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# Do investment management structures and sponsors' activeness affect delegated investment performance?

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## ABSTRACT

We use data on Italian occupational pension funds to investigate the impact of the investment management structure on delegated investment performance. We evaluate investment management structure along two different dimensions: (i) the degree of *specialization* of asset managers' activity and (ii) the level of diversification of the mismanagement risk obtained by apportioning the management of the delegated portfolio to different asset managers (*managerial diversification*). Moreover, we evaluate the effect of the sponsor's propensity to redistribute resources among managers and mandates. We report two main results. First, specialization increases activeness, consistent with plan sponsors' aim of exploiting asset managers' skills at managing specific asset classes. However, we found an increase in alpha achieved by funds that employ specialized managers only when plan sponsors do not delegate market timing and redistribute resources among mandates. Higher active risk might therefore be due to the sponsors' activity and not to the delegated asset managers' superior ability. Second, managerial diversification decreases both active risk and alpha. This result is again driven by plan sponsors' activeness, as it is statistically significant only when plan sponsors are more prone to redistribute resources among managers because they are not satisfied with their results.

**JEL Classification:** G11, G20, G23.

**Keywords:** Institutional investors, Return dispersion, Active management, Fund characteristics.

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## ABSTRACT

We use data on Italian occupational pension funds to investigate the impact of the investment management structure on delegated investment performance. We evaluate investment management structure along two different dimensions: (i) the degree of *specialization* of asset managers' activity and (ii) the level of diversification of the mismanagement risk obtained by apportioning the management of the delegated portfolio to different asset managers (*managerial diversification*). Moreover, we evaluate the effect of the sponsor's propensity to redistribute resources among managers and mandates. We report two main results. First, specialization increases activeness, consistent with plan sponsors' aim of exploiting asset managers' skills at managing specific asset classes. However, we found an increase in alpha achieved by funds that employ specialized managers only when plan sponsors do not delegate market timing and redistribute resources among mandates. Higher active risk might therefore be due to the sponsors' activity and not to the delegated asset managers' superior ability. Second, managerial diversification decreases both active risk and alpha. This result is again driven by plan sponsors' activeness, as it is statistically significant only when plan sponsors are more prone to redistribute resources among managers because they are not satisfied with their results.

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## 1. Introduction

In their seminal 1986 article titled “Determinants of Portfolio Performance” Brinson, Hood and Beebower described the framework still used for attributing returns to asset managers. According to them, a portfolio’s total return originates from three activities. The long-term (or strategic) asset allocation, selected to meet the fund’s objectives and defining its passive benchmark is the first. The under- or overweighting of an asset class relative to its weight in the benchmark (the market timing or tactical asset allocation) is the second. The active selection of investments within an asset class (security picking) is the third. Xing, Ibbotson et al. (2010) include costs in the picture and names “active portfolio management return” the return coming from timing, security selection and fees.

In delegated investment management schemes, such as pension plans, the plan sponsor, representing investors, is in charge of defining the investment process target. Usually, the sponsor is also responsible for long-term asset allocation and for the choice of the benchmark, even though sometimes delegated asset managers might be in charge of performing this task i.e. when they obtain absolute return mandates. Various arrangements to perform market timing and security selection also exist.

Some plan sponsors decide to employ only one manager to oversee the entire asset pool while others hire many. If more than one manager is in charge of investing the fund’s assets, their mandates can have a different degree of specialization. At one end of the spectrum, we find schemes portioned in sub pools whose resources are invested in securities belonging to very specific asset classes (i.e. Japanese equities or European corporate bonds). At the other end, we find schemes whose asset managers can pick securities among a wider investment universe comprising various asset classes (i.e., a Global or a European balanced brief).

On top of that, plan sponsors might also want to diversify the risk that one manager’s judgement errors penalize the scheme overall performance and/or spur competition between managers by hiring more than one with the same benchmark and investment objective. Sponsors might also decide to delegate passive managers instead of active ones.

We call the above arrangements the organizational structure of investment management activity or the “investment management structure”. The characteristics of the investment structure originate from *ex-ante* choices regarding the sponsor’s role in the asset management process. For example, when an investment structure features specialized mandates, the sponsor’s role in market timing is more important. When an investment structure includes passive mandates, the sponsor decided to shed those managers from security picking – activity that she had already performed when she defined the mandate benchmark.

In this paper, we investigate whether the organizational structure of investment management activities delegated to external asset managers by a plan sponsor influences investment activity results, namely, the active return (alpha) and the active risk. We are particularly interested in exploring the influence of two dimensions of the investment management structure:

- (i) the degree of specialization of the mandates given to asset managers – a concept that Williams 1980 calls “diversification of style” and
- (ii) the choice of hiring “more than one manager in case one manager makes a large error”, – a concept that Williams 1980 calls “pure diversification” and that we name “managerial diversification”.

We also analyze if the propensity of the plan sponsor to be involved in the process of redistributing resources – a concept that we name “sponsor’s activeness” – has an impact on both alpha and active risk and if this impact is different depending on the scheme investment structure features. The way the sponsor exercises the rights she is entitled to could indeed influence results. As mentioned above, the degree of specialization of the investment mandates defines the breadth of the sponsor’s role because it determines her responsibility in the market timing activity. When the investment structure of the fund comprises different specialized mandates, a sponsor that forgo the possibility of redistributing resources among mandates is giving up the results of market timing activity that single asset managers are not able to perform due to the features of their tasks.

On the other hand, as fund flows are a way to link results to asset managers’ compensation, sponsors’ discretion at reallocating resources might also be a useful tool to influence managers’ behavior. By making managers *ex ante* credibly believe that the scheme sponsor will exercise this right should *ex post* results not be good enough, managers’ activeness might change, especially when resource reallocation costs are lower because more than one manager perform the same task. In this sense, the risk reduction purpose of “managerial diversification” features of the investment management structure might also have beneficial side effects.

To investigate whether investment management structures and sponsors’ activeness affect delegated investment performance, we selected a sample of Italian pension funds and examined their characteristics and results over the 1999-2015 period. The schemes included in our analysis are industry-wide second pillar defined contribution (DC) funds, whose aim is to allow participants to accumulate the highest possible balance in a way that is compatible with their tolerance for risk.

The pension fund sponsors act as principals in a delegated investment scheme, with external professional investment firms (hereinafter: asset managers) acting as agents.<sup>1</sup> As mentioned above, even if asset management activity is outsourced to external firms, the pension fund’s sponsor maintains the responsibility for the strategic asset allocation plan, summarized in a benchmark, whereas the delegated asset managers are responsible for the material execution of this plan. Delegated managers in our sample can be required either to replicate the benchmark’s performance (passive investing) or to try to outperform it (active investing).

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<sup>1</sup> In fact, pension funds can either carry asset management activity in-house or outsource it to external firms. Even though funds revert to different organizational arrangements, most of them do both, bringing in external asset managers in order to profit from skills that are expensive to build internally (Ambachtsheer, 2016). Only the largest pension funds (for example CALpers in the US, PGGM in the Netherlands, Ontario Teachers’ Pension Plan in Canada, AustralianSuper in Australia or USS in the United Kingdom) have sufficient size to justify the build-up of an internal asset management structure. However even these large funds employ third party managers in some areas, particularly in less mainstream asset classes where the size of potential allocation is too small to justify the cost of building an internal team.

Funds in our sample adopted very different management structures, mirroring the diversity in organizational arrangements found elsewhere, which give us some support about the generalizability of the results we obtain. While we do not have information on each asset manager's gross performance – public sources allowed us to collect data only on each fund aggregate performance net of cost – we were able to reconstruct detailed data on benchmarks and information about fee structure and sponsors' activeness.

Why should investment structure influence managers' behavior and results?

If a plan sponsor hires more than one investment firm with the same mandate, direct competition could push managers to exert more effort and pay more attention to performance: results' evaluation will take place not only against a theoretical benchmark but also against one or more competing players, ability revelation arguably becoming easier.

However, there are drawbacks when sponsors design structures to foster competition. Peers' pressure could cause herding behavior, because asset managers might be worried about the reputational effects of losing resources and worst of all, their mandate. If herding behavior prevails, asset managers may keep their bets to a minimum and stick close to their benchmark, particularly if their mandate does not explicitly set a tracking error target but it establishes a tracking error limit instead - as it seems to be the case in our sample. Moreover, such structures could lead to inefficient hiring and firing decisions based on recent performance experience.

As mentioned, a different reason to hire competing managers might be the aim to diversify away the risk of one of them making a mistaken judgment that could impair performance i.e. alpha risk diversification. For that strategy to be efficient though, the competing active managers' aggregate performance, net of cost, should be consistently better than the results coming from hiring passive managers, as the latter do not produce alpha but command lower fees.

The choice of the degree of specialization of investment mandates also faces pros and cons.

Broad mandates provide more flexibility to asset managers and enable them to add value through market timing as well as security selection decisions. On the other hand, specialist mandates should enable the fund to access superior expertise of dedicated managers whose core business is a specific niche of the investment universe. If the plan sponsor is not as able as the asset managers at market timing though, the advantages coming from specialized mandates might be lost.

Why do we expect that plan sponsors activism at handling the resource reallocation process is relevant in influencing results?

The plan sponsor carries out resource reallocation activity for two reasons at least. The first reason is due to her role in market timing: the logic for moving money from one mandate to the other might be the desire of profiting from market opportunities that make a deviation from the benchmark weights advisable. In investment structures where this responsibility is on the sponsor and the sponsor performs this task, resource reallocation

entails a higher active management risk – which in turn should produce alpha. As mentioned above, sponsors who chose specialized investment structures but give up resource reallocations are shying away from taking active risk that their scheme managers are unable to harvest because of their mandates characteristics.

The second reason for performing resource reallocation activities is due to resource reallocation link to asset managers' incentives. Activism needed to generate alpha implies more risk taking which might not be conducive to better results. Unless appropriate incentives are in place, in an asymmetric information context we can assume that asset managers find passive investing preferable.

Incentives could come from performance fees. Some mandates in our sample indeed have flat management fees (i.e.  $x$  basis points as proportion of assets under management) that reward the management activity performed. Flat management fees link compensation to the manager results up to a certain point (if the manager loses money the asset pool value decreases and, as the management fee rate is constant, her compensation decreases as well). Other mandates comprise a performance-related element on top of the management fee. The performance fee is usually a percentage of the results coming from the difference between the managed portfolio return and its benchmark, measured over a particular timeframe (i.e., 1 year, 3-year annualized etc.), which is paid if a tracking error volatility maximum threshold is respected.

However, due to the noise in investment decisions results, effective fee structures are difficult to design, also considering sponsors' legitimate aim to reduce costs in order to deliver. When negotiating the fee structure, for example the sponsor might impose a reduction in the management fee rate for the introduction of a performance fee, as we document in our sample. If the manager is not sure that her risk-taking activity will pay in time to reap its positive results, she might be tempted to forgo the expensive tasks that active management implies.

Evaluating managers' behavior considering a broader picture instead of applying predefined incentive schemes might be more appropriate, even if entailing higher monitoring costs. As managers' compensation is a percentage of the value of the assets they invest, linking the result of this evaluation procedure to resource reallocation among managers – termination being the last resort option – might spur asset managers' effort. On the other hand, unless driven by a scrupulous performance attribution process, a resource reallocation mechanism might end up obtaining perverse results. A reduction in their compensation due to a resource reduction danger might push managers to stick to the benchmark instead of attempting at deviating from it to improve their relative performance. Therefore, resource reallocation activism when managers are competing influence results through its impact on managers' incentives to behave and its impact, as it is the case for incentive fees, is not predictable.

Our results shed some light on the above speculations. In our sample, a higher number of mandates is linked to a higher active risk and to a higher aggregate alpha. However, the reallocation activeness of the fund sponsors drives the increase in alpha. Therefore, net of cost, we do not find proof of any superior ability of specialized asset managers – which might be obviously due to asset managers being able to reap, on average, most of the benefits they generate through the fees they collectively obtain from the fund.

On the other hand, we find that having a higher number of managers competing for the same pool of money is detrimental to performance, as it reduces both active risk and alpha. The reallocation activity performed by the sponsor is again relevant though: when sponsor activeness is low, managerial diversification has no effect on both alpha and active risk.

With a sponsor that does not take advantage of the right of redistributing resources among his asset managers, hiring multiple managers performing the same task makes sense only if the aim of this choice is alpha risk diversification. In order to ascertain the efficiency of this alpha risk diversification strategy, our control for the percentage of resources delegated to passive mandates help us. The coefficient that links alpha to the percentage of resources allocated to passive mandates is not statistically different from zero while the one that links active risk to the percentage of resources allocated to passive mandates is negative and significant (as we would expect). If we deemed appropriate to measure the overall net performance by using a risk adjusted measure of excess return, the above results would suggest that passive mandates are a more efficient solution than hiring competing active managers.

To some extent, our data allow us to control for the presence of incentives linked to the fee structure. The relationship between incentive fees and performance that we find is at first puzzling. While not having any impact on alpha, the presence of incentive fees reduces active risk. However, we also find that, in our sample, when incentive fees are present, the percentage paid as flat management fee is lower. This result suggest that the incentive replace in part the flat portion of the compensation. However, while the performance fees attainment is uncertain the loss of the management fee that asset managers had to give up is sure. This might have an undesired result: in order not to lose the smaller flat management fee, asset managers might tend to be more conservative instead of taking more risk to obtain better results.

Our results offer at least two new contribution to the literature. First, we examine the relationship between organizational arrangements and pension funds results. As mentioned, organizational arrangements imply a different labor division between sponsor and asset managers. Blake et al. 2013 has examined the influence of organizational arrangements on asset managers' individual results while considering their performance gross of costs. We consider aggregate performance net of cost – which in the end is the one that is relevant for investors – and we are able to perform some checks for fee structure. Second, we analyze the role of the plan sponsor, taking into account that it might not be limited to oversight on managers. Prior research has focused on sponsors' hiring and firing decisions (for example, Goyal and Wahal 2008), on the flow performance sensitivity in defined contribution pension plans flows (Sialm, Starks and Zhang 2015; and Pool, Sialm and Stefanescu 2016) and on how sponsor's supervision influence managers' behavior (Christoffersen and Simutin 2017). However, it has not taken into consideration sponsors' role in resource reallocation for tactical asset allocation purposes.

This paper proceeds as follows. Section 2 reviews the related literature. Section 3 describes our empirical strategy and Section 4 discusses the data sources and summarizes the sample characteristics. Section 5 presents

the empirical results and their economic interpretation. Section 6 concludes. Appendix 1 provides some institutional details regarding the Italian pension funds.

## 2. Literature review

The literature concerning delegated investment by institutions has examined various aspects of the issue.

From a theoretical point of view Sharpe 1981, Barry and Stark 1984, Shleifer 1985, Scharfstein and Stein 1990, van Binsbergen et al. 2008 among others examine the practice of delegating investment activity to more than one asset manager and the appropriate way to benchmark managers' results. This in order to avoid coordination problems and closet indexing – i.e. asset managers not actively performing their task while claiming to do so.

Shleifer 1985 in particular suggests that benchmarking can be useful in order to limit shirking behavior. If the rewards of an asset manager depend on its standing *vis-à-vis* with a shadow asset manager, constructed by suitably averaging the choices of other firms in the peers' group, each asset manager would compete with its shadow firm generating an optimal outcome. A potential limitation of this approach, named by Shleifer "yardstick competition", is collusive behavior by participating firms. However, when the number of asset managers is high, collusion might not be sustainable: The larger the number of firms in the group, the harder the coordination problem to solve in order to punish the deviant firm.

Scharfstein and Stein 1990 also examines herding behavior in investment decisions. Under certain circumstances, management firms simply mimic the investment decisions of other firms, ignoring substantive private information due to concerns about their reputation in the labor market. As even smart managers can get unlucky, an unprofitable decision is not as bad for reputation when others made the same mistake because managers can "share the blame" if there are systematic unpredictable shocks.

However, short-term incentive contracts shift managers' focus from reputation to profits, making them more prone to take contrarian bets if their private information suggests them to do so. Relative ability might also force managers to avoid herding behavior: If top-ranked managers get a disproportionately high wage, mimicking other managers will destroy the possibility of climbing the ranking and access to high compensation. "Superstar effect" reduces herding tendencies (Rosen, 1981).

Empirically, collusion among competing asset managers is extensively analyzed by both connecting fees structure and benchmarking to herding behavior. A large literature on this topic exists but it largely deals with retail mutual funds. Below we limit our review to papers that examined pension investments.

Blake and Timmermann 2002 links herding incentives to the fact that institutional investors often revert to peer benchmarking - which is most easily attainable when asset managers have the same investment goals because they were assigned the same mandate. Targets based on the peer group median or peer group distribution pressure managers to perform at least as the median performer would. However, whereas a fund manager knows the composition of an external index prior to making his own investments and so knows how much he is overweight or underweight in different securities, he will not know for sure what the asset allocation of the median fund



manager is until the end of the performance period. All fund managers will be in the same position and this provides a strong incentive for fund managers not to deviate too far from each other by sticking to the index benchmark.

As a matter of fact, Blake et al. 2002 finds that in the UK during the period 1986-1994 there is a tight distribution of pension fund managers' return around the median fund manager who, in turn, generates a gross performance little different from that of a passive index matcher.

More recently, Christoffersen and Simutin 2017 also documents investment biases induced by benchmarking: when pressured by strict oversight, asset managers strategically increase beta exposure to the benchmark while maintaining and even reducing tracking error volatility.

Del Guercio and Tkac 2002 analyzes the relationship between asset managers' performance and funds resources redistribution from the scheme trustees. Their evidence is consistent with a decision process by pension sponsors that can be justified ex-post to a trustee committee – making it easy to find a scapegoat when returns are lower than expected. The flow-performance relation is concave – a disproportionately higher return does not imply a proportionate reward in terms of new resources, but assets are withdrawn in case of short-term poor performance, reducing asset managers' intake from management fees. Moreover, pension fund sponsors appear to discourage active risk taking, - the relation between flow and tracking error volatility is negative. Del Guercio and Tkac 2002 also documents that trustees have a tendency to fire managers who substantially deviate from their stated investment policies. This evidence suggests that asset managers' sticking to the benchmark could be an outcome of plan sponsors' pressure to avoid unpleasant results that are difficult to justify as Lakonishok et al. 1992 evidence point at.

Jones and Martinez 2017 also corroborates the feeling that career considerations affect sponsors' allocation decision. Using survey data, they analyze institutional investors' expectations about the future performance of fund managers and the impact of those expectations on asset allocation decisions. Institutional investors allocate funds mainly based on fund managers' past performance and on investment consultants' recommendations. This is not because they extrapolate their expectations from these, as flows are only marginally a function of plan sponsors' expectations. Plan sponsors appear to implement scapegoat strategies in order to deflect responsibility. Since past performance and consultants' recommendations are widely followed measures, plan sponsors stick to them.

Goyal and Wahal 2008 reaches a similar conclusion. Specifically, the article examines if there is a link between hiring (firing) decisions and the hired (fired) asset manager's performance in the three-year period preceding the plan's trustee resolution and if there are performance changes after hiring (firing) by the scheme. While asset managers' pre-hiring excess returns are positive, large and statistically significant, post-hiring excess returns are statistically indistinguishable from zero. On the other hand, when the firing is motivated by the asset manager's performance, excess returns prior to the asset manager termination are negative while three-year post firing excess returns are positive. Comparing the excess returns delivered by newly hired managers with those that would have been delivered by terminated managers over the same time period had they been retained, the return differential is

negative (even though with large standard errors). Therefore, on average, plans sponsors' hiring decisions *"represent an unsuccessful attempt by plan sponsors to seek excess post-hiring return"*. Adding the sizable transaction costs due to portfolio transfer *"a reader could reasonably ask why plan sponsors make decisions that, ex-post, appear to be inefficient (...) a possible explanation is job preservation: if plan sponsors did not hire and fire, their raison d'être would be nonexistent"*.

Blake et al. 2013 is more similar to our work. The article analyzes the impact of asset management firms' specialization on performance by taking advantage of the shift towards splitting investment pools among specialized managers that occurred among UK defined benefit pension funds during the 1980s and the 1990s. The authors observe that over the 1984- 2004 period a common pattern among UK defined benefit pension funds has been the outsourcing of investment activity. This has occurred at first by hiring single managers, who were asked to invest in a broad array of asset classes (through "balanced" mandates). However, after the first decade of the timeframe considered in their sample, most pension schemes had shifted to the hiring of multiple managers, each of whom was requested to focus her investment activity by picking assets from a much more restricted set than the one previously allowed –in certain cases from single asset classes.

As the conversion to product specialization commands higher fees, the move towards specialized mandates is defensible only if its outcome is a better performance than the one that could be attained by delegating investment to managers that invest in various asset classes. If that is the case, pension funds are using multiple managers to exploit the skills of specialist active managers having first-rate knowledge of a particular asset class. In other words, asset managers' specialization is due to superior ability and not to the need to differentiate themselves from their peers in a highly competitive market as Lakonishok et al. 1992 contend. To examine that, Blake et al. 2013 estimates a factor model to gauge the Jensen's alpha for each manager/fund pair. From the above they are able to show that post-fee overall performance is highest for specialized managers, whose superior alpha (after estimated fees) is therefore (at least partially) compensating for their higher costs of coordination.

As for the advantages of employing more than one manager, Blake et al. 2013 examines the change in performance after the switch from one manager to multiple managers within asset classes. The shift to a multiple manager setting produces an improvement in the asset class overall performance, which the authors reconcile with the presence of diseconomies of scale, as suggested by the fact that only large funds make the change. However, a yardstick competition effect is also detected: When the conversion to a multiple managers' environment is enacted by adding new managers to an incumbent, the improvement in the overall performance is mostly driven by the increased returns fetched by the incumbent.

Different from Blake et al. 2013, we test whether particular types of management structures decisions lead to differentials in active risk-taking at the fund level, which, at the end of the day, is the relevant one. Moreover, we examine the impact of the sponsor's activeness at redistributing resources among managers - but also among mandates - on performance. The literature that analyzes resources reallocation among managers never examines this topic because it assumes that the sponsor's role is limited to managers' oversight and that the sponsor entirely

delegates the market timing activity. Our results show that this might not be always the case and that market timing performed by the sponsor might produce value.

Unfortunately, we do not have accurate information on single managers' returns, as neither these data are disclosed by Italian pension funds nor a database comparable to UK CAPS exists for Italy. On the other hand, we exploit hand collected information on single mandates: the exact benchmark that pension funds trustees request the managers to take into consideration when investing<sup>2</sup>, the number of competing asset managers, the asset under management of each investment firm at the end of each year, the fees that were paid to them. On top of that, we are able to profit from a precise measure of net of fees return as we were able to gather information concerning the monthly net asset value of the scheme pools.

Before proceeding with our paper, we want to point out three important circumstances that make our analysis of particular interest.

First, different from most of the cited literature (for example Lakonishok et al., 1992; Del Guercio and Tkac, 2002; Blake et al., 2013) the pension funds we are considering are defined contribution plans who are not deemed to guarantee any performance to their participants (we discarded the observation when that was the case). Therefore, in our sample the trustees' behavior is not influenced by the need to secure a certain benefit level to the scheme participants. As Lakonishok et al. 1992 highlights, when defined benefit schemes are considered, underfunding is an important issue because the shortfall becomes the most senior claim on the sponsor. Moreover, the demographic characteristics of the participants' scheme are possibly influencing the fund trustees when establishing mandates guidelines and hiring/firing asset managers. For example, the progressive closing of UK corporate defined benefit plans to new members and the consequent aging of their participants increased the pressure to have liabilities covered with the scheme investment activity's results. As documented in IMA (2014), this demographic trend pushed most UK corporate defined benefit plans to adopt liability driven investment strategies partially shifting away from specialized managers. As in our study we consider defined contribution plans only, we can safely put aside the above issues.

Second, during the timeframe we analyzed, Italian pension funds active mandates did not apparently suffer from constraints coming from tracking error volatility limits. Our evidence - which unfortunately do not cover the entire sample - suggests that the conventional thresholds which separate passive and enhanced passive investments on the one hand from active investments on the other<sup>3</sup> was always below TEV limits for active mandates.

From annual surveys conducted by the Italian pension funds trade organization, Mefop, on one hand pension funds trustees bemoan a generic lack of initiative by asset managers (Mefop 2011). Complaints about asset managers' lethargy echoes in annual reports. For example, Gomma Plastica fund's annual report 2008 states "*With*

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<sup>2</sup> According to BIS 2003, the thresholds are roughly defined by tracking errors of 2% for equity funds and 0.25% for fixed income portfolios.

<sup>3</sup> According to BIS 2003, asset managers are expected to make full use of agreed deviation from benchmark and institutional investors internal processes are explicitly set in order to deal with that. "An Italian interviewee, specifically, stressed that, in case of unanticipated events, it is the responsibility of the asset manager to propose amendments to the agreed mandate".

the partial exception of asset manager Unipol/JP Morgan we observe that managers find it hard to obtain performances that significantly differ from their benchmarks. This phenomenon (is independent of benchmarks' volatility because it) also holds when volatility is extremely high<sup>4</sup>. On the other asset managers justify their stance with the pressure to deliver short term results and never mention too little maneuver space due to mandates limits (Mefop, 2011).

Third, due to regulatory constraints, Italian occupational pension funds completely outsource their investment activity and therefore we do not have complications coming from skills' variance among funds' internal managers competing with external ones for the schemes resources. Moreover, asset managers do not supply services other than investing: we can discard inefficiencies coming from favoritism due to the dual role of administering the plan while managing its assets like the ones documented in Pool et al. 2016.

### 3. Research methodology

To determine whether the investment management structure of the pension funds affect their financial performance, we estimate the following panel regression model with robust standard errors clustered at the sub-fund level:

$$\begin{aligned} performance_{i,t} = & \alpha + \beta investment\ structure_{i,t-1} + \gamma sub-fund\ characteristics_{i,t-1} + \\ & + \delta activeness_{i,t-1} + \lambda STDEV\_BENCH_{i,t} + \tau year_t + \eta_{i,j} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where

- i.  $performance_{i,t}$  is the observed performance for the  $i$ -th sub-fund at year  $t$ ;
- ii.  $investment\ structure_{i,t-1}$  is the vector of investment structure variables, as observed at year  $t-1$ ;
- iii.  $sub-fund\ characteristics_{i,t-1}$  is a vector of control variables;
- iv.  $active\ risk_{i,t-1}$  is a measure of the management activeness measured at year  $t-1$ ;
- v.  $STDEV\_BENCH_{i,t}$  is the standard deviation of the monthly returns of the sub-fund benchmark observed in year  $t$ ;
- vi.  $year_t$  is a vector of time specific dummy variables;
- vii.  $\alpha, \beta, \gamma, \delta, \lambda, \tau$ , the regression coefficients<sup>5</sup>;  $\eta$  the sub-fund fixed effect, and  $\varepsilon_{i,t}$  the disturbance term.

#### 3.1. Performance measures

We refer to two types of performance dimensions, because we consider both the active return and the active risk. The variable named  $ALPHA_{i,t}$ , proxies the active return.  $ALPHA_{i,t}$  is calculated as the average of the difference between the monthly  $i$ -th sub-fund's returns and its benchmark index return in year  $t$ .

<sup>4</sup> Translated from Gomma Plastica's management report for the year 2018, page 13.

<sup>5</sup>  $\beta, \gamma$ , and  $\tau$  are the vectors of regression coefficients for the investment structure variables, the sub-fund characteristics variables, and the year dummy variables, respectively.

$$\text{ALPHA}_{i,t} = \text{mean}(\text{Return}_{\text{sub-fund}} - \text{Return}_{\text{benchmark}}) \quad (2)$$

We use two measures of managerial activeness (*active risk*). The first measure,  $\text{TE}_{i,t}$ , is the sub-fund’s tracking error volatility (hereafter just “tracking error”), which is the usual way to proxy for investment management activeness. The tracking error represents the time-series standard deviation of the difference between the monthly sub-fund returns and its benchmark index return in year  $t$ :<sup>6</sup>

$$\text{TE}_{i,t} = \text{stdev}(\text{Return}_{\text{sub-fund}} - \text{Return}_{\text{benchmark}}) \quad (3)$$

Tracking error measures the volatility of the portfolio’s return that is not explained by movements in the portfolio’s benchmark index return. We use the benchmark index self-reported by the pension fund for each sub-fund. We double-check that the overall benchmark of the sub-fund corresponds to the joined benchmarks the sponsor assigns to each mandate to ascertain that the self-reported benchmark is the actual one. The actual benchmark is the relevant index for performance evaluation purposes and therefore we are sure that deviations from it are intentional. If we employed a “standard” benchmark as most of the past literature does, we could not be completely sure that detected activeness is simply due to asset managers having been assigned a different reference point than the one used for measurement purposes.

Following Amihud and Goyenko 2013, we use an alternative measure of the activeness of the investment management, based on the sub-fund’s  $R^2_{i,j,t}$ , estimated by regressing the  $i$ -th sub-fund’s monthly returns on the returns of its benchmark for each year  $t$ .  $R^2$  is the proportion of the sub-fund’s return variance that is explained by the variation of the benchmark return. Consequently, the lower the  $R^2$ , the higher the deviation of portfolio returns from benchmark returns and, as a result, the more active is the manager<sup>7</sup>

In order to have a measure that – consistently with the tracking error measure – increases with managerial activeness, we adopt the transformation  $1 - R^2$ , that Amihud and Goyenko 2013 define as *selectivity*.

Selectivity is measured by

$$1 - R^2 = \frac{\text{RMSE}^2}{\text{Return variance}} \quad (4)$$

where  $\text{RMSE}$  is the idiosyncratic volatility, i.e., the volatility of the residual from the regression of the fund returns on the benchmark returns.

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<sup>6</sup> See Ammann and Zimmermann 2001.

<sup>7</sup> As argued by Amihud and Goyenko 2013, mutual funds with R-squared values close to 1 are effectively “closet index” funds, while extremely low R-squared might be the result of estimation error. Our main results are qualitatively the same if we winsorize or keep the outliers.

However,  $R^2$  and  $(1-R^2)$  can only range between 0 and 1, which might lead to biased estimation results. We avoid misspecifications in the empirical estimation by using a logistic transform of the variable  $(1 - R^2)$  which leads to our second dependent variable,  $ACTIVER2_{i,t}$ , calculated as

$$ACTIVER2_{i,t} = \ln\left(\frac{(1-R_{i,t}^2)}{1-(1-R_{i,t}^2)}\right) \quad (5)$$

As pointed out by Petajisto 2013, despite proxying for a similar phenomenon, TE should be preferred to  $ACTIVER2$  as a measure of active risk. For example, if the asset manager is timing a market by temporarily holding a large amount of cash, the active risk generated by this strategy would be captured by the TE measure but not by the  $ACTIVER2$  one, which is based on the regression residual.

### 3.2. Investment management structure variables

We evaluate the investment management structure of a pension fund along different dimensions (measured at  $t-1$  to mitigate endogeneity concerns).<sup>8</sup> In the first place, we look at the degree of *specialization* of the investment mandates (Williams 1980's *diversification of styles*), proxied by the number of mandates,  $MNDTS_{i,t-1}$ , assigned by the fund sponsor to the  $i$ -th sub-fund in year- end  $t-1$ . As a matter of fact, a more specialized investment structure would require a larger number of mandates (for each of the asset classes in which the portfolio is portioned) and – in most cases – of asset managers.<sup>9</sup>

We also consider the intensity of *managerial diversification*, proxying it with the Herfindahl-Hirschman index (HHI) of the asset managers' assets under management,  $HHI\_MGRS_{i,t-1}$  for the  $i$ -th sub-fund in year  $t-1$ .<sup>10</sup> HHI has the advantage to capture not only the number of the asset managers in a sub-fund, but also the way resources are allocated among them. Then, in order to make empirical results' interpretation straightforward, we transform the variable so that its value increases with the level of diversification. Therefore we measure *managerial diversification* with the  $1-HHI\_MGRS_{i,t-1}$  variable.

Finally, we claim that an important variable that impact on the results coming from the investment management activity is the propensity of the pension fund sponsor to intervene in the allocation of the financial resources. Sponsors might retain the right to modify the resource and flow allocations deviating from the original allotment written in the mandate and might or might not take advantage of this right. We name this attitude *sponsor's activeness*. We consider a sponsor to be an active one if she performed a resource redistribution during the year –

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<sup>8</sup> It is worth mentioning that the investment management structure variables and other fund-specific variables are all evaluated at the year end. Consequently, when these variables are denoted with  $t-1$ , they refer to the investment management structure or the other characteristics of the funds as at the beginning of year  $t$ .

<sup>9</sup> If a specialization structure aims at exploiting asset managers' specific skills, we should expect that managers specialize on different asset classes, hence different mandates are assigned to different managers.

<sup>10</sup> As an example, if the resources of a sub-fund are assigned to one manager only (i.e., if there is no competition), the HHI is 1; if the resources are assigned to four managers (i.e., if there is significant competition), the HHI is 0.25 (provided that each manager has been allocated with the same amount of resources); etc.

firing and hiring decisions not linked to regulatory reasons included<sup>11</sup> – or if she stated that she did not take advantage of the right to redistribute resources because there was no reason for doing it. A careful examination of pension funds’ annual reports allowed us to gather information on sponsors’ behavior and attitude. If the sponsor is an active one, we assign the value of 1 to the dummy variable  $FLOW\_REALL_{i,t-1}$ . If the sponsor did not perform any resource redistribution and did not state her right to do so, we consider her to have a lower propensity to act and we assign the value of 0 to the dummy variable  $FLOW\_REALL_{i,t-1}$ .

For example, in 2015 annual report Astri pension fund states the following: “*New resources conveyed to the sub-fund by members during the year have been distributed to both asset managers on a fifty-fifty basis even if the sponsor retains the right to modify this allotment by attributing more money to the asset manager that performs significantly better than the other*”.<sup>12</sup>

Fopen fund’s 2013 annual report also states the following: “*Considering the fact that Amundi’s performances were inadequate the fund exercised its right of withdrawal from the contract. Its resources were redistributed to Dexia for the balanced sub-fund and to Axa for the equity sub-fund*”.<sup>13</sup>

It is worth mentioning that the resources that the sponsor has the right to assign can come from various sources. For example, the sponsor might decide to limit reallocation to distributing in a different way than initially stated financial flows coming from fund participants’ new contributions. She can also reduce the assets under management originally allotted to an incumbent manager (who at the extreme she could fire) and reallocate the freed assets among the retained (or newly hired) ones. When reallocation implies transferring assets from one manager to the other – which typically happens when bad results are punished by either firing or reducing the poorly performing manager responsibilities – the process might entail a transition cost. The manager that is assigned the assets might not be as free to redeploy it as she would be had she been given money. Sometimes sponsors hire “transition managers” that are in charge of smoothly managing the changeover.

Moreover, a different allotment of financial resources can imply rearranging them in different ways. On one hand, the sponsor might deviate from the initial allocation of resources across mandates (and asset classes) allotting the resources originally destined to a manager performing a certain task to another manager with a different assignment (a concept that we name *redistribution across mandates*). On the other, the sponsor might redistribute resources between managers assigned to similar jobs (a concept that we name *redistribution among managers*). The reason for the decision to redistribute resources to other managers performing a similar task - keeping the asset allocation in line with the past – might be the intention to sanction poorly performing managers and/or to enforce the managers’ incentives with a (credible) punishment threat. On the contrary, the decision to redistribute

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<sup>11</sup> For example, according to Italian regulation, an occupational pension fund’s asset manager cannot belong to the same group of the fund’s depository bank due to obvious conflict of interest reasons. If ensuing a merger such a conflict arises, the fund must withdraw either from the contract with the asset manager or from the contract with the depository institution.

<sup>12</sup> Translated from Astri’s Annual report for the year 2015, page 10.

<sup>13</sup> Translated from Fopen’s Annual report for the year 2013, page 10.

resources to managers performing different tasks could be the result of market timing strategy: The sponsor might intentionally intend to deviate from the initial strategic asset allocation to achieve short-term over-performance. Unfortunately, while the information available in pension funds' financial reports allows us to identify the existence of sponsor's activeness, it is often difficult to establish if the reallocation activities occur among managers, across mandates, or both. This might be due for example to the same manager having been hired on different mandates: we are informed about the fact that part of his resources is given to other managers, but we do not have details on the mandates this money was intended to be originally channeled.

Therefore, we interact our measure of sponsor's activeness with the number of mandates and the Herfindahl-Hirschman index (HHI) measure to check if the propensity to be active has a different effect – if it has any – depending on the investment management structure features. For example, if there are multiple specialized mandates this might imply a market timing activity performed by the sponsor while if the sub-fund only assigned one mandate to multiple managers the fund sponsor being active might imply a higher credibility of punishments in case of bad performance.

### *3.3. Other variables*

We include a number of additional control variables (also measured at  $t-1$  to mitigate endogeneity concerns) to control for sub-fund-specific characteristics. In the first place, investment mandate's terms and provisions influence managers' behavior. While we do not have detailed information on each mandate, the information retrieved in pension funds' annual reports and investors' filings allow us to identify the sub-funds that have adopted incentive fees structures. We denote them with  $\text{INCENT\_FEES}_{i,t-1}$ , a dummy variable that equals one if the sub-fund's managers are remunerated with an incentive fee on top of a management fee and zero otherwise.

Following the existing literature, we include the variables  $\text{SIZE}_{i,t-1}$  and  $\text{AGE}_{i,t-1}$ , the natural logarithm of the asset under management and the number of operating years of the  $i$ -th sub-fund at year  $t-1$ , respectively. Other variables include  $\text{TURNOVER}_{i,t-1}$ , the minimum between the amount of securities bought and securities sold by the sub-fund divided by its assets under management and  $\text{PASSIVE\_SHARE}_{i,t-1}$ , the percentage of the sub-fund's asset under management allotted to passive investment mandates. We also control for the level of active risk in the previous period, by adding either the  $\text{TE}_{i,t-1}$  or the  $\text{ACTIVER2}_{i,t-1}$  variable.

Finally, in order to control for time specific effects, we include a set of year dummy variables and we include the  $\text{STDEV\_BENCH}_{i,t}$  variable, the standard deviation of the monthly benchmark's returns, to account for the specific financial market conditions.

All the variables are defined in Appendix 2.



#### 4. Data sources and sample characteristics

We use a hand-collected dataset of the Italian occupational pension funds for which accounting, benchmark, financial performance, and financial management structure information is available. Most of the information is retrieved from the funds' websites, while benchmark returns are collected from Bloomberg and Datastream.

We want to select sub-funds whose asset managers perform comparable activities. Sponsors' evaluation of results should also follow a comparable process. For those reasons, we want asset managers' performance to be benchmarked to an index that is a real reference point. Therefore, we exclude from our data set the minimum guaranteed return sub-funds, as the aim of the delegated manager is to reach the minimum guaranteed return. For such sub-funds, the risk of not reaching the minimum threshold is very often shifted to the asset manager, who is paid a distinct fee due to cover that risk. Furthermore, in this case, the disclosed benchmark is merely suggestive, and it is not the main ingredient used to evaluate the asset manager's performance.

For the same reason we also exclude sub-funds whose resources are allotted even partially to total return mandates and sub-funds whose organizational arrangements deviate from a homogenous benchmark based evaluation of investing activity – for example because a single manager is in charge of hedging exchange rate risk, tail risk and so on.

As a result, we end up with an unbalanced data set consisting of 58 sub-funds from 26 pension funds, from 2000 to 2016, for a total of 554 sub-fund-year observations.<sup>14</sup>

The pension funds in our data set exhibit different sophistication as for the investment solutions offered to their participants. Some of them offer, especially at the beginning of their activity, a single asset allocation option, through a single sub-fund. The remaining ones are established as “umbrella funds” and provide several distinct sub-funds (from 2 to 6) to meet different risk-return preferences of their customers. More important for our analysis, sub-funds can exhibit different investment management structures, as the management of the financial resources can be delegated to one asset manager via a single mandate (e.g., the Fopen “Azionario” sub-fund in 2006, with a single mandate) and to various managers as well (up to 9, such as the Fonchim “Stabilità” sub-fund in 2013). Resources can be managed along one or more mandates (up to 7, such as the Telemaco “Prudente” sub-fund in 2007). Similarly, in some cases there is clear evidence of sponsor's activeness, which is absent in other sub-funds, such as the Cometa “Reddito” sub-fund in 2011 or the Fonchim “Crescita” sub-fund in 2013.

Examples of investment structures are reported in Appendix 3.

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<sup>14</sup> As in our main multivariate analysis we evaluate sub-funds' financial performances against some lagged sub-funds' characteristics, we present descriptive statistics on the sample made of sub-fund-year observations that enter all the multivariate analyses, which total 471. For the same reason, the sub-funds' performance refer to the 2001-2016 period, whereas the sub-funds' investment structure and other characteristics refer to the 2000-2015 period.

## 5. Empirical results

### 5.1. Descriptive and bivariate analysis

Tables 1 reports sample descriptive statistics for the financial performance of the sub-funds and their benchmarks (in Panel *A*), our investment management structure variables (in Panel *B*), and the main characteristics of the funds and sub-funds (in Panel *C*). As far as the investment management structure variables, the average sub-fund is set out in two mandates and employs almost three (2.86) asset managers. Interestingly, around 60% of the sub-funds have a single mandate and about one third (31.5%) employ a single manager. The sub-funds that exhibit some sponsor's activeness account for 31.6%. As far as the other characteristics, the average value of a sub-fund's assets under management is 311 million euro (while the average value of assets under management for pension funds in the sample is 776 million euro) and the average age is 4,7 years and 5,9 years for the sub-funds and their funds, respectively. Interestingly, the share of pension funds' assets managed according to a pure passive, benchmark replicating strategy account for only 7% on average, while incentive fees are applied to about half of the sample sub-funds.

**Insert Table 1 approximately here**

Correlations among the main variables are shown in Table 2. In Table 3 we show the results of *t*-tests for the equality of our variables' means. In column 1 of Table 3 we compare sub-funds with a high degree of investment management specialization – i.e., sub-funds with more than two mandates (identified with the value of the dummy variable `MORE_THAN_2_MNDTS` equal to 1) - with sub-funds featuring a low investment management specialization (with `MORE_THAN_2_MNDTS` = 0). We also contrast, in column 2 of Table 3, sub-funds with high and low degree of managerial diversification – i.e. sub-funds with more than three managers (identified with the value of the dummy variable `MORE_THAN_3_MGRS` = 1) versus those with less than three managers (dummy variable `MORE_THAN_3_MGRS` = 0). Last, in column 3 of Table 3, we compare sub-funds whose sponsors we consider as active ones (i.e. dummy variable `FLOW_REALL` = 1) with sub-funds whose sponsors do not undertake any activity aimed at reallocating resources (i.e. dummy variable `FLOW_REALL` = 0).

As expected, we find that specialization and managerial diversification are correlated and are more common in large sub-funds. Also, consistent with Myners 2001's evidence, reallocation of resources occurs more frequently in pension funds employing more concurrent managers and more mandates.

Results in both Table 2 and Table 3 display a strong correlation between the number of mandates (`MNDTS`) and the number of asset managers (variable name `MGRS`) or the Herfindahl-Hirschman index-based measure (1-`HHI_MGRS`). This result is not surprising: as the number of mandates increases, the sponsors tend to hire more managers. Including both variables in a regression could raise multicollinearity issues. To minimize these issues,

we employ the 1-HHI\_MGRS variable, instead of MGRS, as our proxy for the managerial diversification dimension, because it exhibits a lower correlation with the MNDTS variable.<sup>15</sup>

As far as our main research question is concerned, at this level of our analysis we do not find that different investment structures are associated to different levels of financial performance, albeit – quite surprisingly – the average tracking error is significantly smaller in sub-funds whose organizational design either relies on more mandates or envisages the employment of multiple managers. However, sub-funds run by active sponsors exhibit higher level of activeness.

**Insert Table 2 and Table 3 approximately here**

*5.2. Multivariate analysis*

The intrinsic weakness of the above bivariate analysis is that it does not contemporaneously take into account relevant features that differentiate sub-funds beyond their investment management structures' features. We want to include in our analysis variables such as the average sub-fund size, its age, or the percentage of resources allotted to passive mandates. To complete our examination, we estimate a panel regression model whose dependent variable is either a measure of the sub-fund's active return (alpha) or a measure of the sub-fund active risk (tracking error or R2). The explanatory variables included in the analysis are:

- i. our investment management structure proxies (the number of mandates that proxies for the specialization and the Herfindahl-Hirschman index-based that proxies the managerial diversification),
- ii. the dummy that captures the sponsor's activeness,
- iii. relevant controls (among which we include the one that checks for the influence of passive mandates on our performance measures).

Table 4 reports the results of the multivariate regressions based on Equation (1) above. We start by estimating the impact of the two dimensions of our sample sub-funds' investment management structure on their financial performance - i.e. ALPHA (results can be found in columns 1 and 2), the logit transformation of Amihud and Goyenko 2013' selectivity measure, ACTIVER2 (results in column 3), and the tracking error of the sub-fund's performance, TE (in column 4).

Our findings show that the number of mandates increases both the active return and the active risk, whereas managerial diversification has a negative impact on all our performance measures. A more specialized investment management structure is therefore consistent with both higher managers' activeness and higher excess return. Conversely, the result that a larger number of managers is linked to a lower active risk could be explained either with a diversification effect – which might well be the aim of hiring multiple managers - or with a herding effect

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<sup>15</sup>To better address the multicollinearity concern, in a robustness we orthogonalize the MGRS variable with respect to the MNDTS variable, and we use this orthogonalized variable in place of the MGRS one. The results of such specification, not reported, are qualitatively similar to the ones reported.

induced by more intense competition among managers. If that is the case, managers' fears of underperforming the benchmark and their peers might lead them to adopt a safer passive investment strategy instead of the active one they are supposed to perform.

At this stage, our empirical results thus suggest that the adoption of a more specialized investment management structure is compatible with more managerial activeness. On the other hand, the increase in alpha that we ascertain could be reconciled with superior abilities that highly specialized asset managers deploy when performing their activities in the niche businesses they operate as Blake et al. 2013 find in the UK defined benefit pension funds case. On the other hand, an investment structure that designs the asset management activity distributing resources among many managers is conducive to a lower active risk and to lower alphas.

The above results are not enough to prove a causal nexus. In particular, a confounding story could be that more specialized investment management structures are characterized by investment mandates that either give managers more freedom (e.g., through wider tracking error constraints) or stronger incentives to beat their benchmarks (e.g., through incentive fees). Similarly, investment management structures designed to achieve a higher managerial diversification might feature mandates with stricter investment limits. Should this be the case, our results would then be due to differences in the investment mandates rather than in the investment management structures.

Although we cannot directly control for all the features of the investment mandates in our sample, we address this issue with two arguments.

First, at least on a qualitative basis we can exclude that a higher activeness is due to looser tracking error constraints included in the mandate. As mentioned before, anecdotal evidence suggests that mandate tracking error constraints have not limited Italian pension funds asset managers' risk-taking activity during our sample period. Italian pension fund sponsors have rather complained an alleged lack of initiative from their managers, despite significantly wide tracking error constraints.

Second, we can identify sub-funds that adopted incentive fees and we therefore include the `INCENT_FEES` dummy variable among the explicative variables of Equation (1) to control for the influence of the contractual incentive structure on asset managers' behavior. Previous literature – mostly concerning mutual funds though (see for example Elton et al. 2003) – predicts a positive impact of incentive fees on activeness. For example, according to Scharfstein and Stein 1990, incentive fees should decrease herding because they create a more intense incentive to pursue profitable opportunities even if that entails taking higher risks. However, contrary to what we would expect, the sign of the coefficient of the `INCENT_FEES` variable is always negative independent on the activeness measure we adopt as dependent variable.

Our interpretation of the above result refers to three different arguments.

First, our `INCENT_FEES` variable signals the presence of incentive fees in the sub-funds' mandates, but it does not quantify the size of the fees and the strength of the incentive. Low values of these fees (compared to management fees') could make the incentive weak and ineffective. For the sub-funds belonging to our sample that apply incentive fees and disclose their value, the average participation rate is around 5%, which is quite low also

considering that in the Italian mutual fund industry incentive fees rates range from 10% to 25% as documented by Drago et al. 2008 and 2010.

Second, we find that the presence of an incentive fee is on average coupled with a lower flat management fee, pointing at a partial substitution effect between the fixed rate portion of the managers' compensation and their bonus.<sup>16</sup> Such a substitution might have the result of inducing caution in asset managers, whose strategies might become more conservative than they would otherwise be. Massa and Patgiri 2009 find a similar effect by for mutual funds with concave management fees. This explanation is also compatible with the negative coefficient of the variable when excess return is our dependent variable: the savings obtained by funds that compensate their managers with an incentive fee on top of a lower management fee might explain the fact that a lower active risk is not conducive to a lower alpha.

Finally, the presence of incentive fees may signal a more effective monitoring activity of fund trustees over the asset managers, which seems plausible due to the agency problems documented by Del Guercio and Tkac 2002. Now, as a more intense monitoring activity could imply a stronger pressure to herd because of reputational concerns, the presence of incentive fees might end up having the undesired effect of increasing the tendency towards passive investing.

**Insert Table 4 approximately here**

In Table 5 we report the regression estimate of a more complete version of Equation (1), as we include also the explanatory variable capturing the sponsor's activeness (FLOW\_REALL). Previous results are confirmed, and the sponsor's activeness does not affect sub-fund's alpha nor its active risk, except when this is proxied with the tracking error. In this case, the possibility that the sponsor reallocates the financial assets across managers and/or mandates increases the tracking error. We observe the investment performance at sub-fund level though. This means that we are not able to discriminate between two competing explanations. On one hand, the higher tracking error might be the result of either an increased activeness of the sub-fund asset managers, induced by the threat of reducing the amount of asset under management in case their performance turns out to be unsatisfactory. On the other, the higher tracking error might be the result of the sponsor's investment decisions as the reallocation of resources affects the financial performance of the sub-fund *per se*.

**Insert Table 5 approximately here**

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<sup>16</sup> A *t*-test for the equality of the means of the management fees of sub-funds with and without incentive fees shows that they are significantly lower (at the 5%) when INCENT\_FEE equals 1 (0.00116 vs 0.00125). An unreported multivariate analysis, based on a panel regression model, where the dependent variable is a measure of the sub-fund's management fee and the explanatory variables include INCENT\_FEE, confirms that the presence of incentive fees is associated with a reduction in the management fee.

As mentioned before, our FLOW\_REALL dummy variable taking the value of 1 implies that the sub-fund sponsor is prone to perform two different resource reallocation activities, whose implications are different: a reallocation of resources among managers and a reallocation across mandates. Albeit we cannot clearly distinguish between these two, we try to disentangle one from the other through the interaction of the FLOW\_REALL variable with both the MNDTS and 1-HHI\_MGRS variables.

Thanks to this interaction, we claim that the estimation results of the specification of our regression model presented in Table 6 provide a more accurate picture of the relations between the investment structure variables and the sub-funds' performance. Due of the presence of the interaction terms, the coefficients of some variables turn out to have a slightly different interpretation. The coefficients of MNDTS and 1-HHI\_MGRS denote the impact on the performance of a more diversified investment structure (by asset classes and managers, respectively), when the sub-fund's sponsor is not prone to interfere in the investment process with her reallocation decisions. Conversely, the impact of a more diversified investment structure of a sub-fund whose sponsor is more active is measured by the sum of the coefficients of the MNDTS and the FLOW\_REALL×MNDTS variables (as for the diversification of styles) and those of the 1-HHI\_MGRS and the FLOW\_REALL×1-HHI\_MGRS variables (as for the managerial diversification).

This in-depth analysis shows that the only relation between investment structure dimension and sub-funds' performance that is documented irrespective of the sponsor's activeness is the positive one between the specialization of asset managers' activity and the active risk. The coefficients of the MNDTS variable and the sum of the coefficients of MNDTS and the FLOW\_REALL×MNDTS are positive and significantly different from zero in the regression on tracking error. We cannot obtain a similar conclusion if we consider the impact of alpha, as the coefficient of MNDTS in regressions (1) and (2) are non-significant. An increase of the number of mandates (hence, the adoption of a more specialized investment structure) increases the active risk but has no impact on the active return. A positive impact on the sub-fund's alpha occurs only when the more specialized investment management structure is managed by an active sponsor - the sum of the coefficients of MNDTS and FLOW\_REALL×MNDTS is positive and significantly different from zero in regressions (1) and (2) -. This result is consistent with the idea that the sponsor reallocates the financial resources the fund across the mandates, possibly as a temporary adjustment of the long-term asset allocation. In other words, the observed increase in alpha would result from the sponsor's market timing decisions rather than from asset managers' superior skills or stronger efforts.

The inclusion of the interaction effect in our analysis reveals that the managerial diversification affects the sub-fund financial performance only when the sponsor is active in reallocating resources. In such a case both active return and active risk decrease. Our explanation for the decrease in active risk is the following: A larger number of managers, possibly under the same mandate, does not foster the competition *per se*, as the yardstick competition argument proposed by Shleifer 1985 would suggest. However, when the sponsor is more prone towards sanctioning underperforming managers (via firing decisions or a reduction of their resources) a herding effect à la

Scharfstein and Stein 1990 might prevail: managers prefer to stick to their benchmark to avoid an underperformance and a consequent intervention by the sponsor.

We explain the negative effect on alpha by considering that reallocating resources entails a cost, which is especially relevant when assets are transferred from one manager to another, consequent to firing decisions, which usually predate a reallocation among managers but not across mandates.

Finally, we observe that while showing a strong negative correlation with active risk as expected, passive mandates show a statistically insignificant influence on excess return, possibly due to their convenience with respect to active management. Therefore, given our overall results, if evaluated on a risk-adjusted basis, passive mandates might be preferable to managerial diversification strategies, especially if these are coupled with an intense reallocation activity among managers performed by the plan sponsor.

**Insert Table 6 approximately here**

## **6. Conclusions**

This work examines if the investment management structure influences the performance of delegated portfolios. Empirical evidence from a sample of Italian DC occupational pension funds suggest a positive answer. In particular, we find that a higher degree of specialization of asset managers' activity increases active risk, consistent with plan sponsors' aim of exploiting specialized asset managers' superior skills. This result echoes those in Blake et al. (2013), that find the UK trend to move towards specialized mandates is economically rational and not the mere result of a marketing effort aimed at extracting higher rents as contented in Lakonishok et al. 1992. However, the positive effect of specialization on active risk does not go along with a significant impact of it on active return, which might be due to the asset managers' ability at extracting the entire extra value they create through actively managing the scheme assets.

Additionally, our findings do not support the evidence of a significant relation between the performance of the delegated portfolios and the allotment of their resources among many managers. This result suggests that, if the aim of hiring multiple managers is diversifying away possible judgement mistakes, managerial diversification works. On the other hand, if the aim of hiring multiple managers is obtaining better results through an increased effort due to more intense competitive pressure, this tool does not seem to be conducive to the intended goal.

We also find that higher degrees of specialization of asset managers' activity and managerial diversification are more frequent in delegated investment structures whose sponsors exhibit an attitude towards activeness through the propensity at discretionally redistributing resources among asset managers and/or across mandates. In these situations, both dimensions of the investment management structure have a major impact on performance.

In the first place, when the sub-fund sponsors are prone to act, we find that the higher the specialization of asset managers' activity and the higher the portfolio's alpha. We suspect that the better relative performance is due to

the sponsor's actual reallocations of resources across mandates but – because we can only observe the performance at the aggregate (sub-fund) level and not at the asset manager level – we cannot exclude that a more intense monitoring activity by the sponsor increases managers' efforts and performances.

A higher managerial diversification coupled with a more intense sponsor's activeness results in a lower active risk and a lower active return. Once more, reallocation decisions taken by the sponsor could drive these outcomes. On the other hand, the results could be the consequence of a change in managers' behavior and incentives triggered by the sponsor's threat to sanction poor performance.

At this stage of our research, we do not have conclusive evidence that allows us to disentangle the effect of sponsor's reallocation decisions and changes in managers' behavior triggered by the sponsor's activeness. We try to reconcile managers' reactions to sponsor's activeness that differ depending on the investment management structure they operate in by considering that reallocation decisions have a specific meaning in different investment management structures. Transferring resources from one manager to another who is performing the same task - which is possible because the investment structure features at least a certain degree of managerial diversification - imply sanctioning the behavior of the former and prizing the behavior of the latter. On the other hand, relocating resources across mandates – activity which can be performed only in a specialized investment structure – might be simply due to the sponsor performing the market timing activity that she kept for herself when choosing a specialized investment management structure in the first place. This brings us to advance the following interpretation of our results: A credible threat of acting in case of unsatisfactory results has indeed unintended negative consequences on managers' behavior. On the other hand, by performing market timing the scheme sponsor is, on average, able to create value that single asset managers cannot generate because they perform a highly specialized activity.

We also find that the presence of incentive fees is conducive to lower levels of active risk. We explain this result as follows. First, the presence of incentive fees makes underperformance highly visible with compounded negative reputational effects. Second, incentive fees amount could be too little to justify active risk taking. Anecdotal evidence in our sample suggests that the above might be the case for Italian pension funds. We also detect a substitution effect with flat rate management fees that might discourage active pursuit of profitable investment opportunities. Third, incentive fees might be a way for plan sponsors to signal to plan participants their efficiency at policing asset managers' behavior. If that is the case, obtaining a mandate renewal following an underperformance, even though the total results coming from the asset management firm are positive, could be more difficult because sponsors are worried their reputation could be tarnished. This can make managers to stick to their benchmarks in order to avoid risks.

Last, our evidence suggests that an increase in the percentage of assets managed through passive mandates decreases the active risk, as expected, without a significant decrease in the active return. This suggests that sponsors should attentively consider the adoption of passive delegated management, especially if conducive to significant cost savings compared to active management investment solutions.



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## **Appendix 1. The Italian occupational pension funds: Institutional details**

Italian occupational funds are established via collective agreements between workers' and firms' representatives or by unions, regions and other administrative authorities. Workers can join the scheme – membership is voluntary – only if they meet some specific requirements established in the fund bylaws. Even though the establishment of defined benefit plans is possible, in Italy at present only defined contribution plans have been created.

The fund charter initially sets a membership rate target to be achieved within a defined timeframe. If the target is met, the Italian Supervisory Authority allows the fund to start its operations, provided that certain requirements are fulfilled. Once authorized, the fund collects its members' contributions. When the pool reaches a minimum amount, the money is invested by one or more financial intermediaries (hereinafter: asset managers) in charge of managing its resources. According to the Italian law, banks, insurance companies, investment firms, and companies managing UCITS harmonized under the legislations of the European Union, having their legal head office in the European Union, as well as UCITS incorporated in Italy may carry out the activity of managing the resources of pension funds. With few exceptions (e.g. real estate), Italian law requires pension funds investing activity to be mandatorily delegated to external managers, with the board of trustees in charge of their hiring and firing. Administration, trading and custody are also outsourced. In order to prevent conflicts of interests, the outsourced activities cannot be jointly performed by either the same firm or by firms belonging to the same group.

Depending on the investment options design, Italian pension funds offer two or more investment “lines” designed to meet the needs of different risk tolerance levels. Under the “umbrella” fund, each investment line has a specific investment policy as if it were a different pool and therefore is called “compartment” or “sub-fund”.<sup>17</sup> Unlike US 401(k) plans or most UK corporate defined contribution schemes, Italian pension funds do not offer a “self-select” option which enables members to choose from a menu of funds and construct their own asset allocation. Members in Italy are instead given a choice between different balanced allocations along the risk-return spectrum. It is worth pointing out that, unlike in the UK or the US, even the most aggressive profiles of Italian pension funds have a sizable bond weighting. In fact, a 60% equities-40% bonds profile would be considered very aggressive in Italy while it would lie in the middle of the risk spectrum in the US.

With the help of consultants, the board of trustees delineates the goals of the plan and the strategic asset allocation, defining the mix of asset classes in which plans participants' money is going to be invested for each

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<sup>17</sup> Originally the scheme participants were not allowed to split their contributions among different sub-funds and as a consequence most sub-funds invest in a variable mix of both stock and bonds. Moreover, in 2007 an automatic enrolment clause for private employees meant to foster pension plans funding was enacted. The law mandates employers to vest a pension fund with the annual severance pay share of the worker unless the employee explicitly opts out. In this case, unless employers and employees agree on a different destination for contributions, an occupational fund collects it. In order for a scheme to be deemed suitable for the above kind of intakes though, the plan has to offer a viable investment alternative to the worker's severance pay. The law establishes that contributions coming to the fund due to the automatic enrolment clause are to be invested in a way that mimics the severance annual pay share periodic increases on top of a minimum warranted return. In order to tap into that source of money, all Italian pension funds established suitable investment lines, called “minimum guaranteed return sub-funds”.

balanced profile. The strategic asset allocation is expressed in terms of a benchmark and the most appropriate investment structure is chosen in order to achieve the plan goals.

After a selection process that individuates the most suitable asset managers consistent with the investment structure established, pension plan trustees negotiate the contractual terms of the service with a restricted set of potential “winners” and choose among them. Asset managers’ activity is bounded by a contractual agreement (the investment management mandate or “the mandate”). The mandate specifies the asset managers’ goals and defines a benchmark. Limitations on the risks that managers can run are typically set as tracking error volatility limits and constraints on portfolio weights.

Information that the asset managers have to provide to the trustees and the method by which fees are calculated are also included in the mandate. As more than one manager can be delegated within the same mandate, a reference to the managers’ peer group relative performance might be specified, because in this case the mandate also defines the way new resources are to be allocated among competing managers and the fund trustees might retain some discretion over the redistribution of the pool. If that is the case, for example the worst performing manager might be temporarily denied access to future cash inflows coming from participants’ contributions. Transferring some of her resources to other managers, while retaining her, is also possible.

While the consultants and trustees do not interfere with the day-to-day decisions taken by the asset managers, they will monitor their managers’ investment performance, typically quarterly. Underperforming managers are asked to explain their investment strategy and the rationale behind it. If underperformance continues, the fund trustees may decide to fire the manager even before the mandate term. Moreover, Italian law explicitly calls for negotiating changes in the asset classes weights limits included in the mandate, especially when financial markets’ volatility is high. This happened during the financial crisis for example, when restrictions on the managers’ cash holdings were relaxed in order to limit exposure.

The length of the mandate typically varies from 3 to 5 years. At its conclusion the pension plan can either renew it or start anew the selection process. Mandates might not be renewed either because of unsatisfactory performance or because the plan trustees intend to modify the strategic asset allocation of the portfolio and want to involve new managers with different skills. However, as asset managers’ substitution can be costly and often the assets are transferred to the newly hired manager by a transition organization whose goal is to minimize losses due to the shift, changes in strategic asset allocation tend to be managed by retaining at least some of the managers that were selected in the past.

## Appendix 2. Variable description.

VARIABLE	Definition
NUMBER_OF_SUBF	Number of different active subfunds in the pension fund
AUM_F	Assets under management of the pension fund, thousands €
AUM	Assets under management of the sub-fund, thousands €
AGE_F	Number of operating years of the pension fund
AGE	Number of operating years of the sub-fund
TURNOVER	The minimum between the amount of securities bought and securities sold by the sub-fund and its assets under management
INCENT_FEES	Dummy variable which equals 1 if at least one of the managers of the sub-fund is compensated with incentive fees, 0 otherwise
FLOW_REALL	Dummy variable which equals 1 if the sponsor has modified the pre-established allocation of the financial resources among managers and/or mandates, 0 otherwise
MNDTS_F	Number of different investment mandates adopted for all the sub-funds of the pension
MNDTS	Number of different investment mandates adopted in the sub-fund
MGRS_F	Number of different asset managers hired for all the sub-funds of the pension fund
MGRS	Number of different asset managers hired for the sub-fund
1-HHI_MGRS	1-Herfindahl-Hirschman index (HHI) of the assets managers' assets under management
PASSIVE_SHARE	Percentage of the sub-fund's asset under management allocated to passive investment mandates
ALPHA	Average monthly excess return (over the benchmark's net return), multiplied by 100
TE	Standard deviation of the monthly excess returns (over the benchmark's net returns)
R2	Coefficient of determination resulting estimated by regressing the sub-fund's returns on the returns of its benchmark
ACTIVER2	Logistic transformation of the variable $(1 - R^2)$
RET_BENCH	Mean of the monthly benchmark's returns
STDEV_BENCH	Standard deviation of the monthly benchmark's returns

### Appendix 3. Examples of investment management structures.

This table reports the sub-funds, their assigned investment mandates and hired asset managers and the values of the variables MNDTS, MGRS, 1-HHI\_MGRS, and FLOW\_REALL for some representative pension fund-years in our sample. Variable definitions are in Appendix 2.

Year	Fund	Sub-fund	Manager	Mandate	MNDTS	MGRS	1-HHI_MGRS	FLOW_REALL
2006	Fopen	Bilanciato obbligazionario	Pictet	Government Bond EUR	5	6	0.79140	1
			San Paolo IMI					
			Duemme	Corporate Bond EUR				
			Société Générale	US Equity				
2006	Fopen	Bilanciato	Rotschild	Europe Equity	1	1	0	1
			Allianz	Japan Equity				
			Duemme	Balanced - 1				
			Duemme	Balanced - 2				
2007	Telemaco	Conservativo	Fineco	Government Bond Euro	6	5	0.4216	1
			Fineco	US Equity - Passive				
			Axa	Corporate Bond				
			San Paolo IMI	European Equity - Passive				
			Ras	European Equity - Active				
2007	Telemaco	Prudente	Pioneer	US Equity - Active	7	5	0.4898	1
			Fineco	Government Bond Euro				
			Fineco	US Equity - Passive				
			Axa	Corporate Bond				
			San Paolo IMI	European Equity - Passive				
2007	Telemaco	Bilanciato	Ras	European Equity - Active	7	5	0.6567	1
			Pioneer	US Equity - Active				
			Fineco	Japan Equity - Passive				
			Fineco	Government Bond Euro				
			Fineco	US Equity - Passive				
2007	Telemaco	Crescita	Axa	Corporate Bond	7	5	0.7101	1
			San Paolo IMI	European Equity - Passive				
			Ras	European Equity - Active				
			Pioneer	US Equity - Active				
			Fineco	Japan Equity - Passive				
2011	Cometa	Reddito	Allianz	Balanced - Active 1	4	5	0.6945	0
			Amundi	Bond - Active				
			State Street	Balanced - Passive 1				
			Halbis					
2013	Fonchim	Stabilità	State Street	Bond - Passive	5	9	0.86830	1
			UBS					
			Groupama	Short term Government Bond				
			Natixis					
			Eurizon	All maturities Government Bond				
			Generali					
			BlackRock	Corporate Bond				
2013	Fonchim	Crescita	Axa	Balanced - Active	2	2	0.5000	0
			Pioneer					
			Credit Suisse					
2013	Fonchim	Crescita	State Street	Equity - Passive	2	2	0.5000	0
			AnimaSGR	Balanced Growth - Active				
			Dexia	Balanced Growth - Passive				

**Table 1. Sample descriptive statistics.**

This table contains descriptive statistics for the different pension funds and their sub-funds in our sample. Reported are mean and standard deviation values for the financial performance of the sub-funds and their benchmarks (Panel *A*), the investment management structure of the sub-funds (Panel *B*), and the main characteristics of the funds (denoted with *\_F*) and sub-funds (Panel *C*).

Variable definitions are in Appendix 2.

The sub-fund management structures and their characteristics refer to  $t-1$ .

Panel <i>A</i> . Financial performances				Panel <i>B</i> . Investment management structure				Panel <i>C</i> . Sub-fund main characteristics			
<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Variable *</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Variable *</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>
ALPHA( $t$ )	471	0.071	0.151	MNDTS_F( $t-1$ )	471	4.811	2.671	NUMBER_OF_SUBF( $t-1$ )	471	3.289	1.147
TE( $t$ )	471	0.004	0.003	MNDTS( $t-1$ )	471	2.002	1.529	AUM_F( $t-1$ )	471	776,000	1,050,000
R2( $t$ )	471	0.907	0.085	MGRS_F( $t-1$ )	471	5.270	2.253	AUM( $t-1$ )	471	311,000	653,000
ACTIVER2( $t$ )	471	-2.724	1.112	MGRS( $t-1$ )	471	2.866	1.803	AGE_F( $t-1$ )	471	5.900	3.529
RET_BENCH( $t$ )	471	0.004	0.006	1-HHI_MGRS( $t-1$ )	471	0.447	0.324	AGE( $t-1$ )	471	4.673	3.278
STDEV_BENCH( $t$ )	471	0.015	0.008	FLOW_REALL( $t-1$ )	471	0.316	0.466	TURNOVER( $t-1$ )	471	1.028	3.252
								PASSIVE_SHARE( $t-1$ )	471	0.072	0.193
								INCENT_FEES( $t-1$ )	471	0.503	0.501

\* The number of subfunds, (NUMBER\_OF\_SUBF), the number of managers (MGRS\_F), the number of mandates (MNDTS\_F), the asset under management (AUM\_F) and the age (AGE\_F) at the fund level include the guaranteed subfunds. AUM and AUM\_F are in thousands of euros.

**Table 2. Correlation between sub-fund financial performances, main characteristics, and management structure variables.**

The table reports pairwise correlations between sub-fund financial performances, main characteristics, and management structure variables of sub-funds. Variable definitions are in Appendix 2.

The sub-fund characteristics, their management structure and their mandate characteristics refer to  $t-1$ .

\*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10%, respectively.

	ALPHA ( $t$ )	TE ( $t$ )	R2 ( $t$ )	ACTIVER2 ( $t$ )	RET_BENCH ( $t$ )	STDEV_BENCH ( $t$ )	INCENT_FEES ( $t-1$ )	SIZE ( $t-1$ )	AGE ( $t-1$ )	TURNOVER ( $t-1$ )	PASSIVE_SHARE ( $t-1$ )	MNDTS ( $t-1$ )	MGRS ( $t-1$ )	1-HHI_MGRS ( $t-1$ )	FLOW_REALL ( $t-1$ )
ALPHA( $t$ )	1														
TE( $t$ )	0.2898*** (0.0000)	1													
R2( $t$ )	0.0639 (0.1665)	-0.4571*** (0.0000)	1												
ACTIVER2( $t$ )	-0.0766* (0.0968)	0.4718*** (0.0000)	-0.9022*** (0.0000)	1											
RET_BENCH( $t$ )	-0.4320*** (0.0000)	-0.1619*** (0.004)	0.0171 (0.7109)	-0.0247 (0.5935)	1										
STDEV_BENCH( $t$ )	0.4143*** (0.0000)	0.7250*** (0.0000)	0.1269*** (0.0058)	-0.1521*** (0.0009)	-0.1869*** (0.0003)	1									
INCENT_FEES( $t-1$ )	0.0092 (0.8423)	-0.1454*** (0.0016)	0.1865*** (0.0000)	-0.2276*** (0.0000)	0.0028 (0.9514)	-0.0083 (0.8574)	1								
SIZE( $t-1$ )	-0.0488 (0.2907)	-0.2645*** (0.0000)	0.1202*** (0.0090)	-0.1531*** (0.0009)	-0.0342 (0.4590)	-0.2242*** (0.0000)	0.1520*** (0.0009)	1							
AGE( $t-1$ )	0.0215 (0.6417)	-0.1662*** (0.0003)	0.1844*** (0.0001)	-0.2668*** (0.0000)	0.1292*** (0.0050)	0.0024 (0.9580)	0.3067*** (0.0000)	0.5438*** (0.0000)	1						
TURNOVER( $t-1$ )	-0.0640 (0.1653)	0.0845* (0.0670)	-0.1118** (0.0152)	0.0713 (0.1224)	0.0188 (0.6844)	0.0369 (0.4242)	0.0548 (0.2556)	-0.0505 (0.2738)	-0.0366 (0.4276)	1					
PASSIVE_SHARE( $t-1$ )	-0.03 (0.5156)	-0.0247 (0.5933)	0.1332*** (0.0038)	-0.1456*** (0.0015)	0.0085 (0.8540)	0.0236 (0.6098)	-0.0752 (0.1052)	0.1526*** (0.0009)	0.1911*** (0.0000)	0.0228 (0.6220)	1				
MNDTS( $t-1$ )	-0.0221 (0.6318)	-0.0908** (0.0490)	0.0191 (0.6798)	-0.0719 (0.1194)	-0.0543 (0.2395)	-0.1081** (0.0189)	0.0236 (0.6091)	0.4101*** (0.0000)	0.2281*** (0.0000)	0.005 (0.9139)	0.6508*** (0.0000)	1			
MGRS( $t-1$ )	-0.0783* (0.0897)	-0.2375*** (0.0000)	0.1168** (0.0112)	-0.1625*** (0.0004)	-0.0312 (0.5000)	-0.2357*** (0.0000)	0.0488 (0.2906)	0.6797*** (0.0000)	0.3014*** (0.0001)	-0.0148 (0.7483)	0.3675*** (0.0000)	0.7416*** (0.0000)	1		
1-HHI_MGRS( $t-1$ )	-0.1021** (0.0268)	-0.2493*** (0.0000)	0.1200*** (0.0092)	-0.1325*** (0.0040)	-0.017 (0.7129)	-0.2622*** (0.0000)	-0.0848* (0.0659)	0.6312*** (0.0000)	0.1816*** (0.0001)	-0.0445 (0.3384)	0.2550*** (0.0000)	0.5392*** (0.0000)	0.8522*** (0.0000)	1	
FLOW_REALL( $t-1$ )	0.0468 (0.5112)	0.1342*** (0.0035)	-0.0707 (0.1257)	0.1238*** (0.0071)	0.0245 (0.5952)	0.0308 (0.5047)	-0.1185** (0.0101)	0.2663*** (0.0000)	0.1362*** (0.0030)	-0.0171 (0.7108)	0.2757*** (0.0000)	0.2860*** (0.0000)	0.3419*** (0.0000)	0.3143*** (0.0000)	1



**Table 3. Bivariate comparison of sub-fund financial performances, main characteristics, and management structure variables.**

Reported are mean values of sub-fund financial performances, main characteristics, management structure, and mandate variables of sub-funds with specialized investment management and not (MORE\_THAN\_2\_MNDTS=1 and MORE\_THAN\_2\_MNDTS=0, in column 1), sub-funds with few and many managers (MORE\_THAN\_3\_MGRS=0 and MORE\_THAN\_3\_MGRS=1, in column 2), and sub-funds with and without flow reallocation mechanisms (FLOW\_REALL=1 and FLOW\_REALL=0, in column 3). The value in parentheses is the  $t$  statistic for testing the equality of variable means. Variable definitions are in Appendix 2.

The sub-fund characteristics, their management structure and their mandate characteristics refer to  $t-1$ .

\*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10%, respectively.

	(1)		(2)		(3)	
	MORE_THAN_2_MNDTS ( $t-1$ )		MORE_THAN_3_MGRS ( $t-1$ )		FLOW_REALL ( $t-1$ )	
	= 0 $N=346$	= 1 $N=125$	= 0 $N=228$	= 1 $N=243$	= 0 $N=322$	= 1 $N=149$
ALPHA( $t$ )	0.058 (1.327)	0.038	0.059 (0.952)	0.047	0.048 (-1.013)	0.063
TE( $t$ )	0.004 (2.016)*	0.004	0.005 (4.191)**	0.004	0.004 (-2.933)***	0.005
R2( $t$ )	0.906 (-0.279)	0.909	0.902 (-1.227)	0.912	0.911 -1.533	0.898
ACTIVER2( $t$ )	-2.682 (1.346)	-2.839	-2.649 (1.426)	-2.795	-2.818 (-2.703)***	-2.522
RET_BENCH( $t$ )	0.004 (0.832)	0.004	0.004 (1.050)	0.004	0.004 (-0.532)	0.004
STDEV_BENCH( $t$ )	0.015 (2.595)***	0.013	0.017 (5.358)***	0.013	0.015 (-0.667)	0.015
INCENT_FEES( $t-1$ )	0.480 (-1.692)*	0.568	0.526 (0.971)	0.481	0.543 (2.583)**	0.416
SIZE( $t-1$ )	17.778 (-9.643)***	19.413	17.199 (-14.382)***	19.163	17.891 (-5.984)***	18.907
AGE( $t-1$ )	4.344 (-3.673)***	5.584	4.364 (-1.988)**	4.963	4.370 (-2.978)***	5.329
TURNOVER( $t-1$ )	1.012 (-0.181)	1.073	1.114 (0.555)	0.947	1.066 (0.371)	0.946
PASSIVE_SHARE( $t-1$ )	0.015 (-12.095)***	0.228	0.023 (5.443)***	0.117	0.036 (-6.212)***	0.150
MNDTS( $t-1$ )	1.179 (-43.775)***	4.280	1.127 (-14.442)***	2.823	1.705 (-6.463)***	2.644
MGRS( $t-1$ )	2.090 (-22.292)***	5.016	1.338 (-31.243)***	4.300	2.447 (-7.881)***	3.772
1-HHI_MGRS( $t-1$ )	0.345 (-13.409)***	0.730	0.167 (-33.295)***	0.710	0.378 (-7.169)***	0.597
FLOW_REALL( $t-1$ )	0.246 (-5.660)***	0.512	0.171 (-6.876)***	0.453	-	-

**Table 4. The effect of investment management structure on financial performances.**

This table reports the fixed-effect coefficient estimates and robust standard errors (in parentheses) clustered at the sub-fund level of a test for the impact of the investment management structure on sub-fund financial performances. The dependent variables are: (i) ALPHA, i.e., the sub-fund's excess return (columns 1 and 2); (ii) ACTIVER2, i.e., the logit transformation of  $1 - \text{the sub-fund's } R^2$  (column 3); and (iii) TE, i.e., the sub-fund's tracking error (column 4). The explanatory variables are: MNDTS, the number of different investment mandates adopted in the sub-fund; 1-HHI\_MGRS, 1-Herfindahl-Hirschman index (HHI) of the assets managers' assets under management; INCENT\_FEES, a dummy variable that equals one if the mandate(s) comprise(s) (an) incentive fee(s), and zero otherwise; SIZE, the natural logarithm of the sub-fund's assets under management; AGE, the sub-fund's number of operating years; TURNOVER, the minimum between the amount of securities bought and securities sold by the sub-fund and its assets under management; PASSIVE\_SHARE, the percentage of the sub-fund's asset under management allocated to passive investment mandates; TOTAL\_FEES, the ratio of the total fees paid to the asset managers of the sub-fund and its assets under management; STDEV\_BENCH, the standard deviation of the benchmark adopted by the sub-fund's SHARES\_PCT, the percentage of stocks in the sub-fund's benchmark. All estimations include an intercept (coefficient not reported).

\*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
	ALPHA( $t$ )		ACTIVER2( $t$ )	TE( $t$ )
MNDTS( $t-1$ )	0.022** (0.010)	0.020* (0.010)	0.167*** (0.060)	0.000*** (0.000)
1-HHI_MGRS( $t-1$ )	-0.191*** (0.049)	-0.179*** (0.046)	-1.025*** (0.293)	-0.001** (0.001)
INCENT_FEES( $t-1$ )	-0.022 (0.023)	-0.018 (0.024)	-0.627*** (0.165)	-0.001*** (0.000)
SIZE( $t-1$ )	0.023 (0.016)	0.017 (0.017)	0.077 (0.152)	-0.000 (0.000)
AGE( $t-1$ )	-0.121*** (0.030)	-0.019 (0.034)	1.334*** (0.292)	0.002*** (0.001)
TURNOVER( $t-1$ )	-0.003*** (0.001)	-0.003*** (0.001)	-0.001 (0.004)	-0.000 (0.000)
PASSIVE_SHARE( $t-1$ )	-0.077 (0.062)	-0.073 (0.058)	-1.243*** (0.272)	-0.002*** (0.001)
ACTIVER2( $t-1$ )	-0.032*** (0.008)	-	0.205*** (0.059)	-
TE( $t-1$ )	-	-14.990*** (4.343)	-	0.196*** (0.033)
STDEV_BENCH( $t$ )	7.401*** (1.746)	9.780*** (1.982)	-12.793 (13.795)	0.263*** (0.042)
Year dummies	Yes	Yes	Yes	Yes
Observations	471	471	471	471
Number of code	58	58	58	58
Adj. $R^2$	0.372	0.382	0.375	0.619

**Table 5. The effect of the fund reallocation by the sub-fund's sponsor on financial performances.**

This table reports the fixed-effect coefficient estimates and robust standard errors (in parentheses) clustered at the sub-fund level of a test for the impact of the investment management structure and the sponsor's decision of reallocation of financial flows on sub-fund financial performances. The dependent variables are: (i) ALPHA, i.e., the sub-fund's excess return (columns 1 and 2); (ii) ACTIVER2, i.e., the logit transformation of 1- the sub-fund's R2 (column 3); and (iii) TE, i.e., the sub-fund's tracking error (column 4). The explanatory variables are: MNDTS, the number of different investment mandates adopted in the sub-fund; 1-HHI\_MGRS, 1-Herfindahl-Hirschman index (HHI) of the assets managers' assets under management; FLOW\_REALL, a dummy variable that equals 1 if the sponsor has modified the pre-established allocation of the financial resources among managers and/or mandates, and zero otherwise; INCENT\_FEES, a dummy variable that equals one if the mandate(s) comprise(s) an incentive fee(s), and zero otherwise; SIZE, the natural logarithm of the sub-fund's assets under management; AGE, the sub-fund's number of operating years; TURNOVER, the minimum between the amount of securities bought and securities sold by the sub-fund and its assets under management; PASSIVE\_SHARE, the percentage of the sub-fund's asset under management allocated to passive investment mandates; TOTAL\_FEES, the ratio of the total fees paid to the asset managers of the sub-fund and its assets under management; STDEV\_BENCH, the standard deviation of the benchmark adopted by the sub-fund. All estimations include an intercept (coefficient not reported).

\*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
	ALPHA(t)		ACTIVER2(t)	TE(t)
MNDTS( $t-1$ )	0.023** (0.010)	0.021** (0.010)	0.174*** (0.060)	0.000*** (0.000)
1-HHI_MGRS( $t-1$ )	-0.182*** (0.050)	-0.172*** (0.047)	-0.986*** (0.305)	-0.001* (0.001)
FLOW_REALL( $t-1$ )	0.032 (0.020)	0.026 (0.020)	0.137 (0.159)	0.001** (0.000)
INCENT_FEES( $t-1$ )	-0.015 (0.023)	-0.012 (0.024)	-0.598*** (0.164)	-0.001** (0.000)
SIZE( $t-1$ )	0.021 (0.016)	0.016 (0.018)	0.071 (0.150)	-0.000 (0.000)
AGE( $t-1$ )	-0.127*** (0.029)	-0.022 (0.034)	1.308*** (0.289)	0.002*** (0.001)
TURNOVER( $t-1$ )	-0.003*** (0.001)	-0.003*** (0.001)	-0.000 (0.003)	-0.000 (0.000)
PASSIVE_SHARE( $t-1$ )	-0.072 (0.061)	-0.068 (0.059)	-1.222*** (0.279)	-0.002** (0.001)
ACTIVER2( $t-1$ )	-0.033*** (0.008)	-	0.199*** (0.060)	-
TE( $t-1$ )	-	-15.126*** (4.350)	-	0.193*** (0.032)
STDEV_BENCH( $t$ )	7.194*** (1.703)	9.645*** (1.952)	-13.671 (13.689)	0.260*** (0.041)
Year dummies	Yes	Yes	Yes	Yes
Observations	471	471	471	471
Number of code	58	58	58	58
Adj. $R^2$	0.375	0.383	0.375	0.623

**Table 6. The effect of the different forms of fund reallocation by the sub-fund's sponsor on financial performances.**

This table reports the fixed-effect coefficient estimates and robust standard errors (in parentheses) clustered at the sub-fund level of a test for the impact of the investment management structure and the sponsor's decision of reallocation of financial flows on sub-fund financial performances. The dependent variables are: (i) ALPHA, i.e., the sub-fund's excess return (columns 1 and 2); (ii) ACTIVER2, i.e., the logit transformation of 1 - the sub-fund's R2 (column 3); and (iii) TE, i.e., the sub-fund's tracking error (column 4). The main explanatory variables are: MNDTS, the number of different investment mandates adopted in the sub-fund; 1-HHI\_MGRS, 1-Herfindahl-Hirschman index (HHI) of the assets managers' assets under management; FLOW\_REALL, a dummy variable that equals 1 if the sponsor has modified the pre-established allocation of the financial resources among managers and/or mandates, and zero otherwise; INCENT\_FEES, a dummy variable that equals one if the mandate(s) comprise(s) an incentive fee(s), and zero otherwise; SIZE, the natural logarithm of the sub-fund's assets under management; AGE, the sub-fund's number of operating years; TURNOVER, the minimum between the amount of securities bought and securities sold by the sub-fund and its assets under management; PASSIVE\_SHARE, the percentage of the sub-fund's asset under management allocated to passive investment mandates; TOTAL\_FEES, the ratio of the total fees paid to the asset managers of the sub-fund and its assets under management; STDEV\_BENCH, the standard deviation of the benchmark adopted by the sub-fund. *F*-test (MNDTS) is the *F*-statistic of a test on the sum of the coefficients of the MNDTS and the FLOW\_REALL×MNDTS variables; *F*-test (1-HHI\_MGRS) is the *F*-statistic of a test on the sum of the coefficients of the 1-HHI\_MGRS and the FLOW\_REALL×1-HHI\_MGRS variables. All estimations include an intercept (coefficient not reported).

\*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
	ALPHA(t)		ACTIVER2(t)	TE(t)
MNDTS( <i>t</i> -1)	0.012 (0.008)	0.011 (0.008)	0.160** (0.068)	0.000*** (0.000)
1-HHI_MGRS( <i>t</i> -1)	-0.120 (0.072)	-0.115 (0.078)	-0.593 (0.470)	0.000 (0.001)
FLOW_REALL( <i>t</i> -1)	0.022 (0.053)	0.015 (0.058)	0.576** (0.247)	0.002*** (0.000)
FLOW_REALL( <i>t</i> -1) × MNDTS( <i>t</i> -1)	0.031** (0.012)	0.029** (0.011)	0.004 (0.125)	0.000 (0.000)
FLOW_REALL( <i>t</i> -1) × [1-HHI_MGRS( <i>t</i> -1)]	-0.099 (0.070)	-0.092 (0.080)	-0.712 (0.510)	-0.002** (0.001)
INCENT_FEES( <i>t</i> -1)	-0.016 (0.024)	-0.013 (0.025)	-0.577*** (0.161)	-0.000** (0.000)
SIZE( <i>t</i> -1)	0.021 (0.016)	0.016 (0.017)	0.065 (0.150)	-0.000 (0.000)
AGE( <i>t</i> -1)	-0.127*** (0.030)	-0.023 (0.034)	1.306*** (0.289)	0.002*** (0.001)
TURNOVER( <i>t</i> -1)	-0.003*** (0.001)	-0.003*** (0.001)	-0.000 (0.004)	-0.000 (0.000)
PASSIVE_SHARE( <i>t</i> -1)	-0.107* (0.062)	-0.101 (0.061)	-1.237*** (0.336)	-0.002*** (0.001)
ACTIVER2( <i>t</i> -1)	-0.033*** (0.008)	-	0.197*** (0.060)	-
TE( <i>t</i> -1)	-	-14.909*** (4.246)	-	0.192*** (0.031)
STDEV_BENCH( <i>t</i> )	7.255*** (1.678)	9.673*** (1.902)	-13.877 (13.414)	0.260*** (0.040)
Year dummies	Yes	Yes	Yes	Yes
Observations	471	471	471	471
Number of code	58	58	58	58
Adj. <i>R</i> <sup>2</sup>	0.381	0.388	0.375	0.625
<i>F</i> -test (MNDTS)	10.27***	10.91***	2.35	8.11***
<i>F</i> -test (1-HHI_MGRS)	28.37***	29.76***	11.00***	10.41***