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Self-interest on mutual fund management: evidence from the Portuguese market

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SELF-INTEREST ON MUTUAL FUND MANAGEMENT:

EVIDENCE FROM THE PORTUGUESE MARKET ♦

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ABSTRACT

Institutional investors manage an increasingly substantial share of securities in the developed markets. Previous research has concluded that mutual funds' clients do have asymmetric reactions, for they increase capital flows to mutual funds that are winners in performance, but fail to move away from performance losers. Such an asymmetric behavior gives the mutual fund manager the opportunity to optimize the fund's own interests, not the participants'. In this paper we investigate self-interest on Portuguese equity mutual fund management. Our results show that, in Portugal, mutual funds tend to exhibit biased portfolios, i.e., financial assets of the group's parent company outweigh other financial asset holdings. This cannot be explained by performance, risk or securities' characteristics, and is consistent with the hypothesis of the existence of self-interest on mutual fund management.

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1. INTRODUCTION

The potential conflict of interests between mutual funds managers and their clients is a classic agency problem. The clients would like the maximization of risk adjusted returns. The managing companies of the funds are supposedly motivated by their own profits. If the optimizing choices of the managing company differ from the alternatives that maximize the expected adjusted returns of the fund, one can foresee that some conflicts can appear. The literature provides evidence of conflicts of interest and costs of agency associated with the trustee management of savings. In particular, some studies have drawn attention to the high costs of agency supported by the participants (Barclay et al. (1993)), as well as the poor performances attained by mutual funds (Elton et al. (1993)). The effect of incentives on the behavior of fund managers has equally been shown, in particular, the adjustment of systematic risk to the past performance of portfolios (Brown et al. (1996)). The impact of the structure of the management body of the managing company on the management fees charged and the expenses incurred is documented (Tufano and Sevick (1997)), confirming the existence of some freedom in the setting of fees; the use of this discretional power is subject to the interests of the managers and not to the interests of the participants. The phenomenon of "herding behavior" (Grinblatt et al. (1995), and Wermers (1999)) and of "window dressing" is known to exist in both investment in shares (Lakonishok et al. (1991) and O'Neal (2001)), and in bonds (Morey and O'Neal (2002)).

Furthermore, Alves (2003) showed that in a financial system wherein commercial interests, investment banking and portfolio management are concentrated in the same group, there exists space for an overlap between the interests of banks and the interests of portfolio management. The absence of a systematic and symmetrical reaction to the performance of mutual funds contributes to the widening of the abovementioned gap. In other words, the absence of penalization of the worst fund performances allows the subordination of the composition of fund portfolios and, concurrently, the purchase and sale of shares, to the interests of the banking group to which the managing company belongs.

Besides, an investment in shares issued by a financial group is important for the group itself. When buying shares of the group, the fund not only withdraws these securities from the market, thereby preventing them from being acquired by hostile investors, but it also

diminishes the number of shares that the managers need to hold in their own portfolio to approve resolutions in a shareholders general meeting. One notices that it is the managing companies and not the participants that determine the vote of the shares held by the fund, as the exercise of this right can be subordinated to the will of those who possess decision-making power in the group that manages the mutual fund. The acquisition and holding of their own shares trough mutual funds is also favorable to the interests of the financial group because of the signaling effect to other investors. As a result, the acquisition of such shares is favorable to the interests of the group managers (and the shareholders that support them), a fact that is especially true in the case of groups with dispersed capital.

Recognizing the potential conflict of interests, the legislation in force in Portugal only allows the acquisition of securities issued by the managing company, or by a company with which it shares a control relationship, in the event that they are listed on the stock market. However, this norm only warns of the conflict regarding the price and it does not prevent such conflict at the level of the constitution, reinforcement or maintenance of positions. If to this we add the fact that the majority of Portuguese mutual funds are managed by specialized companies that are 100% held by universal banking groups, then the Portuguese market provides specific conditions to permit the measurement of how much the investment policy of mutual funds is influenced by the ample interests of the financial group wherein the managing company belongs.

The Portuguese legislation establishes that the managers of the fund managing entities must act independently in the pursuit of the participants' interests, and that the managing entities must inform both the supervisory authority of the stock market (the CMVM) and the market the reasons for the orientation of the vote inherent to the shares held by the funds that they manage. These two measures contribute to an increase in transparency in the exercising of voting rights, and to the potential alignment of the exercise of these rights with the interests of the participants, without eliminating "per se" the possible agency costs. Until such measures came into force in March 2002, the exercise of the voting rights did not have to be justified before the supervision authority and the market. It matters, therefore, to study the taking up of positions in shares issued by the own group, all the more so given that, in spite of the

decisions of the mutual funds being widely investigated in multiple directions, this aspect in particular has not yet been the subject of a study.

2. DATABASE

The analysis is based on the composition of portfolios, reported at the end of each month, publicly discloused between January 1995 and June 2002, of the 30 funds that in accordance with the association of the funds' managing entities (the APFIN) invested in domestic shares. The average (monthly) number of funds in the period is 20. The total number of monthly portfolios observed is 1,769. The average (monthly) total assets under management on behalf of these funds is 661.5 million euros, with a maximum of 1,805.6 million euros (April 1998) and a minimum of 90.4 million (December 1995). At the end of June 2002 the total net asset value reached 261.4 million euros.

In this period, 111 shares were listed on the Euronext Lisbon, some of which had abandoned this market before the end of the period and others had been listed for the first time during the period of the study[1]. The average number of listed companies is 71. The total number of monthly observations of listed shares is 6,305[2]. The average aggregate weight of the domestic shares in the total net asset value (NAV) managed by the funds studied is 80.6%. Adding the non null positions per share, per fund and per month, a total of 43,714 observations were registered for 98 different shares, which, when compared with the total of 125,179 established positions (including null positions)[3] indicates that, in general, managers carry out a selective management.

As regards the information sources, the daily quotation of each fund, the dates and the sums of the dividends distributed are from Dathis[4]. In terms of risk-free interest rates, the Lisbor 3M (Lisbon Interbank Offered Rate) was used, also from Dathis. The daily values of the general PSI Index, which includes all shares listed in the main market of Euronext Lisbon, are from Euronext Lisbon. The information relating to the listed companies is from Dathis,

[1] This dataset does not tolerate survivorship bias given that, both at the fund level and at the share level, all of the elements were included and not only those that survived to the date of the study.
[2] Value obtained adding the number of months during which each of the 111 shares were listed. In order to avoid biased performance values, only shares that had been listed for at least three months were considered.
[3] Value obtained by adding the monthly product of the number of funds by the number of listed shares.
[4] Financial information disclosure system of Euronext Lisbon.

publications edited by Euronext Lisbon with annual accounting information, and the Stock exchange quotation bulletin from Euronext Lisbon.

3. ANALYSIS OF THE FUNDS' PORTFOLIOS

3.1 STRUCTURE OF INVESTMENTS

Table 1 sums up the sectoral structure of investments, considering all the mutual funds, and carries out its comparison with the weight of these sectors in the stock market. Given the reduced size of the Portuguese market, the financial sector - in particular the banking sector - and the information technology, multimedia and telecommunications (TMT) companies deserve a special attention, due to their importance at the end of the nineties.

TABLE 1 – MUTUAL FUND HOLDING STRUCTURE (%)

	1995	1996	1997	1998	1999	2000	2001	2002[Jun]	1995-02[Jun]
Panel I. Net Asset Value Weight									
Financial Companies	16.5	21.8	23.7	28.5	31.5	22.4	15.7	11.4	22.1
Banks	*15.1*	*18.6*	*20.0*	*24.1*	*25.6*	*20.3*	*15.7*	*11.4*	*19.3*
TMT	5.3	7.2	11.2	12.3	13.8	26.9	27.7	27.0	15.7
Others	42.9	41.0	48.1	46.1	42.8	39.2	39.5	41.8	42.7
Panel II. Equity Portfolio Value Weight									
Financial Companies	25.7	30.2	29.1	34.1	36.4	25.4	19.1	14.0	27.6
Banks	*23.5*	*25.7*	*24.5*	*28.8*	*29.6*	*23.1*	*19.1*	*14.0*	*24.2*
TMT	8.2	10.0	13.8	14.7	15.9	30.8	33.6	33.2	19.1
Others	66.1	59.8	57.1	51.2	47.7	43.8	47.3	52.8	53.3
Panel III. Stock Market Capitalization Weight									
Financial Companies	47.6	50.0	40.6	38.7	38.5	31.8	32.7	34.5	39.6
Banks	*42.7*	*44.2*	*35.3*	*33.9*	*33.4*	*29.1*	*32.6*	*32.7*	*35.7*
TMT	3.2	8.9	18.0	19.6	19.1	28.8	29.5	28.2	18.8
Others	49.3	41.0	41.4	41.7	42.3	39.4	37.8	37.3	41.5

Obs.: (*i*) panel I presents the average of the weights computed at the end of each month for every set of shares in the NAV of each fund; (*ii*) panel II presents the average of the weights computed at the end of each month for every set of shares in the total equity portfolio value of each fund; (*iii*) panel III presents the average of the weights computed at the end of each month for every set of shares in the total stock market capitalization.

One can see that both the banks and the financial companies possess, in general, a share of the NAV (Panel I) that is less than that registered for this type of assets in the stock market capitalization of the Euronext Lisbon (Panel III). The weight of this type of shares in the sum invested by all share funds (Panel II) is also inferior to its relative importance in the market throughout the period.

The circumstances as to why the influence of financial institutions in the funds is inferior to the weight of this type of assets in the market can be explained by the theory of agency. The routing of fund capital for the acquisition of shares of other financial intermediaries would be materialized in the search for competitors' shares and, consequently, their share price

sustentation. Furthermore, Table 1 does not report how much weight the assets of the own group have in mutual fund portfolios. The (eventual) subordination of the choices of fund managers to the interests of the managers of the top of the group would happen through the acquisition of shares of the own group and not by the acquisition of shares of the other financial groups, unless – an improbable hypothesis compared to the established results - a generalized collusion between the management at the top of the different groups was proven. As a result, it is important to distinguish between the positions in own group shares to shares of others in the financial sector. Thus, positions held in shares of financial institutions (banks and insurance companies) of the own group, to which the managing company of the fund belongs, are identified. Only positions in which the listed financial institution holds directly or indirectly more than 50 percent of the managing company are considered, ignoring therefore other positions held in listed companies of the own group[5]. We will identify these positions in shares of the "parent companies" with the expressions "H positions", "H shares" or "type H".

TABLE 2 – RELEVANCE OF H POSITIONS

	H	All Shares	All Shares Without H	FI	OFI
		Panel I. Ratio of Non Null Positions			
		Number of Shares Including Null Positions			
n1	1,590	125,179	123,589	31,897	30,307
		Number of Shares Without Null Positions			
n2	1,200	43,714	42,514	10,535	9,335
n2/n1	75.5%	34.9%	34.4%	33.0%	30.8%
Test Z1		*33.6* *	*34.1* *	*34.6* *	*36.9* *
		Panel II. Average Net Asset Value Weight			
		Including Null Positions			
Average	3.62%	1.12%	1.09%	1.33%	1.21%
Standard Deviation	*3.13%*	*2.18%*	*2.15%*	*2.36%*	*2.25%*
Test Z2		*31.7* *	*32.1* *	*28.8* *	*30.3* *
		Without Null Positions			
Average	4.80%	3.21%	3.16%	4.01%	3.91%
Standard Deviation	*2.71%*	*2.64%*	*2.62%*	*2.47%*	*2.42%*
Test Z2		*20.0* *	*20.6* *	*9.5* *	*10.7* *

Obs.: (*i*) the average, the standard deviation and the number of observations are related to all the funds and months under analysis; (*ii*) panel I reports the proportion of non null portfolio holdings on total potential holdings – i.e., null plus non null positions - for the different groups of shares; panel I also shows the Z1 test statistics of the difference between the n2/n1 ratio computed for H shares and the ratio verified for each one of the other groups of shares; (*iii*) panel II reports the average of each position in the NAV of each fund, its standard deviation and the statistics of the Z2 test of the difference of averages (null hypothesis: equality of averages for group H and the group under analysis); (*iv*) the symbols *, ** and *** show statistical significance at 1%, 5% and 10%, respectively.

We found 1,200 non null positions and 390 null positions, to make up a set of 1,590 positions of type H. It can immediately be noted (Table 2 - Panel I) that the proportion of non null

[5] Those positions are the relevant ones for the definition of the group strategy and for the re-election of the top managers of the parent company, given that the exercise of voting power in the other companies is directly or (in the majority) indirectly controlled by the parent company.

positions (75.5%) is bigger than that verified for the totality of the listed shares including (34.9%) or excluding (34.4%) H positions, for all (H included) financial intermediary (FI) shares (33.0%), and for the other (H excluded) positions in financial intermediaries (OFI - 30.8%). These differences are statistically significant. In other words, in 3 out of 4 possible occasions one finds H shares in fund portfolios; for assets in general the frequency with which they enter non-null positions is 1 in 3. Furthermore, the weight of H positions in the NAV of the managed portfolio is superior to that verified for the other types of shares (Panel II). On average, each H position represents 3.62% (4.8%) of the NAV, if the null positions are (are not) considered.

On the other hand, the average of the other listed shares is only 1.09% or 3.16%, depending on if one includes or not the null positions, and the average position in financial assets excluding H positions is 1.21% (3.91%) with (without) null positions. In all cases, the null hypothesis of equal averages for H and the other positions analyzed is rejected. Thus, one concludes that the weight of H shares in the NAV managed by each fund is, on average, significantly superior to the weight of other shares.

These conclusions do not change when we perform a year by year analysis[6]. As regards the fund-to-fund analysis (Table 3), 8 funds managed by entities whose "parent companies" are not listed on the Euronext Lisbon are excluded. Of the remaining 22, two (F25 and F26) have never taken H positions. In another case (F17), the average value of H positions is inferior to the average value of positions in other financial assets, and it is not distinct from the average weight of the other listed assets, even though the frequency of the presence of H shares is superior to OFI and other shares. These three funds are the exception. In the case of F25 and F26, the leading companies of the group, in spite of being listed, have a narrow free-float. F17 is a fund held originally by a group with largely familial capital and subsequently acquired by a group of dispersed capital. In these cases, the control of the voting rights of a small part of the capital is not relevant for the purposes of defending the positions of the top managers of the group[7].

[6] Results not reported.

[7] In 8 cases (F1, F2, F3, F9, F19, F20, F23 and F30), the average weight of H positions exceeds 5%, surpassing the general rule of legal administration of funds, thereby obliging the respective managing companies to resort to the special rule that allows, under specific conditions, the individual positions to be extended up to 10% of the NAV.

TABLE 3 – AVERAGE WEIGHT OF HOLDINGS H FUND BY FUND

	F1	F2	F3	F4	F8	F9	F14	F15	F16	F17	F18
	Shares H										
Average	6.79%	6.35%	4.09%	1.95%	3.28%	3.47%	3.02%	4.51%	4.70%	0.97%	2.68%
Standard Deviation	*1.89%*	*2.23%*	*3.37%*	*2.12%*	*2.45%*	*2.40%*	*1.53%*	*1.42%*	*0.68%*	*2.25%*	*0.44%*
n1	84	51	133	53	58	86	25	58	25	124	46
n2/n1	1.00	1.00	0.67	0.51	0.69	0.69	0.96	1.00	1.00	0.57	1.00
	All Shares Except H										
Average	1.13% *	1.19% *	1.05% *	1.23% *	1.05% *	1.21% *	0.64% *	1.19% *	1.08% *	1.08%	1.14% *
Standard Deviation	*2.17%*	*2.21%*	*2.08%*	*2.18%*	*2.15%*	*2.20%*	*1.70%*	*2.35%*	*2.32%*	*2.23%*	*2.32%*
n1	5747	3355	4960	3500	4271	6219	1886	3846	1829	4574	4204
n2/n1	0.42 *	0.45 *	0.39 *	0.36 ***	0.37 *	0.42 *	0.28 *	0.30 *	0.24 *	0.31 *	0.28 *
	Shares OFI										
Average	1.07% *	1.21% *	1.03% *	1.46% ***	1.02% *	1.33% *	0.67% *	1.48% *	1.43% *	1.39% **	1.29% *
Standard Deviation	*2.06%*	*2.06%*	*2.12%*	*2.30%*	*2.10%*	*2.36%*	*1.73%*	*2.58%*	*2.40%*	*2.46%*	*2.48%*
n1	1373	715	1254	751	1133	1506	538	837	456	1151	942
n2/n1	0.31 *	0.34 *	0.30 *	0.36 ***	0.29 *	0.34 *	0.28 *	0.34 *	0.34 *	0.32 *	0.26 *

	F19	F20	F21	F23	F24	F25	F26	F27	F28	F29	F30
	Shares H										
Average	4.25%	7.93%	3.10%	7.22%	3.51%	0.00%	0.00%	3.22%	2.51%	3.09%	6.11%
Standard Deviation	*3.47%*	*2.57%*	*3.38%*	*1.84%*	*3.10%*	*0.00%*	*0.00%*	*2.74%*	*1.99%*	*2.19%*	*5.04%*
n1	133	41	35	69	19	42	52	98	148	168	42
n2/n1	0.71	0.98	1.00	1.00	0.89	0.00	0.00	0.72	0.76	0.87	1.00
	All Shares Except H										
Average	0.97% *	0.83% *	1.13% *	0.89% *	1.38% *	1.11% *	1.06% *	1.15% *	0.80% *	1.00% *	0.56% *
Standard Deviation	*2.01%*	*1.98%*	*2.29%*	*1.91%*	*2.47%*	*2.11%*	*2.23%*	*2.16%*	*1.65%*	*1.90%*	*1.51%*
n1	4960	3007	1400	5024	1957	3480	6253	3736	4181	4989	1869
n2/n1	0.35 *	0.22 *	0.28 *	0.35 *	0.35 *	0.34 n.c.	0.27 n.c.	0.37 *	0.30 *	0.38 *	0.28 *
	Shares OFI										
Average	0.95% *	1.16% *	1.48% *	0.97% *	1.39% *	1.45% *	1.28% *	1.16% *	0.66% *	0.92% *	0.42% *
Standard Deviation	*1.95%*	*2.15%*	*2.45%*	*1.99%*	*2.46%*	*2.45%*	*2.41%*	*2.19%*	*1.69%*	*1.95%*	*1.06%*
n1	1254	823	332	1318	382	814	1540	779	1043	1231	521
n2/n1	0.29 *	0.33 *	0.30 *	0.29 *	0.28 *	0.34 n.c.	0.29 n.c.	0.32 *	0.18 *	0.27 *	0.21 *

Obs.: (*i*) the F1 to F30 acronyms identify the mutual funds; (*ii*) the average, the standard deviation and the number of observations are related to all funds and months under analysis; (*iii*) the symbols *, ** and *** show statistical significance at 1%, 5% and 10%, respectively. When the symbol is associated with an average, the null hypothesis is the equality of averages (Z2 test). When the symbol is associated with the ratio n2/n1, it refers to the Z1 test of ratio differences. In both tests the alternative hypothesis is one-sided; (*iv*) «n.c.» identifies the cases where it is not possible to perform the test.

The Modern Portfolio Theory is based on the concept that an efficient set of securities is a portfolio that is diversified and that it is not possible to get additional return without an increase in risk, nor is it possible to reduce the risk without sacrificing the return. The different securities would be, thus, chosen in terms of marginal rates for the elimination of the diversified risk. As a result, the systematic risk of each asset (beta) would determine the ratio with which the securities would be chosen for each portfolio. It could, therefore, be the case that the differential of the positions is a result of the diversity of the risk of the assets. Furthermore, several studies have shown that the choices of institutional investors cannot only be explained by the systematic risk of each asset, without noting that such choices reflect preferences for other characteristics of the shares. Gompers and Metrick (1998) have shown that big institutions, compared to other investors, prefer shares of bigger dimension, more liquid, with high book-to-market ratios and low past returns. Del Guercio (1996) examined mutual fund portfolios and the portfolios of banks and concluded that the preferences are diverse and influenced by the characteristics of the assets, with banks looking more intensely than funds for more "prudent" securities. Frye (2001) concludes that bond funds managed by

banks follow strategies more conservative than funds managed by specialized financial institutions. Falkeinstein (1996) documented that the preferences of mutual funds cannot be explained by the traditional "driver" (systematic risk), showing simultaneously that North American funds have an aversion to shares with low prices, or reduced dimension; they prefer the more liquid shares and shares with larger news coverage in the media. Therefore, it is important to check whether our findings are explained by the risk, performance or other characteristics of the shares, and not the simple circumstance of being shares issued by the group that manages the fund.

3.2 COMPARISON WITH MINIMUM VARIANCE PORTFOLIOS

In order to check whether diversification and risk minimization explain our findings, the monthly minimum variance portfolios of the stock market were computed. For this purpose, the following restrictions were imposed: (*i*) short selling not allowed; (*ii*) borrowing and lending not allowed; (*iii*) individual maximum weight limited to 10% of the portfolio. These restrictions are aimed at adapting the conditions of optimization to the legal restrictions that hang over the management of funds, while condition (*ii*) is also related with the fact that only equity mutual funds are analyzed, and they can't include relevant debt positions in order to keep the APFIN classification. Furthermore, 25% of the listed shares were excluded from the optimization process. This condition aimed at omitting shares of reduced liquidity and size from the optimization process, whose inclusion in fund portfolios would be very improbable given the narrowness of the respective market[8]. The historical period used was 5.5 years and accumulated monthly returns based on daily continuous returns were used.

Ninety minimum variance portfolios were obtained, containing on average 17 securities, with a maximum of 22 and a minimum of 13 shares. Thereafter the hypothesis was created that each one of the funds had chosen an identical structure to that of the portfolios of minimum variance, and a similar exercise to the one on which Table 2 is based was carried out. The results obtained are in Table 4. This Table reports the average weight of H positions comparatively to others, to which the majority of the 30 funds (during the 90 months of analysis) would be driven if they sought to efficiently minimize the risk of the portfolios.

[8] On average 18 shares were excluded; their global average weight in the total stock market capitalization was 0.96%.

TABLE 4 – RELEVANCE OF H POSITIONS IN EFFICIENT PORTFOLIOS OF MINIMUM GLOBAL VARIANCE

	H	MCO	MCO Except H	IF	OIF
		Panel I. Ratio of Non Null Positions			
		Number of Shares Including Null Positions			
n1	1,590	125,179	123,589	31,897	30,307
		Number of Shares Without Null Positions			
n2	355	29,633	29,278	12,424	12,069
n2/n1	22.3%	23.7%	23.7%	39.0%	39.8%
Test Z1		*-1.3*	*-1.3*	*-13.3* *	*-13.9* *
		Panel II. Average Weight in Equity Portfolio Value			
		Including Null Positions			
Average	1.29%	1.41%	1.41%	2.55%	2.61%
Standard Deviation	*2.88%*	*3.10%*	*3.10%*	*3.84%*	*3.88%*
Test Z2		*-1.7* **	*-1.7* **	*-16.7* *	*-17.5* *
		Without Null Positions			
Average	5.77%	5.97%	5.97%	6.54%	6.56%
Standard Deviation	*3.37%*	*3.64%*	*3.65%*	*3.44%*	*3.44%*
Test Z2		*-1.1*	*-1.1*	*-4.2* *	*-4.4* *

Obs.: This Table should be read similarly to Table 2.

These results are, essentially, the opposite to those of Table 2. In the event that the minimum variance strategy had been followed by the domestic shares funds, the H positions would have been selected in only 22.3% of the possible occasions instead of the 75.5% registered. Thus, this ratio would be superior to that registered for the other assets, but it would also be significantly inferior to that which the OFI should record. In terms of average weight, the value of H positions must have been inferior to that recorded for other assets and for OFI.

One can therefore conclude that the minimization of risk by diversification was not efficiently sought, and that led the funds to record the results exhibited in Table 2. Moreover, it can be inferred that those values either resulted from the assumption of a level of risk superior to the possible minimum, or they correspond to inefficient choices (in the Markowitz sense).

3.3 THE STRUCTURE OF THE PORTFOLIOS VIS-À-VIS THE STRUCTURE OF THE MARKET

A possible explanation for the higher weight of H positions in the portfolios of funds is the (possible) larger proportion of these shares in the market capitalization. In this scenario, the results obtained are no more than a reflection of the investment opportunities existing in the market in funds' portfolios, or the result of a preference for shares of a larger dimension (Falkenstein (1996) and Gompers and Metrick (1998)). Furthermore, the dimension of each share is equally a "proxy" of liquidity and of the transaction costs (their importance in the

choice of funds is documented by Falkenstein (1996) and Gompers and Metrick (1998)). Finally, the size of the company can equally be seen as a proxy for the visibility of the issuing entity (whose importance in the choice of the funds was mentioned by Falkenstein (1996)). Thus, it is important to compare the weight of each share in the market with its weight in the portfolio of each fund in order to examine the plausibility of this explanation.

The relative weight (RW) of each share is calculated dividing the weight of the asset in each portfolio by its weight in the Euronext Lisbon, using:

$$RW_{ift} = \frac{W(f)_{it}}{WM_{it}}, \qquad [1]$$

where $W(f)_{it}$ represents the weight of share i (i=1....111) in the portfolio of fund f (f=1,.., 30) in month t (t=1...,90) and WM_{it} represents the weight of the stock market capitalization of share i in month t. If RW>1 then the weight of share i in fund f in month t is superior to its weight in the market.

Our results show that, on average, the weight of H positions in funds' portfolios is 1.97 times its weight in the market (the z-score is 8.5). As regards the positions in OFI shares of Euronext Lisbon, the null hypothesis of RW=1 is rejected (z-score = -54.7); the weight of OFI assets in the market exceeds their weight in the funds' portfolios. When other positions in listed shares in the Euronext Lisbon are compared with H positions we conclude for the superior relative weight of H positions. In other words, in view of the investment opportunities in the market, H shares represent a higher relative average weight[9].

Taking into consideration the fact that maximum limits regarding the weights of positions in fund portfolios are imposed by law and that some (though a small number) of the listed shares have a relevance in the stock market capitalization greater than this legal limit, certain observations of the RW variable are, except when legislation is infringed, lower than one. The manner which these observations distribute themselves amongst the different groups may influence our results. If, for example, the majority of these observations integrated the FI group, the less prominent presence of this group may (possibly) be due to the excessive

[9] We don't control for free float insofar as there is not available information for all the sample period. However, according to the data available for the more recent years of the sample, there is no reason to believe that H shares have higher free float that OFI shares.

(compared to the legal maximum) weight of stock market capitalization of some shares. In this way, it would be impossible to associate this minor representation to the (free) choice of the managers. Therefore, in order to verify the robustness of our results, the RW variable is redefined - the denominator is modified to include the minimum between the weight of the share in stock market capitalization and 5%[10] or 10%[11]. By doing so, these observations do not bias the test towards the rejection of the hypothesis that the ratio is one. The results are unchanged: the inferior representation of the financial sector, and the superior representation of H shares, are evident.

3.4 THE STRUCTURE OF PORTFOLIOS AND THE PERFORMANCE OF THE SHARES

The weight of H positions in funds' portfolios with listed holdings may be related to the difference in performance of the shares. In effect, some studies report the preference of institutional investors for shares with high past returns (Grinblatt et al. (1995), Falkenstein (1996), Daniel et al. (1997) and Borensztein and Gelos (2000)), while other studies noted the preference of large investors for opposite strategies (Gompers e Metricks (1998)). It matters, therefore, to investigate the relationship between the structure of the investments and the performance of the shares.

Accordingly, the performance of each share was calculated for every one of the preceding 12 months. This performance was calculated in three distinct ways: (*i*) the daily average of continuous raw returns (CR); (*ii*) Jensen's alfa, taking the CAPM as the equilibrium model (model M1); and (*iii*) alfa coefficient of Carhart's model (1997), that is, based on a 4 factor APT model, which, besides the excess of market return gauged by the return differential of the PSIG Index and the return of the LISBOR 3M index, also includes the HML factor, SMB and the WML factors (model M2)[12].

In each month, all the securities listed were divided into 4 groups according to the quartile performance category into which each one fell. The positions in the portfolio of each fund

[10] The general limit.
[11] The legal limit admissible in exceptional circumstances.
[12] The variable HML attempts to quantify the *book-to-market* (B/M) effect and corresponds to the return of a portfolio that is long in high book-to-market stocks and short in low book-to-market stocks; SMB measures the size effect, and corresponds to the return of a portfolio that is long in small *caps* and short in *big caps*; WML measures the *momentum* effect, being therefore a return for a portfolio long in *stock winners* and short in recent *losers*. Due to the reduced size of the Portuguese stock market, in the calculation of the factors HML, SMB and WML one uses the methodology of Alves and Mendes (2004).

were analyzed for the different performance quartiles. In this way, the weight of each share in the shares' component of each fund was compared to the performance of the same share over the 12-month period ending before the month analysed. Results are in Tables 5 and 6.

TABLE 5 – RATIO OF NON NULL PORTFOLIO HOLDINGS BY QUARTILES OF PERFORMANCE

	Quartile 1 (Best Performances)	Quartile 2	Quartile 3	Quartile 4 (Worst Performances)	Quartile 1 - Quartile 4
			Panel I. Raw Returns		
	Shares H				
n2/n1	83.1%	75.8%	74.4%	56.9%	26.3%
Test Z3					*6.8 **
	All Shares Except H				
n2/n1	37.7%	37.4%	34.1%	28.6%	9.2%
Tests Z1 and Z3	*19.6 **	*17.7 **	*18.2 **	*8.1 **	*24.4 **
	Shares OFI				
n2/n1	38.0%	32.9%	30.0%	16.1%	21.9%
Tests Z1 and Z3	*18.8 **	*19.8 **	*20.0 **	*13.6 **	*25.5 **
			Panel II. Returns Adjusted Through M1 [CAPM]		
	Shares H				
n2/n1	59.7%	78.6%	80.6%	67.2%	-7.5%
Test Z3					*-1.6 ****
	All Shares Except H				
n2/n1	29.5%	35.6%	39.3%	33.4%	-3.9%
Tests Z1 and Z3	*9.5 **	*21.3 **	*20.5 **	*10.1 **	*-10.5 **
	Shares OFI				
n2/n1	21.3%	33.1%	38.4%	24.1%	-2.8%
Tests Z1 and Z3	*13.0 **	*22.2 **	*20.4 **	*13.6 **	*-3.5 **
			Panel III. Returns Adjusted Through M2 [APT4]		
	Shares H				
n2/n1	65.3%	77.7%	80.2%	67.0%	-1.7%
Test Z3					*-0.4*
	All Shares Except H				
n2/n1	30.7%	37.4%	38.0%	31.8%	-1.1%
Tests Z1 and Z3	*11.6 **	*20.1 **	*20.5 **	*10.2 **	*-3.1 **
	Shares OFI				
n2/n1	24.0%	35.8%	35.4%	20.8%	3.2%
Tests Z1 and Z3	*14.5 **	*20.5 **	*21.3 **	*14.8 **	*4.0 **

Obs.: (*i*) n2/n1 is the ratio of non null portfolio holdings (n2) to total potential holdings (n1) for the different groups of shares; (*ii*) in panel I we used raw returns in order to measure performance; in panel II we measure performance (adjusted for risk) using the alpha estimates of the M1 model, and in panel III rankings of performance were elaborated using the alpha estimates of the M2 model; (*iii*) the symbols *, ** and *** show statistical significance at 1%, 5% and 10%, respectively; *iv)* the Z1 test is the test of the difference between the computed ratio of H holdings and each of the other groups of shares; *v)* Z3 is the test of the equality of the Quartiles 1 and 4 ratios; *vi)* the alternative hypothesis is one-sided.

Table 5 shows the proportion of non null positions (n2) in the total of the positions (n1) for the different performance quartiles. Thus, of the 1,590 H positions identified, 445 relate to securities of higher return (Quartile 1), if calculated with CR returns that are not adjusted for risk (Panel I). The n2/n1 ratio is 83.1%. In all of the performance quartiles the quotient recorded for the H positions is significantly greater than that recorded for other positions. If risk adjusted returns are used, be it based on model M1 (Panel II) or model M2 (Panel III), it is similarly noted that the proportion is greater for H-positions in all of the performance quartiles. It can be concluded that the superiority of H shares is not restricted to a particular performance category.

Besides, the Z3 test on the difference of proportions of the extreme quartiles allows one to conclude that, at the CR level, the proportion of H positions of Quartile 1 exceeds the proportion of this type of position in Quartile 4. However, the same is true for all other types of assets. On the contrary, if the performance is assessed based on the M1 model, a higher proportion is seen in the securities of lower performance, which once again is generalized amongst all groups of shares. If we use the M2 model, merely at the level of OFI positions, a greater propensity in securities of greater performance is seen.

TABLE 6– AVERAGE WEIGHT OF PORTFOLIO HOLDINGS BY QUARTILES OF PERFORMANCE

	Quartile 1 (Best Performances)	Quartile 2	Quartile 3	Quartile 4 (Worst Performances)	[Quartile 1 - Quartile 4]
Panel I. Raw Returns					
Shares H					
Average	5.12%	4.46%	4.38%	3.86%	1.26%
Standard Deviation	*3.42%*	*3.78%*	*4.46%*	*5.51%*	*0.46%*
Test Z4					*2.8 **
All Shares Except H					
Average	1.70%	1.64%	1.30%	0.75%	0.94%
Standard Deviation	*3.06%*	*2.94%*	*2.70%*	*1.89%*	*0.02%*
Tests Z2 and Z4	*21.0 **	*16.7 **	*14.9 **	*7.3 **	*46.5 **
Shares OFI					
Average	2.06%	1.58%	1.30%	0.65%	1.41%
Standard Deviation	*3.23%*	*2.85%*	*2.59%*	*1.95%*	*0.05%*
Tests Z2 and Z4	*18.4 **	*16.9 **	*14.8 **	*7.5 **	*29.7 **
Panel II. Returns Adjusted Through M1 [CAPM]					
Shares H					
Average	3.23%	5.01%	4.94%	3.44%	-0.21%
Standard Deviation	*3.64%*	*3.79%*	*4.19%*	*4.82%*	*0.42%*
Test Z4					*-0.5*
All Shares Except H					
Average	1.26%	1.54%	1.68%	0.91%	0.35%
Standard Deviation	*2.74%*	*2.92%*	*2.92%*	*2.13%*	*0.02%*
Tests Z2 and Z4	*7.7 **	*21.9 **	*19.1 **	*7.5 **	*18.1 **
Shares OFI					
Average	1.03%	1.70%	1.83%	0.94%	0.09%
Standard Deviation	*2.36%*	*3.07%*	*2.96%*	*2.20%*	*0.04%*
Tests Z2 and Z4	*8.6 **	*20.7 **	*17.9 **	*7.3 **	*2.1 ***
Panel III. Returns Adjusted Through M2 [APT4]					
Shares H					
Average	4.01%	4.79%	4.91%	3.45%	0.56%
Standard Deviation	*3.91%*	*3.74%*	*4.25%*	*4.90%*	*0.44%*
Test Z4					*1.3*
All Shares Except H					
Average	1.31%	1.65%	1.58%	0.85%	0.47%
Standard Deviation	*2.76%*	*3.01%*	*2.84%*	*2.07%*	*0.02%*
Tests Z2 and Z4	*10.7 **	*20.4 **	*18.6 **	*7.2 **	*23.9 **
Shares OFI					
Average	1.19%	1.82%	1.68%	0.80%	0.39%
Standard Deviation	*2.53%*	*3.12%*	*2.88%*	*2.03%*	*0.04%*
Tests Z2 and Z4	*11.1 **	*19.0 **	*17.9 **	*7.3 **	*9.0 **

Obs.: (i) this table reports the average weight in the share portfolio value, not in the NAV (bonds and monetary applications were excluded); (*ii*) Z2 tests the null hypothesis of equality of averages between group H and the group under analysis; Z4 tests the null hypothesis of the equality of Quartile 1 and Quartile 4 averages; (*iii*) the symbols *, ** and *** show statistical significance at 1%, 5% and 10%, respectively. The alternative hypothesis is always one-sided.

Table 6, in turn, sums up the results obtained in terms of the average weight in the equity portfolio value. The hypothesis of equal average weight of H positions and of other positions is rejected in all cases, and a superior weight for H positions is inferred. The preference for shares of type H occurs in all performance categories and cannot be attributed to the choice of securities with superior performance.

On the other hand, using the Z4 test of equal averages for Quartiles 1 and 4, only in one case (CR) was it concluded that the average of the H positions of Quartile 1 was higher. Using risk-adjusted performance, the null hypothesis of identical averages is not rejected for H positions. On the contrary, for the other listed shares and OFI positions we found a superior average weight for the assets with better performance.

Thus, the analysis of fund portfolios shows an increased relative presence of higher performing shares amongst all shares than amongst the shares of the own group, which in fact indicates greater "skill" in the selection of the other shares than in the definition of the weight to be attributed to the own group shares.

3.5 STRUCTURE OF THE PORTFOLIOS AND RISK

The (superior) weight of H positions in funds can (possibly) be the result of the risk profile of the portfolio[13]. In order to investigate the relationship between the weight of each security in the shares portfolio of the fund and the respective systematic risk, the risk of each security is calculated based on the estimate of the betas of the M1 and M2 models in the period of 12 months preceding the month under analysis. Monthly rankings are drawn up, and the listed shares are divided into quartiles. Table 7 reports the main results. The average positions in assets with greater betas (Quartile 1) significantly exceed those with lower betas (Quartile 4). This result is valid for all types of assets and denotes a general preference for shares with a higher level of systematic risk[14]. However, this option of the managers does not justify the

[13] The importance of the systematic risk of assets in fund managers' decisions is well documented, amongst others, by Brown et al. (1996), where it is reported that mutual funds alter the systematic risk of portfolios according to past performance.

[14] This result is consistent with the evidence of Brown et al. (1996) according to whom fund managers select shares with a higher level of risk in order to obtain higher returns, and it is also compatible with the results reported by Falkenstein (1996) according to whom the funds show preference for assets with a high volatility level, although this is not always perceived when we use betas as a proxy; it is only fully perceived when the

superior weight verified for H positions. This superiority is evidenced for all the risk quartiles (Z2 test), and thus the preference for assets of higher risk cannot justify the weight of such positions[15].

TABLE 7 – AVERAGE WEIGHT OF PORTFOLIO HOLDINGS BY QUARTILES OF SYSTEMATIC RISK

	Quartile 1 (Bigger)	Quartile 2	Quartile 3	Quartile 4 (Smaller)	Quartile 1 - Quartile 4
			Panel I. Betas Estimated Through M1 [CAPM]		
	Shares H				
Average	5.03%	4.87%	4.32%	2.00%	3.03%
Standard Deviation	*3.39%*	*4.53%*	*5.10%*	*3.41%*	*0.29%*
Test Z4					*10.3 **
	All Shares Except H				
Average	3.00%	1.43%	0.69%	0.28%	2.72%
Standard Deviation	*3.64%*	*2.64%*	*1.86%*	*1.22%*	*0.02%*
Tests Z2 and Z4	*16.1 **	*15.5 **	*11.4 **	*6.4 **	*124.8 **
	Shares OFI				
Average	3.57%	1.47%	0.67%	0.20%	3.38%
Standard Deviation	*3.46%*	*2.69%*	*2.00%*	*1.20%*	*0.04%*
Tests Z2 and Z4	*11.2 **	*15.2 **	*11.5 **	*6.8 **	*78.7 **
			Panel II. Betas Estimated Through M2 [APT4]		
	Shares H				
Average	4.20%	5.19%	4.77%	3.58%	0.62%
Standard Deviation	*3.19%*	*4.12%*	*4.26%*	*4.60%*	*0.31%*
Test Z4					*2.0 ***
	All Shares Except H				
Average	1.72%	1.80%	1.38%	0.51%	1.21%
Standard Deviation	*3.07%*	*3.06%*	*2.65%*	*1.61%*	*0.02%*
Tests Z2 and Z4	*14.0 **	*18.8 **	*16.5 **	*11.8 **	*61.6 **
	Shares OFI				
Average	1.91%	2.31%	1.34%	0.54%	1.37%
Standard Deviation	*2.93%*	*3.36%*	*2.59%*	*1.89%*	*0.04%*
Tests Z2 and Z4	*12.7 **	*15.6 **	*16.5 **	*11.6 **	*31.9 **

Obs.: This Table must be read similarly to Table 6.

3.6 STRUCTURE OF THE PORTFOLIOS AND OTHER SHARE CHARACTERISTICS

Besides the past performance or the systematic risk of each share, other characteristics of securities can be considered by fund managers[16]. In this sense, the estimates of the SMB, HML and WML coefficients of the M2 model were used, to draw up monthly rankings in a similar manner to those formulated for performance and risk. Results are in Table 8.

variance is used.

[15] Our results are invariant to the use of total risk instead of systematic risk (results not reported).

[16] See, for example, Lakonishok et al. (1994), Del Guercio (1996), Falkenstein (1996) and Gompers and Metricks (1998).

TABLE 8 – AVERAGE WEIGHT OF PORTFOLIO HOLDINGS BY QUARTILES OF SMB, HML AND WML ESTIMATED COEFFICIENTS

	Quartile 1 (Bigger)	Quartile 2	Quartile 3	Quartile 4 (Smaller)	Quartile 1 - Quartile 4
			Panel I. SMB Estimated Coefficients		
	Shares H				
Average	0.25%	2.24%	4.58%	4.82%	-4.57%
Standard Deviation	*1.10%*	*4.37%*	*4.68%*	*3.81%*	*0.28%*
Test Z4					*-16.4 **
	All Shares Except H				
Average	0.27%	0.46%	1.32%	3.33%	-3.06%
Standard Deviation	*1.03%*	*1.28%*	*2.58%*	*3.76%*	*0.02%*
Tests Z2 and Z4	*-0.1*	*3.9 **	*13.9 **	*12.6 **	*-138.2 **
	Shares OFI				
Average	0.06%	0.24%	1.25%	2.57%	-2.51%
Standard Deviation	*0.43%*	*1.13%*	*2.70%*	*3.27%*	*0.03%*
Tests Z2 and Z4	*0.8*	*4.4 **	*14.1 **	*18.9 **	*-85.2 **
			Panel II. HML Estimated Coefficients		
	Shares H				
Average	2.25%	4.11%	4.79%	5.09%	-2.84%
Standard Deviation	*2.55%*	*4.27%*	*4.06%*	*4.12%*	*0.33%*
Test Z4					*-8.5 **
	All Shares Except H				
Average	0.61%	1.06%	1.80%	1.90%	-1.29%
Standard Deviation	*1.99%*	*2.45%*	*2.91%*	*3.12%*	*0.02%*
Tests Z2 and Z4	*5.9 **	*15.0 **	*17.5 **	*17.0 **	*-61.6 **
	Shares OFI				
Average	0.20%	1.08%	2.52%	2.73%	-2.53%
Standard Deviation	*1.02%*	*2.36%*	*3.21%*	*3.61%*	*0.05%*
Tests Z2 and Z4	*7.4 **	*14.9 **	*13.1 **	*12.2 **	*-49.3 **
			Panel III. WML Estimated Coefficients		
	Shares H				
Average	4.53%	4.34%	4.86%	4.33%	0.20%
Standard Deviation	*3.23%*	*3.78%*	*4.50%*	*5.08%*	*0.36%*
Test Z4					*0.6*
	All Shares Except H				
Average	1.30%	1.75%	1.39%	0.95%	0.35%
Standard Deviation	*2.72%*	*3.02%*	*2.67%*	*2.33%*	*0.02%*
Tests Z2 and Z4	*20.0 **	*14.1 **	*17.5 **	*10.4 **	*17.1 **
	Shares OFI				
Average	1.45%	1.57%	1.94%	0.80%	0.65%
Standard Deviation	*2.76%*	*2.88%*	*3.18%*	*1.99%*	*0.04%*
Tests Z2 and Z4	*18.8 **	*14.9 **	*14.5 **	*10.8 **	*16.8 **

Obs.:(*i*) This Table must be read similarly to Table 6; (*ii*) «n.c.» identifies the cases where it is not possible to perform the test.

One can conclude that fund managers show a preference for shares not exposed to the size effect, as well as for shares less exposed to HML and for shares exposed to the momentum effect. H positions exhibit this preference, except in shares with greater exposure to WML. This finding suggests that managers choose H shares even if these are not conforming with the strategy of exposure to momentum that does exist in other choices. As a result, the

preference for H seems to take precedence over the generalized option of superior exposure to winning securities.

On the other hand, the superiority of the average weight of H positions is evident for all quartiles and all forms of drawing up the rankings, with one exception: quartile 1 of the SMB rankings. However, it is improbable that the preference for shares of higher capitalization solely justifies the superiority of the weight of H shares. It is clear that an aversion to the SMB effect exists and it is also unequivocal that H shares are less exposed to this effect. The superiority of the choice of H is clear in the other classes of performance, particularly in securities less exposed to the size effect (Quartile 4). As a result, in spite of H securities providing, in general, great capitalizations and the fact that the funds demonstrate an aversion to the SMB factor, it is also true that, amongst the securities of larger dimension, managers choose more intensively the shares of type H.

In summary, there does not exist evidence that the (excess) average weight of H positions is the result of any (generalized) management strategy. On the contrary, there exists evidence that the choice for that type of assets has priority to preferences made based on exposure to the momentum effect.

3.7 MULTIVARIATE ANALYSIS

In the previous sections the bilateral relationship between the weight of H shares in fund portfolios and the performance or the risk was analyzed, using positions in other assets and other financial intermediaries as controls. In no case, however, did performance and the different levels of risk interact in the explanation of the weight of each asset in each fund. Moreover, the previous analysis aggregates the data of the different funds, not analyzing the behavior of each fund individually in relation to the performance and the risk of each asset. As a result, an analysis of the interaction of all the variables providing a potential explanation to the weight of each asset is important and it is also important to distinguish the behavior of the different funds.

The database is an unbalanced panel that encompasses a double sectional dimension (the weight of each asset in each fund can vary from fund to fund and from asset to asset) and a

time-series dimension (a period of 90 months). The implementation of OLS is deemed problematic under these circumstances, for the assumption that the observations are not serially correlated and homoskedastic is highly improbable. Thus, we performed OLS regressions month-to-month and fund-to-fund[17]. These regressions are merely sectional and in only one dimension (asset to asset). The regressions carried out were found to be homoskedastic and absent of specification errors[18]. The estimates of the coefficients of the final regressions were obtained as an average of the individual estimates; the respective *t* statistics are likewise based on this average and the respective standard deviation, using a methodology analogous to that of Fama and MacBeth (1973).

The dependent variable was, in all cases, the weight of share *i* (*i*=1....111) in the portfolio of shares of the fund being analyzed[19]. Amongst the explanatory variables two dummies are included: H and OFI. H takes the value of one if share *i* is a H position and zero otherwise, while OFI is one if share *i* is a financial institution but it does not correspond to a H position. H aims to control for the effect of the interests of the own group and OFI aims to control for the financial sector effect in the choices of managers.

The performance registered for security *i* in the 12 previous months was included as a regressor. It is proxied by the estimate of the alpha parameter of the M1 model (in some cases) or of the M2 model (in other cases). A measure of the systematic risk of share *i* was also included as a regressor, proxied by an estimate of the beta of one of the models (M1 or M2). Furthermore, whenever the performance and the systematic risk were measured based on M2, the estimates of the HML, SMB and WML coefficients were equally included amongst the explanatory variables. The weight of asset *i* in the market was also included as an explanatory variable. In principle the portfolios reflect the investment opportunities existing in the market, for which reason it would be expected that the weight of each asset in the market plays a significant part in determining its weight in the portfolio. Furthermore, our previous analysis clearly shows an aversion to small caps that is important to control. Given

[17] A methodological solution which at first seems plausible is the estimation of a fixed-effects model. However, the explanatory variable whose significance is to be studied – the holding effect – is invariable over time in many funds, thereby making the application of that technique impractical.
[18] Based on the White (1980), and Ramsey (1969) tests.
[19] As a result, as stated by Del Guercio (1996), Falkenstein (1996) and Gompers and Metricks (1998), amongst others, the stocks and not the flows of mutual funds are examined here. However, unlike us, these authors used the percentage of the total of shares issued as the dependent variable.

the imposed legal limitations to the composition of mutual fund portfolios, it would not be probable that the weight of each share in the market has a linear effect on the composition of the portfolios; it rather would be expected that the impact of the first 5% and (if this be the case) of the part that exceeds 5% would be differentiated. Thus, two new variables were defined. WL5, which limits the weight in the market to a maximum of 5%, is computed as

$$WL5_{it} = \text{Min}\,(WM_{it}, 5\%), \qquad [2]$$

where WM_{it} corresponds to the weight of asset *i* in the Euronext Lisbon in month *t*. By turn, WH5 quantifies the weight in the market that goes beyond the 5% limit.

Results of the OLS regressions are in Table 9. The effect of H is positive and significant. That is, the H shares are attributed a weight greater than that of other shares. As a result, we infer that the interests of the group are revealed by the choices of the funds, at least with respect to the choice of the relevant shares for the exercise of power in the group[20]. The OFI variable has a negative and significant effect, confirming the reluctance of funds to choose financial shares of other groups, implying, therefore, a reduced propensity to channel the clients' money to support the demand for the shares of competitors. As expected, the weight of each asset in the market has a positive and significant effect on the weight of the asset in the portfolio, and the impact on the first 5% (WL5) is greater than that of WH5.

TABLE 9 – MUTUAL FUND PORTFOLIO HOLDINGS REGRESSIONS

C	H	OFI	WL5	WH5	Alfa (M1)	Beta (M1)				N	R2	R2Adj
-0.007 *	0.0124 *	-0.0065 *	1.063 *	0.302 *	0.395 *	0.012 *				1127	0.645	0.612
-15.97	*24.64*	*-40.12*	*106.04*	*12.48*	*8.67*	*24.64*						
C	H	OFI	WL5		Alfa (M1)	Beta (M1)				N	R2	R2Adj
-0.007 *	0.0067 *	-0.0074 *	1.201 *		0.416 *	0.012 *				1127	0.608	0.578
-15.79	*7.21*	*-49.21*	*140.94*		*9.15*	*22.93*						
C	H	OFI	WL5	WH5	Alfa (M2)	Beta (M2)	HML (M2)	SMB (M2)	WML (M2)	N	R2	R2Adj
-0.006 *	0.0052 *	-0.0062 *	1.005 *	0.291 *	0.394 *	0.013 *	-0.002 *	-0.004 *	0.000 *	1127	0.664	0.615
-13.28	*4.27*	*-39.53*	*91.92*	*11.19*	*8.44*	*25.84*	*-16.06*	*-21.50*	*4.61*			
C	H	OFI	WL5		Alfa (M2)	Beta (M2)	HML (M2)	SMB (M2)	WML (M2)	N	R2	R2Adj
-0.006 *	0.0066 *	-0.0070 *	1.152 *		0.382 *	0.012 *	-0.002 *	-0.003 *	0.001 *	1127	0.626	0.578
-13.49	*7.05*	*-44.96*	*122.72*		*7.95*	*23.85*	*-14.18*	*-18.45*	*5.42*			

Obs.: (*i*) "C" is the constant, and "H", "OFI", "WL5", "WH5", "Alpha (M1)", "Beta (M1)", "Alpha (M2)", "Beta (M2)", "HML (M2)", "SMB (M2)", and "WML (M2)" are the regressors; (*ii*) Values in *italic* are t-stats; (*iii*) the symbol * denotes statistical significance at 1%; (*iv*) N is the number of individual estimates performed; (*v*) R^2 and R^2 Adj. are, respectively, the average of the R^2 individual estimates and the average of the Adjusted R^2 individual estimates.

[20] The estimates that appear in Table 9 are averages of all the individual regressions. However, if monthly averages are initially calculated and then the final averages are based on the 90 monthly averages initially calculated, the conclusions are similar. Using a different approach, if the averages of each fund are first calculated and thereafter we calculate the final averages giving all funds the same weight, the positive effect of the H-variable continues to exist. Finally, results are also not affected if we split the sample: the H effect is positive when individual regressions of the first and the second 45 months are considered separately. However, this effect is more expressive in the first than in the more recent months (results not shown).

Furthermore, the preference for assets that have produced the best performances in the past – shown by the alpha and WML coefficients - and for securities with the highest systematic risk is unequivocally deducible. As regards the other risk sources, preference for exposure to the returns of large companies and companies with reduced B/M ratios seems clear. This result is in accordance with Lakonishok et al. (1994), who claim that institutional investors prefer glamour shares, with high past returns and low B/M, inasmuch as this fact helps the institutions explain their choices to the general public. Del Guercio (1996) came to the same conclusion, and states that the preference for large companies and (especially) for a low B/M is especially true amongst banks and less intense amongst funds.

It is important to note, however, that the reported global effect does not occur in all the funds included in our sample[21]. Although only two funds less intensively selected this type of share over all other types, and in only three funds was the average weight inferior to the average weight in positions in other financial intermediaries' shares, in 10 funds the positive significance of the H-variable is not present. The distribution of different funds amongst different financial groups allows it to be concluded that the behavior varies from group to group and, within each group, from managing company to managing company. In fact, the H-effect is especially severe in large financial groups with large free-float and professional management, and in the small family controlled banks. However, the OFI effect is universal, all funds exhibit a negative cofficiente for this variable.

4. ANALYSIS OF PURCHASES AND SALES

We now turn to the analysis of the flow of investments (instead of stocks)[22]. Over the period of the study the funds analyzed bought shares in 19,936 occasions (off which 553 type H and 4,260 OFI) and sold shares in 20,535 occasions (off which 602 type H and 4,363 OFI). The distribution of these operations amongst the different performance categories - not reported - suggests that, in all the share categories, both purchases and sales have a very similar distribution to the distribution of the positions in the portfolios.

The distribution of the portfolio holdings and sale and purchase operations of each group amongst the performance quartiles, equally not reported, also indicates that, in both the H and

[21] Results not reported.
[22] Lakonishok et al. (1991) and Grinblatt et al. (1995), amongst others, equally studied the flows of investment and disinvestment instead of the positions in the portfolio.

OFI-shares, the operations of purchase and sale are primarily concentrated in the central quartiles, where one can find the majority of the portfolio holdings. This can be interpreted as evidence of herding behavior (Grinblatt et al. (1995) and Lobão and Serra (2002)).

It is important to compute the relative intensity of sales insofar as sales are conditioned by the weight of each asset in the portfolio. For this purpose, we use:

$$IS_{itf} = \frac{S(i,t,f)/H(i,t-1,f)}{\sum_{i=1}^{K_j(t)} S(i,t,f) \Big/ \sum_{i=1}^{K_j(t)} H(i,t-1,f)} \qquad [3]$$

where IS_{itf} represents the intensity of sales of share *i*, in month *t*, by fund *f*; S(*i*, *t*, *f*) represents the monetary value of sales of share *i*, in month *t*, by fund *f*[23]; H(*i*, t-1, *f*) is the value held in shares *i* by fund *f* at the end of month *t*-1; $K_j(t)$ is the number of shares that in month *t* integrated performance quartile *j* (*j* = 1, 2, 3 and 4). The numerator corresponds to the ratio of the asset in the portfolio that was sold. The denominator gives the ratio of the money invested in the set of shares of the same performance quartile as the share of the numerator, which was the object of disinvestment[24].

TABLE 10 - DISTRIBUTION OF SALES OF SHARES BY GROUPS OF SHARES AND PERFORMANCE

	Quartile 1 (Best)	Quartile 2	Quartile 3	Quartile 4 (Worst)	[Quartile 1 - Quartile 4]
	Shares H				
Average	1.69	1.69	1.66	2.05	-0.36
Standard Deviation	*1.67*	*2.10*	*1.37*	*1.62*	*0.28*
Test Z4					*-1.3*
	All Except H				
Average	2.89	3.02	11.58	4.90	-2.00
Standard Deviation	*25.3*	*24.7*	*423.2*	*58.5*	*0.9*
Tests Z2 and Z4	*-2.9 **	*-3.7 **	*-1.7 ***	*-3.2 **	*-2.2 ***
	Shares OFI				
Average	1.94	2.44	2.40	3.99	-2.06
Standard Deviation	*3.1*	*10.2*	*9.9*	*21.0*	*1.1*
Tests Z2 and Z4	*-1.2*	*-2.6 **	*-2.8 **	*-1.8 ***	*-1.9 ***

Obs.: (*i*) includes total sales for all mutual funds and all months; (*ii*) the symbols *, ** and *** show statistical significance at 1%, 5% and 10%, respectively; *iii)* sales and purchases correspond to the difference (positive in the first case and negative in the second) between the number of shares in the portfolio in two consecutive months, ignoring therefore the purchases and the sales that are mutually compensated every month, as there does not exist a report on these operations.

[23] Sales were evaluated according to the price at the end of the month preceding the month analyzed, in order to avoid the distortion of the disinvested value by the valorization of the asset during the month in which the sale occurred.

[24] Equation [3] compares the ratio of disinvestment in each security with the percentage of disinvestment in the performance class in which the security is included. Thus, for example, if a fund sells 20 percent of the position in a share, but only reduces its investment held in all shares that integrate the same performance quartile by 5 percent, the ratio is 4,0. This indicator is analogous to the one used by Lakonishok et al. (1991), for the study of the window dressing phenomenon.

On average, the intensity of the sales of OFI and other assets surpasses the H-sales in all performance classes (Table 10). Furthermore, it appears that for all types of assets sales are more intense in the worst performance class (Quartile 4) than in Quartile 1. However, in the case of H-positions we cannot reject the hypothesis of equal average intensity of sale of shares with better and worst performances. This means that share funds sell losing shares more intensely, a fact that can be deemed to be both window dressing, and supporting the backing of momentum strategies. In the first case the (more) intense sale of losing assets would aim at preventing the worst performing securities from forming part of the portfolios of funds; in the second, the sale of losing securities would serve the purpose of freeing up "space" for the acquisition of winning securities, on the pretext that the winners (losers) of the past will be the winners (losers) of the future.

In order to determine the intensity of purchases we use:

$$IB_{itf} = \frac{B(i,t,f) \Big/ \sum_{i=1}^{K_{j(t)}} B(i,t,f)}{H(i,t,f) \Big/ \sum_{i=1}^{K_{j(t)}} H(i,t,f)} \qquad [4]$$

where IB_{itf} is the intensity of the purchases of share *i*, in month *t*, for the fund *f* and B(*i*, *t*, *f*) represents the monetary value of the purchases of the share, in month *t*, for the fund *f*[25].

TABLE 11 - DISTRIBUTION OF PURCHASES OF SHARES BY GROUPS OF SHARES AND PERFORMANCE

	Quartile 1 (Best)	Quartile 2	Quartile 3	Quartile 4 (Worst)	[Quartile 1 - Quartile 4]
	Shares H				
Average	1.71	1.80	2.24	1.43	0.29
Standard Deviation	*1.62*	*2.66*	*9.14*	*1.45*	*0.27*
Test Z4					*1.1*
	All Shares Except H				
Average	4.38	2.99	3.72	5.85	-1.47
Standard Deviation	*62.8*	*22.7*	*58.8*	*94.7*	*1.7*
Tests Z2 and Z4	*-2.7* *	*-3.2* *	*-1.5* ***	*-3.2* *	*-0.4*
	Shares OFI				
Average	2.20	2.15	2.81	3.27	-1.06
Standard Deviation	*4.1*	*4.0*	*15.8*	*25.7*	*1.2*
Tests Z2 and Z4	*-1.8* **	*-1.6* ***	*-0.8*	*-1.6* ***	*-0.9*

Obs.: (*i*) this table must be read similarly to Table 10.

[25] This ratio is different to the sales intensity indicator by the fact that not only would the application of an analogous indicator lead to undetermined results in the event of first sales, but also by the fact that purchases in general are very reduced compared to the portfolio values, a fact which caused great volatility in the indicator. Purchases were valued according to the price at the end of the respective month.

Our results (Table 11) point again to the superior intensity in purchases of OFI and other shares compared to H-shares (Z2 Test) in all performance classes. As a result, the significance of the H-variable obtained in section 3 must, basically, be due to the initial positions and lower intensity of sales, and not to the intensity of purchases. This result is not surprising considering that, as previously seen, H-positions were on average very near the legal limit, and portfolios did not have "space" for the expansion of H-positions. On the other hand, both in the OFI and in the other positions in listed shares the purchasing intensity of Quartile 4 surpasses that of Quartile 1, the inverse happening with H-positions[26]. This means that in the case of H-positions the results obtained (even though tenuous) point in the direction of supporting the thesis regarding preference for the momentum strategy.

5. CONCLUSIONS

In this study 30 Portuguese fund portfolios and the respective purchases and sales were analyzed in the period between January 1995 and June 2002. Our results clearly show that excessive weight of shares issued by the parent company, to which the managing companies of the funds belong, does exist. Firstly, it was concluded that H-shares are more frequently selected for the portfolios of the funds than any other shares. While in three out of four possible occasions this type of share can be found in the portfolios of funds, for all other listed Portuguese shares the frequency noted was only one in three. Furthermore, the average weight of the shares of the parent company significantly exceeds the weight of all other shares.

This excessive weight is not justified by risk diversification in order to efficiently minimize the overall risk, nor due to the past performance of the shares, nor the level of systematic risk, nor by the exposure of the assets to the size, book-to-market or momentum effects. Similarly, the weight of the shares in the market does not eliminate the holding effect, even when this effect is analyzed using the legal limits for the investment in each share.

Simulating what would happen if each fund had opted for Markowitz's minimum variance portfolio, the result obtained would be substantially different to that exhibited by fund portfolios. The minimization of total risk would lead to a ratio of about 22.3% of H-shares,

[26] But these results lack statistical significance.

instead of the 75.5% effectively recorded. Furthermore, the average weight of the H positions would be significantly inferior to that registered for other assets, and in particular inferior to that registered for OFI. What we see in the actual fund portfolios is the opposite.

The relationship between the weight of the shares in the portfolio of the fund and the respective weight in the market was also analyzed. On average, the weight of H-positions in the fund portfolio is (almost) double the weight in the market, whereas the weight of the other financial institutions is limited, on average, to 50 percent of their weight in the market. It was also clear that the greatest frequency of choice of H-shares, as well as the greatest average weight, was verified for all the performance classes. The analysis of the level of systematic risk allowed one to conclude that it is not via the risk profile, nor via the preference of funds for shares with higher risk, that the choice of H-shares can be justified. Finally, the analysis of the exposition of shares to the SMB and HML and WML factors equally disclosed that the "excessive" selection of H was not determined by management strategies related to these variables, but, on the contrary, it was observed that the preference for H-shares preceeds the preference for exposure to the momentum effect.

Furthermore, the analysis of the purchases and sales allows one to conclude that funds, in general, do not promote the purchase of shares with good past performances, but that they sell shares more intensely when these record bad performances. In contrast to that reported in Grinblatt et al. (1995) and Borensztein and Gelos (2000), the preference for exposure to the momentum effect is only clear in sales, and is not confirmed at the level of purchases. Fund preference for shares with higher past performances is due to their initial portfolios and to the selling off of losing securities.

Finally, other financial assets are insufficiently represented in funds' portfolios. They are not only infrequently selected, but also their average positions are significantly inferior to those of H-positions. The (negative) OFI effect is not explained by size, performance, systematic risk, B/M or the momentum effect. OFI shares are less frequently and less intensely selected because they are issued by competing banking groups.

We can address our results to the domain of the agency theory. Another possible explanation – not exploited in this paper - is that managers have biased beta estimation for the shares H. However, this hypothesis is (apparently) less strong, insofar as it leads one to believe that managers make persistent estimation errors.

An analysis of the subservience of fund portfolios to the commercial interests of the managing company is the planned theme of the next study. The acquisition of shares of important client companies – present or potential – of the bank to which the managing company belongs, is likewise carried out in accordance with the interests of the financial group managing the fund. The purchase of positions of note, either for the group's own portfolio or for that of its clients – increases the number of voting rights controlled by the bank, a fact that allows it to increase its influence over the issuing entities. As a result, it is worth investigating if the commercial relations of the group that manages the fund similarly affect the choices of funds.

REFERENCES:

Alves, C. (2003), *Os Investidores Institucionais e o Governo das Sociedades: Disponibilidade, Condicionantes e Implicações, PHD Thesis*, University of Porto (Faculty of Economics).

Alves, C. and V. Mendes (2004), «Corporate Governance Policy and Company Performance: The Case of Portugal», *Corporate Governance: an International Review*, Vol. 12, nº 3, pp. 290-301.

Barclay, M., C. Holderness and J. Pontiff (1993), «Private Benefits From Block Ownership and Discounts on Closed-End Funds», *Journal of Political Economics*, Vol. 33, no.3, pp. 263-291.

Borensztein, E. and R. Gelos (2000), «A Panic-Prone Pack? The Behavior of Emerging Market Mutual Funds», *IMF Working Paper*, no. WP/00/198, International Monetary Fund.

Brown, K., W. Harlow and L. Starks (1996), «Of Tournaments and Temptations: an Analysis of Managerial Incentives in the Mutual Fund Industry», *Journal of Finance*, Vol. 51, no. 1, pp. 85-110.

Carhart, M. (1997), «On Persistence in Mutual Fund Performance», *Journal of Finance*, Vol. 52, no.1, pp. 57-82.

Daniel, K., M. Grinblatt, S. Titman and R. Wermers (1997), «Measuring Mutual Fund Performance With Characteristic-Based Benchmarks», *Journal of Finance*, Vol. 52, no.3, pp. 1035-1058.

Del Guercio, D. (1996), «The Distorting Effect of the Prudent-Man Laws on Institutional Equity Investments», *Journal of Financial Economics*, Vol. 40, no.1, pp. 31-62.

Elton, E., M. Gruber, S. Das and M. Hlavka (1993), «Efficiency With Costly Information: a Reinterpretation of Evidence From Managed Portfolios», *Review of Financial Studies*, Vol. 6, no. 1, pp. 1-22.

Falkenstein, E. (1996), «Preferences for Stock Characteristics as Revealed by Mutual Fund Portfolio Holdings», *Journal of Finance*, Vol. 51, no. 1, pp. 111-135.

Fama, E. and J. MacBeth (1973), «Risk, Return, and Equilibrium: Empirical Tests», *Journal of Political Economy*, Vol. 71, May/June, pp. 607-636.

Fama, E. and K. French (1992), «The Cross-Section of Expected Stock Returns», *Journal of Finance*, Vol. 47, no. 2, pp. 427-465.

Frye, M. (2001), «The Performance of Bank-Managed Mutual Funds», *Journal of Financial Research*, Vol. 24, no.3, pp. 419-442.

Gompers, P. and A. Metrick (1998), «How Are Large Institutions Different From Other Investors? Why do These Differences Matter for Equity Prices and Returns?», *Working Paper Series*, no. 1830, Harvard University, Cambridge, Massachusetts.

Grinblatt, M., S. Titman and R. Wermers (1995), «Momentum Investment Strategies, Portfolio Performance, and Herding: a Study of Mutual Fund Behavior», *American Economic Review*, Vol. 85, no. 5, pp. 1088-1105.

Lakonishok, J., A. Schleifer, R. Thaler and R. Vishny (1991), «Window Dressing by Pension Fund Managers», *American Economic Review*, Vol. 81, no. 2, pp. 227-231.

Lakonishok, J., A. Shleifer and R. Vishny (1994), «Contrarian Investment, Extrapolation, and Risk», *Journal of Finance*, Vol. 49, no. 5, pp. 1541-1578.

Lobão, J. and A. Serra (2002), «Herding Behavior - Evidence from the Portuguese Mutual Funds», *EFMA 2003 Helsinki Meetings, http://ssrn.com/abstract=302937*.

Morey, M. and E. O'Neal (2002), «Window Dressing in Bond Mutual Funds», *http://ssrn.com/abstract=285051*.

O'Neal, E. (2001), «Window Dressing and Equity Mutual Funds», *Working Paper*, Babcock Graduate School of Management.

Ramsey, J. (1969), «Tests for Specification Error in Classical Linear Least Squares Analysis», *Journal of Royal of the Statistical Society*, Series B, no. 31, pp. 350-371.

Tufano, P. and M. Sevick (1997), «Board Structure and Fee-Setting in the U.S. Mutual Fund Industry», *Journal of Financial Economics*, Vol. 46, no.3, pp. 321-355.

Wermers, R. (1999), «Mutual Fund Herding and the Impact on Stock Prices», *Journal of Finance*, Vol. 54, no. 2, pp. 581-622.

White, H. (1980), «A Heteroscedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroscedasticity», *Econometrica*, Vol. 48, no. 4, pp. 149-170.

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