Universidade do Minho
Escola de Economia e Gestão

Catherine Viana da Silva

The Performance of US Socially Responsible Mutual Funds

April, 2015

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The Performance of US

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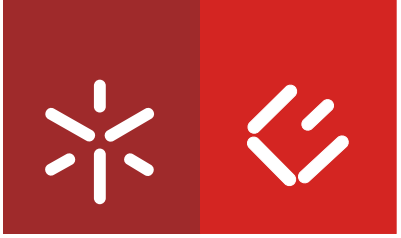

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The Performance of US Socially Responsible Mutual Funds

Master dissertation
Master in Finance

Study realized under the supervision of
Professor Doutor Nelson Manuel P. B. Areal

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Declaração

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RESUMO

Esta dissertação pretende investigar o desempenho dos fundos socialmente responsáveis no período de janeiro de 2001 a setembro de 2014, através da comparação dos fundos de retalho com os fundos institucionais. Desta forma, pretendemos dar uma visão mais clara sobre o desempenho dos fundos de investimento socialmente responsáveis dos EUA num contexto de (não) variação no tempo em diferentes estados do mercado entre os dois tipos de fundos. Para tal, são consideradas várias medidas de desempenho que são amplamente utilizadas na literatura.

O desempenho dos fundos foi avaliado com base nas medidas não condicionais de Jensen (1968) e Carhart (1997) e também no modelo condicional completo de Christopherson *et al.* (1998). Por fim, com o objetivo de obter resultados mais sólidos, uma variável *dummy* será usada para definir os diferentes estados de mercado. Deste modo, o desempenho das carteiras será medido num contexto de tempo variável de acordo com as classificações do NBER.

Os resultados não mostram diferenças estatisticamente significativas entre as duas carteiras na abordagem VW. Estes resultados são consistentes com a evidência empírica. Por sua vez, a EW carteira de fundos institucionais tem um desempenho superior ao da EW carteira de fundos de retalho (modelos não condicionais). Enquanto para o modelo dos quatro fatores de tempo variável de Carhart (1997) os resultados sugerem que os fundos institucionais têm um desempenho significativamente menor que os fundos de retalho.

Por fim, o alfa em períodos de expansão é neutro para as carteiras VW e EW, exceto a carteira VW PINS que tem um desempenho negativo e estatisticamente significativo. Além disso, essas carteiras não variam durante a recessão. Analisando os outros fatores de risco, podemos inferir que as carteiras EW e VW não mudam significativamente dos períodos de expansão para os períodos de recessão. Além disso, os resultados mostram que há algumas evidências de mudanças do fator Momentum em diferentes regimes de mercado.

Abstract

This master thesis investigates the performance of SRI retail mutual funds compared to SRI institutional funds, over the time period of January 2001 to September 2014. By doing so, it provides a better insight into the performance of US socially responsible mutual funds in a (non) time-varying context in different states of the market between both fund types. To this end, several performance measures that are widely used in the literature are considered.

Fund performance was evaluated on the basis of the Jensen (1968) and Carhart (1997) unconditional measures and also the full conditional model of Christopherson, Ferson and Glassman (1998). Finally, in order to get more robust results, a dummy variable will be used to define the different market conditions. Thus, the performance of the portfolio will be measured in a time varying context under the NBER classifications.

The results show no statistically significant differences between the two portfolios for the value-weighted approach. This is consistent with previous empirical evidence. Meanwhile, the EW portfolio of institutional funds has a higher performance than the EW portfolio of retail funds (unconditional models). While for the time varying Carhart (1997) four-factor model, the results suggest that institutional funds underperform significantly more than retail funds.

Finally, the alpha in periods of expansion is neutral for the equally weighted and value weighted portfolios, except the VW PINS portfolio that underperforms significantly. Additionally, those portfolios do not change during recession. Analysing the other risk factors, it may be inferred that EW and VW portfolios do not change significantly from periods of expansion to periods of recession. Furthermore, the results show that there is some evidence that the momentum factor changes across different market regimes.

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LIST OF ACRONYMS AND ABBREVIATIONS

CAPM	*Capital Asset Pricing Model*
ESG	*Environmental, social and governance*
EW	*Equally-weighted*
HAC	*Heteroskedasticity and autocorrelation consistent*
HC	*Heteroskedasticity consistent*
KLD	*Kinder Lydenberg Domini*
NBER	*National Bureau of Economic Research*
PALL	*Portfolio of All (retail and institutional) funds which TNA > $10m*
PINS	*Portfolio of Institutional funds*
PRET	*Portfolio of Retail funds*
PSMALL	*Portfolio of small funds which TNA < $10m.*
SIF	*Social Investment Forum*
SRI	*Socially Responsible Investments*
S&P500	*Standards and Poor's 500*
US	*United States*
VW	*Value-weighted*

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1. Introduction

1.1. Socially responsible funds

Mutual funds have become one of the largest financial intermediaries in the leading world economies, currently controlling about US$26.6 trillion of investments in the world.[1] The performance of mutual funds inevitably becomes of significant interest not only to individual/professional investors investing in funds, but also to academics. Thus, the performance evaluation of investment portfolios has been widely debated in the financial literature.

Moreover, the performance of socially responsible investments (SRI) has been receiving increasing interest in the academic literature. Accompanying this trend, a significant number of socially responsible mutual funds have grown faster than traditional mutual funds (Cortez *et al.*, 2009); a central issue consists on whether the financial performance is sacrificed or not by taking into account social issues. "Socially responsible investing (SRI) is an investment process that considers the social and environmental consequences of investments, both positive and negative, within the context of rigorous financial analysis" (Sustainable and Responsible Investing, 2007). In other words, socially responsible investment is "a set of approaches which include social or ethical goals or constraints as more conventional financial criteria in decisions over whether to acquire, hold or dispose of a particular investment" (Cowton, 1999, p. 60).

Furthermore, concerns of social context are also increasingly patent in financial markets, with more and more investors seeking to invest according to their social and ethical values. An increasing number of investors are willing to invest for ethics into their investment decision (Renneboog *et al.*, 2008).

SRI investment managers have three main strategies, which promote socially and environmentally responsible business practices and motivate positive impacts across the economy: screening, shareholder advocacy, and community investing (Social Investment Forum, 2007).

[1] Lipper's global fund market report

The screening strategy concerns socially responsible investments, which can use social screens (negative, positive, best-in-class) that reflect the social, religious or ethical values of investors, thus non-financial criteria is used in the investment process to decide on the inclusion and exclusion of securities. The negative screen implies the exclusion of companies that invest in socially undesirable business (tobacco, alcohol, gambling) and that are not consistent with social, environmental and ethical standards (unfair labour practices, child labour). The diversification problem appears in the negative screen where total sectors are excluded. The positive screen involves selecting companies with good practices in specific stakeholder-oriented issues (corporate governance, treatment of customers). The best-in-class screen is the best strategy, because it overcomes problems related to possible sector biases and loss of diversification that arise when using negative screens. It involves selecting the companies with the best practices in each sector. Managers of socially responsible mutual funds believe that they can make a long-term profit by selecting securities according to social screens. Investment analyses and decision-making processes incorporate positive, negative or best-in-class screening of environmental, social and governance (ESG) criteria in order to achieve portfolios with high ethical values.

The shareholders advocacy strategy (also known as shareholder activism) is a way in which shareholders can influence a corporation's behaviour by exercising their rights as owners (shareholder resolutions or active dialogue with companies).

The third approach, community investing, involves direct investment in local development initiatives.

The impacts of social screening on mutual fund performance are by definition explained by two conflicting arguments. First, the classical portfolio theory advocates that the addition of constraints will inhibit the creation of the optimal portfolio (Markowitz, 1952). The investments universe of selection is restricted in SRI, so investors will abdicate from the potential for diversification that an unconstrained portfolio shows, which will be translated into lower risk-adjusted returns (Rudd, 1981).

Moreover, a negative relationship is consistent with the neo-classic version of Friedman (1962) that sustains that social responsibility practices imply internalising additional costs, thus penalising corporate financial performance. Those funds could underperform compared with conventional portfolios. On the other hand, however, several arguments are put forward to support a positive relationship between corporate social responsibility and financial performance.

The stakeholder theory considers that the integration of all stakeholders' interests creates value for shareholders, thus resulting in a higher financial performance (Freeman, 1984). Furthermore, Kempf and Osthoof (2007) argue that SRI portfolios perform better then less responsible funds.

1.2. Retail and institutional funds

After the early 1990s, a successful new class of institutional funds was created that quickly won on popularity, more than retail funds (James and Karceski, 2006). In the fund industry, clients are sorted in two groups; "retail" which is a classification for serving individual clienteles, and "institutional" which regroups institutional investors. James and Karceski (2006) refer in their study that the selection of mutual funds by individual investors faces significant search and information costs; therefore they select their funds based on past performance, which will not precisely forecast future fund performance. Meanwhile, institutional investors base their investment decisions on more sophisticated selection criteria than individual investors do.

Concerning the fund selection ability, retail investors are considered as unsophisticated investors. On the other hand, institutional investors represent a more sophisticated type of clients. In accordance with Gruber's terminology, the retail fund investors are classified as unsophisticated and viewed as individual investors (Del Guercio and Tkac, 2002; Palmiter and Taha, 2008). Institutional funds' clients are seen as sophisticated investors or as investors who have account restriction or tax issues. The main focuses of institutional funds are on endowments, foundations, municipalities, pension funds, corporations, non-profit organisations and other large investors, including wealthy individuals. This explains the existing division in mutual funds for retail and institutional clients. Furthermore, institutional mutual fund clients tend to use more quantitatively sophisticated criteria, such as risk-adjusted returns measure and tracking error, so that they are able to prove stronger momentum-driven and herding behaviours and also less sensitive to fund expense ratio (Salganik and Scheiber, 2013).

Empirical papers, such as James and Karceski (2006), Salganik and Scheiber (2013), state that the performance between retail and institutional funds is not different from each other.

1.3.The purpose of the study

The purpose of this study is to provide a better insight into the performance of US socially responsible mutual funds in a (non) time-vary context in different states of the market, by the inclusion of public information variables. More precisely, this research aims to analyse whether there are differences between the performance of SRI retail funds and SRI institutional funds. To this end, several performance measures that are widely used in the literature are considered.

First, unconditional models (not time varying-context) are used, as the alpha of Jensen (1968) and the alpha based on the model of Carhart (1997). Empirical evidence on mutual fund performance indicates that multi-factor approaches are a much more useful characterisation of portfolio returns than single-index models (Elton *et al.*, 1996; Carhart, 1997). Thus the application of the Carhart (1997) model is motivated by possible misspecification of the single-factor model. However, unconditional models are considered to be biased, because they produce incorrect performance estimates, since they can confound the normal variation in risk and risk premiums with manager's performance. Aragon and Ferson (2008) state that the reasons for the biases estimates are that portfolio managers exhibit market-timing skills or engage in dynamic investment strategies resulting in time-varying risk. In order to overcome this limitation, the performance of portfolios is analysed based on a time-varying approach. Ferson and Schadt (1996) developed the partial conditional model, allowing the risk estimates to vary over time depending on economic conditions, with the inclusion of public information variables.

Second, this study only considers the full conditional model of Christopherson *et al.* (1998). The decision to only present the results of the conditional model of Christopherson *et al.* (1998) is due to the statement that those models are more robust, so alphas and betas vary over time; if only alphas are considered time-varying, it may lead to biased estimates of performance and risk (Ferson *et al.*, 2008; Christopherson *et al.*, 1998). This model allows the variation of risk and performance over time, with the inclusion of public information variables. Most empirical evidences are consistent on the fact that conditional models lead to better performance estimates then unconditional models (Cortez *et al.*, 2009; Bauer et al, 2006; Bauer *et al.*, 2007). Ferson and Schadt (1996) state that conditional models are more robust and provide slightly better estimates of performance.

The study of Fama and French (1989) suggests that variables related to economic conditions are useful in predicting the returns of stocks and bonds.

Third, in order to get more robust results, a dummy variable is used to define the different market conditions (Moskowitz 2000; Kosowski 2011, Areal *et al.* 2013; Nofsinger and Varma (2014). Thus, the performance of the portfolio is measured in a time varying context under the NBER classifications.

Finally, the performance evaluation of small funds, which total net asset, is below $10.mil. is assessed. The total net asset of $10mil. will be used as reference to identify the smallest funds, as the study of Bollen (2007). A brief comparison with the portfolio of large funds, whose TNA exceeds $10.mil. is made. According to the literature, the size of the fund is a relevant factor to consider. Chen et al. (2004) state that fund size erodes performance due to liquidity and organizational diseconomies, especially funds investing in small and illiquid stocks.

Although the literature on SRI is growing, there are more SRI equity funds than SRI bond funds available in the Social Investment Forum; therefore I will choose to investigate SRI equity mutual funds. Another thing to point out is that European mutual funds have a lack of readily available fund classification compared to US mutual funds, therefore I decided to choose only equity domestic style and cap-based funds in the United States. The following questions will be answered through this master thesis:

- Does the performance of US socially responsible mutual funds change in different market conditions?
- Is there any difference between the performance of retail and institutional funds?

1.2 The structure of the dissertation

This dissertation is organised into six sections. The first chapter consists on a brief introduction about the topic and the main objectives of the master's thesis. The subsequent chapter focuses on the literature review about the performance of socially responsible investments, the performance of conventional retail and institutional funds and the funds' performance under the NBER classifications. The methodology will be described in the third chapter, along with the models used to assess the SRI performance. The following chapter describes the data, which consists on US socially responsible mutual funds. Chapter five sums up the main results, including an analysis and discussion of the empirical results in terms of performance evaluation based on different methodologies. A main conclusion of the study will be presented in the last chapter, as well the limitations and suggestions for future research.

2. Literature Review

2.1 Introduction

This section presents the supporting literature review to the performed empirical results that will be reported later.

One of the objectives is to discuss the most important literature in relation to socially responsible funds. Additionally, only empirical evidence of conventional retail and institutional funds are presented, because there are no studies in the area of socially responsible investments, which compare both types of funds with each other.

Finally, several studies that used NBER business cycles to define different market regimes for socially responsible and conventional funds' performance are discussed.

2.2 Performance of socially responsible investments

Cortez *et al.* (2009) mentioned in their study that the relationship between social and financial performance has been developed along three different approaches in numerous studies.

The first one consists on the difference between the performance of individual companies that have strong socially responsible performance and other companies with low SRI performance. Numerous studies have investigated the relationship between financial and corporate social performance. Since the study of Moskowitz (1972), some authors obtained the same statement that socially responsible investments are beneficial for the company. Moskowitz (1972) found evidence of a positive relationship between corporate social and financial performance, concluding that socially responsible companies are good investments. Companies with better social and environmental expertise can be identified trough the use of social criteria, by allowing them to choose better management skills and, therefore, a better future financial potential (Moskowitz, 1972). However, there is no definite consensus on the existence and nature of this relationship, this may result from the use of different methodologies, the limited samples and associated time periods, and on the type of measures used to assess the social, environmental and financial performance (Ullman, 1985).

Most academic studies tend to show a positive relationship between corporate social responsibility and financial performance (Margolis and Walsh, 2001; Orlitzky *et al.*, 2003). These results, however, should be interpreted with caution, considering several conceptual and methodological shortcomings that have been pointed out. Margolis and Walsh (2001) state that a company involves stakeholders and deals with their concerns, that it can signal capital market that managers are well skilled and therefore the company's value will improve.

In the second approach estimations of the financial performance of indices of companies that are less socially responsible with conventional market are done (Sauer, 1997; Statman, 2006).

Finally, the last approach concerns the comparison of the performance of socially responsible mutual funds and their unscreened investments, such as conventional funds and indices (Cortez *et al.*, 2009; Goldreyer *et al.*, 1999).

Lately, socially responsible mutual funds have grown faster than traditional mutual funds, bringing up a central issue of whether or not socially responsible mutual funds have a similar performance to conventional mutual funds. According to Markowitz (1952), a portfolio should be diversified across industries. Consequently, two conflicting arguments appear when using socially responsible criteria on mutual fund performance: first, the modern theory suggests that portfolios built on omitting some sectors of stocks will lose diversification possibilities (Rudd, 1981), which may result in underperformance when compared with the conventional mutual fund over the long term. In addition, using various social screenings on mutual funds may weaken the fund managers' incentive to pursue high risk-adjusted excess returns. Second, a negative relationship is consistent with the neo-classic version of Friedman (1962) that sustains that social responsibility practices imply internalising additional costs, thus penalising corporate financial performance, which reflect on lower returns. Those funds could underperform compared with conventional funds. Rudd (1981) argues that the investments universe of selection is restricted in socially responsible investments, which will be translated into lower risk-adjusted returns. Socially responsible mutual funds underperform the domestic conventional mutual funds in the US, the UK and in many European and Asia-Pacific countries by 2.2% to 6.5% (Renneboog *et al.*, 2008a).

However, Drut (2010) states that investors can construct their bond portfolio by considering social screens, and there will not be any lack of diversification. D'Antonio *et al.* (1997) are the first in academic literature suggesting that the concept of socially responsible investing like screening for ESG criteria can be transferred from equity to bond investments. Furthermore, Kempf and Osthoof (2007) argue that SRI portfolios perform better.

In addition, Moskowitz (1972) reports that socially responsible mutual funds may attract investors by requiring managers' requisite skills to run a superior company. As a result, socially responsible mutual funds might outperform non-screened funds, which means a positive relationship between corporate social responsibility and financial performance can appear. Moreover, several arguments are put forward to support a positive relationship between corporate social responsibility and financial performance. The stakeholder theory considers that the integration of all stakeholders' interests creates value for shareholders, thus resulting in a higher financial performance (Freeman, 1984). In support of the above argument, Hill *et al.* (2007), and Kempf and Osthoff (2007) conclude that SRI portfolios benefit from improved performance in the long run. Kempf and Osthoof (2007) argue that SRI portfolios perform better then less responsible funds. They used the ratings of the Kinder Lydenberg Domini (KLD) (social responsibility based on annual data from 1991 to 2003, and used a strategy of buying shares of companies with high ratings and sell stocks of companies with low ratings. These ratings are defined according to qualitative criteria and exclusion criteria. As regards the qualitative criterion, the rule would include filters such as community relations, diversity, labour relationships, environment, human rights and product.

Meanwhile, some authors argue that there is no statistical difference between socially responsible mutual funds and non-socially responsible mutual funds, implying a neutral relationship. The above-mentioned empirical evidence concerns several studies that focus on different geographic areas. Goldreyer *et al.* (1999) and Hamilton *et al.* (1993) show that the performance of US socially responsible mutual funds are not statistically different from conventional funds. In those studies, the single-index framework is used as methodology and for this reason some limitations arise. For UK investment portfolios, Gregory *et al.* (1997) also show the conclusion above.

In an attempt to overcome some limitations that were identified in some earlier studies, Bauer *et al.* (2006), Bauer *et al.* (2007) and Cortez *et al.* (2009) apply multifactor models and conditional models as methodologies for more robust performance. They state that there is no statistical difference between the performance of SRI and conventional funds, meaning no underperformance in relation to unscreened funds. The three studies used different geographic areas: Bauer *et al.* (2006) on Australian funds, Bauer *et al.* (2007) on Canadian funds, Cortez *et al.* (2009) on European funds. Additionally, the performance estimates improved in conditional measures as conventional and socially responsible benchmarks are considered. They showed, on the one hand, a neutral performance of funds to both conventional and socially responsible benchmarks. On the other hand, they showed that the performance is better when funds are evaluated in relation to socially responsible benchmarks. Empirical evidence of time varying beta is stated in the conditional models used in the study of Cortez *et al.* (2009) but this is not the case for alpha. The financial performance is not sacrificed if the investor wishes to implement social screens in his investment decision.

2.3 Performance of conventional retail and institutional funds

According to the literature, James and Karceski (2006), Salganik and Scheiber (2013), state that performance between retail and institutional funds is not different from each other.

In the study of James and Karceski (2006), the performance evaluation is measured through the risk-adjusted five-factor model, which adds an international equities factor, similar to that used by Carhart (1997). They analyzed the differences in performance between retail and institutional funds during the time period of 1995 to 2001. James and Karceski (2006) showed that the performance between retail and institutional funds is not different from each other, despite significantly lower management expenses. Additionally, they studied cross-sectional differences in performance of institutional funds, by splitting them in proxies for the degree of investor oversight. Their results show that institutional funds before and after adjusting for risk and expenses perform significantly better than institutional funds with retail mates and funds with low initial investment requirements.

Salganik and Schreiber (2013) analysed the fund selection abilitily of institutional and retail fund investors from January 1999 to May 2009, to see which one of them is better. His results suggest that institutional fund investor do not demonstrate a better fund ability. They state that retail and institutional funds exhibit a negative, but not statistically significant. The performance is assessed through the unconditional Fama and French model and the Carhart (1997) model. Several studies report that mutual fund performance varies over business cycles (Moskowitz, 2000; Kosowski, 2006). They find that mutual funds outperform the market during recession periods, while underperforming during expansion periods. Salganik and Scheiber (2013) analysed the smart money effect for recession and expansion periods for both types of fund, according to the NBER business cycles. Both institutional and retail investors demonstrate no smart money effect in periods of recession, while showing a significant smart money effect during expansion periods. In other words, significant selection ability is demonstrated in expansion periods, but not in recession periods. The authors also state that the momentum factor differs over different business cycles.

Gallagher and Jarnecic (2003) studied the performance of australian-based open-end international funds by analysing retail and institutional funds separately. The performance evaluation is measured by computing the unconditional CAPM and the conditional model of Ferson and Schadt (1996). They state that average active fund (retail and institutional funds) does not outperform the benchmark.

In accordance with Gruber's terminology, the retail fund investors are classified as unsophisticated and viewed as individual investors (Del Guercio and Tkac, 2002; Palmiter and Taha, 2008).

First, Del Guercio and Tkac (2002) studied the reaction of investors to the past performance of pension funds and funds investment, from 1985 to 1994, using the gross profitability and the Jensen's alpha (1987). He considers institutional fund, namely pension fund sponsors that are professionals specialized in investment management, more sophisticated than retail fund investors. A better access to services of professional experts to institutional funds is provided through the economies of scale. Moreover, the economies of scale reduce more search costs for institutional investors than for individual investors. Institutional investors have access to larger assets, meaning that they have more opportunities of diversification.

Second, Palmiter and Taha (2008) concluded that individual investors are mostly ignorant and financially unsophisticated; because individual investors are unaware of the basic characteristics of the funds they invest in. Additionally, individual investors do not consider the risk and the costs associated with their fund investments, and chase past returns.

2.4. Performance of SRI/conventional funds according to NBER business cycles

Empirical papers, such as Moskowitz (2000), Kosowski (2006) and Glode's (2011), suggest that conventional funds perform significantly better in recession periods than in expansion periods.

First, Moskowitz (2000) analysed two subsamples: the gross and net returns of funds across each quarter separately in order to test if they are driven by fund biases, such as window dressing or tax-motivated trading (conventional funds). Moskowitz (2000) used periods of expansion and recession according to NBER business cycles to define different market regimes while recomputing the performance measures. The results obtained by this computation shows underperformance during expansion periods and outperformance in recession periods. Additionally, he states that adjusting fund returns for size, value and momentum premia increase during recession rather than otherwise, as the average stock style measure indicates, suggesting that active managers deliver returns when investors need them the most.

Second, Kosowski (2011) states that the stylised fact of average mutual fund net return underperform in expansion periods and outperform in recession periods. Thus, funds have a negative and statistically significant performance in expansion periods and in recession periods it is the opposite as alpha is positive. Meanwhile, it means that when the investors' marginal utility of wealth is high, then in a recession period the unconditional performance model would minimise the supplement value by active mutual fund managers. He analysed the performance of the sample by using a full conditional model, where risk and return vary through time. The methodology used by Kosowski (2001) included a dummy variable based on the NBER business cycles. Kosowski (2011) and Moskowitz (2000) note that examination of the unconditional performance of mutual funds may not properly answer the question of how mutual funds perform under the NBER classifications.

Third, Glode (2011) analysed data on US funds and suggests that conventional funds underperform in expansion periods and outperform in recession periods. He states that the ability of active managers to deliver a superior performance during recession periods than during expansion periods could be explained by a strong investor demand for actively managed funds. Moskowitz (2000) and Glode (2011) state that while actively managed mutual funds tend to underperform unconditionally, they may be valuable to investors as they deliver superior returns during recession periods.

The results obtained by Areal *et al.* (2013) are in line with those obtained for conventional funds (Moskowitz, 2000; Glode, 2011; Kosowski, 2011), as they show underperformance during expansion periods.

Areal *et al.* (2013) analysed in their study the performance evaluation of US mutual funds employing different ethical criteria, such as religious and socially responsible and irresponsible criteria (sin funds), and used several models for this end. One was the use of periods of expansion and recession according to the National Bureau of Economic Research business cycles to define different market regimes, and the other was the use of an endogenous classification given by a Markov switching regime. They state that estimates of performance vary across different market conditions. On the one hand, Vice funds underperform in high-volatility regimes and outperform in low ones. Consequently, this result contradicts the "solid investment during recession". On the other hand, SR and MR funds exhibit different performance across different market regimes. MR funds have a negative performance and show underperformance in high-volatility regimes, which contradicts Boasson *et al.* (2006) study of neutral performance.

Moskowitz (2000), Kosowski (2011), Areal *et al.* (2013) are examples of studies that also use NBER business cycles to define different market regimes.

Nofsinger and Varma (2014) analysed US socially responsible funds and their conventional patterns during crisis and non-crisis periods. The performance evaluation is measured by computing the return alphas of CAPM, Fama and French (1993) 3-factor model, and Carhart (1997) 4-factor model with the incorporation of two dummy variables that are based on the NBER classifications. They state a neutral relation of both samples and no differences between them. However, they conclude that SRI funds outperform conventional funds in crisis periods and underperform during non-crisis periods.

Moreover, the cost of underperforming during non-crisis periods comes from dampening of downside risk. Apparently, investors seeking downside protection would value the asymmetry of these returns, which are driven by funds focusing on environmental, social or governance (ESG) screens and use simultaneously positive screens. They analysed differences in performance across SRI foci and screening strategies in order to show possible boosters of results by using different classes of SRI investing strategies.

3. Methodology

3.1. Introduction

After the presentation of the literature review, this chapter proceeds with the presentation of the methodology, assessing the performance evaluation of socially responsible mutual funds.

First, the unconditional evaluation measures, the alpha of Jensen (1968) and the alpha of the four-factor of Carhart (1997) will be presented. As unconditional models do not consider time-varying risk and returns over time, they are considered to be biased, since their application may lead to incorrect performance estimates (Aragon and Ferson, 2008, p.118).

In this context, the Christopherson *et al.* (1998) full conditional model will be presented. Conditional models take into account publicly available information about the state of the economy to predict risk and returns. Farnsworth (1997) states that "a conditional performance evaluation approach refers to the measurement of performance of a managed portfolio taking into account the information that was available to investors at the time the returns were generated" (p. 23). In other words, the expected return and risk are allowed to vary over time with the state of the economy, which is measured using predetermined public information variables. Ferson and Schadt (1996), states that conditional models are more potent and that those estimates of performance are slightly better.

The application of the Carhart (1997) model is motivated by possible misspecification of the single-factor model. The multi-index models have a better ability to capture sources of systematic risk. Therefore, they only attribute to alpha performance the results from the ability of the fund manager. There is a general agreement in the literature that multifactor models are a much more useful characterisation of portfolio returns than single-index models (Elton *et al.*, 1996; Carhart, 1997).

In order to get more robust results, the performance of the portfolio will be measured in a time varying context under the NBER classifications, a dummy variable will be used to define the different market conditions (Moskowitz, 2000; Kosowski, 2011; Areal *et al.*, 2013; Nofsinger and Varma, 2014).

3.2. Unconditional Model

3.2.1. Jensen's alpha (1968)

Jensen's model (1968) is one of the traditional performance evaluation measures used by academics to assess the performance of investment portfolios. This measure is considered to be unconditional because it does not consider the variability of risk over time. The estimation of the Jensen model will serve mainly to compare the exposure of socially responsible funds with the benchmark.

The measure of performance will be based on Jensen's (1968) alpha, which is the intercept (α_i) of the CAPM-based following regression:

$$r_{p,t} = \alpha_p + \beta_p r_{m,t} + \varepsilon_{p,t} \qquad \textbf{(1)}$$

where:

$\boldsymbol{\alpha_p}$ is the abnormal return of fund *p* (return above or below the CAPM equilibrium return implied by its level of systematic risk)

$\boldsymbol{\beta_p}$ represents the systematic risk of fund *p*

$\boldsymbol{r_{p,t}}$ is the excess return of fund p over period *t*

$\boldsymbol{r_{m,t}}$ represents the excess return of the market over period *t*

3.2.2. Carhart's alpha (1997)

A four-factor model will be implemented, i.e. the unconditional Carhart 4-factors model (1997), which includes three more variables: size factor (SML), book-to-value factor (HML) and momentum factor (MOM).

The Carhart four-factor model (1997) increases the risk, size, value and momentum factors in the performance evaluation. The application of the Carhart (1997) model is motivated by possible misspecification of the single-factor model. Multifactor models are a much more useful characterisation of portfolio returns than single-index models (Elton *et al.*, 1996; Carhart, 1997).

The regression of the unconditional Carhart (1997) four-factor model is specified as follows:

$$r_{p,t} = \alpha_{po} + \beta_{po} r_{m,t} + \beta_{p,SMB}(SMB_t) + \beta_{p,HML}(HML_t) + \beta_{p,MOM}(MOM_t) + \varepsilon_{p,t} \quad \textbf{(2)}$$

where:

SMB (small minus big) is the difference in returns between a portfolio of small stocks and a portfolio of large stocks

HML (high minus low) is the difference in returns between a portfolio of high book-to-market stocks and a portfolio of low book-to-market stocks

MOM (momentum) consist on the difference in return between a portfolio of past 1-year winners and a portfolio of past 1-year losers

$\boldsymbol{\beta_{p,SMB}\beta_{p,HML}\beta_{p3,MOM}}$ are the factor coefficients (betas on each of the factors)

3.3. Conditional Models

3.3.1 The conditional model of Christopherson, Ferson and Glassman (1998)

Since the previous models do not consider time-varying risk and returns over time, they are considered to be biased because their application may lead to incorrect performance estimates (Aragon and Ferson, 2008, p.118). In reality, while measuring the performance, the expected return and risk vary through time.

Under these circumstances, unconditional models are considered to be biased, because they produce incorrect performance estimates, since they can confound the normal variation in risk and risk premiums with manager's performance. The reasons for the biases estimates are that portfolio managers exhibit market timing skills or engage in dynamic investment strategies resulting in time-varying risk (Aragon and Ferson, 2008). If time-varying risk is ignored, performance estimates will be biased (Ferson and Schadt, 1996).

Ferson and Schadt (1996) propose a modification in the regression, where market prices and securities only reflect available and public information. They assumed a linear functional form for the changing beta of the managed portfolio, given the market information variables (Z_t).

Meanwhile, Christopherson *et al.* (1998) extended the partial conditional model, where alpha and beta can vary through time according to the public information. They considered the temporal variability of performance and risk, hence known as the fully conditional model. In the same way that betas can be dynamic and change with market conditions, alphas may also be dynamic.

In this study only the full conditional model of Christopherson *et al.* (1998) is considered, therefore time-varying alphas and betas are included in the regression. Ferson *et al.* (2008) state that a time-varying alpha term should be included in the regression in order to obtain unbiased estimates of a conditional beta.

Christopherson *et al.* (1998) assumed the linear function from the conditional alphas, which are related to changes in public information:

$$(r_{p,t}) = \alpha_{0p} + A'_p\, z_{t-1} + \beta_{0p}\, r_{m,t} + \beta'_p (z_{t-1}\, r_{m,t}) + \varepsilon_{p,t} \quad \textbf{(3)}$$

where

$\boldsymbol{\alpha_{0p}}$ is an average alpha

$\boldsymbol{A'_p}$ is a vector that measures the response of the conditional alpha to the information variables, thus A'_p is the sensitiveness of the conditional alpha to the information variables z_{t-1}.

$\boldsymbol{z_{t-1}}$=$\mathbf{Z_{t-1}}$-E(Z) is a vector of deviation of $\mathbf{Z_{t-1}}$, from the unconditional average values;

$\boldsymbol{\beta'_p}$ is a vector that measures the response of the conditional beta to same information variables and

$\boldsymbol{\beta_{0p}}$ is an average beta, which represents the unconditional mean of the conditional betas.

Asset pricing models used time-varying variables that are also known as conditional models. They demonstrated that predetermined variables are statistically significant when the performance measure is changed.

Additionally, the mutual fund performance has a better aspect when public information controls for biases in traditional timing models are conditioned.

Ferson and Schadt (1996) used five public information variables: (1) Short term interest rate on Treasury (TB); (2) Dividend Yield (DY) of a market index; (3) Term Spread (TS), which is a measure of the slope of the term structures of interest rates; (4) Default Spread (DS) resulting from the difference between the yields of high risk bonds and low risk bonds; and (5) a variable dummy (D) for the month of January.

Replacing the market return by a set of factor returns, the equation above can be expressed as:

$$(r_{p,t}) = \alpha_{0p} + \mathrm{A'_p}\, z_{t-1} + \beta_{0p}\, F_{k,t} + \beta'_p (z_{t-1}\, F_{k,t}) + \varepsilon_{p,t} \quad \textbf{(4)}$$

where:

$\boldsymbol{\beta_{0p}}$ is an average beta, which represents the unconditional mean of the conditional betas

$\boldsymbol{F_{k,t}}$ is the vector of factor returns

In this master thesis, three public information variables of Ferson and Schadt (1996) will be used to explain the fund returns, the short term interest rate on treasury, the dividend yield of S&P500 index and the term spread. Gallagher and Jarnecic (2003) used in their study those three variables.

In this context, the full conditional model of a one-factor model is represented in the following way:

$$r_{p,t} = \alpha_{p0} + \alpha_{p,TB}(TB_{t-1}) + \alpha_{p,TS}(TS_{t-1}) + \alpha_{p,DY}(DY_{t-1}) + \beta_{p0}\, r_{m,t} + \beta_{p,TB}(TB_{t-1}) r_{m,t} + \beta_{p,TS}(TS_{t-1}) r_{m,t} + \beta_{p,DY}(DY_{t-1})\, r_{m,t} + \varepsilon_{p,t} \quad \textbf{(5)}$$

Empirical evidence from Elton *et al.* (1996) and Carhart (1997) shows that multifactor models are a much more useful characterisation of portfolio returns than single-index models.

The generalisation of the conditional approach to multi-factor models is straightforward.

The full conditional approach will be extended to a multifactor context, considering the risk factors of Carhart (1994) and the three public information variables mentioned before, which results in the following specification:

$$r_{p,t} = \alpha_{p0}+\alpha_{p,TB}(TB_{t-1}) + \alpha_{p,TS}(TS_{t-1}) + \alpha_{p,DY}(DY_{t-1}) + \beta_{p0}r_{m,t} + \beta_{p,TP}(TP_{t-1})r_{m,t} + \beta_{p,TS}(TS_{t-1})r_{m,t} + \beta_{p,DY}(DY_{t-1})r_{m,t} + \beta_{p,SMB}(SMB_t) + \beta_{pSMB,TB}(TB_{t-1}(SMB_t)) + \beta_{p,SMB,TS}(TS_{t-1}(SMB_t)) + \beta_{p,SMB,DY}(DY_{t-1}(SMB_t)) + \beta_{p,HML}(HML_t) + \beta_{p,HML,TB}(TB_{t-1}(HML_t)) + \beta_{p,HML,TS}(TS_{t-1}(HML_t)) + \beta_{p,HML,DY}(DY_{t-1}(HML_t)) + \beta_{p,MOM}(MOM_t) + \beta_{p,MOM,TB}(TB_{t-1}M(MOM_t)) + \beta_{p,MOM,TS}(TS_{t-1}MOM_t)) + \beta_{p,MOM,DY}(DY_{t-1}(MOM_t)) + \varepsilon_{p,t} \quad \textbf{(6)}$$

The conditional model can be extended to a multifactor approach. Kosowski *et al.* (2006); Cortez *et al.* (2009); Bauer *et al.* (2006) and Bauer *et al.* (2007) used in their study a conditional multi-factor model.

3.4. Time-varying Carhart (1997) four-factor based performance estimates considering NBER cycles

A last detail about the conditional models is that a dummy variable is implemented to the Carhart four-factor model to define different market conditions in order to deal with the time-varying risk issue (Moskowitz, 2000; Kosowski, 2011; Areal *et al.*, 2013; Nofsinger and Varma, 2014). The performance and risk estimates of the sample will be analysed over expansion and recession periods according to the National Bureau of Economic Research (NBER).

In this context, considering the risk factors of Carhart (1994) and the dummy variable, results in the following specification:

$$\mathrm{r_{p,t}} = \alpha_{\mathrm{p0}} + \alpha_{\mathrm{0rec}}(\mathrm{D_t}) + \beta_{\mathrm{p0}}\,\mathrm{r_{m,t}} + \beta_{\mathrm{porec}}(\mathrm{D_t})\mathrm{r_{m,t}} + \beta_{\mathrm{p,SMB}}(\mathrm{SMB_t}) + \beta_{\mathrm{p,SMB,rec}}(\mathrm{D_t}(\mathrm{SMB_t})) + \beta_{\mathrm{p,HML}}(\mathrm{HML_t}) + \beta_{\mathrm{pHML,rec}}(\mathrm{D_t}(\mathrm{HML_t})) + \beta_{\mathrm{p,MOM}}(\mathrm{MOM_t}) + \beta_{\mathrm{p.,OM,rec}}(\mathrm{D_t}(\mathrm{MOM_t})) + \varepsilon_{\mathrm{p,t}} \quad \textbf{(7)}$$

Where the variable $\mathrm{D_t}$ represents a dummy variable that assumes a value of 0 in periods of expansion and a value of 1 in periods of recession.

4. Data

In this chapter, the construction of the portfolios is explained in detail, together with the process of data selection. The sample comprises US open-end SRI equity domestic mutual funds during the period of January 2001 to September 2014.

First, socially responsible mutual funds are identified through the Social Investment Forum (SIF) from 2001 until 2012. Second, the data set is extracted from the Center for Research in Security Prices (CRSP) Survivor-Bias-Free US Mutual Fund Database. When selecting the funds included in this performance analysis, a number of requirements have been set up. In case the fund has several share classes, only the oldest one is considered. Further, only equity domestic cap-based and style funds are considered in the sample. In this paper, the performance evaluation between institutional and retail funds is compared. Finally, the CRSP's classification of institutional and retail funds is used to identify the fund type.

For each fund, the following information is considered: monthly net returns, total net asset (TNA) and investment objective. Another important point to mention is that the survivorship biases approach is normally not affected. Each fund is required to have at least 24 monthly observations. Furthermore, funds that have started/ended during the time period or have been inconsistent with the previous reported requirements are excluded from the sample. The funds have been selected this way to achieve data consistency and increase comparability of the funds over the time period.

In total, the sample is composed of 92 SRI funds, but only 79 funds satisfy the previous requirements. Thus, 6 are non-surviving funds, 3 funds do not have the required monthly observations and 4 funds are equity domestic sector funds. The detailed information on the domestic equity funds is provided in the appendix 7.

Five portfolios are constructed; two of them are separately composed by different fund types, i.e. retail (PRET) and institutional (PINS) funds. The PRET portfolio includes 58 retail funds, while the PINS portfolio is composed by 18 institutional funds. Moreover, a portfolio of all the retail and institutional funds (PALL) is built, which includes 73 funds. SRI funds that have both funds types (3 funds) are included in the corresponding fund type portfolio. In addition to the composition of the PINS and PRET investment portfolios, a portfolio of the difference is built, called PDIFF (PRET – PINS), which reflects the differences between the performance of the retail funds and the institutional funds.

This portfolio will be useful to accomplish the main objective of the master thesis. For the construction of the portfolios indicated above, only funds whose monthly mean TNA exceed $10 million were included in this analysis, than the fund size could change the performance. According to the literature, the size of the fund is a relevant factor to consider. For instance, Chen et al. (2004) state that fund size erodes performance due to liquidity and organizational diseconomies, especially funds investing in small and illiquid stocks. The total net asset of $10mil. is used as referenz to identify small funds, as the study of Bollen (2007). The total sample is therefore composed of 73 funds (PALL), because 6 funds are excluded. Finally, a portfolio including all small funds (PSMALL) is constructed, in order to compare them to large funds (PALL).

An equally weighted portfolio and a value-weighted portfolio are taken into account in order to see if there are any differences between the two approaches. One fund cannot be considered in the value-weighted portfolio because it does not have TNA for all months.

The proxy that will be used for the market portfolio is the Standard & Poor's 500 index [2] since it represents the US market.

Moreover, the other data, such as the 1-month risk free rate, risk premium, SMB factor, HML factor and MOM factor will be extracted from the website of Kenneth R. French[3].

The publicly available information variables that will be considered are term spread, short-term rate and dividend yield. This data will be extracted from Datastream. The term spread will be measured through the difference between a constant 10-year US Treasury bond yield and a constant 3-month US Treasury bill yield. The dividend yield is based on the S&P500 Index. Finally, for the short-term rate the yield on a constant-maturity 3-month US Treasury bill will be used.

A potential problem that might appear is the bias resulting from the spurious regressions, because those variables have the tendency to be highly persistent. Therefore, the procedure of Ferson *et al.* (2003) is used to detrend these variables by 12-moving average. In order to minimise possible scale effects on the results, these series are used in their corresponding mean zero (Bernhardt and Jung, 1979).

[2] More information about the index on the webpage http://www.standardandpoors.com/en_US/web/guest/home
[3] Data extracted from the webpage http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

The returns of the SRI mutual funds extracted from CRSP are already discretely computed, so no change will be done in order to maintain the consistency with the returns extracted from the database of Prof. Kenneth French.

The performance and risk estimates of the sample will be analysed over expansion and recession periods according to the National Bureau of Economic Research[4] (NBER). During the period of 2001 and 2014, the National Bureau of Economic Research identifies a recession from March 2001 to November 2001 (8 months) and from December 2007 to June 2009 (18 months). A dummy variable with a value of one in recessions and a value of zero in expansions is included in all the Excel cells for the entire month during the whole time period.

Table 1 reports the main descriptive statistics for the excess returns of the portfolios and the market index. Equally weighted and value weighted portfolios are analysed, as well as the S&P500 index. All portfolios, including the market index, obtained a positive mean value, except for the EW and VW PDIFF. The value-weighted portfolios always have a higher mean excess return than the equally weighted portfolios. Moreover, all the portfolios and the S&P500 exhibit negative skewness and excess kurtosis, except for the VW PDIFF and EW PSMALL portfolios, which has a positive skewness. The normal distribution of the funds is clearly rejected, again except for the VW PDIFF.

The summary statistics for the individual SRI funds are presented in the appendix 1. Similar conclusions can be drawn in relation to the individual funds, except for 16 funds, which do not follow a normal distribution. All funds have a positive mean, negative skewness and excess kurtosis.

[4] See webpage http://www.nber.org/ for more informations

Table 1 Summary statistics on fund portfolios and benchmark

	No Obs.	Start date	End date	Mean	SD	Skewness	Kurtosis	JB test	JB prob.	Max	Min
S&P500	165	1/31/01	9/30/14	1.84	16.07	-0.67	4.10	20.57	0.00	0.11	-0.17
EW PALL	165	1/31/01	9/30/14	1.41	13.13	-0.54	5.86	64.14	0.00	0.12	-0.16
VW PALL	165	1/31/01	9/30/14	1.63	14.48	-0.71	4.59	31.24	0.00	0.10	-0.16
EW PRET	165	1/31/01	9/30/14	1.41	13.32	-0.56	5.91	67.00	0.00	0.12	-0.16
VW PRET	165	1/31/01	9/30/14	1.63	14.44	-0.71	4.59	31.41	0.00	0.10	-0.16
EW PINS	165	1/31/01	9/30/14	1.05	10.38	-0.41	5.65	52.96	0.00	0.10	-0.12
VW PINS	165	1/31/01	9/30/14	1.33	16.62	-0.58	4.22	19.60	0.00	0.12	-0.18
EW PDIFF	165	1/31/01	9/30/14	-0.12	3.78	-0.30	5.17	3.48	0.00	0.04	-0.04
VW PDIFF	165	1/31/01	9/30/14	-0.18	4.60	0.28	3.47	3.71	0.16	0.03	-0.04
EW PSMALL	165	1/31/01	9/30/14	1.06	10.11	0.06	6.51	85.01	0.00	0.13	-0.10
VW PSMALL	165	1/31/01	9/30/14	1.65	16.30	-0.70	5.40	52.94	0.00	0.14	-0.19

This table reports summary statistics for the equally weighted and value weighted portfolios of SRI funds and for the S&P500 index over the period from January 2001 to September 2014. Annualised mean excess returns and standard deviation are expressed in percentage. The results on the skewness, kurtosis, Jarque-Bera test, and the minimum and maximum excess returns are presented.

5. Empirical Results

5.1. Introduction

In this chapter, the results obtained will be presented and analysed. The performance of the sample was analysed both at the individual fund level and at the aggregate level, using equally weighted and value-weighted portfolios for retail and institutional funds, and for both fund categories.

Finally, in the implementation of these linear regression models, the correction of White (1980) in case of existent heteroscedasticity and the procedure of Newey and West (1987) to correct the possible existence of autocorrelation heteroscedasticity were applied.

5.2. Unconditional models

First, the fund performance evaluation is started by using unconditional models. Both the one-factor CAPM model and the Carhart (1997) four-factor model are considered. Those two models do not consider time-varying risk and returns, and thus do not take into account publicly available information about the state of the economy to predict risk and returns (Aragon and Ferson, 2008, p. 118).

Despite the various limitations mentioned in the literature of the one-factor model, this model is still widely used to measure the exposure of a particular portfolio to a benchmark.

Table 2 summarises the CAPM-based performances estimates (alpha), systematic risk (beta) and the adjusted coefficient of determination of equally weighted and value weighted portfolios. The results suggest that equally weighted and value weighted portfolios are not able to outperform the market and exhibit a neutral performance.

Table 2 Performance estimates using the unconditional one-factor model

		α_0	β_0	Adj. R^2	HAC/HC
Panel A: Equally weighted					
PALL		4E-05	0.7564***	85.66%	*HC*
PRET		-4E-05	0.7726***	86.83%	*HC*
	N -	*58(7)*			
	N +	*58(5)*			
PINS		1E-05	0.5651***	76.43%	*HAC*
	N -	*18(0)*			
	N +	*18(0)*			
PDIFF		-0.0014***	0.2104***	79.82%	*HAC*
Panel B: Value-weighted					
PALL		-1E-05	0.8862***	96.63%	*HC*
PRET		-7E-06	0.8836***	96.59%	*HC*
PINS		-0.0014	1.0038***	94.20%	*HC*
PDIFF		1E-04	-0.1172***	16.28%	*HAC*

This table presents regression estimates for equally weighted (panel A) and value weighted (panel B) portfolios of Retail, Institutional funds and both category funds, obtained by the regression of the unconditional **CAPM [2**] with the S&P 500 market index during the period from January 2001 to September 2014. It reports performance estimates (alpha), systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity. "HC" represents heteroskedasticity consistent and "HAC" represents heteroskedasticity and autocorrelation consistent. Positive (N+) and negative (N-) alphas of the number of individual funds are reported. The square bracket indicates the numbers of funds that are statistically significant.

According to the portfolio of differences, the EW institutional funds have a better performance than the EW retail funds; this difference is statistically significant at a 1% level. However, the value-weighted portfolio of differences shows no statistically significant alpha, so the hypothesis of the returns of the retail funds portfolio being equal to the returns of the institutional funds portfolio cannot be rejected. All equally weighted and value weighted portfolios (PALL, PRET and PINS) exhibit a neutral performance.

The systematic risk of the EW portfolios is always lower than those of the VW portfolios. Additionally, it is slightly less than 1, except for the PINS portfolio that is over 1. The beta of the EW PINS portfolio is lower than the EW PRET portfolio. However, it is the inverse for the VW portfolios.

The adjusted coefficient of determination is relatively high for equally weighted and value-weighted portfolios, meaning that the explanatory power of the model is high. Moreover, it is also always higher for value-weighted portfolios than for their equally weighted peers. The results suggest that the institutional fund portfolio has a lower adjusted coefficient of determination than the retail fund portfolio.

The individual funds present on average neutral performance, an inference that is consistent with most of the previous empirical evidence. Of the retail funds, 7 funds have a negative performance and 5 other funds have a positive performance. Meanwhile, the institutional funds all have a neutral performance. The fund with the highest adjusted coefficient of determination belongs to the PINS portfolio and has a value of 99.92%. The detailed information on the performance of the individual funds is provided in the appendix 2.

Given that multifactor models characterise better portfolio returns than single-index models (Elton *et al.*, 1996; Carhart, 1997), the Carhart (1997) four-factor model will be used to assess the performance of the PALL, PINS and PRET portfolios. Thus, the application of the Carhart (1997) model is motivated by possible misspecification of the single-factor model.

The unconditional Carhart (1997) four-factor model includes three more risk factors as independent variables to the unconditional one-factor model of CAPM, thus small minus big (SMB), high minus low (HML) and momentum (MOM) factors are added.

Table 3 summarises the Carhart (1997)-based performance estimates (alphas), systematic risk (beta), adjusted coefficient of determination of the equally weighted and value-weighted portfolios.

Table 3 Performances estimate using the unconditional four-factor model

		α_0	β_0	β_{smb}	β_{hml}	β_{mom}	Wald	Adj. R^2	HAC/HC
Panel A: Equally weighted									
PALL		-0.0013	0.7565***	0.2143***	0.1668***	0.0644	20.62***	90.12%	*HAC*
PRET		-0.0013	0.7658***	0.2280***	0.1565***	0.0567	23.29***	91.07%	*HAC*
	N -	*58(8)*							
	N +	*58(1)*							
PINS		-0.0011	0.5899***	0.1269***	0.1743***	0.0806**	13.07***	82.40%	*HAC*
	N -	*18(0)*							
	N +	*18(0)*							
PDIFF		-0.0015***	0.1793***	0.0998***	-0.0221*	-0.0237***	15.12***	87.45%	*HAC*
Panel B: Value-weigthed									
PALL		-0.0006	0.8937***	0.0153	0.1589***	0.020565*	6.61***	97.94%	*HAC*
PRET		-0.0006	0.8911***	0.0119	0.1599***	0.019584*	6.91***	97.91%	*HAC*
PINS		-0.0024**	1.0207***	0.2057***	0.0197	0.08611**	22.48***	96.14%	*HAC*
PDIFF		0.0005	-0.1262***	0.1949***	-0.136***	-0.066253*	17.56***	42.47%	*HAC*

This table presents regression estimates for equally weighted (panel A) and value weighted (panel B) portfolios of Retail, Institutional funds and both category funds, obtained by the regression of the unconditional **Carhart (1997) [2**] with the S&P 500 market index during the period from January 2001 to September 2014. It reports performance estimates (alpha), systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Additionally, the regressions coefficients of Size, Value and Momentum factors are reported. Wald corresponds to the hypothesis of factors additional to the market factor being jointly equal to zero.

Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity. "HC" represents heteroskedasticity consistent and "HAC" represents heteroskedasticity and autocorrelation consistent. Positive (N+) and negative (N-) alphas of the number of individual funds are reported. The square bracket indicates the numbers of funds that are statistically significant.

As shown in the table, all portfolios present a neutral performance, except for the VW PINS portfolio, which exhibits a negative statistically significant alpha at a 1% level.

According to the portfolio of differences, EW institutional funds have a better performance than EW retail funds; this difference is statistically significant at a 1% level. However, the value-weighted portfolio of differences shows again no statistically significant alpha, so there is no difference in returns between retail and institutional fund portfolios. There is clearly a difference between PINS and PRET portfolios in relation to the additional risk factors. The HML factor of the EW portfolio of differences is negative and statistically significant, which means that institutional funds invest more in stocks with high book-to-market (value stocks) than retail funds. It may also be noted that the SMB factor of the portfolio of differences is positive and statistically significant, meaning that PINS is more exposed to lower capitalisation than PRET. Additionally, beta three is negative and statistically significant, which means that PINS is more exposed to the momentum factor than PRET.

The EW PRET, PINS and VW PRET portfolios have a neutral performance. However, the VW PINS portfolio has a negative and statistically significant performance.

The null hypothesis of Wald that the SMB, HML and MOM coefficients are jointly equal to zero is rejected for the equally weighted and value weighted portfolios.

The results of the systematic risk maintain that EW portfolios are lower than those of the VW portfolios. Additionally, it is slightly less than 1, except for the PINS portfolio, which is over 1. The beta of the EW PINS portfolio is lower than the EW PRET. However, it is the inverse for the VW portfolio.

The adjusted coefficient of determination is relatively high for equal-weighted and value-weighted portfolios. These values can be considered very high and acceptable, which allows us to draw the conclusion about the explanatory power of the model. After applying the Carhart (1997) model, the adjusted coefficient of determination is always higher for value-weighted portfolios than for their equally weighted peers. The results suggest that the institutional fund portfolio has a lower adjusted coefficient of determination than the retail fund portfolio.

The additional factors (SMB, HML) appear to be able to explain excess returns. The size and style factor is important for the EW portfolio of all funds, indicating that this portfolio is more value-oriented and is more exposed to small caps. Concerning the VW approach, only the HML and MOM coefficient are important for the whole sample. The inclusion of the SMB, HML and MOM factors improves the quality of the performance estimates; indeed, the adjusted R^2 of this regression is higher than the equation of the Jensen (1968) model obtained previously.

While using the unconditional Carhart (1997) four-factor model, the individual funds also present on average neutral performance, an inference that is consistent with most of the previous empirical evidence. Of the retail funds, 8 funds have a negative performance and 1 fund has a positive performance. Meanwhile, the institutional funds all have again a neutral performance. The fund with the highest adjusted coefficient of determination belongs to the PINS portfolio and has a value of 99.92%. The detailed information on the performance of the individual funds is provided in the appendix 3.

5.3. Full conditional model

The performance evaluation of the portfolios is assessed by using the full conditional model of Christopherson *et al.* (1998). Again, both the CAPM one-factor model and the Carhart (1997) four-factor model are considered.

The models applied previously neglect the variability of risk and returns over time. Unconditional models are considered to be biased, because they produce incorrect performance estimates, since they can confound the normal variation in risk and risk premiums with manager's performance. Aragon and Ferson (2008) state that the reasons for the biased estimates are that portfolio managers exhibit market-timing skills or engage in dynamic investment strategies resulting in time-varying risk.

In order to overcome this limitation, the performance of portfolios is analysed based on a time-varying approach. Ferson and Schadt (1996) developed the partial conditional model, allowing the risk estimates to vary over time depending on economic conditions, with the inclusion of public information variables. However, this study only considers the full conditional model of Christopherson *et al.* (1998). The partial conditional model was extended to the full conditional model, which considers not only the variability of betas over time but also the variability of performance over time.

The decision to only present the results of the conditional model of Christopherson *et al.* (1998) is due to the statement presented by Ferson *et al.* (2008) that suggested this model being more robust when alphas and betas vary over time. Therefore, if alphas are considered time-varying, it may lead to biased estimates of performance and risk.

As mentioned before in previous chapters, the public information variables used in this study are: the Treasury Bills in the short-term (TB), the Term Spread (TS) and the Dividend Yield (DY) based on the S&P 500.

Table 4 summarises the conditional CAPM-based performance estimates (conditional alphas), conditional betas, adjusted coefficient of determination of the equally weighted and value portfolios. Public information variables are included in the risk and performance estimates.

As shown in the table, the EW and VW PALL, PINS, PRET portfolios present neutral performances. As before, the PRET portfolios have a greater adjusted coefficient of determination than the PINS portfolios, with the results showing once more that the VW portfolios have a greater adjusted R^2 than the EW portfolios. These results reinforce the importance of incorporating the public information variables in the performance assessment models. Additionally, it is important to note that all adjusted R^2 are greater than those of the unconditional CAPM model. This evidence is consistent with the studies of Christopherson *et al.* (1998), Ferson and Schadt (1996), Otten and Bams (2004), which show that the inclusion of public information variables improves the explanatory power of the model.

Regarding the conditional alphas, there is no evidence of variability over time. Indeed, the results of the Wald test conducted to conditional alphas showed that the performance of the EW and VW portfolios (PALL, PINS, PRET) is not variable over time according to public information variables.

Based on the Wald test, we can reject the hypothesis of the conditional beta being jointly equal to zero for all portfolios, except for the VW PINS portfolio. In sum, it means that in all portfolios, except one, the risk varies over time based on the public information variables.

Table 4 Performances estimate using the full conditional one-factor model

		α_0	α_{TB}	α_{TS}	α_{DY}	β_0	β_{TB}	β_{TS}	β_{DY}	Wald α	Wald β	Adj. R^2	HAC/HC
Panel A: Equally weighted													
PALL		-0.0007	-0.0003	0.0003	-0.0006	1.0798***	-0.1803***	-0.1654***	0.1422	0.5334	26.58***	93.58%	*HAC*
PRET		-0.0010	-0.0002	0.0004	-0.0006	1.0539***	-0.1678***	-0.1550***	0.1431	0.5123	25.75***	93.74%	*HAC*
	N -	*58(5)*											
	N +	*58(0)*											
PINS		2E-05	-0.0007	-0.0002	-0.0001	0.9687***	-0.1969***	-0.1878***	0.1375	1.0212	2.94***	90.62%	*HAC*
	N -	*18(2)*											
	N +	*18(1)*											
PDIFF		-0.0011	-0.0003	0.0007	-0.0005	0.0841	0.0289**	0.0334*	0.0054	3.2973	2.16*	81.37%	*HAC*
Panel B: Value-weigthed													
PALL		0.0042	-0.0001	0.0003	-0.0026	0.8759***	-0.0507***	0.0082	0.0290	0.8039	6.28***	97.70%	*HC*
PRET		0.0043	-0.0001	0.0003	-0.0026	0.8687***	-0.0497***	0.0095	0.0291	0.9810	9.22***	97.65%	*HC*
PINS		-0.0023	-0.0007	0.0010	-0.0002	1.0261***	-0.0399	-0.0332	0.0506	2.6584	1.43	94.65%	*HC*
PDIFF		0.0065	-0.0002	-0.0007	-0.0024	-0.1586	-0.0098	0.0434	-0.0218	0.3349	3.11**	16.61%	*HAC*

This table presents regression estimates for equally weighted (panel A) and value weighted (panel B) portfolios of Retail, Institutional funds and both category funds, obtained by the regression of the full conditional **one-factor Model [5**] with the S&P 500 market index during the period from January 2001 to September 2014. It reports conditional alphas, the coefficients estimates for the conditional alpha function, conditional systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. The predetermined information variables are the short-term interest rate level (TB), the slope of the term structure (TS) and the dividend yield (DY). Wald α and Wald β correspond to the hypothesis of the coefficients of conditional alphas and conditional betas, respectively, being jointly equal to zero. Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity. "HC" represents heteroskedasticity consistent and "HAC" represents heteroskedasticity and autocorrelation consistent. Positive (N+) and negative (N-) alphas of the number of individual funds are reported. The square bracket indicates the numbers of funds that are statistically significant.

According to the portfolio of differences, the null hypothesis is not rejected, so there is no difference in returns between retail and institutional fund portfolios (EW and VW). The results show as well that the conditional alphas do not vary more for one type of portfolio than the other according to public information variables. Nerveless, those results are different for the conditional betas. The Wald test shows for the EW PRET portfolio that the risk estimates vary more with the inclusion of the information variables than the EW PINS portfolio, specially the short-term rate and the term spread. However, for the VW portfolios, the institutional funds suffer more from time-varying betas than retail funds.

The individual funds present on average neutral performance. Of the retail funds, 5 funds have a negative performance. Meanwhile, the 2 institutional funds have a negative performance and one has a positive performance. The fund with the highest adjusted coefficient of determination belongs to the PRET portfolio and has a value of 99.67%. The detailed information on the performance of the individual funds is provided in the appendix 4.

As mentioned several times during the study, the single-index model is extended to a multi-factor model. Therefore, they are a much more useful characterisation of portfolio returns than single-index models (Elton *et al.*, 1996; Carhart, 1997).

Table 5 summarises the conditional Carhart (1997)-based performance estimates (conditional alphas), conditional betas, adjusted coefficient of determination of the equally weighted and value portfolios. The SMB, HML and MOM factors are also reported. Public information variables are included in the risk and performance estimates. In general, the explanatory power of the models increases, compared to the unconditional Carhart (1997) model.

As shown in the table, all portfolios present a neutral performance. The VW PINS underperform the benchmark significantly in the unconditional Carhart (1997) model, but with the inclusion of public information variables, this performance became neutral.

Table 5 Performances estimate using the full conditional four-factor model

	α_0	α_{TB}	α_{TS}	α_{DY}	β_0	β_{TB}	β_{TS}	β_{DY}	β_{smb}	$\beta_{SMB,TS}$	$\beta_{SMB,TB}$	$\beta_{SMB,DY}$	β_{HML}	$\beta_{HML,TB}$	$\beta_{HML,TS}$	$\beta_{HML,DY}$	β_{MOM}	$\beta_{MOM,TS}$	$\beta_{MOM,TS}$	$\beta_{MOM,DY}$	Wald α	Wald β	Adj. R^2	HAC/HC
Panel A: Equally weighted																								
PALL	0.0126	-0.0019*	-0.0020	-0.0041	0.7083**	-0.1177***	-0.1089***	0.2176**	0.1352	-0.0562**	-0.0727*	0.1791**	0.8085***	-0.0716*	-0.0134	-0.3455***	0.0679	0.0053	0.0228	-0.0414	1.68	65.64***	97.09%	*HAC*
PRET	0.0141	-0.0019**	-0.0021*	-0.0048	0.6917**	-0.1078***	-0.0984***	0.2124**	0.0467	-0.0481	-0.0645*	0.2173**	0.8175***	-0.0741**	-0.0175	-0.3485***	0.0468	0.0078	0.0264	-0.0401	2.21**	53.48***	97.41%	*HC*
N-	*58(8)*																							
N+	*58(3)*																							
PINS	0.005309	-0.0018	-0.0017	-0.0007	0.6201**	-0.1373***	-0.1395***	0.2241**	0.3811	-0.0755**	-0.0947**	0.0412	0.6748**	-0.0586	0.0043	-0.2919***	0.1592	-0.0092	0.0029	-0.0442	2.58**	66.85***	93.85%	*HAC*
N-	*18(2)*																							
N+	*18(1)*																							
PDIFF	0.0087***	-0.0009***	-0.0003	-0.0041***	0.0751	0.0292**	0.0413**	-0.0135	-0.3369**	0.0278	0.0308	0.1761***	0.1415	-0.0150	-0.0219	-0.0557	-0.1108	0.0170	0.0234	0.0034	7.34***	18.72***	90.65%	*HAC*
Panel B: Value-weigthed																								
PALL	0.0019	-0.0005	0.0001	-0.0014	0.9072***	-0.0311**	-0.0235	0.0511*	-0.1860	0.0321	0.0228	0.0518	0.4467**	0.0201	0.0089	-0.1977**	0.0501	-0.0133	-0.0112	-0.0054	1.57	49.75***	98.70%	*HC*
PRET	0.0016	-0.0005	0.0002	-0.0013	0.9084***	-0.0312**	-0.0236	0.0496	-0.2030	0.0352	0.0269	0.0513	0.4491**	0.0197	0.0065	-0.1947***	0.0487	-0.0137	-0.0112	-0.0048	2.01***	15.39***	98.66%	*HC*
PINS	0.0134	-0.0025**	-0.0019	-0.0044	0.9095***	0.0031	-0.0033	0.0516	0.0958	-0.0113	-0.0264	0.1115	0.2649	-0.0136	0.0679	-0.2341***	0.2431	0.0121	-0.0111	-0.0807*	5.11	32.77***	97.60%	*HAC*
PDIFF	-0.0119	0.0012	0.0021	0.0031	0.0024	-0.0346	-0.0202	-0.0038	-0.3013	0.0469	0.0538	-0.0601	0.1829	0.0338	-0.0615	0.0401	-0.1928	-0.0258	-0.0001	0.0751	0.75	16.08***	54.43%	*HAC*

This table presents regression estimates for equally weighted (panel A) and value weighted (panel B) portfolios of Retail, Institutional funds and both category funds, obtained by the regression of the full conditional **four-factor Model [6**] with the S&P 500 market index during the period from January 2001 to September 2014. It reports conditional alphas, the coefficients estimates for the conditional alpha function, conditional systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Additionally, regressions coefficients of Size, Value and Momentum factors are reported. The predetermined information variables are the short-term interest rate level (TB), the slope of the term structure (TS) and the dividend yield (DY). Wald α and Wald β correspond to the hypothesis of coefficients of conditional alphas, conditional betas, respectively, being jointly equal to zero. Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity. "HC" represents heteroskedasticity consistent and "HAC" represents heteroskedasticity and autocorrelation consistent. Positive (N+) and negative (N-) alphas of the number of individual funds are reported. The square bracket indicates the numbers of funds that are statistically significant.

Again, the PRET portfolios have a greater adjusted coefficient of determination than the PINS portfolios; the results show once more that the VW portfolios have a greater adjusted R^2 than the EW portfolios. These results reinforce the importance of incorporating the public information variables in the performance assessment models. The results show that all adjusted R^2 of the conditional four-factor model are greater than those of the unconditional Carhart (1997) model, which is consistent with the empirical evidence of Christopherson *et al.*, 1998; Ferson and Schadt, 1996, Otten and Bams, 2004, which states that the inclusion of public information variables improves the explanatory power of the model.

Additionally, the reported adjusted coefficient of determination of the conditional multi-factor model characterise much more the portfolio returns than the conditional one-factor model, as Elton *et al.* (1996) and Carhart (1997) report in their research.

Analysing the conditional alphas function in detail for the EW PALL portfolio, the results show that the short-term rate variable is negative and statistically significant at the 1% level. The other public information variables do not present evidence of variability. This evidence indicates that SRI managers are obtaining lower risk-adjusted abnormal returns when the US Treasury bill is high. However, the Wald test of the hypothesis that conditional alphas being jointly equal is not rejected. Meanwhile, the Wald test on the hypothesis that conditional betas are equal to zero is rejected, meaning that betas vary over time. Concerning the investment style, the results present that the HML factor is important to explain fund excess return.

The results reported for the VW PALL portfolio shows only the exposition to the HML factor and that betas vary over time. Again, the hypothesis of the Wald test that conditional betas are equal to zero is rejected. The conditional alphas do not vary with the inclusion of public information variables.

Comparing retail funds to institutional funds, some evidence of time-varying betas are persistent for EW and VW portfolios. Nevertheless, only the EW PRET portfolio and VW PINS portfolio show evidence of time varying alphas through the inclusion of public information variables. Regarding the additional risks, the EW PINS and PRET are exposed to the HML factor. This is also the case for the VW PRET.

Based on the Wald test, we can reject the hypothesis of the conditional beta being jointly equal to zero for both portfolios. In other words, it means that those risk estimates vary over time, based on the public information variables. However, concerning the conditional alphas, only the Wald test for the VW PINS portfolio is not rejected.

According to the portfolio of differences, EW retail funds have a better performance than EW institutional funds; this difference is statistically significant at the 1% level. However, the value-weighted portfolio of differences once again shows no statistically significant alpha, so there is no difference in returns between retail and institutional fund portfolios.

There is clearly a difference between PINS and PRET portfolios in relation to the additional risk factors. The SMB factor of the EW portfolio of differences is negative and statistically significant, which means that institutional funds are more exposed to small caps than retail funds. Regarding the conditional alphas, there is evidence of variability over time. The short-term rate and dividend yield are statistically significant. This evidence indicates that institutional managers have lower risk-adjusted abnormal returns than retail managers do when dividend yields are high. Indeed, the hypothesis of the Wald test conducted to conditional alphas is rejected. The conditional betas of institutional funds show more evidence of variability over time than retail funds; the hypothesis of the Wald test is rejected as well for conditional betas. For the value weighted portfolio difference, no coefficient is statistically significant, but the Wald test rejects the hypothesis of conditional betas being jointly equal to zero.

While using the full conditional Carhart (1997) four-factor model, the individual funds present on average neutral performance, an inference that is consistent with most previous empirical evidence. Of the retail funds, 8 funds have a negative performance and 3 other funds have a positive performance. Meanwhile, two institutional funds have a negative performance and the other has a positive one. The fund with the highest adjusted coefficient of determination belongs to portfolio PRET and has a value of 99.68%. Additionally, one fund of both categories has a positive performance. The detailed information on the performance of the individual funds is provided in the appendix 5.

5.4. Time-varying Carhart four-factor based performance estimates considering NBER cycles

Finally, in order to get more robust results, a dummy variable is used to define the different market conditions (Moskowitz 2000; Kosowski 2011, Areal *et al.* 2013; Nofsinger and Varma 2014).

The following results are based on the time-varying Carhart (1997) four-factor model over periods of expansion and recession according to US National Bureau of Economic Research (NBER) business cycles with the inclusion of a dummy variable to assess the performance in different states of the economy. The dummy variable takes the value of zero in periods of expansion and 1 in recessions as defined by the NBER.

Table 6 presents the Carhart (1997)-based performance estimates (alphas), risk estimates (betas), adjusted coefficient of determination of the equally weighted and value portfolios for periods of expansion and recession as defined by NBER business cycles.

According to the results, it can be concluded that the alpha in periods of expansion is neutral for the equally weighted and value weighted portfolios (PALL, PRET, PINS), only the VW PINS portfolio has negative and statistically significant performance. Additionally, those portfolios do not change during recession. Even if the portfolios exhibit a positive performance in periods of recession, they are not statistically significant. Besides the PRET portfolios having a greater adjusted coefficient of determination than the PINS portfolios, the results show once more that EW portfolios have a greater adjusted R^2 than VW portfolios.

Analysing the other risk factors, it may be inferred that EW and VW portfolios do not change significantly from periods of expansion to periods of recession.

Furthermore, the results show that there is some evidence that the momentum factor changes across different market regimes. The HML factor is positive and statistically significant during periods of expansion for EW and VW PALL portfolios, but does not change during recession. Moreover, the momentum factor is positive and statistically significant in periods of expansion for the EW and VW PALL portfolios, but the VW PALL portfolio decreases significantly in times of recession.

Table 6 Time-varying Carhart four-factor based performance estimates considering NBER cycles

		α_0	α_{rec}	β_0	β_{0rec}	β_{smb}	$\beta_{smb,rec}$	β_{hml}	$\beta_{hml,rec}$	β_{mom}	$\beta_{mom,rec}$	Wald a	Wald β	Adj. R^2	HAC/HC
Panel A: Equally weighted															
PALL		-0.0013	0.0012	0.7572***	-0.0093	0.2166	-0.0559	0.1079***	0.1014	0.1219***	-0.1159**	0.33	68.91***	90.62%	*HAC*
PRET		-0.0014	0.0014	0.7659***	-0.0050	0.2292***	-0.0496	0.0978**	0.1026	0.1124***	-0.1101**	0.40	10.81***	91.54%	*HAC*
	N -	*51(7)*													
	N +	*40(2)*													
PINS		-0.0011	0.0005	0.5887***	-0.0109	0.1323***	-0.0677	0.1199***	0.0836	0.1394***	-0.1236**	0.12	81.87***	83.19%	*HAC*
	N -	*14(2)*													
	N +	*14(1)*													
PDIFF		-0.0016***	0.0006	0.1826***	-0.0042	0.0955***	0.0166	-0.0234	0.0050	-0.0229**	0.0011	0.69	8.45***	87.14%	*HAC*
Panel B: Value-weighted															
PALL		-0.0008	9E-05	0.9049***	-0.0365	0.0125	-3E-05	0.1585***	2E-05	0.0281*	-0.0231	0.06	36.15***	97.90%	*HC*
PRET		-0.0008	6E-05	0.9024***	-0.0369	0.0089	2E-03	0.1598	8E-05	0.0267	-0.0223	0.04	53.99***	97.87%	*HAC*
PINS		-0.0024***	6E-04	1.0153***	0.0155	0.1996***	-2E-03	0.0185**	-1E-01	0.1423***	-0.1249**	0.24	12.61***	96.72%	*HAC*
PDIFF		0.0003	-9E-04	-0.1077	-0.0625	-0.1921	2E-03	0.1400	9E-02	-0.1116	0.0901	-0.29	13.78***	48.13%	*HAC*

This table presents regression estimates for equally weighted (panel A) and value weighted (panel B) portfolios of Retail, Institutional funds and both category funds, based on the Carhart (1997) four-factor model **[7]** with a dummy variable according to periods of expansion and recession from January 2001 to September 2014.
It reports performance estimates (alpha), systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Additionally, regressions coefficients of Size, Value and Momentum factors are reported. The dummy variable takes the value of zero in periods of expansion and 1 in recessions as defined by the NBER. Wald corresponds to the hypothesis of factor additional to the market factor being jointly equal to zero. Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity. "HC" represents heteroskedasticity consistent and "HAC" represents heteroskedasticity and autocorrelation consistent. Positive (N+) and negative (N-) alphas of the number of individual funds are reported. The square bracket indicates the numbers of funds that are statistically significant.

The EW and VW PINS portfolios have positive and statistically significant size factor during expansion periods, but once again, they do not change during recession. Meanwhile, the EW PRET portfolio has the same result, but the VW PRET portfolio is not statistically significant during expansions and does not change during recession periods. The EW and VW PINS portfolios are exposed to book-to-market factor, indicating that those portfolio are more value-oriented during expansion periods, but do not change during recession. Only the VW PRET portfolio is neutral, and the EW PRET portfolio is also more value oriented.

The momentum factor is positive and statistically significant in expansion periods for EW and VW PINS portfolios, but changes significantly in recession periods. The same result can be concluded for the EW PRET portfolio, but not for the VW PRET portfolio. Therefore, the momentum factor is not statistically significant in either period.

As stated before, the portfolio of differences shows that EW institutional funds have a better performance than EW retail funds; this difference is statistically significant at the 1% level. However, the value-weighted portfolio of differences shows no statistically significant alpha, so the hypothesis that the returns of the retail funds portfolio being equal to the returns of the institutional funds portfolio cannot be rejected. The VW portfolio of differences of the additional factors does not reject any null hypothesis that retail fund portfolio is equal to institutional fund portfolio during expansion periods and there is no change during the crisis period. Instead, the EW PRET portfolio is more exposed to small-caps than the EW PINS portfolio during non-crisis periods, but also does not change during crisis.

The individual funds present on average neutral performance. Of the retail funds, 7 funds have a negative performance and two funds have a positive one. Meanwhile, two institutional funds have a negative performance and the other has a positive one. The fund with the highest adjusted coefficient of determination belongs to portfolio PINS and has a value of 99.92%. Additionally, one fund of both categories has a positive performance. The detailed information on the performance of the individual funds is provided in the appendix 6.

Some funds could not be computed by the time-varying Carhart (1997) with the inclusion of a dummy variable, because the time period of those funds is too short and there are no returns during recession periods.

5.5.Portfolio funds, which have TNA < $10 mil. (PSMALL) and TNA > $10 mil. (PALL)

The following performance evaluation is briefly assessed in order to compare the PALL portfolio (TNA > $10 mil.) and the PSMALL portfolio (TNA < $ 10 mil.). Chen et al. (2004) state that fund size erodes performance due to liquidity and organizational diseconomies, especially funds investing in small and illiquid stocks.

Table 7 summarises the performance estimates, risk estimates and the adjusted coefficient of determination based on the unconditional and conditional models. Both single-index and multi-factor models are considered.

Regarding the performance estimates, all portfolios exhibit a neutral performance.

The adjusted coefficients of determination are greater for equally weighted and value weighted PALL portfolios than the PSMALL portfolios.

Moreover, the unconditional risk estimates are lower for EW and VW PSMALL than PALL. However, the conditional betas are greater for all EW and VW PSMALL than PALL, except for the VW conditional multi-factor.

In general, the results show that all adjusted R^2 of the conditional model are greater than those of the unconditional model, which is consistent with the empirical evidence of Christopherson *et al.*, 1998, Ferson and Schadt, 1996, Otten and Bams, 2004, which states that the inclusion of public information variables improves the explanatory power of the model. Additionally, the reported adjusted coefficient of determination of the (un)conditional multi-factor model characterise the portfolio returns much more than the (un)conditional one-factor model, as report Elton *et al.* (1996) and Carhart (1997) in their research. As mentioned before, the results show once more that VW portfolios have a greater adjusted R^2 than EW portfolios.

Table 7 Comparison of fund portfolios, which have TNA< $10mil. (PSMALL) and TNA > $10mil. (PALL)

	Unconditional CAPM		Conditional CAPM		Unconditional Carhart		Conditional Carhart	
	EW	*VW*	*EW*	*VW*	*EW*	*VW*	*EW*	*VW*
Comparaison of alphas								
PALL	4E-05	-1E-05	-7E-04	4E-03	-1E-03	-6E-04	1E-02	2E-03
PSMALL	1E-03	1E-03	2E-03	2E-03	-1E-04	-6E-04	1E-02	2E-02
Comparaison of betas								
PALL	0.7564***	0.8862***	1.0798***	0.8759***	0.7565***	0.8937***	0.7083**	0.9071***
PSMALL	0.4973***	0.8809***	1.9275***	0.9454	0.5312***	0.8877***	1.2153***	0.0584
Comparaison of adjusted coefficent of determination								
PALL	85.66%	96.63%	93.58%	97.70%	90.12%	97.94%	97.09%	98.70%
PSMALL	62.62%	75.61%	83.38%	83.00%	69.92%	81.81%	91.02%	90.73%

This table presents regression estimates for equally weighted and value weighted portfolios of small funds and large funds, from January 2001 to September 2014. It reports performance estimates (alpha), systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity.

6. Conclusion

Performance evaluation of socially responsible investments (SRI) portfolios has attracted the attention of researchers in Finance. Currently, there is an ongoing debate consisting on whether the financial performance is sacrificed or not by taking into account social issues.

The purpose of this study is to provide a better insight into the performance of US socially responsible mutual funds in different states of the market, by the inclusion of public information variables. More precisely, this research aims to analyse whether there are differences between the performance of SRI retail funds and SR institutional funds. To this end, several performance measures that are widely used in the literature are considered.

First, the unconditional models of CAPM and Carhart (1997) show that the portfolios have a negative and neutral performance. This is consistent with the empirical evidence of Salganik and Scheiber (2013); Gallagher and Jarnecic (2003) and that state as well a neutral performance using the unconditional models for retail and institutional funds. Additionally, James and Karceski (2006) showed that the performance of both funds is not different from each other, in spite of significantly lower management expenses.

The inclusion of SMB, HML and MOM factors improves the performance estimates' quality; indeed, the adjusted R^2 of Carhart's (1997) regression is higher than the equation of CAPM. The additional factors (SMB, HML) appear to be able to explain excess returns. The size and style factor is important for the EW portfolio of all the funds, indicating that its portfolio is more value-oriented and is more exposed to small caps. Concerning the VW approach, only the HML and MOM coefficient are important for the whole sample.

Nevertheless, unconditional models do not consider the variability of risk and returns over time. Therefore, they are considered to be biased, as they produce incorrect performance estimates, since they can confound the normal variation in risk and risk premiums with manager's performance.

Second, in order to overcome this limitation, the performance of portfolios was analysed based on a time-varying approach. Ferson and Schadt (1996), Ferson and Warther, (1996), among others, also state that conditional models are more robust and slightly better estimates of performance.

The time-varying CAPM exhibits a neutral performance for all EW and VW portfolios. Regarding the conditional alphas, no evidence of variability over time is noticed. For instance, the conditional risk estimates vary with the inclusion of information variables. No difference is noticed between retail and institutional funds. Again, these results are consistent with the studies of Salganik and Scheiber (2013) and James and Karceski (2006).

All portfolios present a neutral performance in the time-varying Carhart (1997) four-factor model. The VW PINS underperforms the benchmark significantly in the unconditional Carhart (1997) model, but with the inclusion of public information variables, this performance became neutral. There is some evidence that time-varying conditional alphas and betas vary over time for all portfolios, but some portfolios (EW PINS, VW PRET and VW PALL) only have time-varying risk estimates. Two additional risk factors are important to explain fund excess return for the value weighted PALL and PRET portfolio.

Concerning the portfolio of differences, the results show that, compared to the unconditional models, retail funds have a better performance than institutional funds.

Third, regarding the portfolio of funds whose monthly mean Total Net Return (TNA) is lower than $10 million (PSMALL) and the portfolio of whose funds monthly mean Total Net Return (TNA) is higher than $10 million (PALL), some differences are identified. Both portfolios exhibit a neutral performance. The adjusted coefficients of determination are greater for equally weighted and value weighted PALL portfolios than for the PSMALL portfolios. Moreover, the unconditional risk estimates are lower for EW and VW PSMALL than PALL. However, the conditional betas are greater for all EW and VW PSMALL than PALL, except for the VW conditional multi-factor.

Finally, in order to get more robust results, the performance of those funds is as well analysed across different market regimes to assess whether socially responsible investments perform better in crisis or non-crisis situations (Moskowitz, 2000; Glode, 2011; Kosowski, 2011; Salganik and Scheiber, 2013; Areal *et al.*, 2013; Nofsinger and Varma, 2014). To this end, a dummy variable is added to Carhart (1997) four-factor model specifications to capture the coefficients during expansion and recession periods, according to NBER business cycles.

Considering the results reported previously in the empirical results chapter, it can be concluded that the alpha in periods of expansion is neutral for the equally weighted and value weighted portfolios (PALL, PRET, PINS), except the VW PINS portfolio that underperforms significantly. Additionally, those portfolios do not change during recession periods. Analysing the other risk factors, it may be inferred that EW and VW portfolios do not change significantly from periods of expansion to periods of recession. Furthermore, the results show that there is some evidence that the momentum factor changes across different market regimes. Those results are consistent with the study of Areal *et al.* (2013) and Salganik and Scheiber (2013) that indicate no performance change across recession periods.

In general, all equally weighted and value-weighted portfolios exhibit a neutral performance, except for the VW PINS portfolio that underperforms the benchmark (unconditional Carhart (1997) model and time-varying multifactor model with inclusion of the dummy variable). Those results are consistent with previous empirical studies that presented on average neutral performance (James and Karceski (2006); Salganik and Scheiber, 2013).

The results reported previously are consistent with the literature of Elton *et al.* (1996) and Carhart (1997), which state that multifactor models are a much more useful characterisation of portfolio returns than single-index models.

Additionally, the results also show that conditional models lead to better regression estimates than unconditional models, as shown by the studies of Cortez *et al.* (2009), Bauer *et al.* (2006), Bauer *et al.* (2007), and Areal *et al.* (2013). The study of Fama and French (1989) suggests that variables related to economic conditions are useful in predicting the returns of stocks and bonds.

The adjusted coefficient of determination is always greater for conditional models than for unconditional models. This evidence is consistent with the statement of Christopherson *et al.* (1998), Ferson and Schadt (1996) and Otten and Bams (2004) that the incorporation of public information variables in the model leads to an improvement in the explanatory power of model.

One limitation of this study that can be pointed out is the non-performance evaluation of conventional funds according to the matched-paired analysis. It would be interesting to analyse whether conventional funds differ from SRI retail/institutional funds. Another limitation is that the number of funds in this study is small. More fund categories could be considered.

To conclude, the findings of this study enable a better understanding of fund performance e of SRI funds.

7. References

Aragon, G. & Ferson, W.E. (2008). "Portfolio performance evaluation", *Foundations and Trends in Finance*, 2 (2), 83-190 (chapter 3).

Areal, N., Cortez, M. C. & Silva, F. (2013). "The conditional performance of US mutual funds over different market regimes: do different types of ethical screens matter?", *Financial Markets and Portfolio Management*, 27, 397-429.

Bauer, R., Otten, R., Rad, A.T. (2006). Ethical investing in Australia: is there a financial penalty? *Pac. Basin Financ*. J. 14, 33–48.

Bauer, R., Derwall, J., Otten, R. (2007). The ethical mutual fund performance debate: new evidence from Canada. *J. Bus. Ethics* 70, 111–124.

Bernhardt, I. and B. S. Jung (1979) The interpretation of least squares regression with Interaction or Polynomial Terms. *The Review of Economics and Statistics 61* (3), 481–483.

Boasson, E., Boasson, V., Cheng, J. (2006). Investment principles and strategies of faith-based funds. *Manag. Fin*., 32, 837–845.

Bollen, N.P. (2007). Mutual fund attributes and investor behavior. *Journal of Financial and Quantitative Analysis*, vol. 42, n.º 3, pp.683-708.

Carhart, M. (1997). On persistence in mutual fund performance. *Journal of Finance*. 52, 57–83.

Chen, J., Hong, H., Huang, M., Kubik, J. (2004). Does fund size erode performance? the role of liquidity and organization. *American Economic Review*, 94 (5), 1276–1302.

Christopherson, J., Ferson, W. & Glassman, D. (1998). Conditioning manager alphas on economic information: another look at the persistence of performance. *The Review of Financial Studies*, 11(1), 111-14.

Cortez, M., Silva, F. & Areal, N. (2009). The performance of European socially responsible funds. *Journal of Business Ethics*, 87, 573-588.

Cowton, C.J. (1999). Playing by the rules: ethical criteria at an ethical fund. *Business Ethics: a European review*, 8, p. 60-69.

D'Antonio, L., T. Johnsen and R.B. Hutton (1997). Expanding Socially Screened Portfolios: An Attribution Analysis of Bond Performance. *Journal of Investing*, Vol. 6, pp. 79–86.

Del Guercio, D., and P. Tkac. (2002). The Determinants of the Flow of Funds on Managed Portfolios: Mutual Funds versus Pension Funds. *Journal of Financial and Quantitative Analysis*, 37, 523-557.

Drut, B. (2010), Sovereign bonds and socially responsible investment. *Journal of Business Ethics*, Vol. 92, No. 1, pp. 131-45.

Elton, E., Gruber, M., Blake C. (1996). Survivorship Bias and Mutual Fund Performance. *Review of Financial Studies*, 9, 1097-1120.

Fama, E. F. e French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, vol. 33, n.º 1, pp. 3-56.

Farnsworth, Heber (1997a). Conditional Performance Evaluation, in Paxson, D. and D. Wood, eds., *Blackwell Encyclopedic Dictionary of Finance*, pp. 23-24, Blackwell Business.

Ferson, W. & Schadt, R. (1996). Measuring fund strategy and performance in changing economic conditions. *The Journal of Finance*, 51(2), 425-461.

Ferson, W., S. Sarkissian and T. Simin: (2003). Is Stock Return Predictability Spurious? *Journal of Investment Management* 1 (3), 1–10.

Ferson, W., Sarkissian, S., & Simin, T. (2008). Asset princing models with conditional betas and alphas: the effects of data snooping and spurious regression. *Journal of Financial and Quantitative Analysis*, 43 (2), 331-354.

Freeman, R.E. (1984). Strategic Managment: A stakeholder approach. *Marshfield: Pitman Publishers.*

Friedman, M. (1962). Capitalism and Freedom. *Chicago: University of Chicago Press.*

Gallagher D. R. & Jarnecic E. (2003). International equity funds, performance, and investor flows: Australian evidence. *Journal of Multinational Financial Management*, vol. 14, 81-95.

Glode, V. (2011). Why mutual funds "underperform"? *J. Financ. Econ*. 99, 546–559

Goldreyer, E. F., Ahmed, P. e Diltz, J. D. (1999). The performance of socially responsible funds: incorporating sociopolitical information in portfolio selection. *Managerial Finance*, vol. 25, n.º1, pp. 23-36.

Gregory, A., J. Matatko and R. Luther (1997). Ethical Unit Trust Financial Performance: Small Company Effects and Fund Size Effects. *Journal of Business Finance & Accounting*, 24 (5), 705–725.

Gruber, M. (1996). Another Puzzle: The Growth in Actively Managed Mutual Funds. *Journal of Finance*, 55, 783-810.

Hamilton, S., Jo, H. e Statman, M. (1993). Doing well while doing good? The investment performance of socially responsible mutual funds. *Financial Analysts Journal*, vol.49, pp. 62–66.

Hill, R., Ainscough, T., Shank, T. e Manullang, D. (2007). Corporate social responsibility and social responsible investing: A global perspective. *Journal of Business Ethics*, 70(2), 165-174.

James, C., and J. Karceski (2006). Investor monitoring and differences in mutual fund performance. *Journal of Banking and Finance*, 30 (2006), 2787-2808.

Jensen, M. (1968). The performance of mutual funds in the period 1945-1964. *The Journal of Finance,* 23(2), 389-416.

Kempf, A. and P. Osthoff (2007), The effect of socially responsible investing on portfolio performance. *European Financial Management*, Vol.13, No.5, pp.908-922.

Kosowski, R. (2011). Do mutual funds perform when it matters most to investors? US mutual fund performance and risk in recessions and expansions. *Quarterly Journal of Finance,* 3, 607-664.

Markowitz, H. M. (1952). Portfolio Selection. *Journal of Finance*, 7 (1): 77-91.

Margolis, J. and Walsh, J. (2001). People and Profits? The Search for a Link between a Company's Social and Financial Performance. *Lawrence Erlbaum and Associates, Mahwah, New Jersey.*

Moskowitz, T. J. (2000). Discussion: mutual fund performance: an empirical decomposition into stock-picking talent, style, transaction costs, and expenses. *Journal of Finance*, 55, 1655-1703.

Newey, W. K. and West, K. D. (1987). A Simple, Positive Semi-Definite, Heteroscedasticity and Autocorrelation Consistent Covariance Matrix. *Econometrica*, vol. 55, n.º 3, pp. 703-708.

Nofsinger J. & Varma A. (2014). Socially responsible funds and market crises. *Journal of Banking & Finance*, vol.48, 180-193.

Otten R. & Bams D. (2004). How to measure mutual fund performance: economic versus statistical relevance. *Accounting & Finance,* vol. 44, issue 2, 203-222.

Orlitzky, M., Schmidt, F. and Rynes, S. (2003). Corporate social and financial

performance: A Meta-analysis. *Organization Studies*, 24(3), 403-441.

Palmiter, A. R., and A. E. Taha. (2008). Mutual Fund Investors: Divergent Profile. *Columbia Business Law Review.*

Renneboog, L., Horst, J. Ter, & Zhang, C. (2008a). Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking & Finance*, 32, 1723–1742.

Rudd, A. (1981). Social responsibility and portfolio performance. *Calif. Manag. Rev*. 23, 55–61.

Sauer, D. A. (1997). The impact of socially-responsibility screens on investment performance: Evidence from the Domini 400 Social Index and Domini Mutual Fund. *Review of Financial Economics*, vol. 6, n.º 2, pp. 137-149.

Salganik, G.; Schreiber. A. "The Determinants of Investment Flows: Retail versus Institutional Mutual Funds", Working paper (2013).

Statman, M. (2006). Socially Responsible Indexes: Composition, Performance and Tracking Error. *Journal of Portfolio Management*, 32(3), 100-109.

Ullmann, A. (1985). Data in search of a theory: A critical examination of the relationships among social performance, social disclosure, and economic performance of U. S. Firms. *Academy of Management Review*, vol.10, pp. 540-557.

White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *The Econometric Society*, vol.48, n.º4, pp.817 838.

Sources:

SIF (2001- 2012), "Report on Socially Responsible Investing Trends in the United States", also available on the webpage of Social Investment Forum:
http://www.socialinvest.org/resources/pubs/

https://www.moodys.com/

http://www.standardandpoors.com/en_US/web/guest/home

http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

http://www.nber.org/

Lipper's global fund market report

APPENDIX

Appendix 1 Summary statistics on individual funds

	No Obs.	Start date	End date	Mean	SD	Skewness	Kurtosis	JB test	JB prob.	Max	Min
Retail funds											
6878	73	9/30/08	9/30/14	2.14	19.38	-0.77	5.54	26.82	0.00	0.16	-0.19
16354	165	1/31/01	9/30/14	1.60	14.30	-0.62	4.20	20.28	0.00	0.10	-0.15
5491	75	6/30/08	9/30/14	3.01	21.20	-0.65	4.55	12.80	0.00	0.17	-0.19
5487	165	1/31/01	9/30/14	2.74	22.63	-0.05	8.22	187.63	0.00	0.31	-0.27
3689	165	1/31/01	9/30/14	0.86	17.51	-0.57	4.25	19.78	0.00	0.13	-0.17
28196	76	5/30/08	9/30/14	3.34	17.30	-0.68	4.28	11.15	0.00	0.13	-0.15
7042	165	1/31/01	9/30/14	1.02	15.97	-0.69	4.65	32.01	0.00	0.11	-0.19
7026	165	1/31/01	9/30/14	1.62	16.02	-0.44	4.32	17.35	0.00	0.12	-0.17
28197	63	7/31/09	9/30/14	3.77	14.54	-0.38	3.34	1.81	0.40	0.11	-0.09
31959	165	1/31/01	9/30/14	1.68	14.10	-0.91	5.23	56.76	0.00	0.09	-0.16
6742	165	1/31/01	9/30/14	1.91	23.21	-0.89	5.09	5.18	0.00	0.18	-0.25
6756	95	10/31/06	9/30/14	2.40	18.60	-0.96	5.25	34.52	0.00	0.14	-0.19
6745	165	1/31/01	9/30/14	1.36	15.44	-0.42	3.74	8.53	0.01	0.12	-0.13
28193	100	6/30/06	9/30/14	2.47	17.13	-0.46	5.11	22.01	0.00	0.14	-0.18
12572	161	5/31/01	9/30/14	2.52	17.90	-0.41	3.76	8.31	0.02	0.17	-0.16
17905	106	12/30/05	9/30/14	1.93	20.69	-0.46	3.91	7.33	0.03	0.14	-0.19
7056	77	5/30/08	9/30/14	2.44	21.92	-0.52	3.97	6.45	0.04	0.16	-0.20
4456	135	7/31/03	9/30/14	2.08	16.73	-1.13	6.82	110.53	0.00	0.12	-0.21
19394	124	6/30/04	9/30/14	1.64	16.95	-0.92	5.46	48.94	0.00	0.12	-0.18
37368	42	4/29/11	9/30/14	3.76	15.19	-0.27	4.46	4.25	0.12	0.13	-0.10
30000	131	11/28/03	9/30/14	2.01	19.17	-0.82	5.58	51.01	0.00	0.15	-0.23
29998	131	11/28/03	9/30/14	1.79	15.64	-0.55	4.74	23.07	0.00	0.12	-0.17
29989	146	8/30/02	9/30/14	2.77	16.17	-0.98	6.16	84.01	0.00	0.13	-0.20
6744	165	1/31/01	9/30/14	3.53	20.80	-0.34	3.38	4.26	0.12	0.15	-0.18
6750	95	10/31/06	9/30/14	1.75	23.78	-0.52	4.85	17.81	0.00	0.21	-0.22
28192	124	6/30/04	9/30/14	1.91	18.44	-0.70	6.47	72.32	0.00	0.17	-0.23

Continued

	No Obs.	Start date	End date	Mean	SD	Skewness	Kurtosis	JB test	JB prob.	Max	Min
Retail funds											
9201	165	1/31/01	9/30/14	1.18	17.04	-0.51	4.03	14.60	0.00	0.13	-0.18
9593	145	9/30/02	9/30/14	2.18	15.62	-0.55	4.25	16.70	0.00	0.12	-0.16
36747	45	1/31/11	9/30/14	4.92	13.88	-0.08	4.08	2.25	0.33	0.13	-0.08
36749	45	1/31/11	9/30/14	4.69	13.84	-0.07	4.10	2.30	0.32	0.13	-0.08
14029	165	1/31/01	9/30/14	0.99	16.12	-0.50	3.73	10.53	0.01	0.10	-0.16
6752	95	10/31/06	9/30/14	1.47	23.07	-0.54	4.05	8.97	0.01	0.19	-0.18
6743	165	1/31/01	9/30/14	4.31	23.66	-0.32	3.37	3.73	0.15	0.18	-0.19
5488	165	1/31/01	9/30/14	2.74	20.63	-0.33	6.68	95.99	0.00	0.24	-0.25
7075	165	1/31/01	9/30/14	0.99	20.07	-0.55	4.15	17.41	0.00	0.17	-0.20
7013	135	7/31/03	9/30/14	2.10	15.95	-0.80	5.51	49.90	0.00	0.12	-0.19
9598	165	1/31/01	9/30/14	0.77	17.26	-0.60	3.94	16.01	0.00	0.12	-0.16
46123	52	6/30/10	9/30/14	5.06	13.45	0.03	3.16	0.06	0.97	0.11	-0.06
7290	165	1/31/01	9/30/14	1.39	19.29	-0.35	4.29	14.81	0.00	0.18	-0.17
22031	165	1/31/01	9/30/14	2.00	16.32	-0.72	4.66	33.18	0.00	0.11	-0.19
22023	165	1/31/01	9/30/14	1.94	16.33	-0.72	4.67	33.45	0.00	0.11	-0.19
22058	146	8/30/02	9/30/14	2.15	15.87	-0.87	5.29	50.42	0.00	0.11	-0.19
23827	77	5/30/08	9/30/14	3.48	18.65	-0.87	4.89	21.19	0.00	0.13	-0.18
23824	165	1/31/01	9/30/14	1.92	20.85	-0.01	4.90	24.90	0.00	0.20	-0.20
23826	77	5/30/08	9/30/14	3.72	25.52	0.03	5.04	12.89	0.00	0.26	-0.23
24491	165	1/31/01	9/30/14	1.14	15.97	-0.59	4.00	16.42	0.00	0.12	-0.16
23828	165	1/31/01	9/30/14	2.45	13.71	-0.54	5.14	39.40	0.00	0.12	-0.15
29018	83	11/30/07	9/30/14	2.43	19.79	-0.63	4.16	10.11	0.01	0.14	-0.19
27805	147	7/31/01	9/30/14	2.13	15.92	-0.76	4.78	33.69	0.00	0.11	-0.17
29987	165	1/31/01	9/30/14	2.32	19.71	-0.51	4.04	14.71	0.00	0.17	-0.20
36663	45	1/31/11	9/30/14	4.04	10.59	0.08	3.51	0.53	0.77	0.09	-0.06
7145	165	1/31/01	9/30/14	1.32	19.63	-0.20	5.60	47.61	0.00	0.22	-0.22
31205	136	6/30/03	9/30/14	1.93	18.68	-0.73	4.85	23.97	0.00	0.14	-0.19
43338	35	11/30/11	9/30/14	3.52	12.82	-0.53	2.26	2.44	0.29	0.06	-0.06
30850	147	7/31/02	9/30/14	2.07	14.31	-0.70	4.91	34.39	0.00	0.11	-0.16

Continued

	No Obs.	Start date	End date	Mean	SD	Skewness	Kurtosis	JB test	JB prob.	Max	Min
Instituional funds											
6876	80	2/29/08	9/30/14	2.09	18.83	-0.75	5.62	30.40	0.00	0.16	-0.19
9596	145	9/30/02	9/30/14	2.30	15.66	-0.54	4.22	16.21	0.00	0.12	-0.16
9203	94	12/29/06	9/30/14	2.18	18.31	-0.64	4.19	11.96	0.00	0.13	-0.18
14064	121	9/30/04	9/30/14	2.22	15.42	-0.84	5.15	37.68	0.00	0.11	-0.17
2729	121	9/30/04	9/30/14	2.31	17.35	-0.66	4.41	18.65	0.00	0.12	-0.18
2727	121	9/30/04	9/30/14	2.54	19.73	-0.61	4.65	21.33	0.00	0.16	-0.21
46128	52	6/30/10	9/30/14	4.42	18.16	-0.09	3.07	0.09	0.96	0.13	-0.10
46865	28	6/29/12	9/30/14	6.11	10.06	-0.42	3.17	0.86	0.65	0.07	-0.05
24481	158	8/31/01	9/30/14	1.82	14.35	-0.97	5.29	59.25	0.00	0.10	-0.17
7158	65	5/29/09	9/30/14	6.00	18.14	-0.22	2.99	0.51	0.78	0.14	-0.10
29017	83	11/30/07	9/30/14	2.53	19.80	-0.62	4.15	9.94	0.01	0.14	-0.19
35817	46	12/31/10	9/30/14	4.37	13.69	-0.51	3.61	2.70	0.26	0.10	-0.09
14061	121	9/30/04	9/30/14	2.19	16.57	-0.82	4.81	30.05	0.00	0.12	-0.17
3946	129	1/30/04	9/30/14	2.31	17.33	-0.85	4.33	24.87	0.00	0.10	-0.17
31206	104	2/28/06	9/30/14	1.93	18.68	-0.73	4.85	23.97	0.00	0.14	-0.19
Retail/Instituional funds											
17907	165	1/31/01	9/30/14	0.74	16.20	-0.32	4.46	1.75	0.00	0.16	-0.17
17908	165	1/31/01	9/30/14	0.28	16.75	-0.69	5.74	6.44	0.00	0.15	-0.21
29324	141	1/31/03	9/30/14	2.59	15.73	-0.86	5.85	65.09	0.00	0.11	-0.18
Small funds (TNA < $10 mil.)											
7293	142	12/31/02	9/30/14	2.10	17.56	-1.05	5.87	74.89	0.00	0.12	-0.21
9595	145	9/30/02	9/30/14	1.95	15.63	-0.56	4.23	17.34	0.00	0.12	-0.16
36750	45	1/31/11	9/30/14	5.07	56.79	-0.04	3.50	3.73	0.53	0.01	-0.10
38038	42	3/31/11	9/30/14	3.56	13.33	-0.18	3.42	0.54	0.76	0.11	-0.08
46126	52	6/30/10	9/30/14	4.23	18.15	-0.09	3.08	0.09	0.96	0.13	-0.10
30002	91	3/30/07	9/30/14	2.28	21.68	-0.59	4.12	9.95	0.01	0.17	-0.21

This table reports summary statistics for the individual funds of Retail, Institutional funds, both category funds, and small funds over the period from January 2001 to September 2014. Annualised mean excess returns and standard deviation are expressed in percentage. The results on the skewness, kurtosis, Jarque-Bera test, and the minimum and maximum excess returns are presented.

Appendix 2 Performance estimates using the unconditional one-factor model

	α_0	β_0	Adj. R^2
6878	-0.003322**	1.027219***	92.75%
16354	0.001185*	0.871275***	96.38%
5491	-0.001635	1.130620***	91.60%
5487	0.003349	1.157889***	67.71%
3689	-0.001331	1.035126***	90.67%
28196	0.00233	0.912041***	92.67%
28193	0.000728	0.95728***	86.40%
28192	-0.001506	1.123688***	87.33%
28197	-0.003075	0.91516***	76.76%
31959	0.00153	0.844825***	93.11%
6742	0.000953	1.219402***	71.47%
6756	0.000499	1.025884***	88.24%
6745	0.000126	0.928538***	94.41%
6752	-0.003241	1.229803***	82.34%
6744	0.00507*	1.079708***	71.78%
6750	-0.002699	1.268045***	82.43%
6743	0.006616*	1.179278***	66.81%
5488	0.003434	1.131947***	77.98%
7075	-0.001643	1.117483***	80.94%
7042	-0.000809	0.97833***	97.46%
7026	0.000811	0.959465***	93.30%
7013	-0.00124**	1.053241***	96.95%
9598	-0.001969**	1.036487***	94.47%
9201	-0.000702	1.038350***	96.70%
9593	-0.000672	0.982944***	95.23%
36747	-0.000337	1.116736***	94.97%
36749	-0.000919	1.113638***	94.92%
14029	-0.00104	0.988103***	97.79%
46123	0.000198	0.983545***	96.07%
7290	-0.001204	1.106340***	91.18%
22031	0.001949**	0.965354***	90.70%
22023	0.001786	0.965796***	90.67%
22058	-0.000931	1.010783***	96.92%
23827	0.002113	0.984195***	91.65%
23824	0.000858	1.145995***	78.60%
23826	0.000969	1.222962***	75.31%
24491	-0.000471	0.976538***	97.04%
23828	0.003775***	0.796474***	87.60%
29018	0.000459	1.092468***	98.49%
27805	-0.000438*	1.017576***	99.66%
29987	0.00229	1.065168***	75.91%
36663	0.001747	0.753165***	73.67%
7145	-0.000538	1.138759***	87.22%
31205	-0.001556**	1.112693***	95.70%
43338	-0.00731**	1.114244***	70.19%
30850	0.000143	0.896537***	95.74%
17905	-0.001494	1.129094***	78.37%
7056	-0.001623	1.103871***	83.29%
12572	0.002516	1.042772***	84.61%
4456	-0.001314	1.056088***	88.53%
19394	-0.00195**	1.073119***	94.38%
37368	-0.002751	1.101180***	81.05%
30000	-0.001664	1.153520***	81.73%
29998	-0.001219	0.985364***	89.72%
29989	0.000956	0.984134***	88.47%
6876	-0.001642	1.004848***	91.77%
9596	-0.000358	0.98548***	95.29%
9203	-0.000133	1.049320***	96.41%
14064	-0.000134	0.996444***	99.92%
2729	-0.000267	1.055931***	88.58%
2727	-0.000497	1.191216***	87.14%
14061	-0.000599	1.056527***	97.37%
46128	-0.004244	1.177043***	75.04%
35817	-0.002411	1.062096***	91.35%
46865	-0.000843	1.047850***	82.15%
24481	0.001119	0.859616***	90.82%
7158	-0.001802	1.208638***	85.18%
29017	0.000743	1.092705***	98.48%
3946	0.000111	1.062274***	85.42%
31206	-0.001324	1.117744***	96.12%
17907	-0.001246	0.937771***	86.92%
17908	0.000663	0.997422***	91.92%
29324	-0.000322	1.038067***	96.58%
7293	-0.001245	1.048847***	79.94%
9595	-0.001306**	0.983238***	95.25%
36750	5.91E-05	1.1185***	94.87%
38038	-0.002496	1.033585***	93.09%
46126	-0.004769	1.176994***	75.18%
30002	-0.000718	1.150401***	84.89%

This table presents regression estimates for the individual funds of Retail, Institutional funds, both category funds and small funds obtained by the regression of the unconditional **CAPM [2**] with the S&P 500 market index during the period from January 2001 to September 2014. It reports performance estimates (alpha), systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity.

Appendix 3 Performances estimate using the unconditional four-factor model

	α_0	β_0	β_{smb}	β_{hml}	β_{mom}	Adj. R^2
6878	-0.002998**	0.897172***	0.24748***	0.097907*	-0.130749***	95.68%
16354	0.00073	0.884637***	-0.005031	0.110285***	0.024729**	97.01%
5491	-0.00176	1.006207***	0.149786**	0.121947*	-0.154143***	94.28%
5487	-0.00037	0.954831***	0.739063***	0.687416***	-0.117638	85.64%
3689	-0.00136	1.000449***	0.204193***	-0.141504**	-0.00612	92.21%
28196	0.00233	0.796916***	0.265014***	0.130342**	-0.073745***	95.53%
28193	0.00066	0.895501***	0.517793***	-0.188519***	-0.025805	91.90%
28192	-0.00108	0.953681***	0.506469***	0.051867	-0.139865***	93.09%
28197	-0.001222	0.778245***	0.529742***	-0.097337	-0.228571***	84.48%
31959	0.00077	0.861995***	-0.046878	0.234644***	0.023277	95.92%
6742	-0.00172	1.291006***	0.662098***	-0.09893	0.304781***	82.36%
6756	-0.000587	1.124688***	0.139501*	-0.464084***	0.052955	93.28%
6745	0.000739	0.927713***	-0.133377***	-0.029824	-0.039744*	95.16%
6752	-0.00399	1.193737***	0.837831***	-0.204038*	0.159808***	91.53%
6744	0.001447	0.963788***	0.967692***	0.22987***	0.081023*	91.35%
6750	-0.002647	1.118015***	0.774843***	-0.007014	-0.037536	88.31%
6743	0.002662	1.099437***	0.987171***	0.22935***	0.147954***	83.32%
5488	0.000978	0.992397***	0.467678***	0.486762***	-0.091698	87.75%
7075	-0.002403***	1.075905***	0.566723***	-0.311793***	0.078642*	89.64%
7042	-0.001082	0.961972***	0.076838***	0.028841	-0.005433	97.64%
7026	0.000618	0.930745***	0.142648***	-0.040266	-0.010145	93.88%
7013	-0.001133	1.009699***	0.163702***	-0.065773*	-0.058595***	97.82%
9598	-0.001447**	1.026030***	0.082101**	-0.218034***	-0.001444	96.12%
9201	-0.000706	1.012619***	0.07669***	-0.029154	-0.023221	96.88%
9593	-0.000794	0.984134***	0.139966***	-0.183292***	0.005484	96.53%
36747	0.000289	1.091170***	0.063244	-0.008573	-0.057699	94.79%
36749	-0.000391	1.092616***	0.050602	-0.013189	-0.052694	94.69%
14029	-0.000981**	0.967232***	0.053952***	-0.03251**	-0.021423**	97.93%
46123	-0.00081	1.019314***	-0.024307	-0.298783***	0.034022	97.89%
7290	-0.000893	1.066388***	0.069463	-0.082526	-0.051113**	91.54%
22031	0.001204	0.93782***	0.192491***	0.062131	0.00899	91.83%
22023	0.001042	0.937993***	0.193177***	0.061442	0.008703	91.80%
22058	-0.001077**	1.010291***	0.125247***	-0.088156***	0.022006**	97.54%
23827	0.001544	0.904292***	0.303218***	-0.089041	-0.098264***	94.02%
23824	0.00072	0.983246***	0.340393	0.005722	-0.18165***	82.39%
23826	-0.000311	0.913029***	).1096330***	0.035768	-0.210428***	89.51%
24491	-0.001009**	0.983347***	0.063219***	0.072209***	0.03155*	97.45%
23828	0.003494***	0.79108***	0.059947	0.026792	0.008447	87.58%
29018	0.000363	1.030252***	0.154481***	0.007176	-0.074069***	99.38%
27805	-0.000425	1.007091***	0.010793	0.014243	-0.013589***	99.69%
29987	-0.00092	0.962561***	0.831481***	0.231526***	0.065539*	91.94%
36663	0.000202	0.815764***	-0.157858	0.035708	0.142159	73.77%
7145	-0.001919	1.024496***	0.43613***	0.15933***	-0.067467	91.94%
31205	-0.001379**	1.036890***	0.156066***	0.011936	-0.110326***	97.15%
43338	-0.004329	0.952348***	0.946424***	0.301994*	0.06984	92.39%
30850	3.72E-05	0.902597***	0.061953*	-0.027014	0.029726*	95.93%
17905	-0.00148	0.962851***	).1050287***	-0.083924*	0.02839	93.68%
7056	-0.002655	0.927598***	0.901998***	0.025348	-0.003804	94.01%

Continued

	α_0	β_0	β_{smb}	β_{hml}	β_{mom}	Adj. R^2
12572	0.001096	1.010994***	0.465626***	-0.031952	0.082611***	90.54%
4456	-0.001334	1.095282***	0.17783***	-0.315629***	0.045083	91.82%
19394	-0.001844***	0.979705***	0.01173	0.320628***	-0.082655	97.97%
37368	0.001379	0.905845***	0.734859***	0.054255	0.111169	90.01%
30000	-0.001615	1.115869***	0.634052***	-0.28511***	0.099075***	90.85%
29998	-0.00102	0.967814***	0.33487***	-0.260253***	0.003406	94.03%
29989	0.000545	0.976632***	0.205125***	0.028446	0.068234*	89.85%
6876	-0.00158	0.878616***	0.284919***	0.119389**	-0.098398**	94.66%
9596	-0.00049	0.986172***	0.145382***	-0.182438***	0.006684	96.62%
9203	-0.000203	1.020407***	0.153664***	-0.079151**	-0.046333*	96.94%
14064	-0.000128	0.996854***	-0.000165	-0.00782	-0.002937	99.92%
2729	-0.000497	1.104719***	0.203741***	-0.412102***	0.026443	93.04%
2727	-0.000714	1.038705***	0.838671***	-0.038164	0.02962**	97.75%
14061	-0.000543	1.014637***	0.023302	0.188873***	-0.001015	98.18%
46128	0.001877	0.829741***	).1206393***	-0.077811	-0.065667	93.39%
35817	-0.002176	1.043323***	0.124685	0.035208	0.10344	91.65%
46865	0.000223	1.002053***	0.173012	-0.012555	0.060987	81.95%
24481	0.00037	0.870997***	0.045598	0.231687***	0.073983***	93.43%
7158	0.000768	0.973245***	0.872198***	0.118705***	-0.055822*	98.40%
29017	0.000649	1.030195***	0.152968***	0.007874	-0.075041***	99.38%
3946	8.70E-05	1.061591***	0.319894***	-0.244979***	0.057573**	89.05%
31206	-0.001068	1.037566***	0.14727***	0.05159	-0.105063***	97.59%
17907	-0.00209	0.965506***	0.284133***	-0.123685**	0.12321***	91.19%
17908	-0.00056	0.981092***	0.177224***	0.192046***	0.02777	94.15%
29324	-0.000223	0.988326***	-0.01878	0.151328***	-0.063182***	97.74%
7293	-0.001645	1.039369***	0.45193***	-0.336569***	0.066664*	86.79%
9595	-0.001429*	0.985867***	0.138703***	-0.184532***	0.007687	96.57%
36750	0.000563	1.099009***	0.047118	-0.021649	-0.052589	94.63%
38038	-0.000379	0.935132***	0.299289***	0.061476	-0.065464	94.65%
46126	0.001302	0.83182***	).1200610***	-0.079131	-0.061027	93.42%
30002	-0.000446	0.987196***	0.89131***	0.092385	0.037477	95.13%

This table presents regression estimates for the individual funds of Retail, Institutional funds, both category funds and small funds, obtained by the regression of the unconditional **Carhart (1997) [3**] with the S&P 500 market index during the period from January 2001 to September 2014. It reports performance estimates (alpha), systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Additionally, the regressions coefficients of Size, Value and Momentum factors are reported. Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity.

Appendix 4 Performances estimate using the full conditional one-factor model

	α_0	α_{TB}	α_{TS}	α_{DY}	β_0	β_{TB}	β_{TS}	β_{DY}	Adj. R^2
6878	0.007164	0.012189	-0.001653	-0.002914	0.629574*	0.190588	0.016917	0.127065	92.58%
16354	-0.002517	0.000997	0.000647	4.96E-05	1.094423***	-0.072103***	-0.019697	-0.037688	97.12%
5491	-0.004323	0.01184***	-0.000808	0.00107	1.070364**	-0.039551	-0.014082	0.055882	91.58%
5487	-0.032604	0.004479	0.007481**	0.005441	0.185733	-0.166894**	-0.041553	0.627261***	79.37%
3689	-0.030112	0.002479	0.003919	0.008465	1.501022***	-0.032277	-0.116987**	-0.071346	91.36%
28196	-0.006572	0.01621***	0.001212	0.001596	0.707251***	0.127105	-0.018856	0.103658*	93.52%
28193	-0.002935	0.001079	0.001477	-0.000551	1.248347***	-0.078943	-0.027064	-0.070514	86.03%
28192	-0.034764	0.003134	0.00443	0.009912	0.642703	0.000757	0.01326	0.198616	87.66%
28197	-0.178887	0.082838	0.018392*	0.058594	1.4445874*	-1.599222**	-0.397544***	-1.115742**	80.72%
31959	0.019096	-0.000474	-0.000728	-0.00802***	0.513716***	-0.010154	0.058394*	0.103446**	94.83%
6742	0.056817	-0.002792	-0.004377	-0.022226	1.946652***	-0.079501	-0.174934	-0.100196	71.84%
6756	0.004673	-0.000878	-0.003223	0.001635	1.628386***	0.023342	0.029648	-0.295732*	89.03%
6745	-0.009828	0.000779	0.000211	0.004071	1.221747***	-0.045408**	-0.047905	-0.059257	94.40%
6752	0.004721	0.002053	0.002374	-0.008409	1.2844623***	-0.248045***	-0.359458***	-0.234286	84.04%
6744	0.026814	0.000822	0.004564	-0.017615**	1.390562***	-0.134079*	-0.140408	0.102442	74.35%
6750	-0.000245	-0.000372	-0.001281	7.83E-05	1.137276**	-0.06414	-0.0795	0.156906	81.68%
6743	0.014495	0.002193	0.004472	-0.011934	1.946432***	-0.212007*	-0.283316*	0.091954	68.99%
5488	-0.023887	0.004031	0.005405	0.003865	1,044,990	-0.182632*	-0.031635	0.199803	83.82%
7075	0.0106	-0.001394	-0.000456	-0.004568	1.622404***	-0.010087	-0.0367	-0.196933**	81.02%
7042	0.000113	-7.05E-05	0.00109	-0.00146	0.571671***	0.041406**	0.045155	0.119866***	97.69%
7026	-0.005822	0.001488	0.001939	-0.000113	1.012948***	-0.033537	-0.041293	0.045313	93.40%
7013	-0.010388	-0.000423	-0.000509	0.005505	0.744751***	0.04692*	0.051963	0.061774	97.07%
9598	-0.02354*	0.000187	0.000637	0.010362***	1.405754***	-0.003484	-0.062763	-0.110408*	95.72%
9201	-0.014537	0.000922	0.00218	0.004014	0.865896***	0.010393	-0.015145	0.093632	96.84%
9593	-0.018382*	0.000392	0.00077	0.007546*	1.345329***	-0.038725	-0.078554*	-0.06048	95.53%
36747	0.086887	-0.056155	-0.00681	-0.032355	-0.761894	0.353159	0.177786	0.679363	94.60%
36749	0.092798	-0.057465	-0.007255	-0.034924	-0.876087	0.317158	0.18523	0.724375	94.59%
14029	-0.011**	0.000516	0.001069	0.003594	0.951253***	0.008161	-0.006346	0.019138	97.80%
46123	0.040414	-0.042441	-0.001013	-0.016695	0.073749	0.748061	-0.00252	0.403035	95.96%
7290	0.02026	-0.001973	-0.005109***	-0.003434	0.925462***	0.071618*	0.165749***	-0.146142**	92.63%
22031	0.009368	0.000492	0.000282	-0.004582	0.947895***	-0.014995	0.04462	-0.028356	90.87%
22023	0.00933	0.000466	0.000254	-0.004587	0.938547***	-0.013406	0.046409	-0.026704	90.83%
22058	-0.003119	0.000196	-0.000113	0.001007	1.193921***	-0.002171	-0.001277	-0.07948	96.90%
23827	-0.014557	0.015574*	0.000518	0.006399	0.784532*	0.258526***	0.026024	0.028179	92.70%
23824	-0.038276	0.002496	-0.000536	0.018281*	0.970662	-0.072047	0.035989	0.086198	80.17%
23826	-0.063657	0.042748***	0.003313	0.022104	1.121828**	0.241402*	-0.03281	0.087578	79.25%
24491	-0.004168	0.001376**	0.000842	-0.000448	1.298091***	-0.069997	-0.035706	-0.067197**	97.42%
23828	0.007089	0.000604	-0.000162	-0.002352	0.755949*	-0.045732	-0.025993	0.080012	88.37%
29018	-0.014546*	-0.000113	0.001095	0.005718***	0.789184***	-0.001668	0.029931	0.095497*	98.63%
27805	-0.002472	8.15E-05	-0.000209	0.001193	0.970351***	0.001007	0.013524	0.005816	99.67%
29987	0.028182	-0.000481	-0.001006	-0.012572	1.376862***	-0.121049**	-0.092179	0.034136	76.96%
36663	-0.137474	0.081697	0.016386	0.045678	0.301823	1.30596	-0.032916	0.212046	73.14%
7145	-0.03565*	0.002175	0.003164	0.012592*	0.559943**	-0.012418	-0.031859	0.320862***	88.85%
31205	-0.009262	-0.001002	-0.001113	0.005983**	0.452771*	0.067652*	0.08031**	0.176253***	96.18%
43338	-0.425171	0.028463	0.016478	0.179644*	1.473147	-1.965832	-0.001885	-1.71160	73.27%
30850	-0.002451	0.001043	0.001717	-0.001429	1.109347***	-0.068708***	-0.047837**	-0.012321	96.01%
17905	-0.015401	0.002986	0.00599	-0.00095	1.320290**	-0.026955	-0.057725	-0.007602	77.43%
7056	-0.014194	0.012343***	-0.001316	0.005889	1.652983***	0.029319	-0.07652	-0.13678	82.80%

Continued

	α_0	α_{TB}	α_{TS}	α_{DY}	β_0	β_{TB}	β_{TS}	β_{DY}	Adj. R^2
12572	-0.007155	0.002488	0.004284	-0.002267	1.796264***	-0.126836*	-0.158219*	-0.099439	85.15%
4456	-0.016085	0.001251	6.00E-05	0.006192	1.406609***	-0.001181	0.026127	-0.177464**	88.59%
19394	-0.001499	0.000418	0.000798	-0.001081	0.452816***	0.014039	-0.001384	0.26499***	95.03%
37368	-0.153302	0.17471	0.009858	0.056131	-1.302585	0.41039	0.299777	0.802991	80.30%
30000	0.009313	-0.001642	-0.002385	-0.001988	1.567342***	0.021262	-1.17E-05	-0.189342	81.46%
29998	-0.00675	-0.000756	-0.000959	0.003968	1.530100***	-0.046215	-0.025168	-0.19487*	89.97%
29989	0.013769	0.000342	-0.000949	-0.005769	1.186207***	-0.026836	-0.04365	-0.030912	88.37%
6876	0.010644	0.005954**	-0.001831	-0.003994	0.45842	0.029987	0.052189	0.17301	92.15%
9596	-0.018003*	0.00032	0.000641	0.007715*	1.322219***	-0.033196	-0.073371*	-0.057019	95.58%
9203	-0.016313	0.001219	0.002748	0.00442	0.851898***	0.024219	-0.008271	0.087772	96.49%
14064	0.00103	-0.000237**	-0.000259	-0.000132	0.960446***	0.006424**	0.003656	0.009087	99.92%
2729	-0.006498	-0.000239	0.000498	0.002651	1.468374***	0.013796	0.015817	-0.199145*	88.67%
2727	-0.00632	0.001387	0.003469	-0.001532	1.451784***	-0.030942	-0.07513	-0.021161	86.69%
14061	0.002912	2.69E-07	-0.00021	-0.001663	1.225315***	-0.046887*	-0.049596*	-0.005106	97.36%
46128	0.04751	0.08764	0.001888	-0.030379	0.812356	-1.043424	-0.121178	0.356492	73.46%
35817	-0.133618	0.065278	0.007877	0.052132	1.216979	-0.853669	0.086717	-0.594213	91.26%
46865	-0.22823	-0.139516	0.005825	0.105959	0.13489	0.35083	0.371641	-0.133188	84.33%
24481	0.021878*	-6.55E-05	9.25E-05	-0.010808***	0.854921***	-0.038778	-0.024882	0.05404	91.67%
7158	0.014974	0.058609	0.0017	-0.012694	1.016399	-0.549138	-0.029317	0.15847	84.37%
29017	-0.014087*	-0.000183	0.001094	0.005646***	0.785409***	-0.002552	0.030438	0.096702*	98.63%
3946	-0.015464	0.001254	-0.001913	0.00886	0.879702***	0.117042***	0.141725*	-0.108316	86.63%
31206	-0.011025	-0.001292	-0.001555	0.007238**	0.456588*	0.064386*	0.085984**	0.169978***	96.61%
17907	-0.010691	0.000929	0.001535	0.002061	1.619893***	-0.090384	-0.134765	-0.119823	87.07%
17908	-0.007654	0.001634	0.000794	0.001732	0.907809***	-0.058516	0.012028	0.069672	93.09%
29324	0.003545	0.000654	0.000236	-0.00255	0.803891***	-0.020614	0.002548	0.108328*	96.84%
7293	0.009937	-0.001673	-0.002192	-0.001935	0.953023*	0.121055**	0.07714	-0.087942	80.27%
9595	-0.019017*	0.000397	0.000717	0.007604*	1.333253***	-0.037192	-0.073703*	-0.060865	95.52%
36750	0.087325	-0.053442	-0.00672	-0.032562	-0.720455	0.164779	0.170987	0.67275	94.48%
38038	-0.176755*	0.09535	0.01284**	0.066094*	1.4344110*	-0.3315810**	-0.236471	-1.218820**	93.35%
46126	0.050303	0.085338	0.001799	-0.031783	0.665397	-0.97278	-0.112219	0.412715	73.61%
30002	-0.000882	0.000639	-0.000131	-0.000571	1.535631***	-0.113698	-0.11408	-0.010766	84.33%

This table presents regression estimates for the individual funds of Retail, Institutional funds, both category funds and small funds, obtained by the regression of the full conditional **one-factor Model [5**] with the S&P 500 market index during the period from January 2001 to September 2014. It reports conditional alphas, the coefficients estimates for the conditional alpha function, conditional systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. The predetermined information variables are the short-term interest rate level (TB), the slope of the term structure (TS) and the dividend yield (DY). Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity.

Appendix 5 Performances estimate using the full conditional four-factor model

	α_0	α_{TB}	α_{TS}	α_{DY}	β_0	β_{TB}	β_{TS}	β_{DY}	β_{smb}	$\beta_{SMB,TS}$	$\beta_{SMB,TB}$	$\beta_{SMB,DY}$	β_{HML}	$\beta_{HML,TB}$	$\beta_{HML,TS}$	$\beta_{HML,DY}$	β_{MOM}	$\beta_{MOM,TS}$	$\beta_{MOM,TS}$	$\beta_{MOM,DY}$	Adj. R^2
6878	0.097583***	0.015939	-0.005351**	-0.041166***	0.972383*	0.11979	0.017618	-0.06988	*-0.1145032*	0.3365241**	0.085132	0.697253***	0.1396906*	-0.521557	-0.052644	-0.502163*	0.086678	-0.1229498**	-0.01344	-0.037798	97.40%
16354	-0.005734	0.000856	0.000535	0.001574	1.086194***	-0.059396***	-0.041337	-0.001483	-0.260135	0.048984	0.029926	0.056524	0.33473	0.022114	0.025368	-0.182837**	0.03058	-0.009071	-0.005448	-0.002687	97.72%
5491	0.005344	-0.014583	0.002389	-0.00587	1.2540020***	0.161389	-0.088207	-0.591974**	0	0.411545	-0.167694	0.764246***	-0.207242	0.951201	-0.126322	0.280359	-0.419711	0.632985	0.074289	-0.01555	96.41%
5487	0.031252	-0.001845	-0.001738	-0.014018*	0.927034*	-0.159232**	-0.086246	0.214608	0.352558	-0.056822	-0.119798	0.382684	0.2122091**	-0.214444**	-0.122813	-0.59814**	0.761592	-0.079283	-0.022661	-0.343468***	90.97%
3689	-0.007626	0.000418	5.85E-05	0.002804	1.228799***	0.003462	0.006139	-0.127272	0.000812	-0.031299	-0.027721	0.162188	-0.395306	-0.029755	0.061485	0.100325	-0.546664	0.114721**	0.169049***	0.016616	93.48%
28196	0.015484	0.013575	0.001177	-0.008468	1.221076**	0.115316	-0.05209	-0.132442	-0.525847	-0.345712	-0.122156	0.518273**	0.157193	0.1541	-0.015729	-0.001254	0.36922	-0.115306	-0.042226	-0.102725	96.11%
28193	0.055864***	-0.001541	-0.001866	-0.024259***	1.074320***	-0.0506	0.009096	-0.07273	-0.74724	0.075298	0.044268	0.509892**	-0.016809	0.093413	0.082216	-0.217047	-0.248804	0.126161**	0.103076	-0.056031	93.31%
28192	0.024267	0.000737	0.002223	-0.015325***	0.304288	0.00802	0.031687	0.278739*	0.31469	-0.005145	-0.067467	0.183505	).2055121***	-0.131602*	-0.278038**	-0.60507	-0.096274	0.00176	-0.01404	-0.011494	93.23%
28197	-0.157346	-0.000424	0.020189*	0.050064	1.4899778**	-0.099869	-0.404399*	-0.145789	0.303707	-0.173547	-0.71006***	-0.264481	0.5642125**	-0.949766	-0.370399	-0.2084306	0.6187483*	0.035853	-0.354361**	-0.2533503*	90.26%
31959	0.006827	-0.000203	8.78E-05	-0.003278	0.588766***	0.006797	0.000552	0.144057*	-0.199823	0.048388	0.049144	-0.019872	0.574606**	0.028352	-0.014051	-0.206803*	0.061837	-0.028552	-0.028113	0.014119	96.89%
6742	0.057632	-0.004782	-0.00721*	-0.019807	1,363,622	0.097885	-0.019341	-0.05068	-0.976773	0.119889	0.171959	0.577725	1,163,766	-0.122811	-0.109108	-0.485425	-0.208993	0.199746*	0.110513	-0.009892	84.80%
6756	-0.062514***	-0.003716*	-0.005142*	-0.023777***	0.659299**	0.013811	0.057769	0.134147	0.533121	-0.008971	-0.149338	0.012659	0.1620448*	-0.119239	-0.018221	-0.877396***	0.605792*	0.044041	-0.080313	-0.174197**	95.27%
6745	-0.010392	0.001585	0.001309	0.002964	1.300057***	-0.084039***	-0.071902**	-0.05145	-0.759105**	0.070934	0.075123	0.181071	-0.079792	-0.013737	-0.015121	0.052856	-0.212251	0.005616	0.00384	0.072043	95.20%
6752	-0.070457***	-0.001098	-0.000684	-0.035882***	1.413924***	-0.182701	-0.33246	0.328651	-0.084134	0.073502	-0.100151	0.542816	3,696,894	-0.366911	-0.303024	-1,302,659	0.779937	-0.036793	-0.073373	-0.184922	93.34%
6744	0.057637	-0.004328*	-0.003232	-0.022568*	1.230072*	-0.02878	-0.070061	-0.038633	0.1622627*	-0.17416*	-0.139793	-0.034381	0.393479	-0.02233	0.032728	-0.169701	0.274787	0.033097	-0.004588	-0.124002	92.64%
6750	-0.148069***	-0.006449*	-0.005637*	-0.06541***	0.547464	-0.078264	-0.184293*	0.478953***	0.188368	0.082222	-0.106721	0.387481	).5836565***	-0.43114***	-0.351442***	0.2105345**	).1425325***	0.040259	-0.074559	-0.560397***	92.81%
6743	0.048674**	-0.00324	-0.002606	-0.01972*	1.920991***	-0.046295	-0.186506**	-0.138773	0.940374	-0.117571	-0.162151	0.327709	0.925816	-0.044807	-0.060332	-0.342261	0.124442	0.135559	0.058621	-0.148073	86.81%
5488	0.033216	-0.00161	-0.002013	-0.01443*	1.295415**	-0.129084**	-0.06235	0.026022	-0.564645	-0.004848	-0.000904	0.555572	).2055956***	-0.118231	-0.097371	-0.727681***	-0.034549	0.010517	0.070231	-0.136874	91.98%
7075	0.022924	-0.002844	-0.003372	-0.006886	0.662186	0.070532	0.114759	0.023188	1,136,385	-0.094902	-0.101449	-0.089871	0.042989	-0.045702	-0.039369	-0.109817	-0.043443	0.029663	0.036718	-0.003999	88.97%
7042	0.003505	-0.000455	0.000433	-0.002292	0.439051*	0.058759***	0.066644*	0.149089***	-0.331118	0.032184	0.064283	0.108588	0.2598	-0.024844	-0.041766	-0.075381	-0.180981	0.02289	0.047904	0.019526	97.80%
7026	0.014379	-7.89E-05	-0.000324	-0.007139	1.053929***	-0.035828	-0.030249	0.004235	-0.283037	0.02199	0.051158	0.139863	-0.400833	0.056018	0.087449	-0.021957	-0.039379	0.037983	0.015478	-0.032016	94.57%
7013	-0.00864	-0.000718	-0.0014	0.006074	1.034788***	0.036204	0.044712	-0.085189	-0.543058	0.059212	0.099685	0.198861	-1,161,612	0.056542	0.12026*	0.358211***	-0.293553*	0.002981	0.048204	0.059565	98.24%
9598	-0.014613	-0.000799	-0.001508	0.009079***	1.114826***	0.018872	0.030705	-0.101041	0.018399	-0.0198	0.006522	0.04714	0.1119688**	0.07682	0.15367***	0.252794*	-0.572413*	0.11433***	0.117685***	0.088403	96.96%
9201	-0.000446	-0.0002	0.000629	-0.000916	1.194310***	-0.009307	-0.029494	-0.046042	-0.477917	0.029151	0.071303	0.178695	-0.926981*	0.12066*	0.121937*	0.194309**	0.059757	0.020271	0.007143	-0.050778	97.34%
9593	-0.009089	-0.000412	-0.000832	0.00515	1.013979***	-0.018011	-0.01898	0.015449	0.028615	0.024546	0.055293	-0.035168	-0.656218	0.044542	0.126357*	0.063073	-0.553207***	0.12041***	0.127712***	0.063499	97.17%
36747	0.198339	-0.155449*	-0.017403	-0.071317	-1.3754039	0.3700141	0.485308	0.165296	0.126958	-0.443300	-0.198162	-0.279528	0.577585	-0.707212	-0.583688	-0.1867943	-0.3440475	0.4133968	0.53884	0.94287	94.02%
36749	0.20303	-0.15155*	-0.017788	-0.073447	-1.4003458	0.3619606	0.501746	0.175260	0.126675	-0.454581	-0.168346	-0.313698	0.519114	-0.702955	-0.517571	-0.1666639	-0.3572166	0.3976918	0.550969	0.993697	93.87%
14029	-0.003963	2.94E-06	6.34E-05	0.001438	0.996688***	-0.001862	-0.000967	-0.012261	-0.366277	0.035273	0.055276	0.124513	-0.239154	0.025647	0.034992	0.044714	-0.066953	0.006966	0.025744	-0.006095	97.86%
46123	0.051474	-0.03833	-0.006847	-0.016373	1.28574	-0.36793	0.00453	-0.11185	0.13342	0.18470	-0.24368	-0.45553	0.25209	0.12729	-0.26273	-0.11298	-0.3118802**	0.268477***	0.232661	1.177950	98.56%
7290	0.029808	-0.002249*	-0.004175***	-0.009531*	1.466740***	0.043694	0.091991*	-0.314813***	0.412648	-0.003034	-0.009215	-0.151022	-0.059998	0.01219	-0.113428	0.092012	0.25275	0.023578	-0.090874**	-0.06511**	94.48%
22031	0.032601	-0.001617	-0.002414	-0.012734***	1.046433***	-0.00372	0.013771	-0.055315	-0.071896	-0.016789	0.055679	0.086174	0.869978	-0.041463	-0.04318	-0.371078*	0.558057**	-0.074195	-0.05511	-0.172844*	92.71%
22023	0.032396	-0.001662	-0.002482	-0.012599***	1.027048***	-0.001343	0.016599	-0.050448	-0.042273	-0.018592	0.054695	0.07346	0.844275	-0.037455	-0.038067	-0.367041*	0.54757**	-0.072823	-0.053577	-0.170561*	92.68%
22058	0.011687**	-0.000364	-0.000865	-0.005563***	0.589547***	0.017154	0.04093	0.15815***	-0.074243	0.038048	0.063029	0.009281	).1183532***	-0.045291	-0.129216*	-0.447787***	-0.24132	0.073258*	0.02395	0.050906	98.10%
23827	-0.096507***	0.039345*	-0.004051	-0.042301***	-0.5122	0.017133	0.164081	0.487305*	0.1779933**	-0.61047	0.127001	0.835251***	3917370***	-0.8888*	-0.406274***	0.1329277**	0.196792	-0.415214*	-0.07509	-0.029406	95.59%
23824	0.014484	-0.00036	-0.004706**	-0.002315	0.640007	-0.112365*	-0.018619	0.254506	-0.2447550*	0.191533**	0.217013	0.1096971*	0.1814549*	-0.17838*	-0.098969	-0.783366***	-0.430843	-0.007528	-0.047372	0.150944	86.13%
23826	0.034113	0.067392*	-0.002721	-0.016523	1.983816**	1.066946***	-0.122853	-0.398265	0.063086	-0.1554421**	-0.215895	0.711195	-0.422579	0.642248	0.314305	-0.124225	-0.277997	0.57208**	0.264321*	-0.274733	91.59%

Continued

	α_0	α_{TB}	α_{TS}	α_{DY}	β_0	β_{TB}	β_{TS}	β_{DY}	β_{smb}	$\beta_{SMB,TS}$	$\beta_{SMB,TB}$	$\beta_{SMB,DY}$	β_{HML}	$\beta_{HML,TB}$	$\beta_{HML,TS}$	$\beta_{HML,DY}$	β_{MOM}	$\beta_{MOM,TS}$	$\beta_{MOM,TS}$	$\beta_{MOM,DY}$	Adj. R^2
24491	-0.004896	0.000908	0.00029	0.000778	1.099539***	-0.03296	-0.014371	-0.01687	0.347538	-0.063459**	-0.090063*	0.017455	-0.135898	0.065333**	0.050894	-0.013064	-0.031817	-0.010409	0.016299	0.010842	97.87%
23828	0.014771	0.001027	0.000483	-0.007662	1.067790***	-0.089701*	-0.076263	0.025678	0.2008301***	0.239859***	0.252008***	0.584466***	0.670542	-0.065885	-0.1118	-0.230208	0.213592	-0.023416	-0.028908	-0.057611	89.53%
29018	0.012194	-0.001769**	-0.000291	-0.004946**	0.918349***	0.017918	0.035455	0.001296	0.499839*	-0.093307**	-0.083109**	-0.046816	0.102149	0.05839	0.018885	-0.064365	-0.026638	0.045178**	0.01523	-0.044993	99.45%
27805	-0.003806	0.000124	-0.000147	0.001809	1.071233***	-0.003245	0.006424	-0.036861*	-0.069216	0.009752	0.015803	0.016195	-0.176204	0.008524	-0.000728	0.08755*	-0.052842	0.003329	0.004643	0.012695	99.68%
29987	-0.04006***	-0.003877***	-0.006491***	-0.011543*	1.024039***	-0.031598	-0.066713	0.064284	0.50161	-0.013532	0.035467	0.158746	0.1076700*	-0.048494	-0.052043	-0.365574***	0.073734	-0.008693	-0.012153	-0.009829	92.41%
36663	-0.303093	0.10335	0.036005*	0.10364	-0.973501	1.40103	-0.040646	0.769893	0.299736	-0.865418	0.655095	-0.192380	0.000000	-0.712745	0.662606	0.382373	0.1553738*	-0.7069796**	-0.1578210*	-0.5544922*	82.60%
7145	0.008175	-0.001196	-0.001455	-0.002519	0.915207*	0.008698	0.016325	0.008926	0.232998	-0.14595***	-0.293845***	0.609103***	0.121788	-0.052638	-0.019582	0.032691	0.345081	-0.016292	0.014214	-0.170399*	96.06%
31205	0.002563	-0.001857**	-0.002436**	0.002188	0.935297***	0.049776*	0.047707	-0.034135	0.1135074***	0.092153*	0.174757*	0.390916***	-0.684317*	0.043137	0.049395	0.248454*	-0.390941*	0.011339	0.041214	0.083036**	97.64%
43338	0.127384	-0.184163	-0.020576	-0.033174	-1.707797	0.762894	1.073443**	0.241342	0.787848	0.2154039*	0.961776	-0.144561	1,851,138	-0.505275	-0.882141	-0.752809	0.716829	-0.129739	-0.330906	-0.309605	94.03%
30850	-0.001538	0.000642	0.000963	-0.000677	0.767499***	-0.028206	0.013826	0.060763	-0.053093	-0.021118	0.003461	0.06314	-0.21197	-0.0139	0.055347	0.013985	-0.463871*	0.083966***	0.108663***	0.069837	96.61%
17905	0.03972**	-0.000762	0.000819	-0.020024**	0.431142	0.048094	0.052992	0.163531	).1920158***	-0.134968	-0.246229	-0.070373	0.421271	0.066837	-0.007826	-0.26199	0.067165	0.051087	-0.049656	0.003934	94.09%
7056	0.030999	0.02602	-0.003135	-0.013387	).2656376***	0.66824***	-0.277709***	-0.505026*	-0.1567938*	0.1239856***	0.162165	0.96536***	0.377957	0.890112*	0.058288	-0.184001	0.581898	0.338632*	0.064133	-0.300971***	96.61%
12572	0.007784	0.000166	0.000698	-0.004722	0.623966	0.010179	0.038527	0.151956	0.737524	-0.100082	-0.152749	0.140207	0.902245	-0.045099	-0.118589	-0.335735	-0.716374***	0.139272*	0.151454*	0.119533	91.75%
4456	0.013274	-0.000171	-0.001369	-0.005918	-0.019258	0.082846*	0.173752***	0.293016*	-0.080979	-0.128962**	-0.133181	0.369346**	1,088,038	-0.064408	-0.065471	-0.574496***	-0.556451**	0.154076***	0.081886	0.128131	93.88%
19394	-0.00269	0.000123	0.000793	-0.000248	0.860277***	0.01787	-0.037369	0.09179	-0.06897	0.00634	-0.010643	0.062476	0.662968**	-0.028002	-0.116079***	-0.021096	-0.156328	-0.033518	-0.035336	0.075826**	98.37%
37368	0.064279	0.033859	-0.006669	-0.021956	-0.667122	0.314663	0.163379	0.520318	-0.56655	-0.16980	0.993103	0.213394	-0.598343	-0.403396	-0.013923	0.289899	-0.225475	-0.313430	-0.726868	0.176558	91.65%
30000	0.049938*	-0.003762*	-0.004988*	-0.01785*	-0.038809	0.100342**	0.148631*	0.328235*	0.1556315*	-0.073892	0.065187	-0.464196**	0.1637102**	-0.156961	-0.246963**	-0.585955*	-0.478513	0.157934*	0.121928	0.036572	91.99%
29998	0.018347	-0.002012	-0.002946**	-0.005065	0.750879*	-0.005125	0.063781	0.027848	0.1170048*	-0.073477	-0.079021	-0.283147	0.022542	-0.055957	0.028419	-0.137275	-0.350436	0.053869	0.120091*	-0.000969	94.49%
29989	0.031939*	-0.00064	-0.00218	-0.013604*	0.009882	0.017488	0.015238	0.447123***	0.048047	0.016709	0.019475	0.071808	).2748684***	-0.113585	-0.232482*	-0.998651***	-0.261169	0.099964*	-0.0554	0.142465**	92.44%
6876	0.07153***	-0.001316	-0.002447	0.0318313***	1.136909**	0.101907	-0.028738	-0.089526	-0.222526	0.092856	-0.137737	0.403458**	0.1565969*	0.029426	-0.123243	-0.501115	0.528633*	0.169625	-0.084267	-0.201692**	96.65%
9596	-0.010337	-0.000398	-0.000883	0.006004	0.986419***	-0.011785	-0.010412	0.017122	0.069918	0.027619	0.047239	-0.045654	-0.728888**	0.054019	0.130415*	0.089612	-0.569717***	0.12287***	0.130009***	0.06881	97.22%
9203	-0.003031	-9.77E-05	0.001168	-7.14E-05	1.353300***	0.002929	-0.013376	-0.139136	-0.42775	0.034633	0.131204	0.093494	-0.1221964*	0.205043***	0.106335	0.338284**	0.02055	0.06065	0.000989	-0.038243	97.48%
14064	0.002125	-0.000299*	-0.00029	-0.000536	0.860217***	0.014379***	0.011617**	0.042879***	0.059629	-0.016218*	-0.033727***	0.016257	0.03503	0.002287	0.017958**	-0.036695	-0.083018*	0.009765*	0.017014*	0.015009**	99.93%
2729	0.015077	-0.00194	-0.002606	-0.003859	1.546179***	-0.009471	0.057781	-0.282294*	0.367447	-0.035951	0.017863	-0.092551	0.2135833***	0.154762*	0.294343***	0.403326**	0.258872	0.049826	-0.009165	-0.108269	94.19%
2727	-0.043646***	-0.00157**	-0.000322	-0.020546***	0.502646*	0.013328	-0.005396	0.248095***	0.43795	-0.041839	-0.069851	0.304472*	1.935857***	-0.151995***	-0.219***	-0.625891***	0.035233	0.028919	-0.003427	-0.016929	98.27%
14061	0.007442	-0.00026	0.000259	-0.004192	0.925904***	-0.011328	-0.053825***	0.114497	0.117931	-0.050842**	-0.07294**	0.068669	).1408081***	-0.064901*	-0.132683***	-0.378122***	-0.210754**	0.006649	0.028146	0.051564	98.78%
46128	0.018371	0.016622	0.005475	-0.015066	1.303947	-0.64889	-0.325332	-0.641398	0.372212	-0.223587	-0.322301	-0.858995	0.268891	0.895194	0.015287	-0.131241	-0.171547	0.119234	0.34682	0.471877	92.99%
35817	-0.095815	0.112446	0.00343	0.038032	1.361344	-1.328495	-0.030182	-0.109688	-0.329023	0.535530	0.183113	0.128433	-0.432111	0.177343	0.342136	0.156647	-0.476436	-0.151515	0.344955	0.195204	90.01%
46865	-0.260733	0.146978	0.006897	0.114664	-1.57428	-1.76365	1.01466	1.20128	0.94968	-0.25778	-0.15572	-0.22565	-0.16530	0.47536	0.36645	0.23961	-0.24867	0.36742	0.24684	-0.24124	75.38%
24481	0.01104	-0.000251	-4.36E-05	-0.005289	0.551226*	0.012936	-0.008691	0.162309**	-0.051574	-0.036295	-0.034139	0.13039	0.376113	0.085763	0.006145	-0.141285	-0.063698	-0.013881	-0.008556	0.070573	94.02%
7158	0.033765	0.003369	-0.002358	-0.012974	0.003897	-0.575049	0.113829	0.346862	0.253425	-0.572959	0.100377	0.197221	-0.153187	-0.151164	0.159755	0.643863	-0.594695	-0.148878	0.047746	0.184194	98.31%
29017	0.012848	-0.001818**	-0.000287	-0.00513**	0.938398***	0.015137	0.034356	-0.006078	0.469834*	-0.088956**	-0.079904**	-0.038171	0.088284	0.056766	0.018665	-0.057973	-0.014936	0.042916**	0.01327	-0.047878	99.45%
3946	0.000585	0.000859	-0.002729	0.001767	0.666796	0.089054*	0.177425***	-0.049564	-0.260797	0.123025	0.214747**	-0.030539	-0.066257	-0.05884	-0.116643	0.045581	-0.062328	0.132571***	0.025595	-0.026837	92.01%
31206	-0.000633	-0.002089*	-0.002405**	0.003679	0.978178***	0.05341*	0.059118	-0.064884	0.1310916***	0.078302	0.151339**	0.500378***	-0.722963	0.0538	0.054452	0.264317	-0.406058**	0.007883	0.017533	0.115021*	98.09%

Continued

	α_0	α_{TB}	α_{TS}	α_{DY}	β_0	β_{TB}	β_{TS}	β_{DY}	β_{smb}	$\beta_{SMB,TS}$	$\beta_{SMB,TB}$	$\beta_{SMB,DY}$	β_{HML}	$\beta_{HML,TB}$	$\beta_{HML,TS}$	$\beta_{HML,DY}$	β_{MOM}	$\beta_{MOM,TS}$	$\beta_{MOM,TS}$	$\beta_{MOM,DY}$	Adj. R^2
17907	-0.003349	-0.000939	-0.001701	0.002552	1.353353***	-0.020034	-0.027695	-0.141168	0.1107988*	-0.097373	-0.073739	-0.275927	-0.658758	0.057183	0.148307*	0.046121	0.181776	0.067449	0.049051	-0.115995	92.12%
17908	0.00393	-0.000638	-0.001906	-0.000182	0.592183**	0.031409	0.049821	0.125943	0.811686*	-0.134549***	-0.142232**	-0.038319	0.396916	0.051821	0.049671	-0.24731**	-0.090328	0.022718	0.045664	0.957469	89.79%
29324	0.017506*	6.15E-05	-0.000172	-0.008829***	0.535645***	-0.012371	-0.007043	0.234488***	0.240709	-0.00045	-0.014613	-0.093021	).1762037***	-0.11288***	-0.222421***	-0.473913***	-0.230338	0.013258	-0.006356	0.06	98.37%
7293	0.057662***	-0.003446**	-0.004978*	-0.022288***	-0.540001	0.134564*	0.175916*	0.482292***	0.440463	0.036858	0.037723	-0.039846	).2765790***	-0.233107***	-0.263028*	0.1086623**	-0.062468	0.134598*	-0.011064	-0.003319	89.89%
9595	-0.010606	-0.000368	-0.000834	0.005579	0.968973***	-0.014117	-0.011366	0.0273	0.028636	0.023291	0.055639	-0.034704	-0.659959	0.047038	0.126917	0.06159	-0.571749***	0.122084***	0.129201***	0.070933	97.18%
36750	0.204074	-0.151318*	-0.018083	-0.07328	-1.4053271	1.6398560	0.509652	1.771485	0.152129	-0.475020	-0.208397	-0.394324	0.578916	-0.739079	-0.579655	-0.1876649	-0.3797499	0.4110193	0.593337	0.105673	93.83%
38038	-0.067351	0.111047	0.009201	0.019761	-0.027862	-0.150506	0.08565	0.366115	0.418436	-0.644732	0.035216	-0.174168	-0.606717	0.568442	0.694651	0.200005	-0.820031	-0.107098	0.106699	0.245008	94.03%
46126	0.023462	0.010654	0.005271	-0.017395	1.29353	-0.52368	-0.320516	-0.600385	0.37267	-0.285722	-0.327189	-0.856178	0.290434	0.720165	-0.020069	-0.13668	-0.17910	0.30020	0.348044	0.50288	92.96%
30002	0.062569***	-0.000502	-0.003457	-0.026432***	0.703107**	-0.049654	-0.137219*	0.308079*	0.326307	-0.010108	-0.022095	0.311417	).3067614***	-0.116607	-0.273185*	-0.996896***	0.420425	-0.059557	-0.086813	-0.068745	95.94%

This table presents regression estimates for the individual funds of Retail, Institutional funds, both category funds and small funds, obtained by the regression of the full conditional **four-factor Model [6**] with the S&P 500 market index during the period from January 2001 to September 2014. It reports conditional alphas, the coefficients estimates for the conditional alpha function, conditional systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Additionally, regressions coefficients of Size, Value and Momentum factors are reported. The predetermined information variables are the short-term interest rate level (TB), the slope of the term structure (TS) and the dividend yield (DY). Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity.

Appendix 6 Time-varying Carhart four-factor based performance estimates considering NBER cycles

	α_0	α_{rec}	β_0	β_{0rec}	β_{smb}	$\beta_{smb,rec}$	β_{hml}	$\beta_{hml,rec}$	β_{mom}	$\beta_{mom,rec}$	Adj. R^2
6878	-0.000844	-0.02538***	0.863386***	-0.112644*	0.221584***	0.278158*	0.115092*	-0.196093*	-0.099368**	-0.160459***	97.04%
16354	0.000336	0.001016	0.899702***	-0.034747	-0.008385	-0.013273	0.132029***	-0.068056	0.033721*	-0.028273	97.02%
5491	-0.002279	-0.013644**	1.106597***	-0.349649***	0.029468	0.664493***	0.023466	0.133956	-0.250621***	0.063306	95.86%
5487	2.58E-05	-0.005696	0.990189***	-0.150433	0.645981***	0.291116	0.52453***	0.360856*	0.047905	-0.282016**	87.02%
3689	-0.001615	0.002789	0.992749***	0.040983	0.231305***	-0.206821	-0.149016	-0.046208	0.046744	-0.109944**	92.49%
28196	0.002259*	-0.007632	0.834173***	-0.169637**	0.180223***	0.359642***	0.045629	0.172628*	-0.034509	-0.076276	96.20%
28193	0.000522	-0.004134	0.924164***	-0.111992	0.453278***	0.272469	-0.247211***	0.138775	0.011432	-0.052651	92.00%
28192	-0.000273	0.00121	0.889423***	0.158708**	0.552761***	-0.181178	0.048606	0.006215	-0.110617**	-0.017655	93.14%
31959	0.000913	-0.000655	0.861265***	-0.005724	-0.052544	0.04179	0.207589***	0.094384	0.017867	0.020032	95.91%
6742	-0.00065	-0.000345	1.202809***	0.282485*	0.721551***	-0.294747	0.030775	-0.564502**	0.350567***	-0.109821	84.32%
6756	5.09E-05	-0.000948	1.083082***	0.111601	0.15211***	0.024713	-0.304393***	-0.405233***	0.052548	-0.002326	93.72%
6745	0.00022	-0.000163	0.969499***	-0.138821*	-0.149837***	0.059581	-0.071344*	0.184576*	-0.045209	0.003936	95.70%
6752	-0.003079	-0.003243	1.180517***	0.018725	0.861444***	0.009989	-0.194179	-0.059432	0.089479	0.083365	91.18%
6744	0.001706	0.002289	0.93252***	0.051591	0.1103400***	-0.670041***	0.146341*	0.262528*	0.080473	-0.041325	92.79%
6750	-0.001701	-0.005725	1.072216***	0.05252	0.76105***	0.13134	0.148056	-0.363058**	0.067183	-0.152843	88.18%
6743	0.001408	0.00873	1.107106***	0.026794	0.1066602***	-0.527192**	0.233535***	-0.077432	0.210407***	-0.156571	83.81%
5488	-9.86E-05	-0.001169	1.081584***	-0.250554	0.333116***	0.512246***	0.43458***	0.130449	0.001585	-0.151786	88.77%
7075	-0.002344**	-0.000737	1.068238***	0.02915	0.568495***	-0.030405	-0.23807***	-0.273239*	0.098455*	-0.058746	89.82%
7042	-0.000776	2.05E-05	0.943474***	0.053699	0.086763***	-0.033811	0.007789	0.05015	-0.004554	0.009554	97.64%
7026	0.000239	0.005723**	0.910249***	0.123917*	0.142606***	-0.013104	-0.041587	-0.029997	-0.004746	0.025792	94.01%
7013	-0.000787	-0.002435	1.007693***	-0.016318	0.134899***	0.205729*	-0.110686***	0.110649	-0.050657*	0.008478	97.98%
9598	-0.002182***	0.004525**	1.037847***	0.001103	0.093202*	-0.089849	-0.213036***	-0.00927	0.00057	-0.003629	96.13%
9201	-0.001052	0.002995	1.017204***	0.013542	0.063314**	0.029203	-0.077977***	0.131664*	-0.000189	-0.01714	97.01%
9593	-0.001563*	0.005846*	0.995797***	0.029289	0.122496***	0.033178	-0.168253***	-0.044711	0.015484	0.004941	96.61%
14029	-0.001195	-0.000195	0.987499***	-0.065424	0.035246	0.064696	-0.068145***	0.116913***	-0.006175	-0.024063	98.04%
7290	-0.002027	0.004921	1.099962***	-0.051025	0.05605	0.089371	-0.032774	-0.05743	-0.115086*	0.124791**	92.00%
22031	0.001299	-0.000113	0.930276***	0.005331	0.233293***	-0.230633*	0.057316	-0.014495	0.033117	-0.072269	91.93%
22023	0.001147	-8.33E-05	0.929533***	0.008143	0.235057***	-0.234627*	0.056632	-0.014435	0.032098	-0.070758	91.91%
22058	-0.001075**	0.001633	0.992833***	0.08715**	0.146419***	-0.109167	-0.037841	-0.190577***	0.014458	0.004016	97.72%
23827	0.001521	-0.005793	0.9005***	-0.01243	0.1889*	0.531334***	-0.03349	-0.1895	-0.010402	-0.098739	94.69%
23824	-0.001119	0.005055	1.074941***	-0.244066**	0.298826***	0.149249	-0.049741	0.299423	-0.208512**	0.055174	83.47%
23826	-0.002304	-0.001765	1.002055***	-0.160493	0.924426	0.718819	0.062991	-0.155765	-0.260071***	0.0746	89.85%
24491	-0.001344	-0.000525	1.009679***	-0.086506*	0.051975*	0.0233	0.074077***	0.006505	0.042933*	-0.036421	97.47%
23828	0.002535*	0.005975**	0.816607***	-0.011702	0.007578	0.196357**	-0.041745	0.204859**	0.034685	0.005675	88.45%
29018	0.000756	-0.001417	1.019355***	0.008387	0.17523***	-0.054208	0.026976	-0.043237	-0.073284***	-0.010593	99.37%
27805	-0.000532***	0.000516	1.012402***	-0.014377	0.003569	0.038427	0.005188	0.040325	-0.01479*	0.009241	99.69%
29987	-0.001085	0.000437	0.968196***	-0.011984	0.831244***	-0.017588	0.244593***	-0.048343	0.074483	-0.023865	91.71%
7145	-0.002813*	0.006083	1.042751***	-0.002618	0.416399***	-0.079014	0.063344	0.173672*	0.05653	-0.206544*	92.92%
31205	-0.000734	-0.004701	1.019701***	0.010974	0.125962***	0.284395*	-0.006575	0.005168	-0.094968***	-0.004492	97.36%
30850	-0.000111	0.001962	0.904561***	0.006165	0.047339	0.074128	-0.058133**	0.107427	0.035783	0.01533	95.93%
17905	6.73E-07	-0.002587	0.903228***	0.098426	0.1126375***	-0.276878	-0.108606	0.085557	0.04014	-0.017571	93.72%
7056	-0.002217	-0.018961***	0.95493***	-0.238664*	0.809612***	0.548954*	0.106645	-0.266079	0.087436*	-0.213665***	95.00%
12572	0.000347	0.005637	1.020332***	-0.004904	0.53146***	-0.38434***	-0.072991	0.10555	0.097553*	-0.053533	91.02%
4456	-0.001548	0.005001	1.054999***	0.193725**	0.177009***	0.159986	-0.225787***	-0.318996*	0.025005	0.075318	92.48%
19394	-0.001046	-0.003252	0.957865***	0.008785	0.038863	-0.094291	0.288678***	0.093094	-0.078664***	-0.014201	98.04%

Continued

	α_0	α_{rec}	β_0	β_{0rec}	β_{smb}	$\beta_{smb,rec}$	β_{hml}	$\beta_{hml,rec}$	β_{mom}	$\beta_{mom,rec}$	Adj. R^2
30000	5.04E-05	-0.003275	1.011646***	0.240859***	0.715913***	-0.233687	-0.21364***	-0.253837**	0.115164*	-0.023927	91.37%
29998	-0.000669	-0.000172	0.958495***	0.015929	0.39559***	-0.287844*	-0.245425***	-0.022176	-0.039526	0.033654	94.15%
29989	0.001495	-0.002193	0.910653***	0.226695***	0.253924***	-0.08602	0.132979	-0.441756***	0.029476	0.048931	90.96%
6876	-0.000651	-0.00557	0.864599***	0.01762	0.22806***	0.347423*	0.112222	-0.048032	-0.097495**	0.018079	94.80%
9596	-0.001283**	0.006222***	0.997785***	0.031674	0.128753***	0.022969	-0.1693***	-0.035085	0.016118	0.007627	96.72%
9203	-0.000653	0.003148	1.022232***	0.027561	0.131588*	0.062615	-0.121795*	0.101139	-0.049593	0.031381	96.92%
14064	6.94E-06	-0.000206	0.99115***	0.013868**	0.005316	-0.006398	-0.006912	-0.005834	-0.009662*	0.01077**	99.92%
2729	-0.000328	-0.001567	1,092,779	0.01066	0.196478	0.042574	-0.405473	-0.027177	0.063696	-0.052249	92.80%
2727	0.000233	-0.003007	0.996351***	0.07996	0.864641***	-0.009716	-0.028925	-0.050392	0.028721	0.00525	97.77%
14064	6.94E-06	-0.000206	0.99115***	0.013868**	0.005316	-0.006398	-0.006912	-0.005834	-0.009662*	0.01077**	99.92%
2729	-0.000328	-0.001567	1,092,779	0.01066	0.196478	0.042574	-0.405473	-0.027177	0.063696	-0.052249	92.80%
2727	0.000233	-0.003007	0.996351***	0.07996	0.864641***	-0.009716	-0.028925	-0.050392	0.028721	0.00525	97.77%
14061	-0.00058	-0.001705	1.028682***	-0.053163	0.045185**	-0.127782	0.224444***	-0.086622	-0.011514	-0.022307	98.33%
24481	0.000582	-0.000652	0.864853***	0.004577	0.049595	0.027337	0.21752***	0.091631	0.045844**	0.06454	93.39%
29017	0.001037*	-0.001511	1.020171***	0.005542	0.171865***	-0.048158	0.026961	-0.041648	-0.072626***	-0.012912	99.37%
3946	0.001008	-0.003301	0.977628***	0.177933*	0.333361***	0.015725	-0.172655	-0.264545*	0.166568*	-0.145364**	89.73%
31206	-0.000376	-0.004924	1.018345***	0.015159	0.105543***	0.306704*	0.060757	-0.064442	-0.090061***	-0.007721	97.82%
17907	-0.003392***	0.006467*	0.992169***	-0.013689	0.280525***	-0.139426	-0.078908*	-0.230523***	0.208793***	-0.178955***	92.45%
17908	-0.001288	0.002611	1.008485***	-0.056919	0.160421***	-0.011036	0.184489***	-0.016041	0.080494***	-0.103997**	94.26%
29324	0.000338	-0.000441	0.954617***	0.090739*	0.025134	-0.145745**	0.174719***	-0.070268	-0.101916***	0.058543*	97.90%
7293	0.000212	-0.004169	0.900374***	0.380361***	0.544748***	-0.161199	-0.19117***	-0.585048***	0.068322	-0.009551	89.03%
9595	-0.002216***	0.006096***	0.997279***	0.032336	0.120897***	0.035132	-0.169911***	-0.042413	0.01692	0.008124	96.66%
30002	0.000372	-0.004264	0.981383***	-0.024563	0.900719***	0.043142	0.062365	0.056092	0.012462	0.022651	94.92%

This table presents regression estimates the individual funds of Retail, Institutional funds, both category funds and small funds, based on the Carhart (1997) four-factor model [6] with a dummy variable according to periods of expansion and recession from January 2001 to September 2014.

It reports performance estimates (alpha), systematic risk (beta) and the adjusted coefficient of determination (R2 adj.), expressed in percentage. Additionally, regressions coefficients of Size, Value and Momentum factors are reported. The dummy variable takes the value of zero in periods of expansion and 1 in recessions as defined by the NBER. Asterisks represent statistically significant coefficients at the 10% (*), 5% (**) and 1% (***) significance levels, and are based on the Newey and West (1987) procedure, which adjusts the errors of autocorrelation and heteroscedasticity, and on the White (1980) correction in case of heteroscedasticity.

Appendix 7 List of sample funds

CRSP Nbr.	Datastream code	Fund Name	Inception date	TNA	Fund category	Fund type
6878	AHRAX	City National Rochdale Funds: City National Rochdale Socially Responsible Equity Fund; Class N Shares	8/12/05	26.7	EDYG	R
29989	TLVAX	Timothy Plan: Timothy Plan Large/Mid-Cap Value Fund; Class A Shares	7/14/99	138.8	EDYB	R
16354	AIVSX	Investment Company of America; Class A Shares	1/1/33	57812.3	EDYB	R
29018	SEEKX	Steward Funds, Inc: Steward Large Cap Enhanced Index Fund; Individual Class Shares	10/1/04	38.1	EDYG	R
30000	TAAGX	Timothy Plan: Timothy Plan Aggressive Growth Fund; Class A Shares	10/4/00	19.3	EDYG	R
29998	TLGAX	Timothy Plan: Timothy Plan Large/Mid-Cap Growth Fund; Class A Shares	10/5/00	56.2	EDYG	R
5491	ARFFX	Ariel Investment Trust: Ariel Focus Fund; Investor Class Shares	6/30/05	53.5	EDYG	R
5487	ARGFX	Ariel Investment Trust: Ariel Fund; Investor Class Shares	1/1/86	1759.7	EDCS	R
3689	ATAFX	Advisors Series Trust: American Trust Allegiance Fund	3/11/97	24.4	EDYG	R
28196	AVEDX	Schwartz Investment Trust: Ave Maria Rising Dividend Fund	5/2/05	848	EDYI	R
28193	AVEGX	Schwartz Investment Trust: Ave Maria Growth Fund	5/1/03	282.9	EDYG	R
28192	AVEMX	Schwartz Investment Trust: Ave Maria Catholic Values Fund	5/1/01	242.9	EDYG	R
28197	AVESX	Schwartz Investment Trust: Ave Maria Opportunity Fund	5/1/06	52.7	EDCS	R
31959	AWSHX	Washington Mutual Investors Fund; Class A Shares	7/31/52	51623.5	EDYB	R
6742	BRAGX	Bridgeway Funds, Inc: Bridgeway Aggressive Investors 1 Fund	8/5/94	252	EDYG	R
6756	BRLGX	Bridgeway Funds, Inc: Bridgeway Large-Cap Growth Fund; Class N Shares	10/31/03	59	EDYG	R
6745	BRLIX	Bridgeway Funds, Inc: Blue Chip 35 Index Fund	7/31/97	581.3	EDYB	R
6752	BRSGX	Bridgeway Funds, Inc: Bridgeway Small-Cap Growth Fund; Class N Shares	10/31/03	31.6	EDCS	R
6744	BRSIX	Bridgeway Funds, Inc: Ultra-Small Company Market Fund	7/31/97	387.8	EDCI	R
6750	BRSVX	Bridgeway Funds, Inc: Bridgeway Small-Cap Value Fund; Class N Shares	10/31/03	76.2	EDCS	R
6743	BRUSX	Bridgeway Funds, Inc: Bridgeway Ultra-Small Company Fund	8/5/94	137.7	EDCI	R
5488	CAAPX	Ariel Investment Trust: Ariel Appreciation Fund; Investor Class Shares	12/1/89	1778.5	EDCM	R
7075	CCACX	Calvert World Values Fund, Inc: Calvert Capital Accumulation Fund; Class C Shares	1/1/94	27.6	EDCM	R
22031	NBSRX	Neuberger Berman Equity Funds: Neuberger Berman Socially Responsive Fund; Investor Class Shares	3/16/94	809.2	EDYG	R
22023	NBSTX	Neuberger Berman Equity Funds: Neuberger Berman Socially Responsive Fund; Trust Class Shares	3/3/97	400	EDYG	R
7042	CMIFX	Calvert Social Investment Fund: Large Cap Core Portfolio; Class A Shares	4/15/98	69.6	EDYG	R
7056	CSCCX	Calvert Impact Fund, Inc: Calvert Small Cap Fund; Class C Shares	4/1/05	14.2	EDCS	R
7026	CSIEX	Calvert Social Investment Fund: Equity Portfolio; Class A Shares	8/24/87	1595.8	EDYG	R
7013	CSXAX	Calvert Social Index Series, Inc: Calvert Social Index Fund; Class A Shares	6/30/00	214.2	EDYG	R
7290	MYPVX	Sentinel Group Funds, Inc: Sentinel Sustainable Core Opportunities Fund; Class A Shares	6/13/96	231.2	EDYG	R
9598	DRTHX	Dreyfus Third Century Fund, Inc; Class Z Shares	3/29/72	286.7	EDYB	R
9201	DSEFX	Domini Social Investment Trust: Domini Social Equity Fund; Investor Shares	1/1/90	819.7	EDYG	R
27805	SIAMX	SSgA Funds: SSgA IAM Shares Fund; Class N Shares	6/2/99	248	EDYB	R
9593	DTCAX	Dreyfus Third Century Fund, Inc; Class A Shares	8/31/99	25.7	EDYB	R
19394	MVIAX	Praxis Mutual Funds: Praxis Value Index Fund; Class A Shares	5/2/01	17	EDYB	R

Continued

CRSP Nbr.	Datastream code	Fund Name	Inception date	TNA	Fund category	Fund type
23824	PARNX	Parnassus Funds: Parnassus Fund	12/31/84	624.8	EDYG	R
23826	PARSX	Parnassus Funds: Parnassus Small Cap Fund	4/29/05	584	EDCS	R
24491	PIODX	Pioneer Fund; Class A Shares	2/13/28	4636.8	EDYB	R
23828	PRBLX	Parnassus Income Funds: Parnassus Core Equity Fund; Investor Shares	8/31/92	7511.3	EDYI	R
37368	PXSCX	Pax World Funds Series Trust I: Pax World Small Cap Fund; Individual Investor Class Shares	3/27/08	84.1	EDYG	R
29987	TPLNX	Timothy Plan: Timothy Plan Small Cap Value Fund; Class A Shares	3/21/94	72	EDYG	R
31205	VFTSX	Vanguard World Funds: Vanguard FTSE Social Index Fund; Investor Shares	5/31/00	800.2	EDYG	R
43338	WASOX	Boston Trust & Walden Funds: Walden Small Cap Innovations Fund	10/24/08	88.7	EDCS	R
30850	WSEFX	Boston Trust & Walden Funds: Walden Equity Fund	6/20/99	148	EDYG	R
36747	EGOAX	Wells Fargo Funds Trust: Wells Fargo Advantage Large Cap Core Fund; Class A Shares	12/17/07	34	EDYG	R
36749	EGOCX	Wells Fargo Funds Trust: Wells Fargo Advantage Large Cap Core Fund; Class C Shares	12/17/07	12.1	EDYG	R
12572	FOGRX	Tributary Funds, Inc: Tributary Growth Opportunities Fund; Institutional Class Shares	4/1/98	55.2	EDYG	R
14029	GCEQX	Green Century Funds: Green Century Equity Fund	9/13/95	103.1	EDYG	R
36663	TPYCX	Touchstone Funds Group Trust: Touchstone Premium Yield Equity Fund; Class C Shares	12/3/07	31.1	EDYB	R
7145	TRDFX	Capstone Series Fund, Inc: Steward Small-Mid Cap Enhanced Index Fund; Individual Class Shares	1/31/52	55.8	EDCS	R
22058	NCGFX	New Covenant Funds: New Covenant Growth Fund	7/1/99	409.7	EDYG	R
23827	PARMX	Parnassus Funds: Parnassus Mid Cap Fund	4/29/05	260.8	EDCM	R
4456	IMANX	Allied Asset Advisors Funds: Iman Fund	6/29/00	60.9	EDYG	R
46123	MGNDX	Praxis Mutual Funds: Praxis Growth Index Fund; Class A Shares	5/1/07	53.5	EDYG	R
3946	SPEGX	Alger Funds II: Alger Green Fund; Class A Shares	12/4/00	30.9	EDYG	I
9596	DRTCX	Dreyfus Third Century Fund, Inc; Class I Shares	8/31/99	10.4	EDYB	I
6876	AHRSX	CNI Charter Funds: Socially Responsible Equity Fund; Institutional Class Shares	1/3/05	172.8	EDYG	I
46865	NRARX	Neuberger Berman Equity Funds: Neuberger Berman Socially Responsive Fund; Class R3 Shares	5/27/09	31.9	EDYG	I
17905	AQBLX	LKCM Funds: LKCM Aquinas Small Cap Fund	1/3/94	12.3	EDCS	I
31206	VFTNX	Vanguard World Funds: Vanguard FTSE Social Index Fund; Institutional Shares	1/14/03	430.6	EDYG	I
24481	PYEQX	Pioneer Equity Income Fund; Class Y Shares	7/2/98	496.5	EDYI	I
7158	SCECX	Capstone Series Fund, Inc: Steward Small-Mid Cap Enhanced Index Fund; Institutional Class Shares	4/3/06	83.2	EDCS	I
29017	SEECX	Steward Funds, Inc: Steward Large Cap Enhanced Index Fund; Institutional Class Shares	10/1/04	187.2	EDYG	I
9203	DSFRX	Domini Social Investment Trust: Domini Social Equity Fund; Class R Shares	11/28/03	51.5	EDYG	I
2729	GGEZX	GuideStone Funds: Growth Equity Fund; GS4 Class Shares	8/27/01	1223.1	EDYG	I
2727	GSCZX	GuideStone Funds: Small Cap Equity Fund; GS4 Class Shares	8/27/01	449.6	EDCS	I
14061	GVEYX	GuideStone Funds: Value Equity Fund; GS2 Class Shares	8/27/01	268	EDYG	I
35817	NBSLX	Neuberger Berman Equity Funds: Neuberger Berman Socially Responsive Fund; Institutional Class Shares	11/28/07	711.9	EDYG	I

Continued

CRSP Nbr.	Datastream code	Fund Name	Inception date	TNA	Fund category	Fund type
14064	GEQYX	GuideStone Funds: Equity Index Fund; GS2 Class Shares	8/27/01	86.6	EDCL	I
46128	MMSIX	Praxis Mutual Funds: Praxis Small Cap Fund; Class I Shares	5/1/07	64.1	EDCS	I
17907	AQEGX	LKCM Funds: LKCM Aquinas Growth Fund	1/3/94	31.4	EDYG	I, R
17908	AQEIX	LKCM Funds: LKCM Aquinas Value Fund	1/3/94	58.2	EDYB	I, R
29324	CLVYX	Calvert SAGE Fund: Calvert Large Cap Value Fund; Class Y Shares	12/29/99	74.5	EDYB	I, R
46126	MMSCX	Praxis Mutual Funds: Praxis Small Cap Fund; Class A Shares	5/1/07	7.6	EDCS	R
9595	DTCCX	Dreyfus Third Century Fund, Inc; Class C Shares	8/31/99	6.3	EDYB	R
38038	EPVAX	Epiphany Funds: Epiphany FFV Fund; Class A Shares	3/19/08	4	EDYG	R
30002	TSVCX	Timothy Plan: Timothy Plan Small Cap Value Fund; Class C Shares	2/3/04	8.1	EDYG	R
7293	CEGIX	Sentinel Group Funds, Inc: Sentinel Sustainable Mid Cap Opportunities Fund; Class I Shares	11/1/99	6.3	EDCM	I
36750	EGOIX	Wells Fargo Funds Trust: Wells Fargo Advantage Large Cap Core Fund; Institutional Class Shares	12/17/07	9.7	EDYG	I

This table presents the whole name of the individual funds of Retail, Institutional funds, both category funds and small funds. It reports CRSP number, Datastream code, inception date, Total net asset (TNA), fund category and fund type of each fund used in this study.