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Article

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International Journal of Economic Sciences and Applied Research

Provided in Cooperation with:

International Hellenic University (IHU), Kavala

Suggested Citation: Grose, Christos (2011) : The determinants of cash flows in Greek bond mutual funds, International Journal of Economic Sciences and Applied Research, ISSN 1791-3373, Kavala Institute of Technology, Kavala, Vol. 4, Iss. 1, pp. 55-77

This Version is available at:

<https://hdl.handle.net/10419/66622>

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The Determinants of Cash Flows in Greek Bond Mutual Funds

Christos Grose¹

Abstract

This paper examines the factors that affect inflows – outflows of capital in bond mutual funds that operated in the Greek market during the period 1997-2005. Investors in bond mutual funds do not seek for high gross returns in order to determine their investment decisions in contrast with investors in the stock market. The risk weighted returns however represent a crucial factor in investment decision making. Bond mutual funds that invest primarily in government bonds, appear to be more affected by commissions charged by mutual fund managers, since investors avoid mutual funds charging high commissions, while on the other hand investors that prefer corporate bonds show reduced sensitivity in the commissions charged by mutual funds. Investors in government bonds increase their investment positions when stock markets experience small or negative returns, a clue that shows they seek for safe heavens for their investments. This phenomenon is more evident when investors face a temporary period of low stock market returns and is not as strong when low returns in the stock markets are extended to a period of years. In these cases investment positions in bond mutual funds appear to be part of a more permanent investment policy where bond investments are considered to be an integral part of a diversified portfolio.

Keywords: bond mutual funds, commissions, fund flows

JEL Classification: G15, G11, G12

1. Introduction and literature review

The evaluation of the returns characteristics of investments in bond mutual funds is a topic of increasing interest when taking into account the size of the invested funds in this investment category.

There are a number of factors that render the research presented in this paper important. The first and most apparent one is the size of this market in Greece, given that it exceeded the 5 billion euros margin during the period under consideration, constituting approximately 3 percent of Greek GDP, and 30 percent of the total of funds invested in

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mutual funds in Greece. The majority of capital flows in the Greek market are invested in the bond market. The bond mutual funds market offers the opportunity to small and medium size investment portfolios as well as large portfolios to have equal opportunities in high quality professional investment services. Investments in bonds are treated by investments professionals, CFOs and individual investors alike, as an integral part of their investments with an at least 50 percent overall weighting in their total investment portfolio. International research has shown though that even within this investment category, that is considered of minimum or zero risk, there exist anomalies and alternative investment opportunities that could potentially offer to investors above market average returns (Dritsakis et al., 2006).

It is evident therefore that the analysis of the returns of bond funds in the Greek market is of major importance to investors, market professionals and the academic community. Especially during the period under examination the Greek stock market experienced fluctuations including a long lasting period of continuous losses that had driven a significant part of investment funds to the bond market, hence rendering the present analysis of cash flows determinants of great importance both for market participants and academics. Moreover, the cyclical behaviour of stock returns is a further factor that brings about the important role of bond investments as an integral part of every diversified investment strategy (Papadamou and Siriopoulos, 2003).

This paper aims at analyzing the factors that influence inflows-outflows of capital in these investment portfolios. We study the impact of a number of selected factors in determining flows of capital in bond mutual funds, both when analyzing the whole sample of bond mutual funds that operated in the Greek market, as well as those that have similar investment characteristics based on a categorization that we performed. On the whole, results showed smaller sensitivity of Greek investors in bond mutual funds, when compared to international evidence, towards almost all of the selected factors, that can potentially be attributed to the limited maturity of the market, lack of available data and specialized information to investors. It is estimated therefore that the average investor shows reduced sensitivity to specific quantitative and qualitative attributes of the mutual fund that they invest.

The international literature regarding bond funds focuses on their performance issues (Blake et al., 1993). Other papers focus on specific categories of bond funds, still shedding light on performance issues (Cornell and Green, 1991; Detzler, 1999; Kihn, 1996). Papers by McLeod and Malhotra (1996) and LaPlante (2001) investigate expense ratio issues while window dressing in bond funds is addressed by Morey and O'Neal (2006).

The factors that affect flows of capital in mutual funds have been in the centre of academic interest for years, but with the focus being on equity funds. Many of the factors investigated in these papers could have an impact on bond mutual funds flows as indicated by Elton et al., (1995). According to Gruber (1996), investors in stocks look for a positive historical track record of the fund they consider investing in. Similar

conclusions are drawn by Chevalier and Ellison (1997) and Sirri and Tufano (1998), that add to that the lack of linearity in the returns-flows relation. This can be interpreted as a tendency of investors in equity portfolios to increase their positions in mutual funds with a good recent track record but not to withdraw their capital from mutual funds with a bad track record.

According to Sirri and Tufano (1996) investors in equity portfolios are more sensitive with commissions for entry-withdrawal from mutual funds, given that mutual funds with high commissions seem to experience reduced inflows of capital compared to mutual funds with similar returns and characteristics, but smaller commissions charged. Barber et al., (2005) investigate the different categories of commissions charged by fund managers to investors. They find that commissions charged when entering a mutual fund are negatively related with inflows of capital, while no significant relation is found when examining management fees and flows of capital. Wilcox (2003) reaches the same conclusions, while Ivkovic (2002) and Nanda et al., (2004) study spillover effects, that is mutual funds that have significant inflows because they belong to an investment category that attracts funds as a result of high mean returns irrespective of individual fund returns. Other factors investigated by other papers, including Jain and Wu (2000), Bergstresser and Poterba (2002), Del Guercio and Tkac (2002), James and Karceski (2002), are previous fund flows, the turnover ratio, overall risks undertaken, fund age.

Greek research upon bond mutual funds issues is limited to performance evaluation issues (Milonas, 1999; Philippas, 2000), analysing the collective returns of bond mutual funds, but not factors that influence fund flows. Dritsakis et al., (2006) evaluate returns using conditional and unconditional models, finding that bond mutual funds in Greece on average do not manage to exceed the risk weighted returns of the benchmark index.

This paper attempts to move research, regarding the Greek bond mutual funds market, forward by investigating fund flows issues, which will be very useful, given that the Greek market is amongst the developed markets, a fact that attracts increased flows of funds into Greek bonds in general. This is questionable naturally during this period given that the debt crisis in Greece has reduced dramatically the size of the capital that the Greek government raises from the markets. According to Greek officials though this is only temporary and it should be considered very probable that the Greek government will resume lending from the international markets very soon. These market changes render even more interesting the analysis of the factors affecting flows in bond mutual funds because after government lending resumes we should be able to explain the factors that affect investor decisions. In the meantime, bond mutual funds continue to hold Greek government bonds in their portfolios, and the current analysis could give further insights to academics and market participants as to what their investment policy is expected to be bearing in mind the factors that influenced them in the near past.

2. Factors affecting capital flows

As indicated above, investments in bond funds incorporate high commissions when compared especially with the average risk weighted returns achieved by bond mutual fund managers, while their operation is quite complex for non professionals. For these reasons, among others, potential investors confront unsurpassable difficulties when attempting to create diversified bond portfolios without the expertise of professionals. Thus, bond mutual funds are the sole viable alternative for those wishing to invest in bonds. The Greek Institutional Investors Association reported that inflows into bond mutual funds exceeded 1.5 billion euros during the period 2001-2003, summing up to 5.5 billion euros at the end of 2003, five fold up compared to the funds invested in equity mutual funds. Despite the increasing attention drawn to bond funds by investors, the related research is very limited and especially with regard to the factors that influence inflows-outflows of capital and whether these are mainly influenced by the track record of each fund or from the commissions charged or other factors. Even though a large part of the pertinent research investigates the factors influencing flows into equity mutual funds, the factors affecting flows in bond funds are believed to be different. This can be attributed to the different profile and investment targets of investors in bond funds. Therefore, in this paper there is an attempt to interpret this different behaviour of investors in bond funds and especially in a small developed market.

The paper investigates the factors determining cash flows in the Greek bond mutual funds market. For the purpose of the analysis bond mutual funds are divided into different subcategories depending on the composition of each bond mutual fund and the weights attributed to government bonds, other fixed interest securities, corporate bonds and term deposits, Greek and foreign. Apart from analyzing the factors affecting the flows of capital, the paper divides bond mutual funds depending on their specific investment characteristics. The sample of Greek bond mutual funds is divided into those that a) invest above 90 percent of the funds under management in Greek bonds of various maturities, b) invest 10-30 percent of their assets in corporate bonds, Greek and foreign, c) invest 30-50 percent of their assets in corporate bonds, Greek and foreign and d) invest over 50 percent in foreign corporate and government bonds. By categorizing bond mutual funds according to the composition of their invested assets, it is made possible to investigate the nature of the influence of the selected factors both for the sample as a whole and for each independent category as outlined above.

The paper finds a negative relation between assets under management in bond mutual funds and flows of capital. Following the work of Del Guercio and Tkac (2002) it is found that in contrast with equity mutual funds, investors in bond funds do not prefer to invest in funds with a positive recent returns history. The returns, weighted by the incorporated risk, play an important role though. Also, investors in all different categories of bond funds consider commissions to be an important factor determining investment decisions. This means that investors avoid bond funds that charge high commissions and

are attracted respectively by those that are relatively “cheaper” both when entering-exiting as well as from the management fees perspective. Also investors in bond funds with a significant portion of corporate bonds in their invested assets, seem to be more sensitive with risk issues. Of extreme interest is also the fact that investors view bond funds as an alternative to equity investments especially during times when stock markets have entered bear market periods.

For the purpose of the analysis monthly data for the period 1997-2005 were utilized, including in the sample the 42 bond mutual funds that operated in the Greek market during that period, as well as another 33 mutual funds that had significant assets invested in foreign bonds, mainly corporate. The period chosen is believed to be appropriate for the purpose of the analysis for two reasons. The first is the fact that during this period an important number of bond mutual funds operated in the Greek market, whereas the second one is that during this 8 year period important events took place in the domestic and international market, the impact of which is expected to be found in the results.

Amongst the data set, the available information includes the title of each mutual fund, the company operating it, the initiation date as well as the termination date if it applies, the period of operation in months, the assets under management, total shares available, while the commissions for entry and exit as well as management expenses charged by fund managers to investors are also calculated.

The paper utilises the collective experience from previous papers and especially the methodology followed by Zhao (2005), and includes further factors that might explain flows of capital in bond mutual funds, namely the category of investments where each mutual fund in the data set belongs, and the investment objectives of each mutual fund. Therefore, in this paper the impact of alternative investment opportunities offered to an investor within the same investment management firm in the form of different mutual funds of all possible types offered is examined. This means that possibly the existence of further investment opportunities within a particular investment firm could be a factor with a statistically significant impact, since this would offer investors in bond mutual funds with investment alternatives within the same company during periods when an investor considers appropriate to perform a redistribution of his invested capital, increasing/decreasing overall risk in periods of bull/bear equity markets. Following Sirri and Tufano (1998), in trying to measure the returns relative to other portfolios with similar investment objectives during the same period, influencing capital flows is also included as a factor, the weighted gross average return of the total mutual funds with the same investment objective, attempting to capture investors’ quest for absolute returns.

Most papers in the related literature examine the impact of capital flows with regard to the percentage change in assets under management of each mutual fund, instead of the absolute inflows – outflows of capital in a mutual fund and the corresponding changes in the total assets managed. This is performed because it is natural to speculate that larger mutual funds should have bigger absolute money inflows – outflows compared

to a small or newly founded mutual fund. Absolute flows of capital though appear to be a factor affecting inflows – outflows of capital. Therefore, following Del Guercio and Tkac (2002) absolute flows of capital are used as a dependent variable in a multiple regression when trying to capture the impact of the size of a mutual fund in inflows – outflows of capital.

So, we follow the international practice of calculating flows of capital as the difference in total money assets under management, excluding possible profits or losses achieved by the mutual fund manager. We also exclude new money assets as a result of mergers or acquisitions, so that we only depict inflows – outflows originating from investors only:

$$FLOW_{i,t} = ASSET_{i,t} - ASSET_{i,t-1}(1 + R_{i,t}) - FASSET_{i,t} \quad (1)$$

Where $ASSET_{i,t}$ represents total assets of portfolio i at the end of every 3-month period t , $R_{i,t}$ represents the profits achieved by the portfolio during the 3-month period t and $FASSET_{i,t}$ represents possible new assets arising from mergers-acquisitions during the 3-month period t .

As we mentioned above we also calculate percentage flows, as the percentage increase/decrease of assets under management as a result of inflows/outflows of capital, for comparison reasons:

$$PFLOW_{i,t} = FLOW_{i,t} / ASSET_{i,t-1} \quad (2)$$

When using $PELOW_{i,t}$ variable as a dependent variable we also use the $LASSET_{i,t}$ as an independent variable that is calculated as the logarithm of $ASSET_{i,t}$ as a measure of the size of the bond mutual fund.

We also calculate the returns of each portfolio relative to other portfolios with similar investment objectives utilizing the variable $POSITION_{i,t}$, that depicts the returns of each portfolio in the context of the average returns of the other portfolios with similar investment objectives. As a result, we construct three different variables based on this categorization as those that are in the lower percentile of returns, mean percentile of returns and high percentile of returns as follows:

$$LOWP_{i,t} = \min[POSITION_{i,t}, 0.2] \quad (3)$$

$$MIDP_{i,t} = \min[POSITION_{i,t} - LOWP_{i,t}, 0.6] \quad (4)$$

$$HIGHP_{i,t} = \min[POSITION_{i,t} - LOWP_{i,t} - MIDP_{i,t}, 0.2] \quad (5)$$

The variables analysed above measure the relative returns of each portfolio with regard to the investment objective. For this reason another variable, measuring the

weighted average of the returns of all the portfolios with the same investment objectives, namely $VARET_{i,t}$, is included. The goal is to test whether investors look for absolute returns. As a measure of the risk incorporated in each bond portfolio we include the variable $SDRET$, that measures the standard deviation of the monthly returns of each portfolio in the previous 12 months. We also calculate the risk weighted returns of each portfolio using the Sharpe Ratio, calculated as follows:

$$SRATIO = \frac{\bar{R}_i - \bar{R}_f}{SDRET_i} \quad (6)$$

where \bar{R}_i and \bar{R}_f are the mean monthly returns of each portfolio and the risk free return respectively, while $SDRET_i$ measures the standard deviation of the monthly returns of each portfolio in the previous 12 months. We then construct similar to the variables above using the Sharpe Ratio:

$$LOWSRATIO_{i,t} = \min[POSITION_{i,t}, 0, 2] \quad (7)$$

$$MIDSRATIO_{i,t} = \min[POSITION_{i,t} - LOWSRATIO_{i,t}, 0, 6] \quad (8)$$

$$HIGHSRATIO_{i,t} = \min[POSITION_{i,t} - LOWSRATIO_{i,t} - MIDSRATIO_{i,t}, 0, 2] \quad (9)$$

Utilising previous experience by Blake et al., (1993) and Zhao (2005) we calculated three more variables based on the Sharpe Ratio using monthly returns data for the last 24 months as follows.

$$R_{i,t} = a_i + \beta_{it} BONDDEX_t + \varepsilon_{it} \quad (10)$$

where R_{it} is the return of the bond portfolio above the monthly risk free rate, and $BONDDEX$ is the difference in the returns of the bond portfolio relative to the Bondex index that is considered to be a good proxy of average returns of a bond portfolio since the index contains a series of bonds of different maturities.

The Bondex index was an index containing a portfolio of bonds of various maturities that was used by bond fund managers as a measure of average bond market returns until 2005, which covers the period that we use in our data set. After 2005 the BONDDEX index was substituted by most fund managers by the MSCI Greek Bond index. For this reason we concluded that it represents the only trustworthy measure using which we could categorize, in different average returns categories, bond mutual funds that operated in the Greek market during the period 1997-2005.

The above regression model offers different values of a for each bond portfolio and the above mentioned variables are modified as follows:

$$LOWA_{i,t} = \min[POSITION_{i,t}, 0, 2] \quad (11)$$

$$MIDA_{i,t} = \min[POSITION_{i,t} - LOWA_{i,t}, 0, 6] \quad (12)$$

$$HIGHA_{i,t} = \min[POSITION_{i,t} - LOWA_{i,t} - MIDA_{i,t}, 0, 2] \quad (13)$$

We also include variables, for the age of the bond mutual fund, meaning the time that elapsed since it was initially set up (*AGE*), a variable for the potential movements between alternative mutual funds with similar characteristics (*TURNRATIO*), a dummy variable for the commissions charged by mutual funds (*CDUMMY*), and finally a variable that depicts the potential movements between other mutual funds offered within the same fund management firm (*OBJECTIVES*), so that we capture these movements and how they influence inflows-outflows of capital. The *OBJECTIVES* variable plays an important role in our model because we expect to find an influence in fund flows because Greek investors are believed to switch between different mutual funds within the same investment firm, especially since this is offered at no cost in many cases. Therefore, this alternative for investors is expected to have a positive influence on flows.

We calculate the arithmetic averages of attributes of bond mutual funds with different portfolio composition and investment goals and the results are presented in Table 1.

Table 1: Collective statistical data of bond mutual funds with different investment objectives

Attributes of the bond mutual funds	Total sample	Category 1	Category 2	Category 3	Category 4
ASSET (in million euros)	4,850	2,542	895	830	748
RAW (%)	4,164	3,297	3,584	4,510	3,982
SDRET (%)	1,339	1,231	1,349	1,328	1,512
SRATIO (%)	4,719	9,367	6,287	4,287	2,380
FLOW (in million euros)	281	359	127	456	267
PFLOW (%)	0,126	0,153	0,026	0,189	0,078
TURNRATIO (%)	92,57	95,46	80,27	83,03	102,78
AGE (in months)	41	54	46	36	29

Notes: Category 1 bond mutual funds are the ones that invest above 90% of their assets in government bonds, Category 2 bond mutual funds are those that invest 10-30% of their assets in corporate bonds, Category 3 bond mutual funds invest 30-50% in corporate bonds, while Category 4 bond mutual funds invest over 50% of the managed assets in corporate bonds, Greek and foreign. The *ASSET* variable measures the assets under management in each bond funds category, the *SDRET* gives the standard deviation of monthly returns collectively in each category. *RAW* depicts the gross 3-monthly returns in each category, *SRATIO* is the weighted returns variable depending on the incurred risk, *FLOW* depicts the mean flows of capital in million euros, *PFLOW* is the mean percentage flows, as a measure of the increase/decrease in managed assets, while *TURNRATIO* measures the turnover ratio and *AGE* the mean age of the funds in each category.

Bond mutual funds that invest heavily in government bonds and not more than 10 percent in corporate bonds have the highest mean of assets under management (2.54 billion euros), while the lowest mean assets under management are found in Category 4 bond mutual funds (748 million euros) that are the relatively newest, thus having the lowest mean. Highest mean returns are found in Category 3 bond mutual funds that take comparatively modest risks above zero risk investments (4.5%), and second in our calculations end up Category 4 bond mutual funds (4%) that invest large part of their assets in corporate bonds, Greek and foreign. The smallest returns arise from those bond mutual funds that invest primarily in Greek government bonds of various maturities (3.3%). On the other hand, the highest commissions are charged by Category 1 bond mutual funds while Category 4 charge the lowest, evidently in their quest to increase their assets. Category 4 mutual funds show also the highest volatility as measured by the SDRET variable, whereas the lowest respectively is found in those that invest over 90% of their assets in government bonds. Category 2 bond funds keep apace. Also expectable is the fact that lowest SRATIO rates are found in Category 1 funds and highest in Category 4 bond funds. Category 3 bond mutual funds appear to have the highest mean flows and percentage flows, probably due to the increase in assets under management that they experienced after 1999 when the bear market in the Greek stock market began.

In Table A1 in the Appendix, the correlations between variables included in the models are presented. The results explain the relation connecting the variables and the inflows/outflows of capital. Flows of capital are among others, positively related with returns, and negatively with other variables such as commissions and turnover ratios.

In order to determine the nature and magnitude of the influence of the above mentioned variables we estimate the following model, including in our data set all mutual funds that operated in the Greek market during the period 1997-2005:

$$\begin{aligned}
 FLOW_{i,t} = & \alpha + \beta_1 ASSET_{i,t-1} + \beta_2 FLOW_{i,t-1} + \beta_3 FLOW_{i,t-2} + \beta_4 FLOW_{i,t-3} \\
 & + \beta_5 LOWP_{i,t-1} + \beta_6 MIDP_{i,t-1} + \beta_7 HIGHP_{i,t-1} + \beta_8 AGE_{i,t-1} + \beta_9 TURNRATIO_{i,t-1} \\
 & + \beta_{10} SDRET_{i,t-1} + \beta_{11} OBJECTIVES_{i,t-1} + \beta_{12} WARET_{i,t-1} + \beta_{13} CDUMMY_{i,t-1} + u_i + \varepsilon_{i,t}
 \end{aligned}
 \tag{14}$$

where u_i is the random disturbance term and is stable. We also include the flows of capital variable with two and three time lags to capture the AR(3) process that total flows follow, as it has also been documented by Warther (1995).

When we use the variable for the percentage change of flows ($PFLOW_{i,t}$) in the model (13) we use the logarithm of the assets variable ($LASSET_{i,t-1}$) with one time lag as well as the percentage flow variable with one-two and three time lags:

$$\begin{aligned}
 PFLOW_{i,t} = & \alpha + \beta_1 LASSET_{i,t-1} + \beta_2 PFLOW_{i,t-1} + \beta_3 PFLOW_{i,t-2} + \beta_4 PFLOW_{i,t-3} \\
 & + \beta_5 LOWP_{i,t-1} + \beta_6 MIDP_{i,t-1} + \beta_7 HIGHP_{i,t-1} + \beta_8 AGE_{i,t-1} + \beta_9 TURNRATIO_{i,t-1} \\
 & + \beta_{10} SDRET_{i,t-1} + \beta_{11} OBJECTIVES_{i,t-1} + \beta_{12} WARET_{i,t-1} + \beta_{13} CDUMMY_{i,t-1} + u_i + \varepsilon_{i,t}
 \end{aligned}
 \tag{15}$$

We estimate in separate regressions the Sharpe Ratio variables (*LOWSRATIO*, *MIDSRatio* and *HIGHSRATIO*), and the BONDEX returns variables (*LOWA*, *MIDA* and *HIGHA*) instead of *LOWP*, *MIDP* and *HIGHP* that were included in (15):

$$\begin{aligned}
 FLOW_{i,t} = & \alpha + \beta_1 ASSET_{i,t-1} + \beta_2 FLOW_{i,t-1} + \beta_3 FLOW_{i,t-2} + \beta_4 FLOW_{i,t-3} \\
 & + \beta_5 LOWSRATIO_{i,t-1} + \beta_6 MIDSRatio_{i,t-1} + \beta_7 HIGHSRATIO_{i,t-1} + \beta_8 AGE_{i,t-1} \\
 & + \beta_9 TURNRATIO_{i,t-1} + \beta_{10} SDRET_{i,t-1} + \beta_{11} OBJECTIVES_{i,t-1} + \beta_{12} WARET_{i,t-1} \\
 & + \beta_{13} CDUMMY_{i,t-1} + u_i + \varepsilon_{i,t}
 \end{aligned}
 \tag{16}$$

$$\begin{aligned}
 FLOW_{i,t} = & \alpha + \beta_1 ASSET_{i,t-1} + \beta_2 FLOW_{i,t-1} + \beta_3 FLOW_{i,t-2} + \beta_4 FLOW_{i,t-3} \\
 & + \beta_5 LOWA_{i,t-1} + \beta_6 MIDA_{i,t-1} + \beta_7 HIGHA_{i,t-1} + \beta_8 AGE_{i,t-1} + \beta_9 TURNRATIO_{i,t-1} \\
 & + \beta_{10} SDRET_{i,t-1} + \beta_{11} OBJECTIVES_{i,t-1} + \beta_{12} WARET_{i,t-1} + \beta_{13} CDUMMY_{i,t-1} + u_i + \varepsilon_{i,t}
 \end{aligned}
 \tag{17}$$

After the preceding analysis, our basic hypotheses are the following:

a). Find a strong and positive relation between the dependent variable and the ASSET variable, assuming that funds with significant funds under management should attract inflows of capital.

b). Determine a positive relation with HIGHP, HIGHA, HIGHSRATIO variable and possibly MIDP, MIDA, MIDSRatio in an attempt to determine whether investors in bond mutual funds seek for high historical returns, in line with previous evidence from investors in equity mutual funds (Gruber, 1996).

c). We expect to find outflows of capital for bond mutual funds that incorporate more risk in their overall portfolio as indicated by the SDRET variable.

d). It is expectable to capture a negative relation between commissions charged for entry/withdrawal from bond mutual funds as indicated by the CDUMMY variable. This tendency should be stronger for bond mutual funds investing a significant part of the assets under management in corporate bonds. Blake et al., (1993) and Elton et al., (1995) find that an increase in commissions has an equally negative impact in the returns of the bond mutual fund. Therefore investors that resort to bond mutual funds should normally choose bond mutual funds with low commissions. In contrast, investors in equity mutual funds show limited dependence from commissions issues.

e). We should find a positive relation between the OBJECTIVES variable and flows of capital since the existence of a variety of investment alternatives should influence inflows/outflows of capital.

In Table A2 in the Appendix, the collective results of all models estimated above (14 – 15 – 16 - 17) are presented, while using the whole available data set.

With regard to the hypotheses as outlined above, the first interesting finding is that the estimators regarding the size of the bond mutual fund (ASSET) are negative and statistically significant irrespective of the model that we use. This finding is in line with the correlation results shown in Table A1, and is in contrast with the widespread belief, that led us into using percentage flows, which claims that investors are positively affected by the size of the bond fund they invest. Consequently, this result diminishes the importance of percentage flows in the study and we focus on absolute money flows.

Previous research has shown that previous returns of a bond mutual fund are not indicative of the future expected returns (Dritsakis et al., 2006). It is found that investors are affected by absolute returns, since they prefer mutual funds with high mean returns, but solely in the middle of the distribution of returns since the MIDP variable has a positive and statistically significant estimator. According to our findings, it should be noted that an increase in mean returns of 1 percent (100 basis points) results in an increase in flows of capital of approximately 500 th. euros in a bond mutual fund. On the contrary, the estimators for the LOWP and HIGHP variables are not statistically significant. Also, in line with similar findings in stock mutual funds markets (Ivkovic, 2002), it seems that investors do not “punish” mutual funds with a returns history worse than the mean market returns, since no significant outflow of capital is found. An interesting finding is also the fact that investors in bond mutual funds invest equally in the bond mutual funds that have the best returns and that belong to all the different categories of bond mutual funds that we identified. Similar conclusions are reached in the equity mutual funds as indicated by previous research on developed markets (Wilcox, 2003).

There are a number of clues indicating that the risk involved in each bond mutual fund is an important factor influencing inflows/outflows of capital. The first is the SDRET variable, that incorporates the risk inherent in a mutual fund, which has a marginally negative estimator. The importance applied to risk factors is also evident from the estimated results for the Sharpe ratio variables and the alpha coefficient variables. Models 16 and 17 show a positive relationship between flows and weighted returns, based on the criteria we imposed when calculating the weighted returns, with the exception of those mutual funds that are at the end of the distribution of returns. Overall, the weighted returns have an important role in the inflows/outflows of capital, underlying the basic role of risk related factors in investment decisions.

When investigating the influence of commissions in inflows/outflows of capital it is found that they have a significant impact in flows and returns. Previous evidence (McLeod and Malhotra, 1996) shows that in the US market a one percent change in the commissions charged by bond mutual funds could result in a 1 million dollars outflow of

capital. It is also shown that investors are positively affected by the so called 12b-1 charges, which correspond to promotion expenses performed by bond mutual funds. This is probably due to the fact that investors view positively such expenses as they attract new flows of capital and they show proactive action on the part of the fund managers. These results make evident the need to study the impact of buying/selling commissions as well as operating and promotion expenses separately. These data though, apart from the buying/selling commissions, are not readily available by data banks.

There is further evidence that emphasizes the influence of commissions on investment decisions. Bond mutual funds that invest 30-50 percent of their assets in corporate bonds have significant outflows of capital when they charge higher commissions than bond mutual funds that invest mainly in government bonds. Commissions and risk issues in general, appear to be important factors in the investment decisions of investors in bond mutual funds given the fact that the upside potential of bond funds is small compared to equity mutual funds. Therefore, especially for big investment portfolios, differences in commissions determine flows, since even small changes can affect decisively overall returns of a category of investments that on average offers single figure returns to investors.

The OBJECTIVES variable has a positive influence on inflows/outflows of capital since the ability to switch between funds belonging to the same fund management company, is an alternative that is valued highly, especially during periods of continuous changes in money markets. This is indicative of the fact that investors view investments in mutual funds in general as part of a diversified investment strategy, where the ability to switch between funds of different investment objectives with no or limited cost is important. Flows of capital show autocorrelation since flows of capital with time lags are statistically significant and positive factors in the flows of capital. Autocorrelation is smaller the further back we move, as the estimators with two and three time lags are significantly smaller than the ones with one time lag.

It should also be noted that the above mentioned conclusions do not apply for the total data set. This is because our data set was tested, on different regressions, relative to the four different categories of bond funds identified previously, depending on the weighting of different categories of bonds in their portfolio.

The hypothesis is that some factors that have statistically significant results for the total sample might not have equally as important results when estimating the different categories of bond mutual funds. More specifically, bond mutual funds that invest heavily in corporate bonds have stronger risk-returns characteristics since investors especially in this category of bond funds are more risk loving at least compared to investors in bond funds with a strong government bond portfolio who are more risk averse.

Previous work, by Goetzmann et al., (2003) as well as Agnew and Balduzzi (2003), among others, concludes that investors in bond funds often make investment adjustments between different investments as it was also found in our results indicated by the positive estimators of the OBJECTIVES variable. Extending their findings it is speculated that

stock market returns could be a statistically significant explanatory factor of inflows/outflows of capital in bond funds. It is attempted to capture this influence by including in the model a variable referring to the Greek stock market returns, separately for each one of the four categories of bond portfolios, that was identified previously. We use a time series of returns data from the Athens Stock Exchange General Index as the most suitable measure of stock market returns in Greece. Using three monthly returns data of the Greek General Index during the previous 8 quarters the GGI8QT variable is constructed. This variable is included in the 15 – 16 - 17 models. In Tables 2, 3 and 4 the results of these models are presented, when using the risk weighted returns, the Sharpe ratio returns and the BONDEX index returns respectively (see below).

With regard to the hypotheses outlined above, the impact of equity market returns in inflows/outflows of capital is statistically significant and negative. This applies for all categories except for Category 4, namely the bond mutual funds that invest heavily in foreign, government and corporate, bonds. The above mentioned finding is indicative of the fact that investors treat investments in bond mutual funds as an alternative to equity investments during periods when equity returns are negative or stock markets experience fluctuations. When extending our analysis to stock market returns in the previous quarter solely and not in the previous eight quarters of stock market returns, it is found that this negative relation still applies only for the bond mutual funds that invest over 90% of their portfolio in government bonds. This is characteristic of the fact that only this category of bond funds is considered to be an alternative to equity market investments when equity returns are marginal or present losses.

Some factors appear to affect all categories of bond mutual funds. More specifically, flows of capital with time lag influence positively flows of capital in all models. Risk weighed returns have a strong impact on flows of capital in all models as well. The LOWP and HIGHP variables are not statistically significant irrespective of the category of bond funds that we estimate, indicative of the fact that investors are neither lured by high returns funds nor punish though low returns portfolios.

Certain variables have a steady influence on the flows of capital in all but one category of bond portfolios. Investors are positively affected by absolute returns except when using the sample of the Category 4 bond portfolios that invest over 50% in foreign bonds, where the influence of absolute returns is minimal and non significant. The magnitude of the assets under management has a negative influence on the flows of capital in all categories but Category 4 bond portfolios where it appears to be positive and statistically significant. This probably happens because especially for Greek investors the alternative of investing into foreign bonds, government and corporate, is a relatively new opportunity and also because of the limited historical data. Hence, investors feel more secure when investing in the major players in the market, that hold the most significant portfolios.

Table 2: Factors determining cash flows in bond mutual funds, based on their investment objectives

Variables	Category 1	Category 2	Category 3	Category 4
ASSET (t-1)	-6,142*** (0,000)	-11,256*** (0,000)	-5,129*** (0,000)	3,481*** (0,000)
FLOW (t-1)	0,312*** (0,000)	0,254*** (0,000)	0,303*** (0,000)	0,397*** (0,000)
FLOW (t-2)	0,212*** (0,000)	0,184*** (0,000)	0,195*** (0,000)	0,249*** (0,000)
FLOW (t-3)	0,157*** (0,000)	0,126*** (0,000)	0,083*** (0,000)	0,199*** (0,000)
LOWP (t-1)	-0,025 (0,204)	0,085 (0,352)	-0,056 (0,185)	0,048 (0,367)
MIDP (t-1)	0,024* (0,045)	0,036* (0,039)	0,125 (0,087)	0,088 (0,109)
HIGHP (t-1)	-0,036 (0,307)	0,113 (0,119)	-0,047 (0,128)	0,049 (0,098)
AGE (t-1)	-0,012*** (0,000)	0,026** (0,015)	-0,027* (0,039)	0,018* (0,042)
TURNRATIO (t-1)	0,009*** (0,002)	0,002** (0,012)	0,058 (0,179)	0,043 (0,218)
SDRET (t-1)	0,125 (0,364)	0,119 (0,284)	-0,187 (0,099)	-2,236*** (0,000)
OBJECTIVES (t-1)	0,125 (0,249)	0,167** (0,015)	0,218* (0,037)	0,187 (0,369)
WASET (t-1)	0,928*** (0,0001)	1,116*** (0,000)	0,855*** (0,001)	0,740*** (0,000)
GGI8QT (t-1)	-0,087** (0,015)	-0,075** (0,019)	-0,055** (0,026)	-0,026* (0,046)
CDUMMY	-0,139*** (0,000)	-0,149*** (0,000)	-0,089* (0,039)	-0,123 (0,161)
INTERCEPT	-0,919 (0,318)	1,215 (0,455)	-1,857 (0,377)	-0,761 (0,197)
Overall R²	0,2783	0,3254	0,3379	0,3980

Notes: Apart from the variables referred previously the table depicts the estimated results for the GGI8QR variable that represents the Athens Stock Exchange returns during the previous eight quarters. The rest of the estimated variables were analysed in Tables A1 and A2. Category 1 includes mutual funds that invest over 90% of their managed assets in government bonds, Category 2 for those that invest 10-30% in corporate bonds, Category 3 for bond mutual funds investing 30-50% in corporate bonds and Category 4 for those investing over 50% of their assets in corporate bonds of foreign origin mainly. p statistics are given in brackets. ***, ** and * are indicative of results with 1, 5 and 10 percent statistical significance respectively.

Table 3: Factors determining cash flows in bond mutual funds, using the Sharpe ratio

Variables	Category 1	Category 2	Category 3	Category 4
ASSET (t-1)	-6,356*** (0,000)	-10,268*** (0,000)	-5,849*** (0,000)	4,502*** (0,000)
FLOW (t-1)	0,311*** (0,000)	0,250*** (0,000)	0,302*** (0,000)	0,394*** (0,000)
FLOW (t-2)	0,213*** (0,000)	0,184*** (0,000)	0,194*** (0,000)	0,247*** (0,000)
FLOW (t-3)	0,155*** (0,000)	0,126*** (0,000)	0,081*** (0,000)	0,200*** (0,000)
LOWSRATIO (t-1)	0,036* (0,055)	0,032** (0,021)	-0,026* (0,045)	0,022** (0,019)
MIDSRATIO (t-1)	0,034* (0,042)	0,029* (0,039)	-0,127 (0,149)	0,038 (0,119)
HIGHSRATIO (t-1)	0,031* (0,020)	0,015** (0,017)	-0,021* (0,039)	0,019* (0,028)
AGE (t-1)	-0,015*** (0,000)	0,025** (0,013)	-0,024* (0,045)	0,015* (0,042)
TURNRATIO (t-1)	0,011*** (0,001)	0,005** (0,016)	-0,033 (0,134)	-0,054 (0,211)
OBJECTIVES (t-1)	0,124 (0,233)	0,165** (0,014)	0,214* (0,035)	0,193 (0,381)
WARET (t-1)	0,931*** (0,0000)	1,115*** (0,000)	0,854*** (0,000)	0,742*** (0,000)
GGI8QT (t-1)	-0,077** (0,015)	-0,065* (0,014)	-0,049** (0,016)	-0,035* (0,041)
CDUMMY	-0,130*** (0,000)	-0,122*** (0,000)	-0,085** (0,017)	-0,112 (0,110)
INTERCEPT	-0,854 (0,303)	1,195 (0,449)	-1,131 (0,472)	-0,545 (0,143)
Overall R²	0,2789	0,3248	0,3381	0,3988

Notes: The estimated variables were analysed in Tables A1 and A2. Category 1 includes mutual funds that invest over 90% of their managed assets in government bonds, Category 2, those that invest 10-30% in corporate bonds, Category 3 the bond mutual funds investing 30-50% in corporate bonds and Category 4 those investing over 50% of their assets in corporate bonds, of foreign origin mainly. p statistics are given in brackets. ***, ** and * are indicative of results with 1, 5 and 10 percent statistical significance respectively.

Table 4: Factors determining cash flows in bond mutual funds, using the a coefficient

Variables	Category 1	Category 2	Category 3	Category 4
ASSET (t-1)	-6,230*** (0,000)	-10,271*** (0,000)	-5,482*** (0,000)	3,959*** (0,000)
FLOW (t-1)	0,313*** (0,000)	0,252*** (0,000)	0,301*** (0,000)	0,395*** (0,000)
FLOW (t-2)	0,210*** (0,000)	0,183*** (0,000)	0,194*** (0,000)	0,250*** (0,000)
FLOW (t-3)	0,158*** (0,000)	0,127*** (0,000)	0,083*** (0,000)	0,198*** (0,000)
LOWA (t-1)	0,033* (0,051)	0,024** (0,019)	-0,022* (0,048)	0,021** (0,014)
MIDA (t-1)	0,032* (0,047)	0,029* (0,033)	-0,139 (0,150)	0,052 (0,166)
HIGHA (t-1)	0,028* (0,045)	0,016** (0,018)	-0,019* (0,036)	0,018** (0,024)
AGE (t-1)	-0,010*** (0,001)	0,023** (0,013)	-0,025* (0,035)	0,021* (0,047)
TURNRATIO (t-1)	0,005*** (0,000)	0,001*** (0,002)	-0,039 (0,203)	-0,055 (0,299)
OBJECTIVES (t-1)	0,123 (0,250)	0,161** (0,016)	0,217* (0,037)	0,191 (0,312)
WARET (t-1)	0,925*** (0,0001)	1,113*** (0,000)	0,854*** (0,000)	0,741*** (0,000)
GGI8QT (t-1)	-0,101*** (0,003)	-0,072** (0,015)	-0,067** (0,021)	-0,041** (0,013)
CDUMMY	-0,127*** (0,000)	-0,123*** (0,000)	-0,082* (0,033)	-0,082 (0,159)
INTERCEPT	-0,313 (0,412)	1,323 (0,298)	-1,627 (0,307)	-0,790 (0,186)
Overall R²	0,2784	0,3257	0,3378	0,3984

Notes: The estimated variables were analysed in Tables A1 and A2. Category 1 includes mutual funds that invest over 90% of their managed assets in government bonds, Category 2 for those that invest 10-30% in corporate bonds, Category 3 for bond mutual funds investing 30-50% in corporate bonds and Category 4 for those investing over 50% of their assets in corporate bonds, of foreign origin mainly. p statistics are given in brackets. ***, ** and * are indicative of results with 1, 5 and 10 percent statistical significance respectively.

The importance of each variable and the nature of its influence on the flows of capital varies depending on the different categories of bond mutual funds, underlying the importance of investigating each model – variable and category of bond mutual funds separately in order to draw definite conclusions useful to academics and market participants alike.

Flows of capital are positively influenced by high mean gross returns as indicated by the positive MIDP variable, although this is not the case in Category 3 and 4 bond mutual funds. In these categories gross returns do not appear to influence flows. Yet, Category 1 and 2 bond mutual funds hold bond portfolios with more similar characteristics, making gross returns a more easy to estimate measure of the fund managers abilities, hence gross returns being a statistically significant factor. Categories 1 and 2 of bond mutual funds are also the ones which are most influenced by the commissions variable. This happens because the homogeneity of the bond portfolios in these categories makes more evident the possible differences in returns arising from different commissions charged. Commissions play a crucial role in flows of capital into bond mutual funds in Category 4 as well, which might be attributed to the fact that these funds have high operating costs and commissions when buying/selling shares in the fund. Hence, investors find differences in costs that affects their investment decisions.

Investors in Category 4 bond mutual funds are not affected by absolute returns, whereas risk weighted returns play an important role due to the volatility in this category of bond investments. It is comprehensible therefore that these markets, experiencing volatility due to the existence of corporate bonds in their portfolio as well as high risk government bonds among others, are prone to potential defaults and hence differences in returns from year to year. Past returns therefore are not considered indicative of future returns, the risk therefore being the basic factor that determines investment decisions of shareholders.

Another important diversification factor between the identified categories of bond funds is the potential opportunities for switching between funds of different investment objectives within the same investment management firm, as measured by the OBJECTIVES variable. Investors in Categories 1 and 2 appreciate highly the capability to make portfolio reallocations within the same management firm since especially these low risk categories of investments, are usually treated as part of a diversified portfolio that bears investment weightings depending on the conditions in the market. Therefore, when conditions in equity markets or other high risk investment categories are positive, investors are tempted to have a larger weighting in these high risk investments in their overall investment portfolio. In contrast, they increase their weighting in fixed or low income investments, like Category 1 and 2 bond mutual funds, when high risk investments are at their peak risk conditions. Investors in Categories 3 and 4, however, which have a larger proportion of corporate bonds, that inherently have larger risks, view these investments as a potentially more specialized investment strategy, where it is more unlikely that they might be interested in making frequent switches between funds within

the same investment management firm. It is also true though that this finding can be attributed to the fact that the invested capital in Categories 3 and 4 is considerably smaller compared to Categories 1 and 2, which makes it more rational that a bond fund shareholder might not be eager to make portfolio reallocations depending on the market conditions, exactly because his invested capital is small with regard to the total portfolio that he holds.

3. Conclusion

To sum up, there was an investigation of the factors that influence inflows/outflows of capital in bond mutual funds, both when using the whole sample of bond mutual funds that operated in the Greek market within the period 1997-2005, as well as for the sub-samples of bond funds belonging to each one of the four categories that were identified, depending on their portfolio structure of government bonds, Greek and foreign and corporate bonds.

Investors in bond mutual funds do not consider high mean returns as an important factor driving their investment decisions, which is a major difference in the determinants of flows of capital between bond and equity markets. However, the risk weighted returns are an important determinant of cash flows. Flows in mutual funds investing heavily in government bonds are affected by commissions charged by fund managers, avoiding those bond funds that charge high commissions. On the contrary, investors in bond funds that have a large proportion of corporate bonds, are not affected by commissions and operating costs. Investors also direct their capital to bond funds with small assets under management, in spite of the common belief that only large funds attract inflows of capital, with the exception of bond funds that invest in corporate bonds, where the size of the potential fund appears to be an important factor determining investment decisions.

Greater attention to risk issues is demonstrated by those that invest in corporate and foreign bonds, since all the alternative measures of weighted returns are statistically important, while it is also found that those investing mainly in government bonds regard this investment as part of an integral and diversified investment strategy, where reallocations are not scarce. Investors in government bonds increase their positions when equity markets experience losses, resorting to investment safe havens. This is more evident during periods that the markets experience short term losses and not as intense when this is extended into longer periods of time. In the latter cases positions in bond funds appear to be part of a long term investment strategy.

Overall, after the detailed analysis in this paper, we claim that bond mutual funds in small developed markets represent an investment category that should be further analysed, both because of the size of assets under management as well as of the potential differences in investment behaviour as depicted in our findings. The latter is found when analyzing the whole sample of Greek bond mutual funds but also when estimating the

four different categories of bond mutual funds as identified, depending on the weightings in government and corporate bonds, Greek and foreign.

Useful extensions of this research should include the composition of expenses charged to shareholders in bond mutual funds, whether they refer to commissions for entrance/exit in mutual funds, management or/and promotion expenses. This remains of extreme importance due to the fact that returns on average are relatively small compared to investments in equity, rendering the expenses issue very significant, since they reduce net returns. In more advanced markets, like the US market, this information is readily available to investors and academics, therefore being able to determine the reasons that affect net returns more easily, thus enabling market transparency and equal information opportunities to market participants.

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Appendix

Table A1: Correlations of the variables affecting flows of capital in bond mutual funds

	FLOW	PFLOW	ASSET	RAW	SRATIO	AGE	TURNRA TIO	SDRET	OBJECTIVES
PFLOW	0,132*** (0,000)								
ASSET	-0,175*** (0,000)	-0,075*** (0,000)							
RAW	0,045*** (0,000)	0,037*** (0,000)	0,015*** (0,000)						
SRATIO	0,128*** (0,000)	0,112*** (0,000)	0,084*** (0,000)	0,358*** (0,000)					
AGE	-0,138*** (0,000)	-0,196*** (0,000)	0,481*** (0,000)	0,009 (0,284)	0,015** (0,045)				
TURNRATIO	-0,013** (0,034)	0,068*** (0,000)	-0,049*** (0,000)	0,018*** (0,000)	0,048*** (0,000)	-0,014*** (0,000)			
SDRET	-0,011** (0,029)	0,024 (0,589)	-0,004** (0,039)	0,089*** (0,000)	-0,028*** (0,000)	-0,058*** (0,000)	0,084*** (0,000)		
OBJECTIVES	-0,045*** (0,000)	-0,067*** (0,000)	0,185*** (0,000)	-0,026*** (0,000)	-0,069*** (0,000)	0,095*** (0,000)	-0,067*** (0,000)	0,028*** (0,000)	
WARET	0,068*** (0,000)	0,039*** (0,000)	0,006 (0,782)	0,426*** (0,000)	0,364*** (0,000)	0,016** (0,029)	0,018 (0,089)	-0,063*** (0,000)	-0,035*** (0,000)

Notes: ASSET is the total assets under management of each portfolio. RAW is the gross 3-month return of each portfolio. SDRET depicts the standard deviation of monthly returns of each portfolio in the context of the last 12 months. SRATIO is the Sharpe Ratio result as a measure of the returns above the risk free rate on a monthly basis divided by the standard deviation of returns. FLOW measures the flows of capital in absolute figures, calculated as the difference in total assets beyond possible profits/losses or capital raised as a result of mergers/acquisitions. PFLOW measures percentage flows and is calculated as the rate of increase in assets as a result of inflows/outflows of capital. TURNRATIO which measures the movement between mutual funds of similar characteristics. AGE which shows the time since establishment of each bond portfolio. OBJECTIVES which represents the available opportunities of moving between mutual funds with different investment objectives within the same fund management company. WARET is the weighted average of gross returns of all bond mutual funds with similar investment goals. p statistics are given in parenthesis. *** and ** are indicative of 1 and 5 percent significance level respectively.

**Table A2: Estimated factors determining inflows/outflows
of capital in bond mutual funds**

Variables	Capital Flows			Percentage Flows		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
ASSET/LASSET (t-1)	-5,523*** (0,000)	-5,486*** (0,000)	-5,366*** (0,000)	-5,462*** (0,000)	-5,128*** (0,000)	-5,039*** (0,000)
FLOW/PFLOW (t-1)	0,345*** (0,000)	0,329*** (0,000)	0,321*** (0,000)	0,058*** (0,000)	0,051*** (0,000)	0,045*** (0,000)
FLOW/PFLOW (t-2)	0,178*** (0,000)	0,169*** (0,000)	0,173*** (0,000)	0,002 (0,782)	0,005 (0,691)	-0,003** (0,022)
FLOW/PFLOW (t-3)	0,074*** (0,000)	0,068*** (0,000)	0,075*** (0,000)	0,003* (0,045)	0,001* (0,049)	0,000 (0,895)
LOWP (t-1)	-0,015 (0,582)			0,045 (0,178)		
MIDP (t-1)	0,024*** (0,000)			0,022*** (0,000)		
HIGHP (t-1)	-0,009 (0,748)			0,048** (0,009)		
LOWSRATIO (t-1)		-0,055 (0,135)			0,189*** (0,000)	
MIDSRATIO (t-1)		0,025*** (0,000)			0,029*** (0,000)	
HIGHSRATIO (t-1)		0,137*** (0,000)			0,145*** (0,000)	
LOWA (t-1)			-0,008 (0,680)			0,105*** (0,000)
MIDA (t-1)			0,033*** (0,000)			0,029*** (0,000)
HIGHA (t-1)			0,088** (0,014)			0,109*** (0,000)
AGE (t-1)	-0,007 (0,366)	-0,003 (0,487)	-0,006 (0,287)	-0,012*** (0,000)	-0,014*** (0,000)	0,009*** (0,000)
TURNRATIO (t-1)	-0,003 (0,381)	-0,002 (0,104)	-0,009 (0,175)	0,004*** (0,000)	0,008*** (0,000)	0,007*** (0,000)
SDRET (t-1)	-0,158 (0,207)			-0,128 (0,132)		
OBJECTIVES (t-1)	0,087*** (0,000)	0,094*** (0,000)	0,097*** (0,000)	0,085* (0,079)	0,073* (0,068)	0,077** (0,032)
WARET (t-1)	0,485*** (0,000)	0,548*** (0,000)	0,576*** (0,000)	0,519*** (0,000)	0,536*** (0,000)	0,542*** (0,000)
CDUMMY	-2,354*** (0,000)	-2,289*** (0,000)	-2,175*** (0,000)	-2,894*** (0,000)	-2,729*** (0,000)	-2,953*** (0,000)
INTERCEPT	0,684 (0,589)	0,482 (0,294)	0,045 (0,188)	-10,594*** (0,000)	-11,257*** (0,000)	-11,947*** (0,000)

Notes: In order to study the factors affecting fund flows in bond mutual funds we utilize the estimations of the model below, using the available sample of bond mutual funds.

$$\begin{aligned} FLOW_{i,t} = & \alpha + \beta_1 ASSET_{i,t-1} + \beta_2 FLOW_{i,t-1} + \beta_3 FLOW_{i,t-2} + \beta_4 FLOW_{i,t-3} \\ & + \beta_5 LOWP_{i,t-1} + \beta_6 MIDP_{i,t-1} + \beta_7 HIGHP_{i,t-1} + \beta_8 AGE_{i,t-1} + \beta_9 TURNRATIO_{i,t-1} \\ & + \beta_{10} SDRET_{i,t-1} + \beta_{11} OBJECTIVES_{i,t-1} + \beta_{12} WARET_{i,t-1} + \beta_{13} CDUMMY_{i,t-1} + u_i + \varepsilon_{i,t} \end{aligned}$$

The ASSET variable represents the assets under management of each bond mutual fund. Variable RAW calculates the mean 3-month returns of each portfolio. Variables LOWP, MIDP and HIGHP calculate the returns of each portfolio relative to the mutual funds with similar characteristics, and they refer to the ranking of each portfolio in the normal distribution, as being in the low tails, middle, or high tails of the distribution respectively.

The SDRET variable calculates the standard deviation of monthly returns of each portfolio in a context of 12 months. The SRATIO variables offers the results based on the Sharpe Ratio, as a measure of the incurred risk. It is calculated as the mean monthly returns above the returns of the zero risk fixed interest investments in the last 12 months divided by the standard deviation variable. Variable FLOW measures flows of capital in millions of euros, and is calculated as the difference in total assets under management above the possible profits achieved by the fund manager and potential inflows as a result of mergers/acquisitions. The PFLOW variable measures percentage flows and is calculated as the percentage increase/decrease of flows as a result of inflows/outflows of capital respectively. When PFLOW is used, the dependent variable used as an alternative is the LASSET variable as the natural logarithm of ASSET. Respectively instead of the variables used for FLOW with time lags, the respective variables of PFLOW with time lags are used, to capture the time lags effects of ASSET/LASSET respectively. TURNRATIO measures the movements between bond mutual funds with similar characteristics. OBJECTIVES measures available alternative investment opportunities within the same fund management firm, while AGE measures the years since establishment for each bond fund in our sample. WARET is the weighted average of mean gross returns of all bond funds in our sample with similar investment objectives, while CDUMMY is a dummy variable measuring the impact of commissions on flows.

Furthermore, as indicated in model 16, variables LOWSRATIO, MIDSRATIO and HIGHSRATIO with time lags are used, as a measure of the risk weighted returns. Also variables LOWA, MIDA and HIGHA estimators, as described in model 17, are given. p statistics are given in brackets, while ***, ** and * are indicative of 1, 5 and 10 percent significance level respectively.