FEP WORKING PAPERS

Research – Work in Progress – n. 204, February 2006

Mutual fund flows' performance reaction: does convexity apply to small markets?

Carlos F. Alves*

Victor Mendes

*CEMPRE - Centro de Estudos Macroeconómicos e Previsão

U.PORTO
FEP FACULDADE DE ECONOMIA UNIVERSIDADE DO PORTO

Faculdade de Economia da Universidade do Porto
Rua Dr. Roberto Frias, 4200-464 Porto | Tel. 225 571 100
Tel. 225571100 | www.fep.up.pt

MUTUAL FUND FLOWS' PERFORMANCE REACTION:

DOES CONVEXITY APPLY TO SMALL MARKETS?

Carlos Alves
CEMPRE[•], Faculty of Economics, University of Porto
Rua Dr. Roberto Frias
4200-464 Porto
Portugal
Telephone: +351 225 571 100
Fax: +351 225 505 050
Email: calves@fep.up.pt

Victor Mendes
CMVM - Portuguese Securities Commission
Avenida da Liberdade, 252
1056-801 Lisboa
Portugal
Telephone: +351 213177000
Fax: +351 213537077/8
Email: victormendes@cmvm.pt

JEL: G21, G23 and G28

KEYWORDS: Mutual Fund, Performance Reaction, Investor Behaviour, Small Markets and Regulation

ABSTRACT

In this paper we study the performance reaction of investors in a small market context. Instead of the asymmetrical investors' reaction to winners and losers, as usually documented for the US, an absence of risk-adjusted performance reaction was observed. The absence of reaction can be attributed to either lower investor sophistication, conflicts of interests in the context of the Portuguese universal banking industry, or the existence of relevant back-end load cost which prevent investors from reacting. A high persistence of net investment flows was also noted. Our results are consistent with the idea that the financial groups with larger market shares have the capacity "to drive" their customers to funds with larger fees. This practice emerges as a non-transparent means of increasing prices.

• CEMPRE is supported by CFT through POCTI of the QCAIII, which is financed by FEDER and Portuguese funds.

1. INTRODUCTION

The study of the performance reaction of mutual funds investors has been a matter of investigation for developed markets, particularly the US. However, as far as we know, there are not such studies for small and emergent markets. Nevertheless, there are reasons to suspect that in small markets the reaction of mutual fund investors can be quite different from that of investors in more developed and complex markets. On the one hand, small markets are less complex and products are less differentiated than in the US mutual fund industry, thus simplifying the task of calculating performance (with the correspondent lower information costs for retail investors). This conjecture leads one to expect a more effective performance reaction in smaller markets that in more developed markets. On the other hand, small markets are less developed and less competitive, and one can also conjecture that the information dissemination process is less efficient. This may bring about higher information costs, and less effective performance reaction. Finally, inferior investor sophistication and organization of the mutual fund industry can also lead to different investor behaviour in small markets.

Some of the attempts to explain the phenomenon of asymmetrical performance reaction are as much applicable to large and complex markets as to smaller and emerging markets. This is the case of the explanation based on investors' cognitive dissonance and the theory relative to the expected about-turn of investment policy. However, the applicability of the theory of the industry's complexity and the concomitant difficulty to compute and compare performances (and the inherent costs of acquiring information) to small economies, with financial systems characterized by a reduced number of intermediaries and mutual funds, is not straightforward. In a market with fewer (and easy to compare) mutual funds, the task of retail investors distinguishing between good and bad performances can be less complex and less costly. This leads one to suspect that, in small markets, mutual funds flows react symmetrically to the mutual fund performances.

However, small markets are less developed and competitive, and the information dissemination process is likely less efficient. This leads to higher costs of acquiring information about the stock market, as well as the ongoing cost of monitoring a portfolio of risky assets, and may bring about a sub-optimal performance reaction. Moreover, when the small market is also characterized by a universal banking system, where in the same holding we can find retail banking and fiduciary

management (including the mutual fund management), the hypothesis of absence of reaction again makes sense. In this case, differing from the US, there are no independent brokers between retail investors and mutual fund managers. The bank who sells the mutual fund is a member of the holding. Therefore, when a bank customer asks for advice regarding mutual fund investment, the advice he/she gets can be biased due to conflicts of interest. As a result, absence of mutual fund performance reaction is expected.

It is important to investigate whether the asymmetry documented for large and complex markets also exists in emerging markets, and smaller and less complex, but also less developed, markets. However, no study on the performance reaction of investors in funds in emerging and/or smaller markets is known to exist.

The aim of this study is to fill this gap. The performance reaction of mutual funds' investors is analysed in the domestic environment of the Portuguese mutual fund industry. There are two reasons why the Portuguese market is studied. Firstly, the Portuguese securities' market is small in size: in March 2001 there were only 261 mutual funds, managing a total net asset value (NAV) of 21 390 million euros. Those mutual funds were managed by 19 management companies. In the segment of equity funds predominantly investing in Portuguese shares, only 30 funds have existed from 1st January 1994 to 31st March 2001. The total amount managed by these 30 funds reached its maximum value in April 1998, 1805.6 million euros. These figures are in stark contrast to the complexity and dimension of the US market, where the total managed value surpassed 3.3 trillion dollars in 1998 (Zheng (1999)). We must also note that the Portuguese financial system is a universal banking system, in which the financial holding has businesses in other areas besides the fiduciary activities. Mutual funds are usually commercialized by the retail bank of the holding, and the mutual funds are managed by the holding's mutual fund management company.

The second reason is based on the fact that the information available to the public is unlike that of any other market, given that not only is the value of the portfolios managed by the funds and their composition published monthly, but also the value of each investment unit is published daily[1,2].

[1] As far as we know, Hungary is the only other country in the EU that publishes portfolios (and their value) each month, but not for all mutual fund categories.

Therefore, in Portugal is it possible to monitor the monthly development of the net flows of capital channelled to each fund as well as monitor the daily value of investments and respective returns.

The paper analyses the performance reaction of the clients of Portuguese funds investing in domestic shares, over a 7 year 3 month period. Our results indicate that a performance reaction is only noteworthy, both on the winning as well as the losing side, when the raw return for one year is compared to the normalised capital flows of the following year. That reaction is associated to the connection between the capital flows during first half-year periods and the return in the prior calendar year. For other time horizons and for risk-adjusted returns, a reaction is either not detected or the inverted reaction phenomenon is observed, where winners are transformed into losers and vice-versa. In spite of this, the analysis of the capital flows of subsequent demand periods clearly shows that demand persists both on the winners' side and (especially) on the losers' side. Our results also allow one to conclude that financial groups, in particular those with higher market shares, are able to channel their customers to their more expensive mutual funds.

The paper is structured as follows. In section 2 we have a brief literature review. Section 3 describes the dataset. Contingency tables are in section 4, and regression analysis is in section 5. Finally, the main conclusions of the paper are summarized in section 6.

2. BRIEF LITERATURE REVIEW

An issue that has been motivating the work of some researchers is that of understanding the type of investor response to the performance of mutual funds. This is particularly motivated by the fact that some studies show that performance persistence is (especially) observable amongst funds recording lower performances (for example, Hendricks et al. (1993), Shukla and Trzcinka (1994) and Carhart (1997)).

There is consensus amongst researchers on one point: the capital flows into each mutual fund are sensitive to past performances. Several studies have documented this for the US market (Ippolito (1992), Gruber (1996), Chevalier and Ellison (1997), Goetzmann and Peles (1997), Sirri and

[2] This information is available at the Portuguese Securities Commission website (www.cmvm.pt) since 2002. Before 2002, some daily newspapers published this information in the markets section. Therefore, the costs of monitoring a portfolio of risky assets are negligible.

Tufano (1998) and Christoffersen (2001)). What has been intriguing academics is the diversity of reaction to higher and lower performance. A number of studies have shown the phenomenon of asymmetry, reporting that the better the past performance the greater the attracted flow is for superior performances, whereas lower performances don't encompass redemption or negative growth rates (Ippolito (1992), Chevalier and Ellison (1997), Goetzmann and Peles (1997), Sirri and Tufano (1998), Lynch and Musto (2000), Christoffersen (2001) and Del Guercio and Tkac (2001)). More specifically, the relationship between performance and the flow of the subsequent period is convex in nature (Chevalier and Ellison (1997) and Sirri and Tufano (1998), amongst others). The phenomenon is perceptible both when the return is risk-adjusted and when it is not risk-adjusted, in much the same way that such is evident when either absolute performance measures are used or when there is reaction to performance rankings.

Christoffersen (2001) documents the phenomenon for funds aimed at institutional and private customers. Gruber (1996) claims that there are informed investors capable of foreseeing future performance based on past performance, channelling their net investments to funds with better future performances ("smart money effect"). These investors are in contrast to another type of less informed and less sophisticated consumers, the existence of which justifies the continuation of money in funds that will foreseeably record poor performances.

The asymmetry of investor behaviour in mutual funds, expressed through a convex relationship between performance and capital flows, certainly has causes. In the absence of transaction costs, Ippolito (1992) found that the investor - assuming performance persistence - will tend to choose the funds with better recent performances instead of making random choices. Similarly, investors will tend to avoid funds with the worst performances. The only obstacles are the costs involved with acquiring information, and with the redemption of investments from the worse performing funds and the subscription to winning funds. These costs are, in this context, the (rational) explanation as to why large market shares are not transferred from some funds to others when the fund performances are published. In support of this theory, Ippolito (1992) documents that the net flows of funds with lower load costs are more sensitive to performance than the net flows of funds with higher load costs. Sirri and Tufano (1998) also concluded that funds with larger fees tend to have more sluggish growth than funds with lower fees.

Sirri and Tufano (1992), in turn, explain investor behaviour using the operational structure of the US mutual fund industry as their basis. They argue that the industry's exponential growth creates confusion and selection difficulty for investors[3]. This is worsened by the frequent name changes, in addition to the merger and disappearance of existing funds, as well as the constant appearance of new funds[4]. Simultaneously, the financial industry has been marked by increasing competitive complexity. In fact, mutual fund management companies provide different services, at different prices, designed with different strategies, aimed at different market segments and distributed through distinct marketing channels. Thus, the industry has created differentiated products which, with the aid of marketing, increase investor confusion. The underlying idea is, therefore, that the operational complexity of the industry gives rise to high costs in obtaining and handling information regarding the performance of all existing mutual funds, for which reason those investors avoiding these costs make their decisions based on the information made available to them, which may be through marketing initiatives or through the media. However, both the marketing initiatives and the media tend to emphasize the better performances and not dwell on the worse performances (Sirri and Tufano (1998) and Jain and Wu (2000)).

Lynch and Musto (2000), in a different type of explanation, propose that the absence of any significant reaction to extreme negative performances can be due to the prospect of an alteration to investment policy. These researchers put forward that strategy alterations occur after bad results, and the expectation of more favourable results associated to the change in strategy could be sufficient justification for investors to remain in these segments.

Another approach based on cognitive dissonance phenomena is provided by Goetzmann and Peles (1997), who conclude that investors adjust their main beliefs in order to support the (bad) choices they have made. These authors suggest that a positive bias exists in investors' memories, which is consistent with the absence of any reaction to the worst performances.

[3] The differentiation of the product as a means of diminishing the importance of performance and complicating its use in assessing the achievements of fund managers is an argument subscribed by Lakonishok et al. (1992), in relation to pension funds.

[4] The name changing strategy has proven to be quite successful. Cooper et al. (2003) analysed the relationship between capital flows and the change of mutual fund names. The results denote that the flows to funds dramatically increase when funds change their names to obtain a greater association with the styles that are producing higher returns at that time. This outcome is true even for those funds that do not change their portfolios to profiles closer to the style implied by the new name.

3. DATASET AND VARIABLES

(i) Sample

The sample includes all Portuguese open-end mutual funds (30 funds) which were deemed to be "domestic equity funds" by APFIN[5], between 31st December 1993 and 31st March 2001. This means that the sample coincides with the population.

The sample possesses characteristics that are of great bearing on the purposes of this investigation: (*i*) it refers only to the equity funds of one single country[6]; (*ii*) by including all funds we avoid survivorship bias; (*iii*) investments in bonds are of little significance[7], a fact that has contributed – just as (*i*) has too – to increase the effectiveness of performance measurements.

The total assets (monthly average) under the management of these funds is 635.2 million euros, with a maximum of 1805.6 million euros (April 1998) and a minimum of 90.4 million euros (December 1995). At the end of March 2001 the total NAV was 495.8 million euros.

(ii) Mutual Fund Investment Flow Variables

To measure the monthly investment flow of each fund two metrics are used: the absolute capital flows (CF) and the normalized capital flows (NCF). The absolute capital flows is given by

$$CF_t = NAV_t + I_t - NAV_{t-1}(1 + R_t) \qquad [1]$$

where: NAV_t is the total net value of the fund's portfolio, at date t, after the distribution of income; I_t is the income distributed by the mutual fund; and R_t is the return achieved by the fund between t-1 and t[8/9].

The normalised capital flows is given by[10]:

$$NCF_t = \frac{CF_t}{NAV_{t-1}}. \qquad [2]$$

[5] APFIN is the Portuguese association of mutual fund management companies.
[6] The inclusion of foreign shares would mean taking into consideration the systematic risk of other countries. The importance of local factors in the calculation of the price of the risk of each one of the return generating factors is documented by Serra (2000).
[7] The mean aggregate percentage of domestic shares in the NAV managed by the samples' funds is 82.0%.
[8] We assume that the income distribution occurs on date *t*. Events, such as fund mergers, are handled using the follow the money approach (Gruber (1996)).
[9] Purchases (net of sales) made by fund of funds of the same financial group were deducted from the total flow, thereby ensuring that only capital flows originating from clients outside of the fund complex is considered.
[10] NCF is used by Ippolito (1992), Sirri and Tufano (1998) and Zheng (1999), among others.

The first metric favours larger funds that tend to have greater absolute cash flows disassociated from performance, while NCF tends to amplify the results of smaller funds (Gruber (1996)). Therefore, it is important to use both measurement methods. The exclusive use of the former could hide the reaction of the clients of large funds, in much the same way that the exclusive use of NCF could lead to the excessive prominence of the reaction of clients of smaller funds.

(iii) Performance Variables

The mutual funds' performance was calculated in three distinct ways: (*i*) the continuous raw returns; (*ii*) Jensen's alpha, taking the CAPM as the equilibrium model; and (*iii*) the alpha 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[11] and the return of the LISBOR[12], also includes the HML, SMB and WML factors[13].

(iv) Sources of Information

The daily price quotation of each fund, the dates and the sums of the distributed incomes, and the fund monthly portfolios are from Dathis[14]. Market and accounting information for listed companies is from Dathis, from the annual publications issued by Euronext Lisbon with yearly accounting information on listed companies, and from the daily quotation bulletins of Euronext Lisbon. Information regarding the fees charged by each fund was obtained from the funds' management rules published in the quotation bulletins of Euronext Lisbon. Accounting information relative to the management companies of the funds is from the quotation bulletins and CMVM [Portuguese Securities' Commission]. The information on banks is from the 'Boletim Informativo' published by the Portuguese Association of Banks.

[11] We use the PSIG Index (the Euronext general Index for Euronext Lisbon) as the market returns proxy.
[12] We use the Lisbor 3 months (an inter-bank monetary rate) as a proxy of risk-free interest rate.
[13] The HML variable attempts to quantify the book-to-market 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, and is the return of a portfolio long in stock winners and short in recent losers. Due to the reduced size of the Portuguese stock market, the small markets methodology of Alves and Mendes (2004) is used in the calculation of the HML, SMB and WML factors.
[14] Financial information disclosure service of Euronext Lisbon.

4. CONTINGENCY TABLES

4.1 PERFORMANCE REACTION

(i) Methodological Issues

Our study of investors' performance reaction is based on a methodology frequently used to analyse both the mutual fund performance persistence (for large[15] and small[16] samples), and the response of the funds' management to performance[17]: the analysis of contingency tables. . This methodology is appropriate to study small markets (Cortez (1998)). However, regressions analysis was also used to check the robustness of our results.

Bi-dimensional tables were used with the variables: *i)* performance achieved over a given time period and *ii)* new capital flows in the subsequent period[18]. The performance was divided into two categories, winner (W) and loser (L), according to whether the fund in question achieved an above or below median performance. The investor reaction variable is similarly divided into two categories, W^* (winner) and L^* (loser), according to whether the fund in question achieved an above or below median net capital flow.

If the attraction of new capital flows is independent of performance it would be expected that the observations would be equally distributed between the 4 cells of the contingency table. However, if good performances are rewarded and bad performances penalised – «the performance reaction hypothesis» - then the observations tend to concentrate in WW^* and LL^*. It is possible, nevertheless, that other reaction patterns occur, which lead to winners being transformed into losers and vice-versa – «the inverted reaction hypothesis».

In terms of the statistical tests used, the chi-square test was firstly applied - with and without the Yates continuity correction – which is based on the expected frequency of each cell[19]. The other tests used are the following: the cross-product ratio, also known as the odds ratio test or relative risk test[20] (to test the independence of two variables in a multinomial sample), the joint repetition test of Pesaran and Timmermann (1992), and the repetition of winners /losers Malkiel (1995) test.

[15] *Vide* Goetzmann and Ibbotson (1994), Brown and Goetzmann (1995), Malkiel (1995) and Kahn and Rudd (1995).
[16] *Vide* Cortez (1998).
[17] *Vide* Busse (2001) and Goriaev et al. (2005).
[18] Different time horizons were considered in order to assess the robustness of the results.
[19] The independence hypothesis of performance rankings and the rankings of capital flows of the following period is the null hypothesis of all the formulated tests. *Vide* Everitt (1977, p.14) and Conover (1999, p.190), in addition to others.
[20] *Vide* Everitt (1977, p.31) and Brown and Goetzmann (1995).

(ii) Preceding Period Performance Reaction

Table 1 presents the main results. The risk-adjusted performance reaction hypothesis is rejected. The only circumstance in which a reaction exists is when the (Y/Y)[21] annual period is considered and the returns are non-risk-adjusted (raw returns). But, even in this case, the reaction of clients is only noticeable for NCF, and no perceptible significance is observed using the measurement that would (theoretically) benefit demand for bigger mutual funds (CF).

TABLE *1* – CONTINGENCY TABLES AND INVESTOR PERFORMANCE REACTION TESTS

	Contingency Table				Test of X^2		Test of X^2 Adjust. of Yates		Odds Ratio Test		Test of Pesaran and Timmerman		Repeat Winners Test		Repeat Losers Test	
	WW^*	WL^*	LW^*	LL^*	χ^2	p	χ^2 Aj.	p	CP	p	RR	p	RW	p	RL	p
Panel A: Absolute Capital Flow (FC)																
	Raw Returns															
Q/Q	128	143	143	127	1.78	0.09 *	1.55	0.11	0,79	0.09 *	0.47	0.09 *	0.47	0.18	0.47	0.17
S/S	59	63	67	59	0.57	0.22	0.56	0.23	0.82	0.22	0.48	0.22	0.48	0.36	0.47	0.24
Y/Q	125	121	126	130	0.13	0.36	0.07	0.39	1.07	0.36	0.51	0.36	0.51	0.40	0.51	0.40
Y/Y	26	25	29	29	0.01	0.46	0.01	0.47	1.04	0.46	0.50	0.46	0.51	0.44	0.50	0.50
	CAPM Model															
Q/Q	131	141	140	129	0.82	0.18	0.67	0.21	0.86	0.18	0.48	0.18	0.48	0.27	0.48	0.25
S/S	57	66	69	56	1.95	0.08 *	1.93	0.08 *	0.70	0.08 *	0.46	0.08 *	0.46	0.21	0.45	0.12
Y/Q	120	135	131	116	1.79	0.09 *	1.56	0.11	0.79	0.09 *	0.47	0.09 *	0.47	0.17	0.47	0.17
Y/Y	28	23	27	31	0.76	0.19	0.71	0.20	1.40	0.19	0.54	0.19	0.55	0.24	0.53	0.30
	Carhart Model															
Q/Q	129	144	142	126	1.78	0.09 *	1.56	0.11	0.79	0.09 *	0.47	0.09 *	0.47	0.18	0.47	0.16
S/S	56	68	70	54	3.16	0.04 **	3.14	0.04 **	0.64	0.04 **	0.44	0.04 **	0.45	0.14	0.44	0.08 *
Y/Q	115	137	136	114	3.86	0.02 **	3.51	0.03 **	0.70	0.02 **	0.46	0.02 **	0.46	0.08 *	0.46	0.08 *
Y/Y	27	25	28	29	0.09	0.39	0.07	0.40	1.12	0.39	0.51	0.38	0.52	0.39	0.51	0.45
Panel B: Normalised Capital Flow (NFC)																
	Raw Returns															
Q/Q	128	143	141	129	1.35	0.12	1.15	0.14	0.82	0.12	0.48	0.12	0.47	0.18	0.48	0.23
S/S	60	62	65	61	0.14	0.35	0.14	0.35	0.91	0.35	0.49	0.35	0.49	0.43	0.48	0.36
Y/Q	124	122	126	130	0.07	0.40	0.03	0.43	1.05	0.40	0.51	0.39	0.50	0.45	0.51	0.40
Y/Y	29	22	25	33	2.06	0.08 *	1.98	0.08 *	1.74	0.08 *	0.57	0.07 *	0.57	0.16	0.57	0.15
	CAPM Model															
Q/Q	129	143	140	129	1.15	0.14	0.98	0.16	0.83	0.14	0.48	0.14	0.47	0.20	0.48	0.25
S/S	59	64	66	59	0.58	0.22	0.57	0.23	0.82	0.22	0.48	0.22	0.48	0.33	0.47	0.27
Y/Q	126	129	124	123	0.03	0.43	0.01	0.46	0.97	0.43	0.50	0.43	0.49	0.43	0.50	0.47
Y/Y	26	25	28	30	0.08	0.39	0.07	0.40	1.11	0.39	0.51	0.39	0.51	0.44	0.52	0.40
	Carhart Model															
Q/Q	134	139	135	133	0.09	0.38	0.15	0.35	0.95	0.38	0.49	0.38	0.49	0.34	0.49	0.40
S/S	61	63	64	60	0.15	0.35	0.14	0.35	0.91	0.35	0.49	0.35	0.49	0.43	0.48	0.36
Y/Q	123	129	127	123	0.20	0.33	0.13	0.36	0.92	0.33	0.49	0.33	0.49	0.35	0.49	0.40
Y/Y	24	28	30	27	0.46	0.25	0.42	0.26	0.77	0.25	0.47	0.25	0.46	0.29	0.47	0.35

Obs.: (*i*) Q/Q, S/S, Y/Q and Y/Y identify the time horizon for performance (first symbol) and capital flows (second symbol), where Q, S and Y represent respectively the quarter, the half-year and the year; (*ii*) WW^* is the number of funds that were double winners (performance rankings of a given period and capital flows rankings of the subsequent period); LL^* identifies the number of funds that were double losers (performance rankings of a given period and capital flows rankings of the subsequent period); WL^* is the number of funds that were winners on performance rankings and losers on capital flows rankings of the subsequent period; e LW^* identifies the number of funds that were losers on performance rankings and winners on capital flows rankings of the subsequent period; (*iii*) χ^2 identifies the qui-square statistic; χ^2 Aj. identifies the qui-square statistic after the Yates adjustment; CP identifies the cross product (odds ratio); RR identifies Pesaran and Timmermann repetition percentage; RW (RL) identifies the percentage of repetition of winners (losers); p identifies the p-values for one-sided tests; (*iv*) the symbols ***, ** and * show statistical significance at 1%, 5% and 10%, respectively.

[21] This is the performance of one year (first Y) which is compared to the capital flows of the following year (second Y).

The independence hypothesis is not even rejected in favour of the performance reaction hypothesis when the performance is measured in quarterly terms (Q/Q) nor when calculated in annual terms (Y/Q). On the contrary, evidence of the inverse reaction of the CF variable exists, relative to the raw returns of the previous quarter (Q/Q), and there is evidence of inverse reaction for both quarterly (only with the Carhart Model) risk-adjusted returns as well as for those of the previous year. When the half-year period is used as the time horizon (S/S), the same conclusion applies, i.e. that the only situation of rejection of the independence hypothesis occurs with the use of non-normalised capital flows (CF) and risk-adjusted returns. Thus, funds with the worst risk-adjusted performances occupy the top places of the ranking of capital flows in the following half-year.

In short, no evidence exists that the clients of funds react to performance, with the exception of the comparison of normalised annual flows with non-risk adjusted returns relative to the preceding year (Y/Y). On the contrary, in terms of risk-adjusted performance, a perceptible phenomenon of inverted reaction was observed, where the winners are transformed into losers and the losers converted into winners, whenever the reaction of clients is assessed in terms of absolute flows, in half-yearly (S/S) and quarterly (Q/Q) terms.

(iii) Prior Calendar Year Performance Reaction

The evidence that investors react to the performance of funds in Y/Y terms, and that no reaction exists in Y/Q terms, raises the suspicion that investors are only sensitive to the performance relative to each calendar year. Therefore, it is important to assess to what extent investors memorise the performances of each calendar year and react in function of these. Table 2 reports the results obtained from comparing the performance of each calendar year with the demand in the four quarters of the following year.

TABLE 2 – INVESTOR REACTION TO THE LAST CIVIL YEAR PERFORMANCE

	Contingency Table				Test of X^2		Test of X^2 Adjust. of Yates		Odds Ratio Test		Test of Pesaran and Timmerman		Repeat Winners Test		Repeat Losers Test	
	WW*	WL*	LW*	LL*	χ^2	p	χ^2 Aj.	p	CP	p	RR	p	RW	p	RL	p
Panel A: Absolute Capital Flow (FC)																
	Raw Returns															
Civil Year/1Q	41	28	29	39	3.86	0.02 **	1.79	0.09 *	1.97	0.03 **	0.58	0.02 **	0.59	0.06 *	0.57	0.11
Civil Year/2Q	31	24	24	35	2.80	0.05 **	0.77	0.19	1.88	0.05 **	0.58	0.05 *	0.56	0.17	0.59	0.08 *
Civil Year/3Q	29	31	33	31	0.13	0.36	0.12	0.37	0.88	0.36	0.48	0.36	0.48	0.40	0.48	0.40
Civil Year/4Q	23	31	33	29	1.31	0.13	0.13	0.36	0.65	0.13	0.45	0.13	0.43	0.14	0.47	0.31
	Carhart Model															
Civil Year/1Q	37	33	33	34	0.18	0.34	0.04	0.42	1.16	0.34	0.52	0.34	0.53	0.32	0.51	0.45
Civil Year/2Q	28	28	27	31	0.14	0.36	0.19	0.33	1.15	0.36	0.52	0.36	0.50	0.50	0.53	0.30
Civil Year/3Q	30	30	32	32	0.00	0.50	0.50	0.24	1.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Civil Year/4Q	26	31	30	29	0.32	0.29	0.05	0.42	0.81	0.29	0.47	0.29	0.46	0.25	0.49	0.45
Panel B: Normalised Capital Flow (NFC)																
	Raw Returns															
Civil Year/1Q	38	31	31	37	1.23	0.13	0.23	0.31	1.46	0.13	0.55	0.13	0.55	0.20	0.54	0.23
Civil Year/2Q	34	21	22	37	6.85	0.00 ***	3.31	0.03 **	2.72	0.00 ***	0.62	0.00 ***	0.62	0.04 **	0.63	0.03 **
Civil Year/3Q	27	33	33	31	0.53	0.23	0.00	0.49	0.77	0.23	0.47	0.23	0.45	0.22	0.48	0.40
Civil Year/4Q	25	29	32	30	0.33	0.28	0.04	0.42	0.81	0.28	0.47	0.28	0.46	0.29	0.48	0.40
	Carhart Model															
Civil Year/1Q	39	31	30	37	1.64	0.10	0.43	0.26	1.55	0.10	0.55	0.10 *	0.56	0.17	0.55	0.20
Civil Year/2Q	27	29	29	29	0.04	0.42	0.37	0.27	0.93	0.42	0.49	0.42	0.48	0.39	0.50	0.50
Civil Year/3Q	31	29	29	35	0.50	0.24	0.00	0.50	1.29	0.24	0.53	0.24	0.52	0.40	0.55	0.23
Civil Year/4Q	27	30	30	29	0.14	0.35	0.16	0.34	0.87	0.35	0.48	0.35	0.47	0.35	0.49	0.45

Obs.: (i) This table relates the capital flows of the first (Q1), second (Q2), third (Q3) and fourth (Q4) quarters with the performance calculated for the previous civil year (January 1th to December 31 th); (*ii*) In other aspects, this table should be read similarly to Table *1*.

The results indicate that the flows of new capital in the first (Q1) and second quarters (Q2) react to the absolute returns of the previous calendar year, but the same does not occur over the rest of the year. It can thus be concluded that investors react to the absolute returns of each calendar year, but they only memorise those results during the first six months of the year. A possible explanation of this result is the low level of the dissemination of information on risk-adjusted performance in the media, in comparison with the profusion of information published at the start of each year regarding the rankings of the previous year, as well as the absence of the update of information relative to the absolute returns of the preceding 12 months[22]. Investors, aware of the out-of-date nature of the information, invest in the last two quarters of the year without the "beacon" that guides investment decisions in the first six months of the year.

4.2 PERFORMANCE ANTICIPATION

In 3.1. the reaction of investors to past performance was analysed. However, Gruber (1996) and Zheng (1999) provide evidence that investors have some capacity to anticipate performance ("the

[22] This result is in line with the evidence reported by Sirri and Tufano (1998), in addition to others, according to which the attention given to prior performance depends on the marketing efforts of each management company and the attention it obtains in the media.

smart money effect")[23]. If this phenomenon exists, capital flows are significantly correlated to future performances. In this section we shall test to see if this is the case with our sample[24].

The observations are distributed amongst the cells of the contingency table relative to the rankings of demand (CF or NCF) for a given period and the performance rankings of the immediately subsequent period. The null hypothesis corresponds to the «independence hypothesis» between demand rankings and performance rankings in the following period, the alternatives to which are the «smart money effect hypothesis» and the «dumb or misled money hypothesis»[25].

TABLE *3* – CONTINGENCY TABLES AND SMART MONEY EFFECT TESTS

	Contingency Table				Test of X^2		Test of X^2 Adjust. of Yates		Odds Ratio Test		Test of Pesaran and Timmerman		Repeat Winners Test		Repeat Losers Test	
	WW*	WL*	LW*	LL*	χ^2	p	χ^2 Aj.	p	CP	p	RR	p	RW	p	RL	p
Panel A: Absolute Capital Flow (FC)																
	Raw Returns															
Q/Q	135	138	138	130	0.23	0.32	0.15	0.35	0.92	0.32	0.49	0.32	0.49	0.43	0.49	0.31
S/S	62	64	63	59	0.15	0.35	0.14	0.35	0.91	0.35	0.49	0.35	0.49	0.43	0.48	0.36
Y/Y	28	27	28	26	0.01	0.46	0.01	0.47	0.96	0.46	0.50	0.46	0.51	0.45	0.48	0.39
	CAPM Model															
Q/Q	135	138	140	128	0.42	0.26	0.32	0.29	0.89	0.26	0.49	0.26	0.49	0.43	0.48	0.23
S/S	60	66	66	56	1.04	0.15	1.03	0.16	0.77	0.15	0.47	0.15	0.48	0.30	0.46	0.18
Y/Y	26	29	30	24	0.75	0.19	0.70	0.20	0.72	0.19	0.46	0.19	0.47	0.34	0.44	0.21
	Carhart Model															
Q/Q	131	142	143	125	1.56	0.11	1.35	0.12	0.81	0.11	0.47	0.11	0.48	0.25	0.47	0.14
S/S	54	72	72	50	6.48	0.01 ***	6.44	0.01 ***	0.52	0.01 ***	0.42	0.01 ***	0.43	0.05 *	0.41	0.02 **
Y/Y	26	29	30	24	0.75	0.19	0.70	0.20	0.72	0.19	0.46	0.19	0.47	0.34	0.44	0.21
Panel B: Normalised Capital Flow (NFC)																
	Raw Returns															
Q/Q	141	127	132	141	0.98	0.16	0.82	0.18	1.19	0.16	0.52	0.16	0.53	0.20	0.52	0.29
S/S	60	64	65	59	0.40	0.26	0.39	0.26	0.85	0.26	0.48	0.26	0.48	0.36	0.48	0.30
Y/Y	26	28	30	25	0.45	0.25	0.41	0.26	0.77	0.25	0.47	0.25	0.48	0.39	0.45	0.25
	CAPM Model															
Q/Q	136	132	139	134	0.00	0.48	0.00	0.48	0.99	0.48	0.50	0.48	0.51	0.40	0.49	0.38
S/S	58	66	68	56	1.61	0.10	1.60	0.10	0.72	0.10	0.46	0.10	0.47	0.24	0.45	0.14
Y/Y	22	32	34	21	4.85	0.01 **	4.73	0.01 **	0.42	0.01 **	0.39	0.01 **	0.41	0.09 *	0.38	0.04 **
	Carhart Model															
Q/Q	131	137	143	130	0.66	0.21	0.53	0.23	0.87	0.21	0.48	0.21	0.49	0.36	0.48	0.22
S/S	55	69	71	53	4.13	0.02 **	4.10	0.02 **	0.60	0.02 **	0.44	0.02 **	0.44	0.10	0.43	0.05 *
Y/Y	21	33	35	20	6.68	0.00 ***	6.54	0.01 ***	0.36	0.01 ***	0.38	0.00 ***	0.39	0.05 *	0.36	0.02 **

Obs.: (*i*) W*W identifies the number of funds that were double winners (capital flows rankings of a given period and performance rankings of the subsequent period); L*L is the number of funds that were double losers (capital flows rankings of a given period and performance rankings of the subsequent period); W*L identifies the number of funds that were winners on capital flows rankings of a given period and losers on performance rankings of the subsequent period; e L*W is the number of funds that were losers on capital flows rankings of a given period and winners on performance rankings of the subsequent period; (*ii*) In other aspects, this table should be read similarly to Table *1*.

[23] In Zheng (1999) the evidence is concentrated around the flows of smaller funds.

[24] It should be noted that this exercise is opportune, even if performance persistence doesn't exist. In fact, Zheng (1999) documented that the phenomenon of "smart money" cannot be fully explained by the "pursuit" of previous returns, therefore specific information on each additional fund exists that is incorporated into the investors' decision.

[25] Winning (losing) funds in terms of demand record an increased probability of being losers (winners) in performance in the following period.

Results are in Table 3. The smart money hypothesis is always rejected. On the contrary, half-yearly (S/S) and annual (Y/Y) analyses recorded situations of rejection of the independence hypothesis in favour of the dumb or misled money hypothesis. In other words, the new capital flows recorded half-year to half-year and year to year periods favour funds that in the following half-year period (Carhart Model) or following year period (CAPM and Carhart Model) perform worse in terms of risk-adjusted returns[26].

4.3. DEMAND PERSISTENCE

In this section funds are assessed to see if they are persistent winners and/or losers relative to the rankings of net capital flows (CF or NCF). The rankings of each one of the demand variables for a given period and in the immediately subsequent period are compared (Table 4).

TABLE *4* – INVESTOR DEMAND PERSISTENCE

	Contingency Table				Test of X^2		Test of X^2 Adjust. of Yates		Odds Ratio Test		Test of Pesaran and Timmerman		Repeat Winners Test		Repeat Losers Test	
	W*W*	W*L*	L*W*	L*L*	χ^2	p	χ^2 Aj.	p	PC	p	RR	p	RW	p	RL	p
Panel A: Absolute Capital Flow (FC)																
Q/Q	178	94	87	178	57.11	0.00 ***	55.8	0.00 ***	3.87	0.00 ***	0.66	0.00 ***	0.65	0.00 ***	0.67	0.00 ***
S/S	79	46	41	80	21.15	0.00 ***	21.09	0.00 ***	3.35	0.00 ***	0.65	0.00 ***	0.63	0.00 ***	0.66	0.00 ***
Y/Y	29	26	22	32	1.57	0.10	1.51	0.11	1.62	0.11	0.56	0.10	0.53	0.34	0.59	0.09 *
Panel B: Normalised Capital Flow (NFC)																
Q/Q	152	114	105	166	18.21	0.00 ***	17.5	0.00 ***	2.11	0.00 ***	0.59	0.00 ***	0.57	0.01 ***	0.61	0.00 ***
S/S	71	53	46	76	9.43	0.00 ***	9.39	0.00 ***	2.21	0.00 ***	0.60	0.00 ***	0.57	0.05 *	0.62	0.00 ***
Y/Y	28	26	20	35	2.65	0.05 *	2.57	0.05 *	1.88	0.05 *	0.58	0.05 *	0.52	0.39	0.64	0.02 **

Obs.: (*i*) W*W*, W*L*, L*W* e L*L* identify, respectively, the number of funds that were double winners, initially winners and then losers, initially losers and then winners, and double losers; (*ii*) In other aspects, this table should be read similarly to Table *1*.

There is strong evidence of persistence, both in relation to winners and, above all, in relation to losers. In fact, our results indicate the persistence of winners and of losers, in both quarterly and half-yearly terms. In annual terms, the persistence of losers only was observed. This means that, in general, the ranking of a period and the ranking of the following period are not independent. On the contrary, winners are repeatedly winners and losers are repeatedly losers.

Analysis fund by fund[27] allows one to conclude that there are funds that are systematically winners (12 funds, using absolute quarterly flows). Ten other funds (that is, a third of the sample) are repeatedly losers. These results confirm, therefore, the demand persistence shown in Table 4.

[26] The evidence, though not as strong in terms of absolute flows, points in the same direction, especially in the half-yearly analyses.
[27] Non-reported results.

5. REGRESSION ANALYSIS

The methodology used in this section is similar to that used by Carhart (1997)[28] and Sirri and Tufano (1998), which consists of individually analysing the observations of each period[29]. In other words, an explanatory model of the NCF variable was estimated for each month, using, therefore, just one observation per fund. Then, considering the time series of the coefficients, the estimates of each coefficient were calculated, as well as the respective t statistics, using the method of Fama and MacBeth (1973). This method hinders any potential dependence on periodic observations, and it is noted for producing more conservative conclusions regarding the individual significance of each one of the variables.

The range of explanatory variables included only variables of a sectional nature (prone to variation from fund to fund). The first one was the performance recorded in the preceding period ($PERF_{T-1}$), calculated in a number of ways in order to check the robustness of the results and given the fact that the performance measurement to which the investors react is not clear. As for the calculation method, raw returns and the alphas of the model of Carhart were used. The following periods were tested (see Table 5): the month (Panel A), quarter (Panel B) and year (Panel C) prior to the period for which the calculation of the dependent variable (NCF) was made. Other control variables are the fund's market share (of domestic equity funds) in the previous quarter (QF_{t-1}) and the respective management company's share (QSG_{t-1}) in the domestic mutual fund market in the three preceding months. In a number of studies the size of the fund or the fund complex into which the fund is incorporated is used as a proxy for the costs of acquiring information that each investor is faced with[30]. In the context of the reduced dimension of the Portuguese market, the share of each management company can be regarded as an indicator of the size of the financial group, for which reason it can be seen as an indicator of that financial

[28] In a study of the determining factors of fund performance and performance persistence.

[29] Despite the fact that our sample is a pool of time and sectional-based data, the use of OLS on the entire pool could lead to incorrect inferences: "*the models can be estimated on the entire dataset as a pool, in which each firm-year observation is considered an independent observation. This technique may inappropriately underestimate standard errors and overestimate t-statistics if each fund-year is not an independent observation*" - Sirri and Tufano (1998, p. 1597).

[30] Sirri and Tufano (1998), for instance, assess the reputation of each fund and each fund complex using the lagged logarithm of the total amount of managed assets. The underlying idea is that the largest fund complexes have greater visibility and therefore investors will preferentially opt, minimizing the costs of obtaining information, for the larger funds and fund complexes. The need to include both the size of each fund as well as the size of the management company is based on the fact that the largest companies usually possess more than one equity fund, so it is important to distinguish the reputation of the fund from the reputation of the company managing it.

group's capacity to attract investment from private clients.

It is known that the normalised capital flows benefit (younger and) smaller funds. Therefore, in order to understand by how much the effect attributed to QF_{t-1} is a reflection of the reputation of the fund or the (natural) mirror of the loss of market share of the oldest and larger funds, the age of each fund (ID) is included amongst the explanatory variables. ID is the quarterly average of the number of years since the fund started operations, calculated at the beginning of each month.

Two other variables were tested: the lagged dependent variable (NCF_{t-1}) and the next period performance ($PERF_{t+1}$). With the first variable, we intend to confirm the demand persistence phenomenon reported in table 4. As for $PERF_{t+1}$, it allows one to test the absence of the smart money effect reported in table 3.

Finally, the total cost of each mutual fund (which includes subscription, management, custody and redemption costs), assuming a five year investment horizon (CT60M), is included as a regressor.

TABLE *5* – NORMALIZED CAPITAL FLOW REGRESSIONS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A		Panel B				Panel C	
	Monthly Performance		Quarterly Performance				Annual Performance	
	Raw Returns		Raw Returns		Carhart Model		Raw Returns	Carhart Model
C	0.037 *	0.038	0.046 *	0.106	0.014	-0.037	-0.037	-0.035
	1.45	*0.46*	*1.35*	*1.36*	*0.81*	*-0.96*	*-0.58*	*-0.92*
$PERF_{T-1}$	-3.998	*-28.794*	-19.987	-49.691	-10.837 *	-14.006	-46.325	-40.534
	-0.55	*-0.77*	*-1.27*	*-1.00*	*-1.48*	*-0.57*	*-0.31*	*-0.39*
QF_{t-1}	-0.120 **	-0.316 ***	-0.122 **	-0.274 ***	-0.118 ***	-0.297 ***	-0.208 ***	-0.311 ***
	-2.25	*-2.57*	*-2.25*	*-3.13*	*-2.35*	*-2.43*	*-2.55*	*-2.53*
CT60M	0.323 **	0.833 ***	0.390 ***	0.846 ***	0.317 **	0.722 **	0.657 **	0.643 **
	2.32	*2.50*	*2.71*	*2.54*	*2.31*	*2.17*	*1.87*	*1.72*
QSG_{t-1}	0.092 ***	*0.147*	0.097 ***	0.011	0.091 ***	0.071 *	-0.031	0.053
	2.40	*0.99*	*2.49*	*0.14*	*2.37*	*1.28*	*-0.49*	*1.09*
ID	-0.006 ***	-0.004	-0.005 ***	-0.002	-0.005 ***	-0.001	0.000	-0.002
	-5.06	*-1.18*	*-3.87*	*-0.68*	*-3.82*	*-0.33*	*-0.05*	*-0.88*
NCF_{T-1}		0.177 **		0.111		0.180 ***	0.184 ***	0.192 ***
		1.77		*0.97*		*2.64*	*2.39*	*3.00*
$PERF_{T+1}$		*10.638*		41.811		22.286	40.974	9.877
		0.36		*0.91*		*1.16*	*0.35*	*0.14*

Obs.: (*i*) the dependent variable is the normalized capital flow (NCF), calculated for each fund; (*ii*) the Fama-MacBeth (1973) method was applied to estimate coefficients and calculate t statistics; the symbols ***, ** and * show statistical significance at 1%, 5% and 10%, respectively.

The Fama-MacBeth coefficient estimates are in Table 5. It can be concluded that the funds with the largest market share in the equity fund segment tend to grow less rapidly than smaller funds, in much the same way that old funds tend to lose market share to young funds[31]. In fact, the estimated coefficient of QF_{t-1} is significantly negative in all regressions, which means that bigger funds tend to lose market share; and the mutual fund age variable (ID) exhibits a negative coefficient in all regressions[32], meaning that the youngest founds are preferred by capital inflows.

Moreover, the most expensive funds are the most successful in attracting new capital flows[33]. Consistent with these results is the idea that management companies use the discretionary power resulting from their reputation and the unwillingness of their customers to bear information acquisition costs (or the lower investor sophistication) to channel the savings entrusted to them to these more expensive funds.

On the other hand, given that the new funds launched in the Portuguese market have costs that are on average 30.5% higher than the equity funds of the same management company existing at the time the new fund is launched, it can be concluded that management companies were able to launch new funds with higher costs for investors (instead of increasing fees for existing funds[34]) and still attract investors. So, there is evidence that financial groups drive their costumers to funds with larger fees, and we can (at least) suspect that they launch new (and more expensive funds) funds with this objective. Moreover, new funds launched by companies that have never previously managed equity funds are on average 15.5% cheaper, which means that the launch of new and more expensive funds exists - mainly - as a phenomenon amongst the largest management companies.

As regards performance, there is no perceptible evidence that fund investors react to past performance. The phenomenon of inverted reaction is marginally perceptible in regression 5 only. There is no evidence in favour of the smart money effect as well.

[31] Worthy of note is the fact that in unreported analyses (in order to economise space), the negative effect of the ID (age) variable on absolute capital flows (CF) is similarly documented.
[32] And significant in the short versions of the model.
[33] The coefficient of CT60M is always positive and significant.
[34] In our sample, there is no case of increasing fees for existing funds.

Finally, positive and significant coefficients for NCF_{t-1} where found in all but one regressions, which can be interpreted as evidence of persistence of demand (as in table 4).

6. CONCLUSIONS

Existing literature documents, for the USA, evidence of investor reaction to past performances, as well as asymmetry of reaction. Different explanations have been put forward for this type of behaviour. These include the complexity (and the confusion) that the industry manages to create through its growth and the differentiation of the products on offer. Such complexity increases the costs of obtaining information and it would explain why there is only a performance reaction for funds whose marketing efforts and the attention afforded by the media provide information at reduced costs. There are grounds to believe that the more complex the mutual fund industry becomes the greater this problem will be. If one reverses the argument, we may believe that in small markets we have symmetry of reaction

However, small markets are less developed and competitive, and the information dissemination process is likely less efficient. Therefore, absence of mutual fund performance reaction is possible. So, in the absence of known literature on the subject, it is important to investigate whether the behaviour reported for the US market is paralleled in smaller and less complex markets.

We found that, in the Portuguese market, fund investors do not generally react to performance. On the contrary, in terms of risk-adjusted performance it was perceptible that, in many circumstances, the winners are transformed into losers and the losers into winners. The smart money hypothesis was also studied and rejected, given that the capital flows do not favour funds that obtained higher performances in the subsequent period. The hypothesis of demand persistence is elected, suggesting that the characteristics of each fund or of each management company can be relevant in explaining the behaviour of demand.

It was also concluded that bigger funds tend to loose market share, and that the most expensive funds grow relatively faster than other funds. Additionally, given that management companies with more than one fund launch new funds that are more expensive than the ones they currently

manage, we conclude that these companies possess the capacity to “divert” investors from older funds to the more expensive funds (which are, in some cases, the more recently created mutual funds). These results provide, therefore, a possible explanation for the absence of systematic performance reaction.

In short, this study demonstrates the absence of risk-adjusted performance reaction in a small market. This seems to be particularly associated to investor behaviour in the second semester. If we assume that there is more information and marketing at the end of a year than during the first half-year period, then these results can be considered as supporting the theory (of Sirri and Tufano (1998)) that investors in order to minimise costs use the information available to them, which is asymmetrical, favouring the winners and, (supposedly) unbalanced in time, benefiting the annual rankings of absolute returns. Given that the Portuguese market is small, and that the costs of acquiring information on the daily value of each investment unit are negligible, the absence of reaction can be attributed to either lower investor sophistication, conflicts of interests in the context of the Portuguese universal banking industry, or the existence of relevant back-end load cost which prevent investors from reacting. This deserves further research.

A number of regulatory policy implications emerge from this paper. Firstly, the importance of the existence of continuous public dissemination mechanisms regarding the performance of different mutual funds seems to be evident. Similarly, the creation of conditions that allow capital to be transferred from one fund to another at the lowest possible cost seems to be important. Moreover, it seems evident that financial intermediaries have a wide margin of influence on the fund selection decisions of their clients, using this margin of manoeuvre to channel investment to funds with higher fees. When applied to funds with the same investment policy, and the same level of service, this practice emerges as a non-transparent means of increasing prices, a fact worthy of the attention of supervisory and regulatory authorities.

REFERENCES:

Alves, C. and V. Mendes, 2004, Corporate Governance Policy and Company Performance: The Case of Portugal, Corporate Governance: an International Review 12, 290-301.

Brown, S. and W. Goetzmann, 1995, Performance Persistence, Journal of Finance 50, 679-698.

Busse, J., 2001, Another Look at Mutual Fund Tournaments, Journal of Financial and Quantitative Analysis 36, 53–73.

Carhart, M., 1997, On Persistence in Mutual Fund Performance, Journal of Finance 52, 57-82.

Chevalier, J. and G. Ellison, 1997, Risk Taking by Mutual Funds as a Response to Incentives, Journal of Political Economy 105, 1167-1201.

Christoffersen, S., 2001, Why Do Money Fund Managers Voluntarily Waive Their Fees?, Journal of Finance 56, 1117-1140.

Conover, W., 1999, Practical Nonparametric Statistics, 3th Ed. (New Work: John Wiley & Sons).

Cooper, M., H. Gulen and R. Rau, 2003, Changing Names with Style: Mutual Fund Names Changes and Their Effects on Fund Flows, EFA 2003 Annual Conference Paper nº 293.

Cortez, M. (1998), «On the Persistence of Mutual Fund Performance in Small Markets», *PHD Dissertation*, University of Minho, Portugal.

Del Guercio, D. and P. Tkac, 2001, Star Power: the Effect of Morningstar Ratings on Mutual Fund Flows, Working Paper Series, nº 2001-15, Federal Reserve Bank of Atlanta.

Everitt, B., 1977, The Analysis of Contingency Tables (London: Chapman & Hall).

Fama, E. and J. MacBeth, 1973, Risk, Return, and Equilibrium: Empirical Tests, Journal of Political Economy 71, 607-636.

Goetzmann, W. and N. Peles, 1997, Cognitive Dissonance and Mutual Fund Investors, Journal of Financial Research 20, 145-158.

Goetzmann, W. and R. Ibbotson, 1994, Do Winners Repeat? Patterns in Mutual Fund Performance, Journal of Portfolio Management 20, 9-18.

Goriaev, A., T. Nijman and B. Werker, 2002, Journal of Empirical Finance 12, 127-137.

Gruber, M., 1996, Another Puzzle: The Growth in Actively Managed Mutual Funds, Journal of Finance 51, 783-810.

Hendricks, D., J. Patel and R. Zeckhauser, 1993, Hot Hands in Mutual Funds: Short-Run Persistence of Relative Performance 1974-1988, Journal of Finance 48, 93-130.

Ippolito, R., 1992, Consumer Reaction to Measures of Poor Quality: Evidence From The Mutual Fund Industry, Journal of Law and Economics 35, 45-70.

Jain, P. and J. Wu, 2000, Truth in Mutual Fund Advertising: Evidence on Future Performance and Fund Flows, Journal of Finance 55, 937-958.

Kahn, R. e A. Rudd, 1995, Does Historical Performance Predict Future Performance?, Financial Analysts Journal 51, 43-52.

Lakonishok, J., A. Schleifer e R. Vishny, 1992, The Structure and Performance of the Money Management Industry, Brookings Papers on Economic Activity: Microeconomics 1992, pp. 339-391.

Lynch, A. and D. Musto, 2000, How Investors Interpret Past Fund Returns, Working Paper, New York University.

Malkiel, B., 1995, Returns From Investing in Equity Mutual Funds 1971 to 1991, Journal of Finance 50, 549-572.

Pesaran, M. and A. Timmermann, 1992, A Simple Nonparametric Test of Predictive Performance, Journal of Business and Economic Statistics 10, 461-465.

Serra, A., 2000, Country and Industry Factors in Returns: Evidence from Emerging Markets' Stocks, Emerging Markets Review 1, 127-151.

Shukla, R. and C. Trzcinka, 1994, Persistence Performance in the Mutual Fund Market: Tests With Funds and Investment Advisors, Review of Quantitative Finance and Accounting 4, 115-135.

Sirri, E. and P. Tufano, 1992, Competition and Change in the Mutual Fund Industry, in: Hayes III, S. (Ed.), Financial Services: Perspectives and Challenges. Boston, MA: Harvard Business School Press, pp. 181-214.

Sirri, E. e P. Tufano, 1998, Costly Search and Mutual Fund Flows, Journal of Finance 53, 1589-1622.

Zheng, L., 1999, Is Money Smart? A Study of Mutual Fund Investors' Fund Selection Ability, Journal of Finance 54, 901-933.

Recent FEP Working Papers

Nº 203	Carlos F. Alves and Victor Mendes, *Are mutual fund investors in jail?*, February 2006
Nº 202	Óscar Afonso and Paulo B. Vasconcelos, *Numerical computation for initial value problems in economics*, February 2006
Nº 201	Manuel Portugal Ferreira, Ana Teresa Tavares, William Hesterly and Sungu Armagan, *Network and firm antecedents of spin-offs: Motherhooding spin-offs*, February 2006
Nº 200	Aurora A.C. Teixeira, *Vinte anos (1985-2005) de FEP Working Papers: um estudo sobre a respectiva probabilidade de publicação nacional e internacional*, January 2006
Nº 199	Samuel Cruz Alves Pereira, *Aggregation in activity-based costing and the short run activity cost function*, January 2006
Nº 198	Samuel Cruz Alves Pereira and Pedro Cosme Costa Vieira, *How to control market power of activity centres? A theoretical model showing the advantages of implementing competition within organizations*, January 2006
Nº 197	Maria de Fátima Rocha and Aurora A.C. Teixeira, *College cheating in Portugal: results from a large scale survey*, December 2005
Nº 196	Stephen G. Donald, Natércia Fortuna and Vladas Pipiras, *Local and global rank tests for multivariate varying-coefficient models*, December 2005
Nº 195	Pedro Rui Mazeda Gil, *The Firm's Perception of Demand Shocks and the Expected Profitability of Capital under Uncertainty*, December 2005
Nº 194	Ana Oliveira-Brochado and Francisco Vitorino Martins, *Assessing the Number of Components in Mixture Models: a Review.*, November 2005
Nº 193	Lúcia Paiva Martins de Sousa and Pedro Cosme da Costa Vieira, *Um ranking das revistas científicas especializadas em economia regional e urbana*, November 2005
Nº 192	António Almodovar and Maria de Fátima Brandão, *Is there any progress in Economics? Some answers from the historians of economic thought*, October 2005
Nº 191	Maria de Fátima Rocha and Aurora A.C. Teixeira, *Crime without punishment: An update review of the determinants of cheating among university students*, October 2005
Nº 190	Joao Correia-da-Silva and Carlos Hervés-Beloso, *Subjective Expectations Equilibrium in Economies with Uncertain Delivery*, October 2005
Nº 189	Pedro Cosme da Costa Vieira, *A new economic journals' ranking that takes into account the number of pages and co-authors*, October 2005
Nº 188	Argentino Pessoa, *Foreign direct investment and total factor productivity in OECD countries: evidence from aggregate data*, September 2005
Nº 187	Ana Teresa Tavares and Aurora A. C. Teixeira, *Human Capital Intensity in Technology-Based Firms Located in Portugal: Do Foreign Multinationals Make a Difference?*, August 2005
Nº 186	Jorge M. S. Valente, *Beam search algorithms for the single machine total weighted tardiness scheduling problem with sequence-dependent setups*, August 2005
Nº 185	Sofia Castro and João Correia-da-Silva, *Past expectations as a determinant of present prices – hysteresis in a simple economy*, July 2005
Nº 184	Carlos F. Alves and Victor Mendes, *Institutional Investor Activism: Does the Portfolio Management Skill Matter?*, July 2005
Nº 183	Filipe J. Sousa and Luís M. de Castro, *Relationship significance: is it*

	sufficiently explained?, July 2005
Nº 182	Alvaro Aguiar and Manuel M. F. Martins, *Testing for Asymmetries in the Preferences of the Euro-Area Monetary Policymaker*, July 2005
Nº 181	Joana Costa and Aurora A. C. Teixeira, *Universities as sources of knowledge for innovation. The case of Technology Intensive Firms in Portugal*, July 2005
Nº 180	Ana Margarida Oliveira Brochado and Francisco Vitorino Martins, *Democracy and Economic Development: a Fuzzy Classification Approach*, July 2005
Nº 179	Mário Alexandre Silva and Aurora A. C. Teixeira, *A Model of the Learning Process with Local Knowledge Externalities Illustrated with an Integrated Graphical Framework*, June 2005
Nº 178	Leonor Vasconcelos Ferreira, *Dinâmica de Rendimentos, Persistência da Pobreza e Políticas Sociais em Portugal*, June 2005
Nº 177	Carlos F. Alves and F. Teixeira dos Santos, *The Informativeness of Quarterly Financial Reporting: The Portuguese Case*, June 2005
Nº 176	Leonor Vasconcelos Ferreira and Adelaide Figueiredo, *Welfare Regimes in the UE 15 and in the Enlarged Europe: An exploratory analysis*, June 2005
Nº 175	Mário Alexandre Silva and Aurora A. C. Teixeira, *Integrated graphical framework accounting for the nature and the speed of the learning process: an application to MNEs strategies of internationalisation of production and R&D investment*, May 2005
Nº 174	Ana Paula Africano and Manuela Magalhães, *FDI and Trade in Portugal: a gravity analysis*, April 2005
Nº 173	Pedro Cosme Costa Vieira, *Market equilibrium with search and computational costs*, April 2005
Nº 172	Mário Rui Silva and Hermano Rodrigues, *Public-Private Partnerships and the Promotion of Collective Entrepreneurship*, April 2005
Nº 171	Mário Rui Silva and Hermano Rodrigues, *Competitiveness and Public-Private Partnerships: Towards a More Decentralised Policy*, April 2005
Nº 170	Óscar Afonso and Álvaro Aguiar, *Price-Channel Effects of North-South Trade on the Direction of Technological Knowledge and Wage Inequality*, March 2005
Nº 169	Pedro Cosme Costa Vieira, *The importance in the papers' impact of the number of pages and of co-authors - an empirical estimation with data from top ranking economic journals*, March 2005
Nº 168	Leonor Vasconcelos Ferreira, *Social Protection and Chronic Poverty: Portugal and the Southern European Welfare Regime*, March 2005
Nº 167	Stephen G. Donald, Natércia Fortuna and Vladas Pipiras, *On rank estimation in symmetric matrices: the case of indefinite matrix estimators*, February 2005
Nº 166	Pedro Cosme Costa Vieira, *Multi Product Market Equilibrium with Sequential Search*, February 2005
Nº 165	João Correia-da-Silva and Carlos Hervés-Beloso, *Contracts for uncertain delivery*, February 2005
Nº 164	Pedro Cosme Costa Vieira, *Animals domestication and agriculture as outcomes of collusion*, January 2005
Nº 163	Filipe J. Sousa and Luís M. de Castro, *The strategic relevance of business relationships: a preliminary assessment*, December 2004
Nº 162	Carlos Alves and Victor Mendes, *Self-Interest on Mutual Fund Management: Evidence from the Portuguese Market*, November 2004

Editor: Prof. Aurora Teixeira (ateixeira@fep.up.pt)
Download available at:
http://www.fep.up.pt/investigacao/workingpapers/workingpapers.htm
also in http://ideas.repec.org/PaperSeries.html

U.PORTO
FEP FACULDADE DE ECONOMIA
UNIVERSIDADE DO PORTO

WWW.FEP.UP.PT