

## PERSISTENCE IN PERFORMANCE FOR MUTUAL FUNDS IN PERIODS OF CRISIS

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**Abstract:** *The study investigates the persistence in performance for a sample of South European funds, domiciled in Portugal, Italy, Greece and Spain. Employing the Sharpe ratio, risk adjusted performance is measured in an attempt to judge the influence of the 2008 crisis and the current debt crisis on funds' inclination to persist in their previous returns record. Examination period extends from January 2004 to December 2010 incorporating stages of relative stability in the stock and bond markets while also capturing the early stages of the eurozone crisis. We categorize funds as winners and losers in consecutive 6-monthly periods, thus being able to judge persistence in the short run, while our results suggest that the identification of winners and losers could enable us to investigate the possibility to gain investment advantages through this finding. Overall results suggest evidence of persistent results, whether positive or negative, both during the 2008 crisis and the current debt crisis, leading us to deduce that factors leading to performance persistence are not affected by market changes, since medium to long term persistence bypasses any temporary market mischief. This finding could be of use for fund managers aiming at establishing viable investment strategies, at their epicenter being the exploitation of such clues, suggesting persistence in returns. A fund of funds manager employing funds both in equities and fixed income could potentially choose to invest exclusively or more heavily in the winners of previous periods and avoid accordingly poor performers, thus achieving higher returns on average. For this purpose simple investment strategies are employed where we test the outcome of an investment strategy that would invest on fixed income securities by choosing those funds that were winners in the distribution of returns in the previous 6-monthly period, while disinvesting from poor performers and funds switching sides in performance persistence measurement in consecutive periods. The eurozone crisis makes more apparent the need to make use of such anomalies which could result in over performance relative to market benchmarks or reduction in overall losses during periods of unrest in fixed income markets like the one currently faced. Bond funds could also prove a valuable "helping hand" to portfolio managers when equity markets suffer, but that is not guaranteed by all funds under the same market conditions.*

**Keywords:** *Performance Persistence, Fixed Income, Sharpe Ratio*

**JEL Classification Codes:** G15, G11, G23

## **1. INTRODUCTION**

The current study attempts to shed light on the continuous performance phenomena in the organized funds market. Academic literature has continuously attempted to explore such phenomena with research focusing on individual fund markets. In this context we use both a sample of equity and fixed income mutual funds to explore persistence in the returns patterns of funds in the southern European region. We specifically focus on the pre and post period of the 2008 financial crisis, that did not leave unaffected south European markets, while we manage to capture early effects of the current debt crisis that affects south European economies, especially Greece.

The concept of performance analysis is of major importance to finance professionals, while it has been covered extensively in its various aspects through time. Studies focus their attention on exploring how mutual funds perform relative to market benchmarks, that being the basis for performance persistence measurement. In attempting to reach robust conclusions, researchers have been surveying whether the potential abnormal returns of the funds are due to fund managers' security selection ability, that allows them to detect and acquire possibly undervalued securities, or whether they have some informational advantages over their counterparts that allow them to effectively handle their portfolio of assets, thus depicting market timing capabilities. Market timing models measure whether the mutual fund managers have any capability of forecasting the relative market upward or downward movements so as to adjust their portfolio weightings accordingly.

By shedding light on the performance persistence element of fixed income funds we attempt to deduct conclusions towards the appropriateness of the fund management strategies followed. This is of increased importance given that the competition between mutual fund managers is growing especially in bond funds where returns are usually marginal thus creating ground for intense rivalry. Furthermore, the debt crisis has made evident the fact that fixed income portfolios are not zero risk. In fact since 2010 Greek bond mutual funds have been sustaining continuous losses, while the same applies for other country funds in the south European area, namely, following sequence in terms of magnitude of losses, Portugal, Spain and Italy. These market changes render even more interesting the analysis of performance persistence in mutual funds investing in fixed income since investors and fund managers have to come up with ways to reduce losses or possibly achieve returns in the midst of an unstable environment with recession looming ahead. Furthermore, however long the debt crisis will last, diversified funds will still be holding debt, as obliged by law directives, more or less applying in the same way to all four sample countries, and looking for equity placements that will do the trick to overall portfolio returns. More specifically in Greece, with government borrowing scheduled to resume possibly in 2015, investors might herd into Greek bonds lured by increased returns that are insured by the high credit default spreads, which will remain way above average in the coming years, even after government borrowing resumes. Therefore the understanding of performance persistence is of particular interest to investors, institutional or non, in order to be able to evaluate the quality of the investment management service offered to them by fund managers. Lastly it always poses interest to academics and regulatory authorities who wish to scrutinize various investment aspects of managed funds market.

## **2. MARKET OVERVIEW AND RECENT LITERATURE**

Mutual funds captured the public attention in the last three decades when mutual fund investment hit record highs and investors experienced unprecedented returns, while having professional management for their large or small available money. Research on mutual funds has

been extensive, performance persistence capturing a significant percentage in the last fifteen years. During the period under scrutiny in this study though, investor demand for mutual fund units as measured by the net new cash flow declined. The global financial crisis played a major role in that. Globally the industry had a net cash outflow of \$297 billion in 2010. In the same period most developed European countries experienced slower economic growth and weak stock markets. Emerging markets overcame the stock prices slump, achieving returns on a par with the United States. Funds under management worldwide in 2010, as expressed by the total net assets of mutual funds, amounted to \$24.7 trillion, by far the biggest proportion being held by the American mutual fund market with 48% and second biggest market being the European one with 32% (\$7.9 trillion). Bond and stock mutual funds in the south European region constitute about 20% of total funds managed by organized funds in the eurozone area.

International literature has attempted to identify the driving forces that lead performance. The US fund management industry has been the focus for the majority of this research. Brown et al. (1992) found that mutual funds that perform poorly relative to their peers are more likely to cease to exist, while Hendricks et al. (1993) after examining a sample of US open-end no-load equity funds in the period of 1974-1988, found a “hot hands” phenomenon in short run risk adjusted fund returns. However, they found no evidence of persistence for longer periods. Elton et al. (1996), using a sample of equity funds designed to control for the survivorship bias effect, reconfirms the performance persistence phenomenon identified in Hendricks et al. (1993). In Carhart (1997), a new measure of performance which adjusts for risk factors is introduced. Persistence in performance is explained by the one year momentum effect of Jegadeesh and Titman (1993) and overall results do not support the existence of skilled mutual fund managers. Droms and Walker (2001) conclude that no evidence of persistence is found over long-horizons, while Bollen and Busse (2005) find positive short-term performance persistence elements, but this does not apply for longer investment horizons. Our considered fund management strategy is influenced by their empirically confirmed view that investors may generate superior returns through a naïve buy-and-hold strategy by becoming performance seekers. In studies shedding their focus on European funds we find among others, Blake and Timmermann (1998), recording significant persistence among small equity funds in UK using contingency tables, Fletcher and Forbes (2002), who find no persistence in performance using the Carhart measure, while Cuthbertson et al. (2005) support the view that underperforming managers exhibit poor skills rather than bad luck. Otten and Bams (2002) performed a cross-country analysis of mutual funds in Europe, representing the major study attempting to tackle the performance persistence issue on a multiple country sample. Countries included were France, Italy, UK, Germany and the Netherlands for the period 1991-1998, recording weak performance persistence, with the exemption of the UK.

On performance persistence in more recent years we find Huij and Verbeek (2007), Polwitoon and Tawatnuntachai (2008), Du et al. (2009), Fortin and Michelson (2010), Chen et al. (2010). More specifically Polwitoon and Tawatnuntachai (2008) analyzing a sample of US based emerging markets bond funds, conclude that performance persistence is found, while interestingly highlight the diversification opportunities offered by emerging market funds developing a prelude to our own rationale in this paper. The tendency towards acknowledging clear elements of performance persistence is also supported in Du et al. (2009), who investigated corporate bond portfolios, that exhibited negative performance persistence before expenses in consecutive time periods. Contradicting though our rationale, they only offer an alternative to avoiding below average returns funds, at least in the short run, whereas superior returns funds manipulation is not proven viable.

The Greek related literature is not negligible. Babalos et al. (2007), uses non-parametric tests, finds evidence for persistence for separate periods, but not significant for the overall

sample period extending till 2004. Sporadic and short-lived performance persistence is also found in Drakos and Zachouris (2007) who examined Greek equity mutual funds from 1995 until 2003, indicating also an underlying self-correcting mechanism in the organized funds market. No superior market timing ability on the part of fund managers is found in Thanou (2008) while in Giamouridis and Sakelariou (2008) in the context of attempting to capture both stock picking and market timing ability, the analysis shows that mutual fund performance does not persist over short-term horizons.

The preceding analysis proves that there is still ample space for research attempting to clear the picture as to whether patterns of persistence can be identified, either in the short or long run, positive and negative likewise and if this information can be used in constructing continuously rebalanced portfolios.

### 3. METHODOLOGY AND DATA

The present research builds upon the apparently interesting element of persistent performance while focusing on the four markets of the troubled southern Europe. In this context selected data of fixed income funds, domiciled in four markets, were used, namely, Italy, Spain, Portugal and Greece, incorporating in their managed assets for the most part country of origin long and short term government debt. The examination period is seven years (January 2004–December 2010), the data used is weekly and the source databases were the local Institutional Investors Associations. The dataset almost equally contains data split into a bull and a bear market phase, thus covering different aspects of the economic cycle. As risk free rate we used the three–month Euribor rate for the period under question. Returns refer to the average weekly return achieved by the considered mutual funds measuring the change in the net asset value from period  $t-1$  to period  $t$ . Income of any associated dividends is assumed to be reinvested thus incorporated in the fund NAV.

The data set has not been cared upon for the survivorship bias effect. That is our analysis ignored funds that ceased to exist somewhere in the beginning or middle of our examination period while the same applies for any other fund born after January 2004, for which no full data set is naturally available for the 7-year period. Prices quoted are net of expenses so we did not have to make any further adjustments to calculate returns before and after catering for fees charged by fund managers to unit holders.

Performance persistence measurement requires as the first step to measure performance using an acceptable methodology. In estimating the returns of a bond portfolio, in order to test for performance persistence on the second phase, various methodologies have been suggested. The traditional Jensen (1968) model still remains the basis for performance measurement given also further suggested extensions. Most studies employ variations of the traditional CAPM model and it still remains the basis for the estimations followed by many academics and market practitioners (indicatively see Christopherson et al. (1998), Becker et al. (1999) and Kothari and Warner (2001)).

The base for our own portfolio ranking approach involves the traditional Sharpe ratio, as developed initially by Sharpe (1966). The Sharpe ratio relates risk and returns as the basis for any investment decision and as a model requires no previous validation. This is partly a limitation of other popular calculating returns methodologies, such as the Jensen model, since they require the validation of the model with regard to the systematic risk involved. Representing the return of each portfolio above the risk free rate, based on the risk of the overall portfolio, the Sharpe ratio has some observed inefficiencies since during periods of extreme volatility returns might be over or under estimated. The performance measure debate is addressed in Eling (2008). It is found that the use of a large number of proposed Sharpe ratio modifications produced

almost identical, to the original Sharpe ratio, performance rankings. This finding is made even stronger in Eling and Faust (2010), where, after comparing a series of suggested measurement methods, they find identical ranking results using the original and some major suggested modifications (Israelsen, 2005).

The traditional Sharpe ratio is the following:

$$S_p = \frac{E_p - R_f}{\sigma_p} \quad (3.1)$$

where  $S_p$  is the return of the portfolio based on the Sharpe ratio,  $E_p$  is the mean return of each portfolio,  $R_f$  is the mean return of the risk free portfolio and  $\sigma_p$  is the standard deviation of the returns of the examined portfolio.

The performance persistence hypothesis considers that mutual funds with an above average return in one period will also have an above average return in the next period and vice versa. The proposed statistical tests for performance persistence measurement attempt to identify to what extent fund performance during one period continues during the following period. The mechanism is as follows: Fund performance is measured for every 6-monthly period, the same measurement occurs for the next 6-monthly period, market average returns are calculated for each period and the fund is consequently considered to be a winner in the period in question, meaning having above average returns, and the same is performed for the latter part of the examination period. If the fund manages to surpass average returns in both 6-monthly periods then it's a case of a clear winner in both. Under the same rationale we identify losers in both periods. If funds tend to be winners or losers in consecutive periods, while statistical tests verifying the robustness of these results, we could judge performance persistence as being present in our data at least in the short run.

If the funds show persistence in performance, active fund selection based on past performance may be of interest to individual investors. On the other hand, if there is no sign of persistence, past information would have no value for investors. To investigate whether persistence in mutual fund performance is also present in our data set, we construct the winner and losers portfolios following the methodology described above, while the remaining funds go into two border portfolios (Winners-Losers and Losers-Winners). Therefore we have four types of categories for each six monthly period, winner funds (WW), loser funds (LL), winner-loser (WL) and loser-winner (LW). Following the construction of two way contingency tables, funds that achieve above average returns in two periods are characterized as winners, funds that underperform in consecutive periods are losers, while respectively we present bond funds that achieve above average returns in one period, but worse in the next as winners-losers and vice versa. These four equally weighted portfolios are then held for their 6-month period before we rebalance them again based on their returns over the next 6-monthly period. After completing this process we get a time series of returns for all four portfolios.

In determining performance persistence results are tested given the relevant statistical models. We utilize Kahn and Rudd (1995) as well as Brown and Goetzmann (1995) to determine, using relevant statistical measures, whether performance persistence holds. The described method is used extensively in the related literature including Agudo and Magallon (2005) and Ribeiro et al. (1999), studies that investigated the Southern European market.

More analytically:

a). The odds ratio (OR) by Brown και Goetzmann (1995):

$$OR = \frac{WW \times LL}{WL \times LW} \quad (3.2)$$

where we calculate the winners times the losers ratio in consecutive periods relative to the winners-losers times the losers-winners.

The Z-test is then calculated upon the price derived from the below mentioned ratio:

$$Z = \frac{\ln(OR)}{\sigma_{\log(OR)}} \quad (3.3)$$

where

$$\sigma_{\log(OR)} = \sqrt{1/WW + 1/WL + 1/LW + 1/LL} \quad (3.4)$$

b). The chi-squared test ( $\chi^2$ ) by Kahn and Rudd (1995):

Considering that the probability of occurrence, of one out of the four scenarios is equal, the chi-squared test has as follows:

$$\chi^2 = \frac{(WW - N/4)^2}{N/4} + \frac{(WL - N/4)^2}{N/4} + \frac{(LW - N/4)^2}{N/4} + \frac{(LL - N/4)^2}{N/4} \quad (3.5)$$

where  $N$  is the total number of observations/portfolios.

The chi-squared is calculated in this respect and based upon its results, the likelihood of occurrence is calculated, as well as the ensuing performance persistence conclusion.

Based upon the preceding analysis investors and funds managers could distinguish consistently good and bad performers, being in this way able to make conjectures on the future returns pattern of individual portfolios. The essence of this analysis can be useful though to investors if we manage to see the inferences to real life portfolio construction and active management. Based on the work of Bialkowski and Otten (2011) we can regress excess the returns of the constructed portfolios relative to appropriate benchmarks for each of the four sample countries. Thus, we test separate regressions where as the dependent variable we use the weekly returns of our constructed portfolios of the funds that appear as being the best three winners-winners in consecutive periods. These constructed portfolios are continuously rebalanced to accommodate for the changing performers given the preceding results arising from the performance persistence analysis. By implementing the above mentioned alternative investment strategies, potential opportunities to exploit the performance persistence analysis results can be identified, in order to construct investment strategies that could lead to above average profits.

In this respect we test the following model:

$$P_{p,t} = \alpha_p + \beta_p P_{benchmark,t} + \varepsilon_p \quad (3.6)$$

where  $P_{p,t}$  are the returns of our continuously rebalanced portfolio whereas  $P_{benchmark,t}$  represents the benchmark returns for the same 6-monthly period examined. Results are run on ex ante basis for all periods but the first 6-monthly period of our sample (January 2004-June 2004), for which, due to the lack of data for the last quarter of 2003, we have not calculated abnormal returns. A positive alpha denotes above average returns for each of the four regressions run for each country included in our sample.

#### 4. EMPIRICAL RESULTS

Our intention is to figure out whether performance is persistent in a sample of fixed income funds operating in the PIGS area. Having used the traditional Sharpe ratio as our ranking tool we rank all funds based on the past 6-monthly return according to the two following categories. In category one, that of winner funds, we include those with the highest examination

period returns relative to the median return for the whole country sample, while in category two, that of the loser funds, the ones with the lowest examination period returns relative to average returns, are included. Corresponding results are reported in Tables 1 to 4.

#### INSERT TABLES 1 TO 4

According to the results, at a six month horizon, for the seven –year period we find a positive spread of repeated winner funds. This means that for the surviving funds the documented persistence in performance is mainly driven by ‘hot hands’, that is positive performance persistence, even though ‘cold hands’ (negative performance persistence) as referred to in Hendricks et al. (1993) represents the second largest category in the observed results. This means that funds that underperform in one period are likely to be underperforming funds in the following period, but even stronger is the tendency for over performing funds to continue surpassing mean returns. In the case of Spain the WW funds are 704, while in Italy they were 445. For the same period, LL funds were 261 and 297 respectively. These figures might be indicative of positive performance persistence being stronger, but are still high when compared to funds turning from losers-winners and vice versa. When considering WL and LW funds, their correspondence is 1 to 7 in Spain and 1 to 3 in Italy, relative to WW funds. The described representation applies for Portugal likewise, even though in lesser extent, while in Greece performance persistence is still evident, but slightly stronger on the negative side. Positive performance persistence is also existent and second in importance.

Overall, the main finding that holds is that the fund sample shows evidence of persistence driven by ‘hot hands’. The difference between the portfolios of winners over successive periods and those of the losers (LL) over two successive periods is not negligible. Summing up, at a 6 month horizon, for the whole sample period, we find a significantly positive spread of winners over losers with the exception of the Greek market, a fact that could be attributed to the crisis periods where some funds belonging to specific banking/financial groups could be sustaining larger losses than the average fund. Funds documented with persistence in performance are mainly driven by ‘hot hands’, rather than ‘cold hands’, indicating that funds that outperform mean returns in one period are most likely the ones to perform well in the next as well. Underperforming ones are also likely to continue doing so. This is important especially in light of the fact that we examine fixed income funds where prospective returns are in any case rather small. Investors should therefore avoid these funds. Fixed income funds are also considered of minimum or zero risk. The current financial crisis, striking primarily fixed income organized funds, shows how false this widespread notion could be. It should also be noted that outperformance relative to mean returns is asymmetrical. Some funds referred as winners in one period could have outperformed market returns relative to another, where this overperformance might be marginal. This affirmation does certainly not lessen the need for a fund of fund manager or individual large caliber investor to seek for the best performers. Reported results on performance persistence are statistically robust as confirmed by both the Brown and Goetzmann and the Kahn and Rudd tests performed for our data set as outlined in Table 5. The reported results depicted as averages of the per country reported results are statistically significant at the 5% significance level.

#### INSERT TABLE 5

Our data set does not address the survivorship bias issue, well documented in the literature, which should be considered in case of further in-depth analysis on the referred markets. Many non surviving funds have been removed from the lists of offered funds to investors because of

bad performance, but we should bear in mind that many others may have merged or taken up by other funds, while also we have those that were born after the initiation of our data set and may exist until today, which have also been removed from the present analysis. For example in the oligopolistic Greek market a number of mergers took place in the banking/financial system that influenced part of our sample, the mutual fund market having shrunk at least as far as the number of available funds is concerned. In this context many funds that existed for a particular period may not exist in the next, as a result of mergers with other funds (Dritsakis et al., 2006).

The data set spanning several years and utilizing weekly data incorporates the pre 2008 crisis period, as well as the pre and part of the current debt crisis period that initiated towards the end of 2009. Unreported empirical data depict not significant difference in performance persistence measurement before and during the 2008 crisis. Initial data regarding the debt crisis show negative performance persistence becomes even stronger in 2009-2010 which could be attributed to the large exposure of some funds to Greek debt. Results for Portugal, Spain and Italy have only captured the initial phases of the ongoing crisis, thus definite conclusions on the impact of the debt crisis on performance persistence remains to be investigated by future research.

Practical inferences from academic scrutiny requires the application of derived findings to real life applicable problems. In this perspective, as outlined in Section 3, we test for the possibility to achieve above average returns when employing available funds to top performers as indicated by performance persistence testing. In achieving that, we use as benchmarks per country bond indices, to capture the possibility of ex ante excess returns arising from the best three winner funds in consecutive periods. Empirical results support our hypothesis that such a phenomenon could be verifiable. As shown in Table 6, a positive alpha is observable for all four south European countries. A statistically significant average alpha of approximately 0.5% is undeniable an attractive prospect for fund managers striving for few basis points that will distinguish their managing abilities from those of their peers. Greece appears to have the highest alpha, with 0.65% outperformance for the whole sample, with Portugal being last with 0.32%. Italy has the highest observable 6-monthly alpha of 1.32%, but this was only observed for one examination period. When dividing the sample in subperiods no significant deductions can be made other than the fact that top performing funds in each country consistently outperform the passive benchmark. Negative alphas are very scarce in model 3.6 results but some marginal observations are captured from the regression analysis as also depicted in Table 6 from the negative minimum alphas reported for Spain, Portugal and Greece.

#### INSERT TABLE 6

The analysis above is in line with Agudo and Marzal (2004), who having substantiated the existence of performance persistence in investment funds, confirm the possibility to create simple and functional systematic investment strategies allowing the decision-maker, asset manager or investor, to attain higher returns than those that could be achieved via random investments.

## 5. CONCLUDING REMARKS

Among the fundamental goals of every institutional investor is appropriate asset allocation, effective diversification, and increased fund selection ability. From an investor perspective these goals remain equally as important whether an investor is in a stage of asset accumulation or withdrawal. The present work attempts to partly cater the needs of both. We test for performance persistence in a sample of fixed income funds domiciled in Portugal, Spain, Italy and Greece. Our performance measurement and ranking methodology is derived from the original Sharpe



ratio as recent literature shows its superiority relative to alternative suggested measures. This analysis is of increased importance in light of the fact that our data set included all the southern eurozone countries currently confronting different phases of the debt crisis. The target funds invest in fixed income, hence bearing the brunt of the crisis and suffering from reduction in returns or losses as in the case of Greece. The data spanning though the period 01/01/2004-31/12/2010 provides useful inferences as to how the 2008 crisis influenced the ability of fund managers to beat mean returns, evidence which can be extrapolated to the current crisis and provide useful information to fund of fund managers and practitioners focusing their research in the various attributes of mutual fund management.

The Greek sample, representing the only country from our sample that already since 2009 had started suffering from the current crisis, offers some initial hints of how the crisis affects performance persistence. Results show that performance persistence is marginally impacted. On average results indicate statistically significant evidence of positive performance persistence with the exception of Greece where 'cold hands' are observed, a fact that can be interpreted as funds ability to continue outperforming mean returns primarily on the positive side and to some extent on the negative side as well.

Following the preceding analysis, we utilize the derived information in order to test for the possibility to have achieved superior market returns in fixed income by continuously rebalancing a diversified portfolio, based on the gathered 6-monthly information. Regression analysis, individually run for each of the four countries under examination, shows that realizing superior returns than passive benchmarks on an ex ante basis is possible by investing on 6-monthly periods on the three best winners per period. Following this rationale a generalized statement leads us into believing that an investor could use past performance persistence data for different portfolios to exploit opportunities on this basis.

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## APPENDIX

**Table 1.** Performance persistence results Greece

Subperiod	WW	WL	LW	LL
01/01/2004-31/12/2004	5	3	1	5
01/07/2004-30/06/2005	4	2	2	6
01/01/2005-31/12/2005	5	1	4	4
01/07/2005-30/06/2006	4	5	3	2
01/01/2006-31/12/2006	2	5	3	4
01/07/2006-30/06/2007	4	1	4	5
01/01/2007-31/12/2007	5	3	2	4
01/07/2007-30/06/2008	3	4	4	3
01/01/2008-31/12/2008	6	1	2	5
01/07/2008-30/06/2009	5	3	2	4
01/01/2009-31/12/2009	3	4	3	4
01/07/2009-30/06/2010	2	3	3	5
01/01/2010-31/12/2010	3	2	7	2
<b>TOTAL FUNDS</b>	51	37	40	53

Note: The Table reports the number of funds found to be winners in 6-monthly consecutive periods (WW), those that had losses or below average profits in two successive periods (LL), those becoming losers from winners (WL) and losers turned into winners (LW). Performance measurement and ensuing ranking method is the traditional Sharpe ratio.

**Table 2.** Performance persistence results Spain

Subperiod	WW	WL	LW	LL
01/01/2004-31/12/2004	60	4	2	23
01/07/2004-30/06/2005	58	4	5	22
01/01/2005-31/12/2005	57	6	6	20
01/07/2005-30/06/2006	61	2	3	23
01/01/2006-31/12/2006	56	8	5	20

<b>01/07/2006-30/06/2007</b>	47	14	6	22
<b>01/01/2007-31/12/2007</b>	47	6	4	32
<b>01/07/2007-30/06/2008</b>	45	6	9	29
<b>01/01/2008-31/12/2008</b>	47	7	6	29
<b>01/07/2008-30/06/2009</b>	48	5	19	17
<b>01/01/2009-31/12/2009</b>	65	2	17	5
<b>01/07/2009-30/06/2010</b>	66	16	1	6
<b>01/01/2010-31/12/2010</b>	47	20	9	13
<b>TOTAL FUNDS</b>	704	100	92	261

Note: The Table reports the number of funds found to be winners in 6-monthly consecutive periods (WW), those that had losses or below average profits in two successive periods (LL), those becoming losers from winners (WL) and losers turned into winners (LW). Performance measurement and ensuing ranking method is the traditional Sharpe ratio.

**Table 3.** Performance persistence results Italy

<b>Subperiod</b>	<b>WW</b>	<b>WL</b>	<b>LW</b>	<b>LL</b>
<b>01/01/2004-31/12/2004</b>	36	20	4	22
<b>01/07/2004-30/06/2005</b>	37	3	18	24
<b>01/01/2005-31/12/2005</b>	49	6	3	24
<b>01/07/2005-30/06/2006</b>	45	7	8	22
<b>01/01/2006-31/12/2006</b>	42	11	7	22
<b>01/07/2006-30/06/2007</b>	45	4	11	22
<b>01/01/2007-31/12/2007</b>	44	12	10	16
<b>01/07/2007-30/06/2008</b>	41	13	7	21
<b>01/01/2008-31/12/2008</b>	37	11	9	25
<b>01/07/2008-30/06/2009</b>	17	29	24	12
<b>01/01/2009-31/12/2009</b>	25	16	13	28
<b>01/07/2009-30/06/2010</b>	12	26	19	25
<b>01/01/2010-31/12/2010</b>	15	16	17	34
<b>TOTAL FUNDS</b>	445	174	150	297

Note: The Table reports the number of funds found to be winners in 6-monthly consecutive periods (WW), those that had losses or below average profits in two successive periods (LL), those becoming losers from winners (WL) and losers turned into winners (LW). Performance measurement and ensuing ranking method is the traditional Sharpe ratio.

**Table 4.** Performance persistence results Portugal

<b>Subperiod</b>	<b>WW</b>	<b>WL</b>	<b>LW</b>	<b>LL</b>
<b>01/01/2004-31/12/2004</b>	5	2	1	3
<b>01/07/2004-30/06/2005</b>	3	2	1	5
<b>01/01/2005-31/12/2005</b>	2	3	4	2
<b>01/07/2005-30/06/2006</b>	5	2	2	2
<b>01/01/2006-31/12/2006</b>	4	2	3	2
<b>01/07/2006-30/06/2007</b>	4	2	3	2
<b>01/01/2007-31/12/2007</b>	3	2	3	3
<b>01/07/2007-30/06/2008</b>	4	1	2	4
<b>01/01/2008-31/12/2008</b>	1	5	2	3
<b>01/07/2008-30/06/2009</b>	4	1	2	4
<b>01/01/2009-31/12/2009</b>	3	2	3	3
<b>01/07/2009-30/06/2010</b>	2	3	4	2
<b>01/01/2010-31/12/2010</b>	2	4	3	2
<b>TOTAL FUNDS</b>	42	31	33	37

Note: Table reports the number of funds found to be winners in 6-monthly consecutive periods (WW), those that had losses or below average profits in two successive periods (LL), those becoming losers from winners (WL) and losers turned into winners (LW). Performance measurement and ensuing ranking method is the traditional Sharpe ratio.

**Table 5.** Statistical tests for performance persistence

<b>Subperiod</b>	<b>Brown &amp; Goetzmann Z</b>	<b>Kahn &amp; Rudd X<sup>2</sup></b>
<b>Jan.04-Jun.04</b>	1.369	1.811
<b>Jul.04-Dec.04</b>	1.437	2.014
<b>Jan.05-Jun.05</b>	1.521	1.894
<b>Jul.05-Dec.05</b>	1.434	2.300
<b>Jan.06-Jun.06</b>	1.436	2.381
<b>Jul.06-Dec.06</b>	1.253	1.755
<b>Jan.07-Jun.07</b>	1.295	1.455
<b>Jul.07-Dec.07</b>	1.405	1.518
<b>Jan.08-Jun.08</b>	1.320	1.249
<b>Jul.08-Dec.08</b>	1.415	1.329
<b>Jan.09-Jun.09</b>	0.413	0.891

<b>Jul.09-Dec.09</b>	0.733	1.925
<b>Jan.10-Jun.10</b>	0.140	2.007
<b>Jul.10-Dec.10</b>	0.337	0.895
<b>AVERAGE</b>	1.108	1.673

Note: Table reports Brown and Goetzmann and Kahn and Rudd statistical tests to control for the accuracy of the derived results from the performance persistence analysis. Results are reported collectively by calculating simple averages for individual results calculated separately for all four countries included in our data set. Results are statistically significant at the 1% significance level.

**Table 6.** Summary ex ante investment strategy results collectively for Italy, Spain, Portugal and Greece for the period 2004-2010

	<b>Alpha (<math>\alpha</math>)</b>	<b>Beta (<math>\beta</math>)</b>	<b>Min <math>\alpha</math></b>	<b>Max <math>\alpha</math></b>	<b>Q1 <math>\alpha</math></b>	<b>Q2 <math>\alpha</math></b>	<b>Q3 <math>\alpha</math></b>	<b>Adjusted <math>R^2</math></b>
<b>Italy</b>	0.0059*	0.5532	0.0001	0.0132	0.0023	0.0035	0.0089	0.6745
<b>Spain</b>	0.0047**	0.6259	- 0.0007	0.0114	0.0056	0.0074	0.0028	0.7247
<b>Portugal</b>	0.0032**	0.6289	- 0.0024	0.0098	0.0015	0.0056	0.0029	0.7879
<b>Greece</b>	0.0065***	0.8127	- 0.0033	0.0118	0.0045	0.0027	0.0069	0.7082

Note: Following the Treynor-Mazuy quadratic regression model as outlined in equation 3.6, the table reports excess returns on an ex ante basis. Portfolios appearing as dependent variables are country portfolios containing the top performers per period, per market and their returns are regressed relative to benchmark returns in the individual market. Data period is split into three parts and correspondingly results are reported for each, while minimum and maximum alphas are also provided. Coefficient beta ( $\beta$ ), measures the systematic risk measure, and  $R^2$  results column quotes the adjusted  $R^2$  results.

\*\*\* Significant at 0.01; \*\* Significant at 0.05; \* Significant at 0.10