii) a part depending on the specific (or unsystematic) return;

iii) a part depending on the market return.

The principal must optimise the market portfolio value by searching for the appropriate weights to assign to these three components. If managerial actions are not observable ex post, the Pareto optimal incentive contract will depend on the realised unsystematic (or specific) return of the asset as well as the market return.

Ramakrishnan-Thakor argue that specific risk is inconsequential for risk sharing purposes. Its presence in equation for the optimal contract is simply to motivate the manager to take the optimal action. Systematic risk is important for risk sharing purposes because the principal is concerned with the market risk he bears. Since the asset total return contains both risks, a contract contingent on the asset total return will obviously accomplish some risk sharing and have some motivational effect.

In Golec's performance approach study**,** the starting point is a traditional linear incentive fee:

$$\Phi(k_b, K_i, R_P, R_X, A) = K_b A R_p + K_i A (R_P - R_X) \qquad [1]$$

where K_b and K_i are the base and incentive fee parameters, respectively, R_P is the gross return on the managed portfolio and R_X is the return on the index portfolio; A is the total value of the portfolio assets. The index portfolio is assumed to be perfectly diversified so that $R_X = \beta_X M$ (where *M* is the market portfolio).

Therefore, the expected fee paid to the fund manager can be expressed as:

$$E(\Phi) = [\beta_P K_b + (\beta_P - \beta_X) K_i] A \overline{M} + [K_b + K_i] A I \qquad [2]$$

where I is the non-random portfolio return due to information supplied by the manager.

This fee schedule rewards the agent for two services to the investor: systematic risk sharing and information supply, following the separation of the portfolio return in market-based and information-based portions. The specialisation of the parameters is not complete. The first part of the scheme rewards the manager for bearing systematic risk: K_b is applied to a return with a beta value of β_P and K_i is applied to a return with a beta value of $(\beta_P - \beta_X)$. The second part is information-based: each fee parameter is applied to a return with the same information-based component, hence the parameters are equally weighted. Golec shows that changes in β only affect the relative attraction of K_b and K_i for risk sharing.

3. FEE PARAMETERS AND INVESTMENT PERFORMANCE MEASUREMENT: THE HYPOTHESES TESTING

3.1 THE SPECIFICATION OF FUND MANAGER COMPENSATION SCHEME

As described in the previous section, the signalling approach to contract design relies on *ex-ante* disclosure of investment forecasts by the fund manager (and therefore on the error of his prediction); indeed, since forecasts are not directly revealed, investors can derive them from analysing the observable variables such as the actual return time series or the end-of-period portfolio composition. Thus, even in the signalling approach, manager's reward can be dependent on an investment performance measurement.

Following the mentioned literature, we state that manager's compensation (Φ) is a function of *W* (the end-of-period value of fund), *g* (the performance measures) and *z* (a noise trading proxy), that is:

$$\Phi = f(W, g, z) \tag{3}$$

In function [3] *g* and *z* can be used as signals for carrying inferences about the manager's forecasting abilities. The higher the performance measures and the lower the volume of noise trading, the more accurate the manager's predictions are; the accuracy of forecasts in turn increases - according to Huberman and Kandel's model - manager's reputation (*W*) and consequently the reward the fund-shareholders are willing to pay at the end of each period.

As *W* and *g* depend on the quality of the manager's information set (i.e. the effort in agency term), they represent rightful parameters for a reward scheme, whereas *z*, being the result of inadequate effort, ought to reduce the manager's remuneration.

3.2 THE INVESTMENT PERFORMANCE MEASUREMENT: A REDEFINITION OF THE MHM MODEL

For the purpose of carrying out performance measurement, it is assumed that security returns are generated by a linear process as in Jensen's (1968) version of the Capital Asset Pricing Model:

$$R_{Pt} = \alpha_P + \beta_P R_{Mt} + u_{Pt} \qquad [4]$$

where R_{Pt} is the return on the *P*-th portfolio in excess form (i.e. net of risk-free rate); R_{Mt} is the excess return of market portfolio; α_P can be described as a proxy for the non-random return associated to the manager's ability to supply security specific information; β_P measures the sensitivity of the portfolio return to the market return (that is the systematic risk) and u_{Pt} is the unexpected portfolio-specific return - distributed as NID(0,σ^2) - that captures the effects of random factors.

The literature on performance evaluation theorises the existence of two distinct components of manager's investment performance, namely: market timing and selectivity. As stated firstly by Fama (1972) and Jensen (1972), the term <u>market timing</u> refers to the manager's skill to change portfolio risk level by increasing or decreasing the amount of funds invested in risky assets, in order to anticipate favourable or unfavourable stock market-price movements. The term <u>selectivity</u> refers to the manager's ability to identify individual stocks that are mispriced relative to the expected returns conditional upon the manager's micro-information. Nevertheless, from the above definitions it is worth noting that, while selectivity is represented in the linear equation [4] by the intercept α_P, the market timing component is not identified. Anyway, the identification procedure presents non trivial methodological problems. In fact, the existence of market timing implies that the fund manager is able to continuously vary the portfolio systematic risk level, dependent on his interpretations of macroeconomic signals[14]. However, this possibility is not consistent with the standard agency theory framework, since this envisages a contract for portfolio managers that entails a compensation scheme based on a chosen β_P (i.e. the risk-sharing rule), other than on an incentive to supply information (α_P). Therefore, if investors set a target Beta (βp*), a contractual problem could arise as portfolio managers change the pre-fixed level of systematic risk[15]. In fact, a market timing activity causes a time-varying Beta. In this context, testing for market timing ability could give rise to a regulatory problem with regard to the tolerable magnitude of manager's choice divergence. The rationale is that systematic risk choice should not produce any agency costs because it implies a passive investment strategy.

As for the measurement of timing and selectivity, the key assumptions of the following two models were considered:

1) the Merton (1981) and Henriksson-Merton (1981) model (MHM)[16];

2) the Bhattacharya and Pfleiderer procedure (BP)[17].

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14 *Furthermore, another issue is given by the fact that security specific information affects the systematic risk level (see Elton and Gruber (1991), for an evaluation theory accomplishing this problem).*

15 *On the point, Bruni, Pototschnig and Zingales (1987) argue that mutual fund portfolios should be differentiated in terms of risk profile so as to satisfy different investors' preferences.*

16 *The model MHM was tested originally by Henriksson (1984). For the Italian case see Ferretti-Murgia (1990) and Panetta -Zautzik (1990).*

17 *The Bhattacharya and Pfleiderer procedure was drawn from Lee-Rahman (1990). For an extension see Admati, Bhattacharya, Pfleiderer and Ross (1986).*

The basic idea of the MHM model is that the fund manager increases the Beta of portfolio when he forecasts stock market to outperform the bond one and reduces the Beta in the opposite case; therefore:

$$\beta_t = b + \theta_t \quad [5]$$

where *b* is the unconditional (on the forecast) expected value of β_t ;

θ_t is the unanticipated component of β_t dependent on the manager's forecast.

In an example of two target risk levels, the manager is assumed to have:

$\overline{\theta}_1$ for $E(R_M) \leq 0$; $\overline{\theta}_2$ for $E(R_M) > 0$; with $\overline{\theta}_1 < \overline{\theta}_2$ if the forecaster is rational.

The MHM regression equation is set as:

$$R_{pt} = \alpha_p + \beta_p R_{mt} + \gamma_p Put_t + u_{pt} \quad [6]$$

where $Put_t = \max[0, -R_{m_t}]$, γ_p represents a measure of market timing ability and the other variables have the same definition as in equation [4]. The parameter Put has the economic meaning of a "put option" on a stock market portfolio with an exercise price equal to the risk-free rate *r.* As a result, if γ_p has a positive value and results statistically significant, then the fund manager adjusts the portfolio composition accordingly to prevent adverse stock market movements.

An "alternative" but "more intuitive" specification of the MHM model is[18]:

$$R_{Pt} = \alpha' + \beta_1' x_{1t} + \beta_2' x_{2t} + \varepsilon_{Pt} \quad [7]$$

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18 *See Henriksson and Merton (1981) page 530*

where $x_{1t} \equiv \min[0, R_{Mt}]$ and $x_{2t} \equiv \max[0, R_{Mt}]$.

Given this specification, the test for market timing ability would be to show whether $\beta_2^{'}$ (defined as the "up-market beta") is significantly greater than $\beta_1^{'}$ ("the down-market beta" of the portfolio).

As regards the <u>BP procedure</u>, it is an extension of a Jensen's theoretical work[19], in which the manager is supposed to go through an error learning process of market forecasts in order to set optimal portfolio adjustments. Jensen (1972) states that at each point in time, given the manager's information ϕ and assuming investors have a constant absolute risk aversion coefficient equal to *a,* optimal choice of portfolio systematic risk, β_{P_t}, is given by:

$$\beta_{p_t} = \beta_p^* + \theta_p \pi_t^* \qquad [8]$$

where β_p^* is the investors' "target Beta"[20] equal to $\theta_p E(R_m)$, with $\theta_p = 1/[2a \operatorname{var}(\pi_t / \phi_t)]$ that measures the manager's action conditional upon *a* and ϕ, and $E(R_m)$ that represents the <u>unconditional</u> expected market portfolio return;

π_t^* is the optimal forecast given by $\psi(\pi_t + \varepsilon_t)$, with $\pi_t = [R_{m_t} - E(R_m)]$ that indicates the forecast error and $\psi = \sigma_\pi^2 / (\sigma_\pi^2 + \sigma_\varepsilon^2)$ the minimum variance of the forecast error[21].

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19 *See Jensen (1972).*

20 *Jensen (1972) defines the <u>target Beta</u> as "that risk level which on the average the manager wishes to maintain given the unconditional expected returns on the market portfolio and the preferences of his (fund) shareholders" (page 316).*

21 *Using the above mentioned relationships, equation [4] becomes:*

$$R_{p_t} = \alpha_p + \theta\left\{E(R_m) + \psi[R_{m_t} - E(R_m) + \varepsilon_t]\right\}R_{m_t} + u_{p_t} \quad [9]$$

Rearranging, equation [9] gets:

$$R_{p_t} = \alpha_p + \theta E(R_m)(1-\psi)R_{m_t} + \theta\psi R_{m_t}^2 + \theta\psi\varepsilon_t R_{m_t} + u_{p_t} \quad [10]$$

Equation [10] is rewritten in reduced form in terms of observable variables as follows:

$$R_{p_t} = \eta_0 + \eta_1 R_{m_t} + \eta_2 R_{m_t}^2 + \omega_t \quad [11]$$

where the coefficient estimates in a large sample are:

$$\eta_0 = \alpha_p \quad [12]$$

$$\eta_1 = \theta E(R_m)(1-\psi) \quad [13]$$

$$\eta_2 = \theta\psi \quad [14]$$

and the error term is $\omega_t = \theta\psi\varepsilon_t R_{m_t} + u_{p_t}$ *[15]*

As reported above, the coefficient estimate $\eta_0 = \alpha_p$ *reveals the presence of selectivity ability, while a measure of timing ability is obtained in BP procedure by regressing* ω_t^2 *on* $R_{m_t}^2$*:*

$$\omega_t^2 = (\theta\psi\varepsilon_t R_{m_t} + u_{p_t})^2 = \theta^2\psi^2\sigma_\varepsilon^2 R_{m_t}^2 + \zeta_t \quad [16]$$

where

$$\zeta_t = \theta^2\psi^2 R_{m_t}^2(\varepsilon_t^2 - \sigma_\varepsilon^2) + u_{p_t}^2 + 2\theta\psi\varepsilon_t R_{m_t} u_{p_t} \quad [17]$$

Thus, since the estimated value of $\theta\psi$ *is known from [14], regressing equation [16] allows us to obtain* σ_ε^2.

Since in an agency contract for portfolio management it should be possible to settle a risk sharing rule that avoids portfolio Beta to be either fixed or stochastic, a new specification was searched in order to encompass the innovative theoretical assumptions of the MHM and Jensen's models in an agency framework.

The starting point was to set some constraints to the Beta variability. Being in a context of principal-agent relationship, these constraints should be defined *ex ante* so as to design a forcing path for the systematic risk level chosen by the fund manager.

To build the alternative specification process, the Jensen's definition of the investors' "target Beta" β_p^* was modified adding a constant term λ_0 to a linear function of $E(R_M)$, that gets:

$$\beta_p^* = \lambda_0 + \lambda_1 E(R_M) \qquad [19]$$

where λ_0 describes the contractual "minimum" of systematic risk level, that means the minimum percentage of portfolio risky assets; $\lambda_1 = \theta_p$, and $E(R_M)$ the unconditional expected market portfolio.

Furthermore, to design an error correction path for manager's systematic risk choice, it is useful to exploit the intuition backing the MHM model specified in [5] as follows:

As for σ_π^2, Bhattacharya and Pfleiderer use an estimating procedure introduced by Merton (1980) based on the assumption that π_t follows a stationary Wiener process:

$$\sigma_\pi^2 = \left\{\sum_{t=1}^{n}[\ln(1+R_{m_t})]^2\right\} \Big/ (n-2) \qquad [18]$$

Now by estimating σ_π^2, it is possible to determine $\psi = \sigma_\pi^2 / (\sigma_\pi^2 + \sigma_\varepsilon^2) = \rho^2$ and then ρ that provides evidence of manager's market timing ability.

$$y_p^* = \begin{cases} \beta_p^* + \lambda_2 Call_t \\ \beta_p^* + \lambda_3 Put_t \end{cases} \qquad [20]$$

where γ_p^* defines the pre-fixed discretionary range of variation for portfolio target Beta; λ_2 and λ_3 settle the boundaries of this range; $Call_t$ .is equal to *max*[0, R_{MT}] and Put_t equal to *max*[0, -R_{MT}]. It has the same effect to impose constraints on investment strategies.

Therefore, considering [20], portfolio Beta can be written as:

$$\beta_P = \lambda_0 + \lambda_1 E(R_m) + \lambda_2 Call_t + \lambda_3 Put_t \qquad [21]$$

where $\lambda_0, \lambda_1, \lambda_2, \lambda_3$ are the parameters of the risk sharing contractual rule; besides, λ_2 and λ_3 define the tolerated deviations from target Beta.

Moreover, to solve the agency problem involved with Beta function [21], some conditions are to be satisfied:

a) λ_0 and λ_1 must be non negative in order to allow for short selling restraint;

b) λ_2 must be positive and λ_3 negative to set portfolio rational adjustments to anticipated positive or negative shocks;

c) the magnitude of λ_3 must be limited by the positive value of β_P given by the contractual minimum risk (i.e., λ_0).

d) λ_2 should be less than the absolute value of λ_3 if we assume investors are risk averter.

Now, substituting [21] in equation [4] and using the target Beta definition [19], the Jensen's security return process can be written as:

$$R_{Pt} = \alpha_P + \beta_P^* R_{Mt} + \lambda_2 Call_t R_{Mt} + \lambda_3 Put_t R_{Mt} + v_t \qquad [22]$$

where α_P is the Jensen's measure for selectivity abilities, λ_2 and λ_3 reveal the existence of the manager's market timing ability[22].

Finally, for the purpose of estimating function [3], the standard deviation of the portfolio specific-return (σ_v) was chosen as proxy of noise trading.

3.3 THE HYPOTHESES TESTING

Assuming the manager's compensation function [3] to have a linear form and adopting equation [22] as performance measurement model, we empirically tested[23]:

1) whether the <u>actual shape of the manager's compensation scheme</u> (that is with and without incentive fee parameters) affects the manager's behaviour in terms of performance measures, systematic risk level and noise trading;

2) whether these mentioned factors have effects on the measure of <u>contractual management fee parameters</u> (controlling the differences in the estimates when incentive fees are applied) [24], in order to know if the managers' compensation reflects a reliable assessment of their quality.

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22 *Intuitively, equation [22] looks like the Treynor and Mazuy (1966) model, in which a quadratic term R_{MT}^2 was added to the standard CAPM regression equation to test for market-timing ability; in fact, since $Call_t$ *R_{MT} = $(R^+_{MT})^2$ and Put_t * R_{MT} = $(R^-_{MT})^2$, equation [22] entails separately positive and negative quadratic innovations on market portfolio value.*

23 *The estimating procedure is conditioned by the fact that portfolio management contracts envisage a wide range of incentive schemes, making meaningless any numerical definition of incentive fees parameters.*

24 *As pointed out by Golec (1992), "base" fees also provides incentive to the fund manager to supply specific information; in fact, since they are paid at the end of each*

The hypothesis 2) was tested cross-sectionally - as in Golec's (1992). The general form of this cross-sectional regression is:

$$K_{b_j} = b_0 + b_1\alpha_j + b_2\beta_j^* + b_3\lambda_{2_j} + b_4\lambda_{3_j} + b_5\sigma_{v_j} + b_6W_j + e_j \qquad [23]$$

where K_{bj} is the "base" (or management) fee as annual percentage of the *j*-th portfolio value, b_0 a constant term, the explanatory variables have the same meaning as before, whereas $b_1, b_2, b_3, b_4, b_5, b_6$ .are the regression coefficients that measure the sensitivity of base fee to the respective independent variable; and finally, e_j is the random error term.

Differently from function [3] and contrary to agency standard theory, in [23] we introduced target beta between the regressors to verify its explanatory power on the level of management fees [25].

4. **DATA AND METHODOLOGY**

The data base consists of a sample of 80 Italian open-end mutual funds *(fondi comuni d'investimento mobiliare di tipo aperto),* whose portfolios are invested extensively in Italian stocks. Data were made available from *Moneymate Software.*

For a fund to be included in the sample, it had to have weekly return data available over the period from January 1993 to December 1995. The fund sample can be divided for specialisation: 29 in Italian stocks (*Azionari Italia* - A), 37 in Italian stocks and government bonds (*Bilanciati Italia*- B) and 14 in Italian stocks and corporate

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period, the manager receive a portion of the amount invested and a portion of the return yielded over the period.

25 *According to Ramakrishnan-Takor's (1984) model, "base" fees should be independent of beta (because it does not imply agency costs) only if performance fees are not envisaged in portfolio management contract.*

bonds (*Specializzati Italia*- S)[26]. Of these n. 43 have only base fees (WIF)and n. 37 have base and incentive (or contingent) fees (IF).

Specifically, the mutual fund sample can be described as follows:

Specialisation	WIF	IF	TOTAL
A	15	14	29
S	4	10	14
B	24	13	37
Total	43	37	80

In the group of mutual funds using incentive schemes just 3 (IMIT, PRIMIT and PRIMCL) adopt the Comit as an index of the Italian market portfolio to determine the incentive fees; 1 (FINV2) employs a composite index of Treasury Bill and Comit, another (FINV3) a composite benchmark of consumer price index and Comit, and finally, 2 (IMICAP and IMIND) apply a composite index of Government Bonds, Comit and Morgan Stanley World Composite Index. Some of the other funds, 4 in all, use a spread on the Treasury Bill, while the majority, 23, use a spread on the Italian Consumer Price Index.

As for base fee parameters, they appear to be related to the contractual investment specialisation of the sampled funds. They are expressed as a percentage of the fund value and are paid with a fix periodicity in time (weekly, monthly or quarterly). The minimum level in the sample is 1,0% and the maximum one is 2,0% in annual terms; the average is equal to 1,44%.

The raw data used in the research are:

- weekly returns on portfolios of the sampled Italian mutual funds;

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26 The sample of mutual funds is specified in the Appendix 1.

- weekly return on the Italian stock-market portfolio (i.e. *MIB Storico*) as market return;
- weekly net return on short-term government-bonds (i.e. Bank of Italy net capitalised BOT index) as a proxy for the risk-free rate;
- “base” fee parameters (as annual percentage rates)[27];
- monthly average of portfolios market value (in billions of Italian Lire) for 1995.

All returns are measured as annually continuously compounded rates of return. The portfolio values have been expressed in natural logarithm terms in order to reduce the problem of different scales.

The period of analysis is from 1993 to 1995.

As for the methodology[28], the OLS (Ordinary Least Squares) regression technique was applied to equation [22] for each fund in the sample, for which the usual assumptions of the classical multiple regression analysis were verified through the following diagnostic tests on the residuals, in order to proceed to unbiased OLS estimations:

a) Jarque-Bera test for normality;

b) Breusch-Godfrey serial correlation LM test (no 8 lags);

c) White test for heteroscedasticity (including cross-terms);

d) Ramsey Reset test for functional form (no 2 fitted terms);

e) Chow breakpoint test for parameters stability (120 observations);

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27 In this study have been applied the parameters in force in June 1996.

28 To proceed with the estimates we have used the package “Econometric Views - Micro TSP for Windows”.

f) Augmented Dickey-Fuller (ADF) test for stationarity (with trend and intercept in the test equation; 8 lagged differences).

Especially, with regard to the return model [22], the condition of the regression parameters time invariance (i.e. stability) is crucial for the following cross-sectional analysis (equation [23]). Indeed, if the target level of fund systematic risk is time-variant rather than fixed then any estimates from the OLS regression method will be inefficient[29].

For estimating the cross-sectional regression [23], the econometric technique of generalised least squares (GLS) was applied in order to moderate the heteroscedasticity issue related to the heterogeneity of the data. As a weighting, we used the "White Heteroskedasticity-Consistent Standard Errors&Covariance" which is included among the options in the econometric package utilised.

5. EMPIRICAL RESULTS

The parameters of the adjusted MHM model [22] was estimated by the OLS method for each mutual fund. In order to check whether a compensation scheme, including a reward for performance, really motivates the Italian fund managers to forecast "better" and to take riskier positions on an informative basis, we created two sub-samples: one for mutual funds with incentive fees (IF) and the other without (WIF). According to the *t-ratios,* in the period of analysis, only the target Beta and "lambda 3" coefficient results are always significantly different from zero even at the 1% level, whereas the coefficient of "upward" market forecasting ability (lambda-2) is significantly different from zero only in half of the whole sample. Also, the alpha parameter is statistically significant at the 5% level just in 38 cases; not surprisingly

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[29] *See Maddala (1992) page 528.*

these cases are more evident in the sub-sample IF where risky funds (A and S) are the majority.

The F-test shows that the parameters are always jointly significantly different from zero. Besides, the R-squared statistics suggest that the variables considered have a very high explanatory power of the variance of mutual fund returns.

As for the diagnostic tests, about half of the estimated regressions suffers for heteroscedasticity and functional form issues. Therefore, the estimate of the coefficients should be interpreted with caution. However, the equations are modestly affected by serial correlation on the residuals; naturally, it means that the used regressors are able to capture the influence of other economic variables. Also, the parameter instability issue does not appear present in the adjusted version of the MHM model. Finally, non-normality and unit root problems have been discovered, but they are not so as to affect heavily the meaning of the results.

With regard to the economic interpretation of the estimates, we can appreciate the possible distinction of managers' investment behaviour between the two sub-samples of mutual funds by observing mean, standard deviation and percentage of significance of the estimated equation parameters, the noise trading proxy and the management fee charged. The results are shown in Table I.

TABLE I - MEAN AND STANDARD DEVIATION OF MANAGEMENT FEE, PERFORMANCE MEASURES, SYSTEMATIC RISK AND NOISE TRADING IN IF AND WIF GROUPS

Sub-Sample	α	β *	λ_2	λ_3	σ_v	M_F
IF - Mean	0.07	0.56	-0.01	-0.23	0.306	1.47%
IF - StDev	0.06	0.10	0.03	0.07	0.078	0.30%
Significant %#	62%	100%	57%	100%		
WIF- Mean	0.03	0.54	-0.01	-0.22	0.267	1.41%
WIF-StDev	0.05	0.07	0.02	0.06	0.074	0.27%
Significant %#	35%	100%	26%	100%		
ALL - Mean	0.05	0.55	-0.01	-0.23	0.285	1.44%
ALL - StDev	0.06	0.09	0.03	0.06	0.080	0.28%
Significant %#	49%	100%	40%	100%		

 # Percentage of mutual funds with parameters statistically significant at the 5% level.

According to the empirical results, a slight positive difference in selection ability of IF portfolio managers, captured from the alpha parameter, was revealed by the model; however, the percentage of significantly positive alpha for the first group (62%) is considerably higher than that of the second (35%).

In order to assess the impact of the contingent fees on the risk position of the portfolio chosen by fund managers, we analysed coefficient Beta together with the measures of market timing ability (λ_2 and λ_3). A negligibly higher systematic risk level is observable for the first sample; thus a divergent behaviour cannot be seen. However, in both sub-samples, managers clearly exhibit an equal defensive capacity in anticipating negative shocks: the coefficient of “downward” market movements (λ_3) is indeed negative, its magnitude is notably greater, in absolute value, than λ_2 (about 23% against 1%), making evident an asymmetric managerial attitude towards changes in the target level of Beta, and especially the statistically significant percentage equal to 100%. As for λ_2, the small size (about 1%) and, differently from the expectations, the negative sign in the two groups show no ability to forecast up-market movements[30], (but in 6 examples the sign is positive). Nevertheless, despite the statistically significant percentage of λ_2, the discretionary space for modelling portfolio systematic risk appears negligibly wider in IF sub-sample than in the WIF one.

TABLE II - MANAGEMENT FEE, PERFORMANCE MEASURES, SYSTEMATIC RISK AND NOISE TRADING OF MUTUAL FUNDS CLASSIFIED FOR INVESTMENT SPECIALISATION

Specialisation		α	β^*	λ_2	λ_3	σ_v	M_F
S - IF	Mean	0.11	0.62	0.01	-0.29	0.31	1.58%
	Std. Dev.	0.05	0.07	0.03	0.05	0.05	0.26%
	Significant %#	90%	100%	40%	100%		
S - WIF	Mean	0.12	0.59	0.01	-0.28	0.36	1.52%
	Std. Dev.	0.04	0.06	0.02	0.01	0.10	0.40%
	Significant %#	100%	100%	25%	100%		
A - IF	Mean	0.07	0.54	-0.02	-0.23	0.33	1.55%
	Std. Dev.	0.05	0.12	0.03	0.07	0.06	0.28%
	Significant %#	78.6%	100%	57.1%	100%		
A - WIF	Mean	0.07	0.60	-0.01	-0.27	0.31	1.54%
	Std. Dev.	0.06	0.07	0.02	0.05	0.07	0.27%
	Significant %#	66.7%	100%	26.7%	100%		
B - IF	Mean	0.02	0.52	-0.03	-0.18	0.27	1.31%
	Std. Dev.	0.04	0.08	0.02	0.05	0.11	0.26%
	Significant %#	23.1%	100%	69.2%	100%		
B - WIF	Mean	0.00	0.50	-0.02	-0.19	0.23	1.31%
	Std. Dev.	0.01	0.04	0.02	0.03	0.04	0.22%
	Significant %#	4.2%	100%	25%	100%		

 # Percentage of mutual funds with parameters statistically significant at the 5% level.

[30] *The negative sign of $\lambda_{\square}$ can be interpreted as a sale of call options, that is it indicates an upward market risk exposition.*

A more insightful assessment of the impact of the incentive compensation scheme can be carried out by analysing the estimated parameters of equation [22] for class of investment specialisation. These estimates are shown in Table II.

In this context, a more appreciable comment can be made. Firstly, the mean and the standard deviation values of the coefficient α are absolutely equivalent in IF and WIF groups for the *S* and the *A* funds (*Specializzati Italia* and *Azionari Italia*); this finding is supported by the measures of significant percentages (90% against 100% for *S* funds; 78.6% against 66.7% for the second class). As well as this, in the case of balanced funds (*B*) managers rewarded with incentive fees perform, on average, moderately better than portfolio managers who received fixed compensation, after controlling for noise trading. However, significant percentages of α are really low in both groups (23.1% against 4.2%).

Secondly, as regards target Beta estimates, it is worth noting that in two of the three fund classes (*S* and *B*) IF funds exhibit a modestly higher value. Paradoxically, in class *A* IF funds have a lower Beta in comparison with that of WIF (0.54 against 0.60).

Thirdly, as for λ_2, the coefficient size is approximately equivalent in IF and WIF sub-samples for all classes (*S*, *A* and *B*), but its sign is positive only for *S*. The negative sign of λ_2 in classes *A* and *B* could be explained as an evidence of a strategy in portfolio management aimed to liquidate risky assets as soon as their price grows (rather than as a revelation of inability to forecast positive innovation in market return). The fact that significant percentages are consistently superior in the IF groups makes evident that incentive compensation schemes affect the manager's attitudes towards "up-market" risk, even though the power and the direction of this influence seem related to the systematic risk level of portfolio funds.

Finally, with regards to λ_3, the negative sign and the significant percentage (100% for all classes S, A and B, in both sub samples IF and WIF) reveal the existence of the manager's ability to adjust portfolio composition in order to prevent "down-market" movements. As for magnitude, the observation of the empirical results shows a numerical equivalence within each fund class (-0.29 and -0.28 for class S; -0.23 and -0.27 for class A; -0.18 and -0.19 for class B), but a relevant difference among classes. However, the discretionary space for downside risk correction is positively related only to the target Beta level (that is related to the class of fund specialisation).

On the grounds of these results, it is possible to argue that distinct form of compensation schemes do not appear to have supplied different incentives either in terms of non-random return associated with the manager's selectivity ability or in terms of additional portfolio return due to market timing ability. Furthermore, the use of performance fee parameters did not encourage manager to adopt "divergent" behaviour in terms of remarkably riskier asset positions. In this sense, since the actual incentive fees are generally based on a scale of the consumer price index, they can be considered on average as an additional "tax" paid by the investors on the excess return without effects on their welfare state.

With regard to the second hypothesis testing, we have proceeded to estimate, by GLS technique with White correction for heteroscedasticity, the cross-sectional compensation function [23]. The GLS estimates are shown in Table III.

Some considerations arise from the reading of the statistical results shown below. The estimates of the coefficients of equation [23] are severely (downward) biased by the presence of measurement errors, since the right hand side variables are estimated. Therefore, they must be regarded with extreme caution.

As regards the ALL sample, two factors explain significantly the change in the size of the management fee parameter, other than the constant term: 1) the target Beta; 2) the average value of the portfolio fund (*W*). The coefficients of the other variables included in the risk sharing rule (λ_2 and λ_3) are not statistically significant. The value of the F-test shows that the parameters of the explanatory variables in regression [23] are jointly significantly different from zero. Moreover, the R-squares measure an unsatisfactory goodness of the whole estimates (about 30%). In addition, the ALL regression exhibits heteroscedasticity problems that reduce the informativeness of the results.

TABLE III - GLS ESTIMATES OF THE CONTRACTUAL MANAGEMENT FEE PARAMETERS
(dependent variable is mf)

VARIABLE	ALL Sample 1 80	WIF Sample 1 43
Constant ***T-ratio***	0.0098 3.25	0.0019* 0.27
α ***T-ratio***	0.0056* 0.67	-0.0106* -0.61
β^* ***T-ratio***	0.0147 2.11	0.0233* 1.19
λ_2 ***T-ratio***	0.0039* 0.35	-0.0161* -0.95
λ_3 ***T-ratio***	0.0038* 0.36	0.0051* 0.19
σ_v ***T-ratio***	0.0025* 0.52	0.0100* 0.97
M_F ***T-ratio***	-0.00068 -2.50	-0.0003* -1.16
F-Test	4.46	1.97**
R-squared	0.27	0.24

** Not significantly different from zero at the 10% level.*
*** Not significantly different from zero at the 5% level.*

TABLE IV - DIAGNOSTIC TESTS

	ALL	WIF
Normality	0.933	1.28
[Prob.]	[0.620]	[0.525]
Serial Correlation	0.090	1.77
[Prob.]	[0.91]	[0.185]
Heteroscedasticity	1.96	1.58
[Prob.]	[0.02*]	[0.175]
Functional Form	0.104	1.31
[Prob.]	[0.901]	[0.281]

The null hypothesis is rejected at the 10% level of significance.

However, it is worth pointing out that - unlike the agency theory - the target Beta has a strong impact on the level of management fee. This outcome is consistent with Ramakrishnan-Thakor model (1984) where, because of the presence of moral hazard, investors desiring a higher efforts face a higher agency cost. To counteract this effect, they increase the weight assigned to the portfolio systematic risk (given by the target Beta in the fee schedule), since this is not accompanied by increases in agency cost. As for *W,* as expected the sign of the parameter is negative consistently with the usual policy of many mutual funds to scale the fee level according to the amount of capital endowed by the investors. Noise trading (i.e. the standard deviation of portfolio specific return) does not have an evident relation with the contractual manager's reward.

In the case of the WIF group, no significant explanatory factor was found, even though the regression function does not seem to suffer econometric problems according to the diagnostic tests applied.

Given the different results obtained in the estimation procedure for the ALL sample and for the WIF sub-sample, we can conclude that, in the incentive compensation schemes of mutual funds management fees are directly related to target Beta, so as to balance the undesirable effects of performance fees, and inversely to the size of fund value. Nevertheless, investors do not assess straightforwardly the manager's forecasting abilities to set his compensation. Therefore, according to this result, manager's reputation seems not to affect base fees contractual level (i.e. fee in percentage terms).

6. CONCLUSIONS

In this paper Italian mutual funds performance has been analysed to infer whether or not the shape of the managers' compensation scheme leads to informational advantage and how the existence of incentive affects the features of their behaviour. Moreover**,** the hypothesis of a base compensation to fund managers by aware investors was tested.

The context of the study is the investigation of a principal-agent relationship between investors and fund managers. In the presence of moral hazard and asymmetric information, the investors are not able to observe the manager's effort in acquiring and processing information to an optimal portfolio selection. Thus, they cannot distinguish how much of the observed outcome is due to the manager's action and how much due to random events. The literature on the principal-agent relationship has shown that in this case the structure of the managerial compensation has a serious role to play. Thus, the principal problem is to design an appropriate incentive system that induces the agent to avoid any divergent behaviour from the principal's desire.

The fund manager's undesirable behaviour can reveal itself in three different ways:

a) by acquiring no specific information for stock selection;

b) by taking a position on risky assets without any ability to predict stock price movements;

c) by carrying out “noise” trading just to signal to the investors that he is informed, when this is not the case.

To some extent this paper tried to make evident any investment behaviour dissimilarity due to the existence of differences in the compensation scheme for Italian fund managers. The empirical results of this study can be summarised as follows:

- on average, no substantial difference has been discovered in terms of abnormal return gained, systematic risk level and managerial ability to risk adjustments (i.e. market timing abilities), among the portfolios of mutual funds with incentive fees and those of mutual funds without incentive fees. As a consequence, we argued that the type of index commonly used by the Italian mutual funds to determine the performance fees (i.e. the consumer price index) did not supply a successful incentive to exploit the manager’s ability in gathering and processing private information, but at the same time it did not encourage manager to adopt divergent behaviour in terms of riskier asset positions on an uninformed basis;

- differences in noise trading volume between funds for class of specialisation do not appear to change the above considerations;

- for the mutual funds with the manager’s compensation based on a performance measurement, management fee size was found to be directly related to the target Beta and inversely related to portfolio fund value. Therefore, even though the explanatory power of the two variables was quite low, the fund managers’ base compensation can be considered as not straightforwardly related to the assessment of their quality.

Finally, on the grounds of these results, it is possible to conclude that in the Italian context of mutual funds the actual form of incentive schemes does not produce appreciable effects on the investors' welfare state.

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APPENDIX 1 **SAMPLE OF ITALIAN MUTUAL FUNDS**

1	ANFAT	B – IF	Anima Fondattivo	21	EUMST	B – WIF	Euromob. Euromob.Strat.
2	ANFTR	A – IF	Anima Fondo Trading	22	FCRIAZ	S – IF	Fondicri Carimonte Az. It.
3	ARCA27	A – WIF	Arca Arca 27	23	FCRIBIL	B – WIF	Fondicri Fondicri Bil.
4	ARCABB	B – WIF	Arca Arca BB	24	FCRISEL	S – IF	Fondicri Fcri. Selez. Italia
5	ARCAZIT	S – WIF	Arca Arca Az. Italia	25	FERSEL	B – WIF	Ersel Fondersel
6	AUREO	B – WIF	Coogest. Aureo	26	FFLAZIT	S – IF	Fin&Fut Lagest Az. Ita.
7	AURPR	A – WIF	Coogest. Aureo Previd.	27	FFPRGIT	S – IF	Fin&Fut Prof. Gest. Ita.
8	AZIMBIL	B – IF	Azimut Azimut Bil.	28	FFPROF	B – WIF	Fin&Fut Professionale
9	AZIMGC	A – IF	Azimut Azimut Glb. Cresc.	29	FFPRRIS	B – IF	Fin&Fut Prof. Risparmio
10	BNMULT	B – WIF	Sofiban BN Multifondo	30	FININRAZ	A – IF	Fininvest Risp. Ita. Az.
11	BNSIC	B – WIF	Sofiban BN Sicurvita	31	FINV2	B – IF	Fondinvest Fondinvest 2
12	CARIDEL	A – WIF	Fondigest Cari. Delta	32	FINV3	A – IF	Fondinvest Fondinvest 3
13	CARILIB	B – WIF	Fondigest Cari.Libra	33	GCREDBIT	S – WIF	Gcredit Gcredit Bor. Ita.
14	CENTC	A – WIF	Centrale Cent.Capital	34	GCREDIT	B – WIF	Gcredit Capitalcredit
15	CGESTAZ	A – WIF	Capitalgest Capital.Az.	35	GELLEA	S – WIF	Gestielle Gelle A
16	CGESTBIL	B – WIF	Capitalgest Capital Bil.	36	GELLEB	A – WIF	Gestielle Gelle B
17	CISAZ	A – WIF	Cisalp. Cisalp. Az.	37	GENCOMIT	B – WIF	Genercomit Genercomit
18	CISBIL	B – WIF	Cisalp. Cisalp. Bil.	38	GENERG	A – WIF	Genercomit Gener. Capit.
19	EPTAC	B – WIF	Eptafund Eptacapital	39	GEPOC	A – WIF	Sogepo Gepocapital
20	EUMRF	A – IF	Euromob. Euromob.Risk F.	40	GEPOR	B – WIF	Sogepo Geporeinvest
41	GESLOMB	A – IF	Gesfimi Lombardo	61	QUADAZ	A – WIF	G.I. Gest. Qd.foglio Az.
42	GESVIS	B – IF	Gesfimi Visconteo	62	QUADBIL	B – WIF	G.I. Gest. Qd.foglio Bil.
43	GINTER	B – WIF	Gestinter Intmobiliare	63	RASCAP	S – IF	Gras Capitalras
44	GMVENT	A – IF	Gmerchant Venture Time	64	RASM	B – IF	Gras Multiras
45	GNAGRA	B – WIF	Gfondi Nagracapital	65	ROLO	B – WIF	Rolofond Rolomix

46	GNORDC	B – WIF	Gnord Nordcapital	66	ROMAZZ	B – IF	Roma Azzurro
47	GRIFOC	B – WIF	Grifogest Grifocapital	67	ROMF	A – IF	Roma Finanza Romagest
48	IMICAP	B – IF	Fideuram Imicapital	68	ROMGIAL	B – IF	Roma Giallo
49	IMIND	A – IF	Fideuram Imindustria	69	ROMIND	A – IF	Roma Industria Romagest
50	IMIT	S – IF	Fideuram IMI – Italy	70	SAIGAL	A – WIF	SAI Galileo
51	INGAZ	S – IF	ING Azionario	71	SAIPHEN	A – WIF	SAI Phenixfund Top
52	INGP	B – IF	ING Svil. ING Portfolio	72	SGCFIT	B – IF	Sogesfit Capitalfit
53	INTBAZ	A – IF	Intbanca Intbanca Az.	73	SGFIN	A – IF	Sogesfit Sgsfit Finanza
54	INTBBIL	B – IF	Intbanca Invest. Bil.	74	SPFALD	S – WIF	S.Paolo SPF Aldebaran
55	INTBINV	S – IF	Intbanca Invest. Az.	75	SPFJ	A – IF	S.Paolo SPF Junior
56	MIDABIL	B – WIF	Fidagest. Mida Bil.	76	VENB	A – WIF	Gveneto Venetoblue
57	PRIMCAP	A – IF	Prime Prime Capital	77	VENC	B – WIF	Gveneto Venetocapital
58	PRIMCL	S – IF	Prime Primeclub Az. Ita.	78	VENV	A – WIF	Gveneto Venetoventure
59	PRIMIT	S – IF	Prime Prime Italy	79	ZETABIL	B – WIF	Zeta Salvadanaio Bil.
60	PRIMR	B – IF	Prime Prime Rend.	80	ZETAZ	A – WIF	Zeta Salvadanaio Az.

INVESTMENT SPECIALISATION

A = PREFERIBLY ITALIAN STOCKS *(AZIONARIO ITALIA)*

B = ITALIAN STOCKS AND GOVERNMENT BONDS *(BILANCIATO ITALIA)*

S = ONLY ITALIAN STOCKS *(SPECIALIZZATO ITALIA)*

COMPENSATION SCHEME

IF = WITH INCENTIVE FEES

WIF = WITHOUT INCENTIVE FEES

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