Do US green funds perform well?

Cátia Catarina Eira Martins

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Universidade do Minho
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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

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Resumo

Os fundos verdes dos EUA têm um bom desempenho?

Esta dissertação avalia o desempenho de 13 fundos verdes e 26 fundos convencionais correspondentes dos EUA, de fevereiro de 2004 a setembro de 2019. O desempenho dos fundos é avaliado usando modelos multifatoriais não condicionais, bem como modelos multifatoriais condicionais que permitem que os alfas e betas variem com o tempo. Adicionalmente, este estudo avalia as habilidades dos gestores dos fundos. Além disso, avaliamos também o desempenho dos fundos em diferentes estados do mercado, incluindo uma variável *dummy* nos modelos multifatoriais. O *benchmark* de mercado é representado por dois índices: um índice geral de mercado (S&P500) e um índice socialmente responsável (MSCI KLD 400).

Os resultados deste estudo estão de acordo com a maioria dos estudos sobre o desempenho dos fundos verdes e sugerem que os investidores verdes podem esperar não serem nem penalizados nem beneficiados por investir em fundos verdes. Os fundos convencionais também apresentam um desempenho neutro em relação ao mercado. Além disso, os resultados indicam que os fundos verdes não apresentam um desempenho diferente dos fundos convencionais. O desempenho semelhante entre estes dois tipos de fundos parece estar relacionado com as boas habilidades de seletividade dos gestores de fundos convencionais, combinadas com as boas habilidades de *timing* dos gestores de fundos verdes. Usando o modelo condicional de cinco fatores de Fama and French (2015) com a variável *dummy,* os fundos verdes apresentam um desempenho inferior aos fundos convencionais em períodos de expansão. No entanto, em períodos de recessão, o desempenho dos fundos verdes não varia, enquanto que o desempenho dos fundos convencionais diminui significativamente. Assim sendo, investir em fundos verdes é uma boa forma de reduzir a desvantagem associada a períodos de recessão. Em suma, os investidores convencionais podem investir em fundos verdes para diversificar e proteger as suas carteiras.

Palavras-chave: Desempenho de fundos, Finanças sustentáveis, Fundos convencionais, Fundos socialmente responsáveis, Fundos verdes.

Abstract

Do US green funds perform well?

This dissertation evaluates the performance of 13 US green funds and 26 US matched conventional funds from February 2004 to September 2019. Fund performance is evaluated using unconditional multi-factor models as well as conditional multi-factor models that allow for time-varying alphas and betas. Besides that, this study assesses fund managers' abilities. Furthermore, we evaluate fund performance in different market states, by including a dummy variable in the multi-factor models. The market benchmark is proxied by two market indexes: a general market index (S&P500) and a socially responsible index (MSCI KLD 400).

The results of this study are in line with the majority of the studies on the performance of green funds and suggest that green investors may expect no superior or inferior returns by investing in green funds. Conventional funds also present a neutral performance compared to the market. Besides that, the results indicate that green funds do not perform different from conventional funds. The similar performance between these two types of funds seems to be linked with the good selectivity abilities of conventional fund managers combined with the good timing abilities of green fund managers. Using the conditional Fama and French (2015) five-factor model with a dummy variable, green funds underperform conventional funds in expansion periods. However, in recession periods the performance of green funds remains while the performance of conventional funds decreases. So, investing in green funds it is a good way to reduce the downside associated with recessions periods. Overall, conventional investors can invest in green funds in order to diversify and protect their portfolios.

Keywords: Conventional funds, Fund performance, Green funds, Socially responsible funds, Sustainable finance.

Index

List of tables

1. INTRODUCTION

The main objective of this study is to evaluate the performance of US domestic green funds. The motivation for research topic is associated to the fact that in the past years, the world has been experiencing environmental changes that have become a major concern in society. The number of investors willing to introduce their ethical and social values into their investment's decision process has been growing all over the world, in this way promoting the growth of socially responsible funds. Financial market players are changing their style of investment, towards becoming more environmental and social friendly when making investment decisions. Keefe (2007) argues that the world is in transition to a sustainable investing, which involves the incorporation of environmental, social and governance (ESG) factors into financial analysis and decision-making.

According to US SIF (2018), the amount of investments that incorporate ESG criteria has been growing quickly. In fact, in the US, the assets being professionally managed under social responsible investment (SRI) strategies increased 38% since 2016 representing, at the start of 2018, 26% of the $46.6 trillion of the total US assets under professional management. This study also reports that money managers integrated social factors a little bit more than environmental and governance ones. Furthermore, the category with higher growth in the period of 2016-2018 was 'products': Tobacco-related restrictions had the largest growth, increasing 432%, and 'climate change/Carbon' is the most significant specific environmental factor taken into consideration by money managers.

SRI is not new in the marketplace, and according to European Sustainable Investment Forum (Eurosif, 2018), it "is a long-term oriented investment approach which integrates ESG factors in the research, analysis and selection process of securities within an investment portfolio. It combines fundamental analysis and engagement with an evaluation of ESG factors in order to better capture long term returns for investors, and to benefit society by influencing the behavior of companies" (Eurosif, 2018, p. 12).

Environmental issues are one of the concerns and the forefront of socially responsible investors. Problems such as global warming, pollution, energy shortage and climate changes are making people apprehensive all over the world, and because of that individuals and organizations worldwide are devoting extra attention to green investments. Chang et al. (2012) point that green investing could be considered a subdivision of SRI and due to the growing concerns about environmental issues, a new subset of SRI funds has emerged: green funds. These funds attract

investors concerned with the negative impact that corporate activities have on the environment. Green funds provide investors a way to invest in mutual funds that are friendly to the environment, by investing in companies that have a smaller ecological impact than other alternatives. For example, investing in renewable energy companies, or companies that produce ecologically friendly products.

The development of green funds has motivated the debate on the impact of considering environmental screens in the investment process. Do investors benefit from an improved financial performance or do they suffer a cost when investing with environmental concerns? This dissertation investigates this topic by analyzing if green funds investors in the US can do well, without sacrificing financial performance. The aim is to compare the performance of US green funds to that of the market and conventional funds. This analysis is also performed for different market states. Since there are still few studies on the performance of green funds and there is no clear consensus on this topic, this is the main motivation to perform this study.

In order to evaluate the performance of green and conventional funds this study uses multifactor-models: the Carhart (1997) four-factor model and the Fama and French (2015) five-factor model. To have more robust results, the conditional approach of Christopherson et al. (1998) that allows for time-varying alphas and betas, will be used. Since the screening process can restrict or improve opportunities for different manager skills, this study also analyzes the timing and selectivity abilities of both types of funds. To do that this study uses the unconditional and conditional four-factor and five-factor version of the Treynor and Mazuy (1966) model.

This dissertation is divided into 6 chapters. After a brief introduction to the topic in chapter 1, chapter 2 discusses the main studies in the field. This chapter is divided into four parts: the nature of the relationship between corporate social and financial performance, the relation between environmental performance and financial performance, the performance of green funds, and selectivity and timing abilities. Chapter 3 presents the methodology that will be used in this study. Chapter 4 describes the data and presents some descriptive statistics of the dataset. The empirical results are discussed in chapter 5, and, finally, the last chapter summarizes the results and presents the main conclusions, as well some limitations and suggestions for future research.

2. LITERATURE REVIEW

2.1. The nature of the relationship between corporate social and financial performance

SRI is becoming a very relevant investment approach, having been widely discussed in the finance literature. Many investors seek to obtain a good financial performance and, at the same time, incorporate social criteria in their investment decisions. However, it is controversial that including social criteria in the financial performance of investments is beneficial.

There are two theoretical views on the financial impact of SRI: the first argues that investing in a socially responsible way can be harmful to investors as well as to companies; the second claims that socially responsible investing can bring advantages for both companies and investors.

According to Friedman (1970), a corporation's social responsibility is to make a profit. This comment prompted intellectual debate and motivated additional interest in the nature of the relationship between corporate social responsibility and financial performance. The more traditional view of corporate social responsibility (CSR), inspired by Friedman (1970), supports the argument that environmental performance will lead to additional costs that are not offset by potential gains, thus affecting negatively corporate profitability (Walley and Whitehead, 1994). Furthermore, increasing the operating costs in order to be socially responsible can put a firm at a disadvantage relative to rivals that do not follow social criteria in their investment decisions (Aupperle et al., 1985; McGuire et al., 1988; Ullmann, 1985). In line with this perspective, Feldman et al. (1997) argue that companies should only take investments in CSR practices when it is required by law regulations: all other CSR investments are unnecessary and reduce the value of the firm.

At the portfolio level, Chang et al. (2012) argue that investing according to green criteria will limit the pool of investments, thus portfolios will suffer from diversification losses, resulting in lower risk-adjusted returns. The additional costs associated to screening activities also contribute to a lower portfolio performance (Cortez et al., 2009).

On the other hand, Stakeholder Theory supports that firms should consider the interests of all stakeholders and not only the shareholders, in order to increase their productivity and the value

of the company (Freeman, 1984; Solomon and Hansen, 1985). Additionally, Ambec and Lanoie (2008) argue that being environmentally friendly can lead to an increase of revenues for several reasons, such as differentiating products. These authors also argue that a better environmental performance can lead to a cost reduction in some levels, for example, at the level of risk management and relations with external stakeholders. Therefore, according to this viewpoint, investing in environmentally friendly companies can lead to improved portfolio performance.

One of the first studies in this area was performed by Moskowitz (1972), which analyzes the performance of companies with good social performance against companies that are less socially responsible. The author concludes that corporate social performance is beneficial for companies, demonstrating a positive relationship between corporate social performance and financial performance.

2.2. The effects of environmental performance on financial performance

Previous research has provided mixed results regarding the relationship between environmental performance and financial performance. Some studies find a negative relation between environmental and financial performance, others a positive relationship between environmental and financial performance, and others find no relation between environmental and financial performance.

At first glance, it may appear that if firms improve their environmental performance will hurt from the additional costs and consequently reduce their financial performance. On the other hand, there are also reasons to think that a good environmental performance will lead to a better financial performance.

In order to study the benefits and the market response to good environmental management, Klassen and McLaughlin (1996) proposed a theoretical model that links strong environmental management with future financial performance, as measured by stock market performance. The results show that positive returns are associated with strong environmental management, while negative returns are associated with weak environmental management.

King and Lenox (2001) show a positive relationship between pollution reduction and financial gain, although they cannot demonstrate the direction of this connection. They argue that

only firms with specific characteristics reduce their pollution levels in a profitable way. Stanwick and Stanwick (1998) show that a firm's corporate social performance is, in fact, affected by the size of the firm, the level of profitability, and the quantity of pollution released by the firm.

In the same line, Wahba (2008) demonstrates that the market rewards firms that protect the environment, arguing in favor of a positive impact of corporate environmental responsibility on its market value. In contrast to Friedman (1970), the author argues that the implementation of an environmental management system can improve firm competitive advantages by optimizing resources usage. In this sense, corporate environmental responsibility will not hurt corporate financial performance.

Regarding the Japanese market, Nakao et al. (2007) also find that environmental performance has a positive impact on a firm's financial performance and vice-versa. Even if the initial investment is not based on socially accepted practices, firms can invest the surplus in environmentally friendly practices, technologies and initiatives.

Pollution reduction sometimes is considered as a cost burden on the firm and this cost can reduce its competitiveness. Alternatively, it can be viewed as way to increase efficiency, saving money and giving firms a cost advantage. To resolve this paradox, Hart and Ahuja (1996) examine the relationship between emissions reductions and financial performance. The results suggest that it does pay to be green. The operating performance is better only in the following year after the initiation of the efforts to prevent pollution and reduce emissions, whereas it takes about 2 years to affect financial performance. Furthermore, firms with the highest levels of emission are the ones who gain the most.

The relationship between corporate environmental performance and corporate financial performance is mostly studied for developed countries. Because of that, Manrique and Martí-Ballester (2017) analyze this relationship considering the economic development of the market, during a global financial crisis. The findings show that in times of economic crisis, corporate environmental performance has a positive impact on corporate financial performance. However, the effect is weaker for firms in developed countries, where the improvement only occurs in short-term corporate financial performance, than for companies in emerging and developing countries.

Jo et al. (2015) investigate how environmental costs affect the performance of firms in the financial sector from 29 countries. The results show that lowering environmental costs will lead to

an increase in financial performance in the long term. Reducing environmental costs brings advantages to the firms, for example, improving production efficiency and competitiveness, a better company reputation and reducing the cost of capital. They also find that the effect of reducing environmental costs differs for different levels of development of the markets and across regions. For well-developed financial markets this has a rapid effect; however for firms in less-developed financial markets the effect is observed in the long term.

Konar and Cohen (2001) also analyze this relationship by relating the market value of firms in the S&P500 to objective measures of their environmental performance, instead of subjective environmental performance criteria. The results point out that bad environmental performance is negatively correlated with the intangible asset value of firms. If firms reduce the emissions of toxic chemicals by 10%, the market value of those firms increases $34 million. Yet, the impact of this effect differs across industries.

Although Entreat et al. (2014) point out the lack of consensus, integrating the results of 149 studies by meta-analytic analysis they show that for the majority of the studies this relationship is positive. They also argue that this relationship is stronger when the strategic approach underlying corporate environmental performance is proactive.

Using meta-analytical techniques and focusing on corporate carbon performance, Busch and Lewandowski (2018) examine “When does it pay to be green?”. The results show that there is a positive relationship between carbon performance and financial performance, implying that companies have an incentive to engage in carbon mitigation measures.

At a portfolio level, Derwall et al. (2005) analyze if investing in portfolios of companies with high environmental standards leads to inferior or superior performance. Based on eco-efficiency scores, the results show that from 1995 to 2003 high-ranked portfolios offer higher returns than their low-ranked counterparts.

Another set of studies supports the view that firms with high environmental performance contribute negatively to financial performance. For the US market, Cordeiro and Sarkis (1997) demonstrate a negative relationship between environmental proactivism and financial performance, using a different measure of financial performance: security analyst earnings forecasts. They argue that security analysts anticipate lower earnings-per-share in the short-term,

around 1 to 5 years, for companies that are more environmentally proactive. Therefore, there are short-term disadvantages of environmental proactivism.

Lioui and Sharma (2012) also find a negative relationship, arguing that environmental strengths and concerns are negatively associated with corporate financial performance, measured by ROA and Tobin's Q. They argue that this relationship is driven by the fact that investors see environmental initiatives as a cost or disadvantage.

At a portfolio level, Boulatoff and Boyer (2009) find evidence that green firms underperform comparable Nasdaq firms. The authors also show that green firms have higher volatility. Haan et al. (2012) also observe a negative relationship between corporate environmental performance and stock returns, motivated by the common risks associated with corporate environmental performance.

Finally, some studies do not find any relationship between environmental performance and financial performance. Puopolo et al. (2015) show that there is no linear relationship between being green and financial returns, pointing out that the implementation of environmentally friendly standards is new in the marketplace.

It is also important to mention that there is even evidence of curvilinear relationship between environmental performance and firm performance, as in Ramanathan (2018). As firms improve their environmental performance, they achieve higher levels of financial performance, but after a certain level of environmental performance, financial performance deteriorates. Pekovic et al. (2018) also state a non-linear relationship, finding an inverted U-shaped relationship, suggesting that there is an optimal level of environmental investment.

2.3. The performance of green funds

There are many studies that compare the performance of socially responsible funds with conventional ones or the market. Overall, the majority of the studies find that SRI funds have similar performance to conventional funds and to the market. There are also some studies on the performance of socially responsible funds that focus specifically on funds that screen for environmental criteria – the so-called green funds. As far we know, the first study that evaluates the performance of green funds in the US and German markets is that of White (1995). The results

show that US green funds underperform the market, but green funds perform similarly to the market in Germany.

Climent and Soriano (2011) examine the financial performance of US green funds compared to conventional funds from 1987 to 2009. They find that US green funds underperform conventional funds, because green funds are subject to higher risks, since they limit the number of investments in which they can invest. However, when focusing in the period from 2001 to 2009, green funds had a similar performance. The authors argue that the initial poor performance of green funds may be explained by their more restricted investment set. Other possible explanation for these results may be that green funds increased in terms of value faster than conventional funds, due to a higher demand.

Chang et.al (2012) compare the financial performance of green and conventional funds in the US. The results of this study indicate that green funds underperform conventional ones. Green mutual funds exhibit higher expenses ratios, lower returns and lower risk-adjusted returns. In terms of risk, green mutual funds' risk seems to be similar to conventional funds, so green investment restrictions in terms of diversification does not engender more risk.

Also for the US market, but from 1998 to 2007, Mallett and Michelson (2010) find that US green fund returns are similar to SRI fund and index returns. They argue that the lack of performance differences between green and SRI funds is due to the small period that green funds have been operating. As time passes, more information and data become available and the difference in green funds and SRI funds may grow wider.

Adamo et al. (2014) collected a data set of 257 green funds all over the world and evaluated their performance. The authors concluded that green funds have a growing importance and have a positive performance even in recession periods.

Controlling for crisis and non-crisis periods, Muñoz et al. (2014) analyze the financial performance of US and European SRI funds. For US SRI funds, the results show that in crisis periods SRI funds have a statistically insignificant performance, whereas in non-crisis market periods US SRI funds underperform the market. The authors argue that green funds perform similarly to other forms of SRI funds. For European SRI funds, the results show that regardless of market conditions, SRI funds show a statistically insignificant performance.

Silva and Cortez (2016) also consider the performance of US and European green funds in different market states. Their results show that green funds tend to underperform the benchmark mainly in non-crisis periods and when short-term interest rates are inferior than normal. Besides that, they find that funds certified with a SRI label do not out-or-under perform green funds without the label. However, the number of funds presenting negative performance is higher for non-certified funds.

Lesser and Walkshäusl (2016) analyze the financial performance and screening activity of socially responsible, green, and faith-based equity funds for periods of crisis and non-crisis. In crisis periods, the results show that these three types of funds perform similar to their conventional peers and the market. However, during non-crisis periods, green and socially responsible funds tend to underperform. The authors argue that the performance differences are due to the funds' screening activities since there are performance drivers and reducers for each strategy. For example, social screens lead to the underperformance of socially responsible funds, while energy screens drive the performance of green funds.

Ibikunle and Steffen (2017) perform a comparative analysis of European green, black and conventional mutual funds from 1991 to 2014. The results show that green mutual funds underperform relative to conventional funds. However, there is no significant risk-adjusted performance differences between green and black mutual funds. Peculiarly, the green fund's risk-adjusted return improves until the point where there is no difference in the performance of the green and the conventional funds. From 2012 to 2014, green funds begin to outperform their black peers, since fossil energy and natural resources are being replaced by renewable energy.

Within the green arena, several studies have focused specifically on funds that invest in renewable energy companies. The number of alternative energy funds have been growing as a result of many countries trying to encourage stakeholders to consider renewable energy sources. Reboredo et al. (2017) evaluate the performance of alternative energy funds in several countries and show that these funds underperform SRI and conventional mutual funds in terms of returns and downside risk protection. Therefore, investors are paying a premium for being green, especially using renewable energies.

Marti-Ballester (2019a) stresses that renewable energy mutual funds channel private resources into climate finance, if managers adopt renewable energy principles in investors' portfolios. As such, renewable energy mutual funds play an important role as financial instruments.

This author analyzes the performance of these funds in Europe over 2007-2018 and compares their financial performance with black energy and conventional funds. She finds that renewable energy funds outperform the energy benchmark but underperform the fossil fuel energy and conventional market benchmarks. Thus, investing in renewable energy funds has a cost for investors when compared with conventional funds.

In another study, Marti-Ballester (2019b) analyzes the financial performance of energy and renewable energy mutual funds in Europe using conditional and unconditional models. Using unconditional models, the results show that renewable energy mutual funds outperform the specific benchmark but underperform the conventional benchmark. Using conditional models, renewable energy funds perform similarly to the market, but underperform their conventional peers using a specialized market benchmark. This author also concludes that fund characteristics such as SRI certification does not affect the financial performance of renewable energy funds. However the expense ratio has a negative effect on financial performance.

2.4. Selectivity and timing abilities

It is also important to consider that fund performance can be a result not only fund managers' selectivity abilities but also their market timing abilities (Muñoz et al. 2014). Stock-picking and market-timing abilities have been widely discussed in the mutual fund literature, especially for conventional funds. Depending on the market or the period analyzed, the empirical evidence shows mixed results.

Muñoz et al. (2014) find that European and US global green funds do not exhibit good timing abilities. Furthermore, for the European market Leite and Cortez (2014) do not find differences in terms of timing abilities between SRI funds and their matched conventional funds. Ang et al. (2014) compare SRI funds in Europe and North America, finding market-timing abilities in both regions. In contrast, Ferruz et al. (2010) find negative timing abilities for both SRI and conventional funds in the UK market. For the Swedish market, Leite et al. (2018) show that SRI and conventional fund managers do not present selectivity and timing abilities.

Leite and Cortez (2014) argue that SRI funds present different selectivity and timing abilities relative to conventional funds for several reasons. On the one hand, if the screening

process generates informational advantages, it can help fund managers to recognize undervalued securities. On the other hand, the limited investment universe restricts fund managers compared to conventional funds, since SRI should follow social investment criteria. The restrictions in terms of selectivity for SRI fund managers, might motive them to be more focused on market timing opportunities. Yet, SRI fund assume a more long-term perspective compared to their conventional peers, being more loyal to the companies in which they invest, which may limit their possibility to explore market timing opportunities.

3. METHODOLOGY

This chapter presents the methodology used to evaluate fund performance. Starts by presenting the four-factor model of Carhart (1997) and the five-factor model of Fama and French (2015). Then, we present these models in their conditional specification. Then the models to evaluate the timing and selectivity abilities. Finally, we present the models that include a dummy variable to distinguish performance in recessions and expansions periods.

3.1. Unconditional Models

Using a market benchmark as the unique risk factor, Jensen (1968) measures performance as the difference between the actual portfolio's return and the expected risk-adjusted return based on the CAPM. Despite the popularity of Jensen's (1968) alpha, it has been widely argued that this model is not sufficiently good at explaining the cross-section of expected stock returns (Fama and French, 1993). One of the reasons is that the single-factor model tends to overestimate fund performance (Elton et al., 1993). In fact, multi-factor models have been recognized as much more useful to characterize portfolio returns than a single-factor model (Derwall et al., 2005; Climent and Soriano, 2011).

The Carhart (1997) four-factor model includes the original factors of the Fama and French (1993) three-factor model (market, size and book-to-market) with the momentum factor. This model is expressed by the following equation:

$$r_{p,t} = \alpha_p + b_{p1}(r_{m,t}) + b_{p2}(SMB_t) + b_{p3}(HML_t) + b_{p4}(MOM_t) + \varepsilon_{p,t} \quad (1)$$

where $r_{p,t}$ is the excess return of fund p in period t, $r_{m,t}$ represents the market's excess return in period t, SMB_t (small minus big) is the difference in returns between a portfolio of small stocks and a portfolio of large stocks; HML_t (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_t is the difference in the returns of a portfolio of past winners and a portfolio of past losers and b_{p1}, b_{p2}, b_{p3} and b_{p4} are the factor coefficients (betas on each of the factors).

A more recent model to evaluate the performance is the five-factor model of Fama and French (2015). Using this model, it has become possible to better understand the investment strategies of funds' managers, since the Fama and French (1993) model does not explain the variation of returns related to the investment and the profitability. We note that there are few studies evaluating fund performance with this model since it is relatively recent. Besides the market, size and book-to-market factors, this model adds two new factors: profitability (RMW) and investment (CMA), and is expressed by the following equation:

$$r_{p,t} = \alpha_p + b_{p1} r_{m,t} + b_{p2}(SMB_t) + b_{p3}(HML_t) + b_{p4}(RMW_t) + b_{p5}(CMA_t) + \varepsilon_{p,t} \quad (2)$$

where RMW_t is the difference between the returns on diversified portfolios of stocks with robust and weak profitability and CMA_t is the difference between the returns on diversified portfolios of the stocks of low and high investment firms (conservative and aggressive).

It has been widely debated in literature that unconditional models such as those presented so far can produce biased estimates of performance, as these models assume constant expected returns and risk. Considering this limitation, we also apply conditional models to evaluate performance. These models are more robust, as they assume that expected returns and risk vary over time, considering market conditions.

3.2. Conditional models

This conditional approach to evaluate the performance allows betas to vary over time as linear functions of a vector of predetermined information variables. These variables represent the public information that is available at time t-1 in order to predict returns at time t. The conditional single-factor model of Ferson and Schadt (1996) is represented by the following equation:

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

where z_{t-1} represents a vector of the deviations of Z_{t-1} from the unconditional values, β_{0p} is an average beta that represents the unconditional mean of the conditional betas, and β'_p is a vector that measures the response of the conditional betas to the information variables.

The conditional single-factor model proposed by Ferson and Schadt (1996) can be viewed as partial conditional model, considering that it only allows betas to vary over time, while assuming that alphas are constant.

Christopherson et al. (1998) extend the model of Ferson and Schadt (1996) by also allowing alphas also to be time-varying, as follows:

$$\alpha_p(Z_{t-1}) = \alpha_{0p} + z_{t-1}A'_p \tag{4}$$

where α_{0p} represents the average alpha and A'_p measures the sensitivity of the conditional alpha to the information variables.

Rearranging the equations by combining equations (3) and (4), we have the full conditional of Christopherson et al. (1998), represented by the following equation:

$$r_{p,t} = \alpha_{0p} + z_{t-1}A'_p + \beta_p(r_{m.t}) + \beta'_p(z_{t-1}r_{m.t}) + \varepsilon_{p,t} \tag{5}$$

The conditional Carhart (1997) four-factor model is obtained combining the conditional single-factor model with the Carhart (1997) risk factors. Combining equation (5) with the four risk factors gives the conditional multi-factor model with time-varying alphas and betas, represented as follows:

$$\begin{aligned} r_{p,t} = {} & \alpha_{0p} + z_{t-1}A'_p + \beta_p r_{m.t} + \beta'_p(z_{t-1}r_{m.t}) + \beta_{0p,SMB}r_{SMB.t} \\ & + \beta'_{p,SMB}(z_{t-1}r_{SMB.t}) \\ & + \beta_{0p,HML}r_{HML.t} + \beta'_{p,HML}(z_{t-1}r_{HML.t}) \\ & + \beta_{0p,MOM}r_{MOM.t} + \beta'_{p,MOM}(z_{t-1}r_{MOM.t}) + \varepsilon_{p,t} \end{aligned} \tag{6}$$

In turn, the conditional Fama and French (2015) five-factor model with time-varying alphas and betas is represented by the following equation:

$$\begin{aligned} r_{p,t} = {} & \alpha_{0p} + z_{t-1}A'_p + \beta_{0p}r_{m.t} + \beta'_p(z_{t-1}r_{m.t}) + \beta_{0p,SMB}r_{SMB.t} \\ & + \beta'_{p,SMB}(z_{t-1}r_{SMB.t}) \\ & + \beta_{0p,HML}r_{HML.t} + \beta'_{p,HML}(z_{t-1}r_{HML.t}) \\ & + \beta_{0p,RMW}r_{RMW.t} + \beta'_{p,RMW}(z_{t-1}r_{RMW.t}) \\ & + \beta_{0p,CMA}r_{CMA.t} + \beta'_{p,CMA}(z_{t-1}r_{CMA.t}) + \varepsilon_{p,t} \end{aligned} \tag{7}$$

As in Cortez et al. (2012), this study applies the Wald test, to assess the importance of introducing public information variables. In order to determine if there are time-varying alphas and time-varying betas, this test tests the null hypothesis that the conditional alphas, conditional betas and the joint conditional alphas and betas are jointly equal to zero.

3.3. Managerial Abilities Models

Muñoz et al. (2014) combine the Treynor and Mazuy (1966) market-timing model with the Carhart (1997) model, in order to evaluate the fund managers style-timing abilities. Thus, this study also applies this approach combining the Treynor and Mazuy (1966) market-timing model with both Carhart (1997) four-factor model and Fama and French (2015) model, represented, respectively as follow:

$$r_{p,t} = \alpha_p + b_{p1}(r_{m,t}) + b_{p2}(SMB_t) + b_{p3}(HML_t) + b_{p4}(MOM_t) + b_{p5}(r_{m,t})^2 + b_{p6}(SMB_t)^2 + b_{p7}(HML_t)^2 + b_{p8}(MOM_t)^2 + \varepsilon_{p,t} \quad (8)$$

$$r_{p,t} = \alpha_p + b_{p1}r_{m,t} + b_{p2}(SMB_t) + b_{p3}(HML_t) + b_{p4}(RMW_t) + b_{p5}(CMA_t) + b_{p6}(r_{m,t})^2 + b_{p7}(SMB_t)^2 + b_{p8}(HML_t)^2 + b_{p9}(RMW_t)^2 + b_{p10}(CMA_t)^2 + \varepsilon_{p,t} \quad (9)$$

where, α_p measures the stock-picking ability of the managers and $b_{p5}, b_{p6}, b_{p7}, b_{p8}, b_{p9}$ and b_{p10}represent the timing abilities of the fund manager.

As in Leite et al. (2018), this study also evaluates the timing and selectivity of green and conventional fund managers extended to a conditional context, by including the Carhart (1997) and Fama and French (2015) factors with the public information variables in the Treynor and Mazuy (1996) model, represented as follow:

$$r_{p,t} = \alpha_{0p} + z_{t-1}A'_p + \beta_{0p}r_{m.t} + \beta'_p(z_{t-1}r_{m.t}) + \beta_{0p,SMB}r_{SMB.t} + \beta'_{p,SMB}(z_{t-1}r_{SMB.t}) + \beta_{0p,HML}r_{HML.t} + \beta'_{p,HML}(z_{t-1}r_{HML.t}) +$$

$$\beta_{0p,MOM} r_{MOM.t} + \beta'_{p,MOM}(z_{t-1} r_{MOM.t}) + \beta_{2p}(r_{m.t})^2 + \beta_{2p,SMB}(r_{SMB.t})^2 + \beta_{2p,HML}(r_{HML.t})^2 + \beta_{2p,MOM}(r_{MOM.t})^2 + \varepsilon_{p,t} \quad (10)$$

$$r_{p,t} = \alpha_{0p} + z_{t-1}A'_p + \beta_{0p} r_{m.t} + \beta'_p(z_{t-1} r_{m.t}) + \beta_{0p,SMB} r_{SMB.t} + \beta'_{p,SMB}(z_{t-1} r_{SMB.t}) + \beta_{0p,HML} r_{HML.t} + \beta'_{p,HML}(z_{t-1} r_{HML.t}) + \beta_{0p,RMW} r_{RMW.t} + \beta'_{p,RMW}(z_{t-1} r_{RMW.t}) + \beta_{0p,CMA} r_{CMA.t} + \beta'_{p,CMA}(z_{t-1} r_{CMA.t}) + \beta_{2p}(r_{m.t})^2 + \beta_{2p,SMB}(r_{SMB.t})^2 + \beta_{2p,HML}(r_{HML.t})^2 + \beta_{2p,RMW}(r_{RMW.t})^2 + \beta_{2p,CMA}(r_{CMA.t})^2 + \varepsilon_{p,t} \quad (11)$$

3.4. Fund performance in different market states

We further investigate green and conventional fund' performance in different states of the market. The issue of whether fund performance is better in periods of recessions/crisis is a relevant one, as Areal et al. (2013) claim. Following Areal et al. (2013), a dummy variable will be added to the Carhart (1997) four-factor model and the Fama and French (2015) model to analyze the performance of green funds in periods of expansion and recession. The Carhart (1997) model with the dummy variable is represented by the following equation:

$$r_{p,t} = \alpha_p + \alpha_{rec,t} D_t + \beta_{p1,t}(r_{m.t}) + \beta_{p1rec,t,t}(r_{m.t}) D_t + \beta_{p2,t} SMB + \beta_{p2rec,t,t} SMB D_t + \beta_{p3} HML + \beta_{p3rec,t} HML D_t + \beta_{p4,t} MOM + \beta_{p4rec,t} MOM\, D_t + \varepsilon_{p,t} \quad (12)$$

where D_t is the dummy variable that is equal to 0 in expansion periods and 1 in recession periods.

The dummy variable will be also added to the Fama and French (2015) five-factor model, represented as follows:

$$\begin{aligned} r_{p,t} = {} & \alpha_p + \alpha_{rec,t} D_t + \beta_{p1,t}(r_{m.t}) + \beta_{p1rec,t,t}(r_{m.t}) D_t + \beta_{p2,t} SMB \\ & + \beta_{p2rec,t,t} SMB D_t + \beta_{p3} HML + \beta_{p3rec,t} HML D_t + \beta_{p4,t} RMW \\ & + \beta_{p4rec,t} RMW\, D_t + \beta_{p5,t} CMA + \beta_{p5rec,t} CMA\, D_t \\ & + \varepsilon_{p,t} \end{aligned} \quad (13)$$

The identification of the markets states was based on the recession and expansion periods as identified by the National Bureau of Economic Research (NBER). For the period under evaluation the NBER identifies the following states for the US market:

-From February of 2004 until December of 2007- Expansion period

-From December of 2007 until June of 2009- Recession period

-From June of 2009 until September of 2014- Expansion period

4. DATA

The dataset of this study includes US funds that invest domestically (US equity funds). Selecting the green funds is one of the most crucial and difficult steps of this study, since there isn't a clear definition of what is a "green" fund: generally this term is used to describe a fund that uses environmental criteria in the security selection process.

As in Chung et al. (2012), we identified green funds using the Social Investment Forum (SIF) website.[1] This forum provides information about the funds, like screening standards and funds' general profiles. Following Chung et al. (2012), we selected SRI funds with a positive (key: P) or restricted investment (Key: R) in at least one of the 3 subsets of the "environment" category which includes "climate/clean technology", "pollution/toxic", and "environment/other" subsets. The green mutual funds were identified using the most recent information provided by the US SIF (US SIF 2018). We analyzed the information provided by US SIF 2018 under Screening and Advocacy and selected only the funds with at least one P or R in one of the subsets of the "environment" category.[2]

As in Climent and Soriano (2011), the sample excludes bonds funds, balanced funds, guaranteed funds, index funds and institutional funds. Besides that, only funds with at least 24 monthly observations are included in the dataset, as in Silva and Cortez (2016). In the case of funds with different share classes, only the oldest one was considered (Cortez et al., 2012).

This study compares the performance of US green funds with a portfolio of US conventional funds. Like other studies (e.g., Nofsinger and Varma, 2014) we use a common procedure for that purpose: matched paired analysis. In this study, the conventional funds were identified using DataStream. The matching procedure was based on the following criteria: base date, Lipper classification and the total net assets, as in Nofsinger and Varma (2014). Firstly, funds with same Lipper objective and inception dates within a year of the green funds were identified. Then, for each green fund, two conventional funds were selected with the closest total net assets. As in Nofsinger

[1] https://www.ussif.org/ US SIF: The Forum for Sustainable and Responsible Investment is the leading voice advancing sustainable, responsible and impact investing across all asset classes. Its mission is to rapidly shift investment practices toward sustainability, focusing on long-term investment and the generation of positive social and environmental impacts.

[2] The limitation of using this procedure to identify green funds is that we cannot identify funds that ceased to exist, so the dataset is not survivorship bias-free.

and Varma (2014), in the case that conventional funds did not meet the age criteria, the age criteria were extended for 3 years. If after that it was still not possible to identify any fund, the age criteria was dropped completely and the fund with the same Lipper objective and closet total net asset was selected.

In this study we created two equally weighted portfolios: a portfolio of green funds and a portfolio of conventional funds. The average monthly returns of each fund it was computed according to the following formula (n is the number of sample funds):

$$Equally\ Weighted = \frac{\sum_{i}^{n} return_i}{n} \quad (14)$$

Besides the analysis of fund performance at the aggregate level, this study analyzes funds' performance individually, as in Silva and Cortez (2016), considering that the results based on equally weighted portfolios can hide some significant performance differentials at the individual level.

As market benchmark we use two benchmarks, in order to compare the exposure of green and conventional funds to a green and conventional index. The conventional benchmark used is the Standard & Poor`s 500 index (S&P500), that includes the top 500 companies in the US market. Climent and Soriano (2011) use the FTSE KLD Global Climate 100 Index to characterize the green sector, since this index promotes investment in 100 public companies that demonstrate a good potential for mitigating short-term and long-term causes of climate change. However, the fact that this index is a global one and this study is focused in the US market led us to choose the MSCI KLD 400 index as the benchmark used to represent the green sector.[3] This benchmark is generally recognized for measuring the impact of social and environmental screening on investment portfolios (Climent and Soriano, 2011). To proxy for the risk-free rate, the 1-month treasury bill was collected from the website of Professor Kenneth R. French.[4] From this website we

[3] The MSCI KLD 400 Social Index is a capitalization weighted index of 400 US securities that provides exposure to companies with outstanding Environmental, Social and Governance (ESG) ratings and excludes companies whose products have negative social or environmental impacts. The parent index is MSCI USA IMI, an equity index of large, mid and small cap companies. The Index is designed for investors seeking a diversified benchmark comprised of companies with strong sustainability profiles while avoiding companies incompatible with values screens. Launched in May 1990 as the Domini 400 Social Index, it is one of the first SRI indexes. Constituent selection is based on data from MSCI ESG Research. (https://www.msci.com/documents/10199/904492e6-527e-4d64-9904-c710bf1533c6 accessed on October 24, 2019)

[4] https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

also collected the risk factors: the SMB factor, the HML factor, the MOM factor, the RMW factor and the CMA factor.

Fund monthly returns, in US dollars, were obtained from DataStream. To be consistent with the data extracted from the professor Kenneth R. French, the data for both benchmarks were extracted from DataStream and the returns were computed in a discrete way.

To apply the conditional models of Christopherson et al. (1998), two lagged information variables were used: the dividend yield and the short-term rate, as in Ferson and Warther (1996) and Cortez et al. (2012). Cortez at al. (2012) argue that financial markets are increasingly integrated, in this way supporting the use of global information variables. The dividend yield is based on the S&P500 index and was extracted from DataStream. The short-term rate variable is proxied by the 3-month US Treasury bill yield, extracted from the Federal Reserve website.[5]

As these variables tend to be highly persistent, a potential problem that might arise is the bias resulting from the spurious regressions (Cortez et al., 2009). To prevent this problem, we used the procedure of Ferson et al. (2003) that consists in detrending these variables by subtracting their 12-month moving average. To minimalize possible scale effects on the results, these variables are used in their corresponding mean zero values (Bernhardt and Jung, 1979).

In order to correct the standard errors for heteroscedasticity and autocorrelation, the procedure of Newey and West (1987) was used. As in Baum (2006) the number of lags is determined by the rule of thumb: $\sqrt[4]{N}$, where N represents the number of observations.

Table 1 shows the list of US green funds used in this study and their corresponding conventional peers. The sample is composed of 13 green funds and 26 matched conventional funds.

Table 2 reports the descriptive statistics for the two equally weighted portfolios: the equally weighted portfolio of US green funds and the equally weighted portfolio of US conventional funds. Besides that, it also reports the descriptive statistics for the green (MSCI KLD 400) and conventional (S&P500) benchmarks and for the risk factors. The period under analysis is the last 15 years (from 2004 to 2019).

[5] https://fred.stlouisfed.org/

Table 1- List of US green and conventional funds

	Fund	Name	Inception date	Lipper Global Classification	Total net assets
1	**Green**	ARIEL FOCUS FD.INVR.CL.	01/02/2006	Equity US	40,8
	Conventional	FID.ADVI.ASST.MANAGER 85% CL.C	02/10/2006	Equity US	40,9
		HARTFORD GW.OPPS.FD.CL. R3	21/12/2006	Equity US	44,5
2	**Green**	ASPIRATION REDWOOD FUND	16/11/2015	Equity US	84,5
	Conventional	SEI INST MGD TAX-MANAGED MANAGED VOLATILITY Y	30/04/2015	Equity US	87,7
		AQR TM LARGE CAP MULTI- STYLE FUND I	11/02/2015	Equity US	92,8
3	**Green**	BROWN ADVISORY WINSLOW SUSTBY.FD.INSTL.SHS.	29/06/2012	Equity US	861,3
	Conventional	TOUCHSTONE FOCD.FD.CL.Y	16/04/2012	Equity US	829,1001
		WELLS FARGO PREMIER LARGE CO GR FD R6	03/12/2012	Equity US	789,5
4	**Green**	PARNASSUS ENDEAVOR FUND INVESTOR	29/04/2005	Equity US	2709,7
	Conventional	AMERICAN CENTURY MID CAP VALUE FUND I	31/01/2005	Equity US	2375,5
		MFS VAL.FD.CL.R4	01/04/2005	Equity US	2975,6
5	**Green**	PARNASSUS FUND INVESTOR	27/08/1987	Equity US	776,1001
	Conventional	ANCHOR SA WELLINGTON CAPITAL APPRECTN PORT 1	23/03/1987	Equity US	771
		AMG MANAGERS BRANDYWINE FUND I	23/05/1986	Equity US	786,2
6	**Green**	PARNASSUS MID CAP FUND INVESTOR	29/04/2005	Equity US	2271,2
	Conventional	ADVANCED SRS WELLINGTON MANAGEMENT HEDGED EQ PTF	05/12/2005	Equity US	2067,6
		DFA US.CORE EQ.1 PRTF.	21/10/2005	Equity US	26071,1
7	Green	TIAA-CREF INSTL.SOCIAL CHOICE EQ.FD.RTMT.CL.	12/12/2002	Equity US	657,7
	Conventional	AMERICAN FUNDS AMCAP FUND R2	31/05/2002	Equity US	614,8
		BRIGHTHOUSE/WELL CORE EQUITY OPPTY PTFL B	30/07/2002	Equity US	683,2
8	**Green**	GREEN CENTURY EQUITY FUND INDIVIDUAL INVESTOR	22/09/1997	Equity US	243,4
	Conventional	AB GROWTH FUND ADVISOR	31/03/1997	Equity US	202,8
		ALGER CAP.APPREC.FD.CL.C	08/08/1997	Equity US	217,3
9	**Green**	PARNASSUS CORE EQUITY FUND INVESTOR	19/04/1993	Equity US Income	9591,898
	Conventional	PTNM.EQ.INC.FD.CL.A	14/10/1993	Equity US Income	8184,898
		JP MORGAN EQUITY INCOME FUND I	01/09/1989	Equity US Income	9908
10	**Green**	ARIEL APPRECIATION FUND INVESTOR CL.	19/07/1990	Equity US Sm&Mid Cap	997,3
	Conventional	ICM SML.CO.PRTF.INSTL. CL.	28/02/1991	Equity US Sm&Mid Cap	890
		INVESCO OPPENHEIMER MID CAP VALUE FUND A	03/12/1991	Equity US Sm&Mid Cap	824,2
11	**Green**	ARIEL FUND INVESTOR CL.	16/03/1987	Equity US Sm&Mid Cap	1303,8
	Conventional	NORTHWESTERN MUTUAL MCG STK PFOLIO	30/11/1990	Equity US Sm&Mid Cap	1095,2
		INVESCO OPPENHEIMER DISCOVERY FUND A	02/02/1987	Equity US Sm&Mid Cap	1341,1
12	**Green**	WALDEN SMALL CAP FUND	30/10/2008	Equity US Sm&Mid Cap	110,5
	Conventional	MML MID CAP GROWTH FUND SERVICE	15/08/2008	Equity US Sm&Mid Cap	103,4
		NATIONWIDE NVIT MULT- MNGR MCG FD II	24/03/2008	Equity US Sm&Mid Cap	138,2
13	**Green**	WALDEN SMID CAP FUND	29/06/2012	Equity US Sm&Mid Cap	57,1
	Conventional	NATIONWIDE BAILARD COGNITIVE VALUE FUND M	16/09/2013	Equity US Sm&Mid Cap	60
		MADISON MID-CAP FD.CL.R6	29/02/2012	Equity US Sm&Mid Cap	54,1

This table presents the sample of green funds identified using the US SIF 2018 and the respective conventional funds. For each fund present the name of the fund, inception date, Lipper Global classification and the total net assets extracted from DataStream.

Table 2- Descriptive statistics of US green and conventional funds, market benchmarks and risk factors

	No. of obs.	Mean excess returns (%)	Standard deviation (%)	Kurtosis	Skewness	Min	Max	Adj. χ^2	P value
US green portfolio	188	0.672	4.44	5.866	-0.474	-0.196	0.175	19.73	0.0001
US conventional portfolio	188	0.663	4.20	5.192	-0.828	-0.187	0.117	24.90	0.0000
S&P500	188	0.662	3.93	5.090	-0.764	-0.169	0.109	15.72	0.0004
MSCI KLD 400	188	0.644	3.94	4.475	-0.594	-0.155	0.106	22.81	0.0000
SMB	188	0.0422	2.38	2.837	0.303	-0.0478	0.0681	3.08	0.2148
HML	188	-0.0737	2.55	5.364	0.0765	-0.112	0.0829	12.55	0.0019
RMW	188	0.307	1.55	3.468	0.240	-0.0399	0.0508	3.86	0.1449
CMA	188	-0.0434	1.41	2.873	0.329	-0.0333	0.0370	3.54	0.1699
MOM	188	0.109	4.40	22.29	-2.659	-0.344	0.125	.	0.0000

This table reports summary statistics for equally weighted portfolios of US green and conventional funds, market benchmarks and the additional risk factors. Mean excess returns, standard deviation, kurtosis, skewness, minimum and maximum for the period of February 2004 to September 2019. The Adj. χ^2 is a statistic that is around a χ^2 distribution with 2 degrees of freedom under the null of normality. The result "." should be interpreted as an absurdly large number so the data are most surely not normal.

Over the period under analysis both fund portfolios and the market factors present positive mean excess returns, except the book-to-market (HML) and investment factor (CMA). Comparing the green fund portfolio with the green benchmark, the green portfolio presents higher mean monthly excess returns and a higher standard deviation. In addition, the conventional fund portfolio presents higher mean monthly excess returns and higher standard deviation than the conventional benchmark. Comparing both portfolios, the green portfolio presents higher mean excess returns than conventional funds and also a higher standard deviation, meaning that green funds present a higher risk. Comparing the benchmarks, the conventional benchmark has a higher mean monthly excess return and a lower standard deviation than the benchmark of the sector.

Regarding the symmetry of the distribution, both portfolios and benchmarks have a negative skewness (negatively skewed), which indicates that the left tail of the distribution is greater than the right tail. Regarding to the characterization of the peak of the distribution, both portfolios and benchmarks have exhibit excess kurtosis (higher than 3), which classifies it as leptokurtic.

Additionally, the normality test was performed. The results support that the portfolios of green and conventional funds and the benchmarks are not normally distributed, since we do not accept the null hypothesis of normality at the level of 5 %. For the risk factors, we only reject the null hypothesis for the HML and MOM factors. As argued by Adcock et al. (2012), the rejection of normality of returns supports the application of conditional models.

Table 3- Mean excess returns by years for green fund and conventional funds

Year	Green (1) (%)	Conventional (2) (%)	Difference (1)-(2) (%)	p-value
2004	0.694	0.814	-0.1202	0.9205
2005	-0.076	0.458	-0.534	0.6218
2006	0.703	0.705	-0.002	0.9985
2007	-0.0898	0.601	-0.691	0.5602
2008	-3.347	-3.912	0.565	0.8472
2009	3.262	2.46	0.803	0.7755
2010	1.464	1.588	-0.124	0.9601
2011	-0.0652	-0.1472	0.0820	0.9706
2012	1.359	1.256	-0.103	0.9410
2013	2.571	2.464	0.107	0.9202
2014	0.843	0.801	0.042	0.9719
2015	-0.0898	0.160	-0.25	0.8700
2016	1.245	0.793	0.453	0.7554
2017	1.315	1.531	-0.2156	0.6721
2018	-0.728	-0.571	-0.157	0.9360
2019	2.024	1.945	0.0773	0.9730

This table reports the mean excess returns for the equally weighted portfolios of green and conventional, and for the difference between these two, by years. The p value is calculated for the difference of the mean between green and conventional funds.

Table 3 reports the monthly mean excess returns for both portfolios (green and conventional) by years, from 2004 to 2019. From this table, it seems that green and conventional funds present similar fluctuations over time. In 2008, the year of the global financial crisis, the mean monthly excess returns dropped drastically for both green and conventional funds. This drop was higher for conventional funds. The mean monthly excess returns start to increase again in 2009. Analyzing the expansion periods, overall, conventional funds present higher values for the mean excess returns. However, in recession periods, green funds present higher values. Yet, there are no statistically significant differences between the mean monthly excess returns of green and conventional funds.

These results suggest the importance of controlling the funds' performance by market states, since these fluctuations may be in accordance to the business cycles identified by the NBER.

5. EMPIRICAL RESULTS

This chapter presents the results on the performance of the US green and conventional funds. The analysis starts with the results of the unconditional multi-factor models (Carhart, 1997 and Fama and French, 2015) and then those of the conditional approach, as in Christopherson et al. (1998), applied to each model. Then we compare timing and selectivity abilities of both types of funds, using the multifactor version of the Treynor and Mazuy (1966) model. To finish we present the results of the Carhart (1997) four-factor model and Fama and French (2015) with a dummy variable, in order to analyze the performance of green and conventional funds in different market states.

5.1 Fund performance using unconditional models

Considering that multi-factor models are more useful to explain the cross-section of expected stock returns, we apply the Carhart (1997) four-factor model and the Fama and French (2015) five-factor model to evaluate fund performance.

5.1.1 Unconditional Carhart (1997) four-factor model

Table 4 presents the results of fund performance at the aggregate level for the Carhart (1997) four-factor model from 2004 to 2019 and summarizes the results on individual fund performance. Appendixes 1 and 2 detail the results for individual funds.

Panels A and B show the results considering a conventional index (S&P500) and a green index (MSCI KLD 400), respectively, as the market benchmark. As in Climent and Soriano (2011), this study also evaluates the "difference" portfolio, constructed by subtracting the returns of the conventional portfolio from the green portfolio. This portfolio is constructed in order to evaluate the differences in risk and return between the different investment approaches.

The explanatory power of the models is above 95% for the green and conventional portfolio regressions, which means that more than 95% of the variability of the excess returns is explained by the model. The explanatory power is slightly higher when the benchmark is the S&P500, which

Table 4 - Unconditional Carhart four-factor model performance

Panel A: Benchmark S&P500						
Portfolios	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	R^2 **adj.**
Green (1)	0.0002	0.9910***	0.3075***	-0.0022	-0.1083***	97.44%
N+	5[1]	13[13]	13[12]	4[3]	4[1]	
N-	7[0]	0[0]	0[0]	9[3]	9[7]	
Conventional (2)	-0.0003	1.0030***	0.3269***	-0.1417***	0.0264*	97.99%
N+	10[1]	26[26]	23[22]	10[6]	13[6]	
N-	16[4]	0[0]	3[0]	16[12]	13[5]	
Difference (1)-(2)	0.0005	-0.0120	-0.0193	0.1364***	-0.1347***	45.77%
Panel B: Benchmark MSCI KLD 400						
Portfolios	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	R^2 **adj.**
Green (1)	0.0003	1.0026***	0.2527***	0.0340	-0.0849***	97.23%
N+	6 [1]	13[13]	12[10]	7[4]	6[1]	
N-	7[1]	0[0]	1[1]	6[3]	7[7]	
Conventional (2)	-0.0000	1.0000***	0.2791***	-0.1015**	0.0463**	95.68%
N+	10[1]	26[26]	22[17]	10[7]	16[7]	
N-	14[2]	0[0]	4[1]	16[12]	10[2]	
Difference (1)-(2)	0.0004	0.0026	-0.0264	0.1355***	-0.1312***	45.64%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained from the four-factor model regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 -September 2019. It reports estimates of performance (α_p), systematic risk (β_p) , factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj.*). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented.

means that the conventional index is more capable to explain portfolio performance than the SRI index.

Analysing panel A, none the portfolio alphas are statistically significant. Individually, there are 5 green funds with positive alpha coefficients, but only one is statistically significant. Regarding conventional funds, there are 10 conventional funds with positive alpha coefficients, but only one is statistically significant. Overall, the majority of green and conventional funds present neutral performance, so we can conclude that neither green or conventional funds perform significantly differently from the market. These results are consistent with previous studies (e.g., Climent and Soriano, 2011; Muñoz et al., 2014) on the performance of green funds. Climent and Soriano (2011) show that green funds underperform the market benchmark from 1987 to 2001**,** which is not in accordance with panel A. However, focusing in the period from 2001 to 2009, Climent and Soriano (2011) show that green and conventional funds did not perform differently from the market

and that the difference between green and conventional funds is statistically insignificant. In panel B, using the MSCI KLD 400 as the market benchmark, the alpha coefficients are also statistically insignificant for both green and conventional portfolios, meaning a neutral performance. In sum, comparing the performance of green and conventional funds, whatever benchmark is used, we can observe that the alphas of the green performance are higher than those of the conventional portfolios, although the difference is not statistically significant.

In relation to market risk, the results show that betas are statistically significant at the 1% level for both green and conventional portfolios. Green funds present higher values of beta when the benchmark is the green benchmark (MSCI KLD 400), whereas the conventional funds exhibit higher beta when the benchmark is the conventional benchmark (S&P500). This means that green funds are more exposed to the green benchmark and the conventional funds to the conventional benchmark. However, there is no statistically significant difference regarding the market risk between the two portfolios. At the individual level, all coefficients associated with the market risk are positive and statistically significant.

Regarding the risk factors, the results demonstrate that green and conventional funds are more exposed to the size (SMB) factor, since this risk factor is statistically significant at the 1% level. At the individual level, the majority of the funds also present positive and statistically significant SMB coefficients.

The betas associated to the book-to-market (HML) factor are only statistically significant for conventional funds, with a negative sign, suggesting that conventional funds are more exposed to growth stocks than to value stocks. Observing the coefficients of the difference portfolio, we conclude that green funds are more exposed to value stocks than conventional funds.

The MOM risk factor is statistically significant for all portfolios. However, the green portfolio presents negative coefficients and the conventional portfolio positive coefficients. This means that green funds are more exposed to companies with poor performance in the recent past, while conventional funds are more exposed to companies with a good past performer.

5.1.2 Unconditional Fama and French (2015) five-factor model

The Fama and French (2015) model adds the profitability (RMW) and the investment (CMA) factors, excluding the momentum (MOM) factor, to the previous model. The results of this model are presented in table 5. Detailed estimates on the individual funds are reported in Appendixes 3 and 4.

Table 5- Unconditional Fama and French (2015) five-factor model performance

Panel A: Benchmark S&P500							
Portfolios	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	R^2 **adj.**
Green (1)	-0.0002	1.0246***	0.3088***	0.0637**	0.0237	0.0004	96.53%
N+	5[1]	13[13]	13[12]	8[4]	8[2]	7[0]	
N-	8[0]	0[0]	0[0]	5[1]	5[0]	6[1]	
Conventional (2)	0.0003	0.9724***	0.3032***	-0.1237***	-0.1275***	-0.1154***	98.20%
N+	13[2]	26[26]	23[20]	11[9]	8[5]	6[3]	
N-	13[2]	0[0]	3[0]	15[11]	18[11]	20[11]	
Difference (1)-(2)	-0.0005	0.0522***	0.0056	0.1874***	0.1512***	0.1157*	29.02%
Panel B: Benchmark MSCI KLD 400							
Portfolios	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	R^2 **adj.**
Green (1)	-0.0000	1.0293***	0.2537***	0.1048***	0.0323	-0.0566	96.71%
N+	5 [2]	13 [13]	12 [8]	8 [5]	8[2]	3[6]	
N-	8 [1]	0[0]	1[1]	5[2]	5[0]	10[2]	
Conventional (2)	0.0006	0.9579***	0.2574***	-0.0781*	-0.1338***	-0.1795***	95.93%
N+	15 [2]	26 [26]	22 [16]	11[9]	7 [5]	4 [1]	
N-	10 [1]	0 [0]	4 [1]	15[11]	19[11]	22 [12]	
Difference (1)-(2)	-0.0007	0.0714***	-0.0037	0.1830***	0.1661***	0.1229**	31.15%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained from the five-factor model regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj.).* Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented.

Compared with the previous model, we observe that in spite of adding the two risk factors, fund performance estimates remains neutral. In fact, the alpha coefficients remain statistically insignificant, being consistent with the previous results. The difference between the performance of the green portfolio and the conventional portfolio is not statistically significant.

At the individual level, in panel A one green fund and two conventional funds outperform the market. Additionally, two conventional funds underperform. In panel B, two green funds and

two conventional funds present a positive and statistically significant alpha, meaning that these funds outperform the market, and only one green and one conventional funds underperform the market. Overall, the majority of the funds present a neutral performance.

Comparing the R^2 adj. of both models, the five-factor model presents a slightly lower R^2 adj. for green funds and a slightly higher for conventional funds, consistent with, the two additional factors being statistically insignificant for green funds.

In terms of market exposures, all betas are positive and statistically significant at the 1% level for both green and conventional funds. As in the previous model, individually all the coefficients (of green and conventional funds), are statistically significant. However, with this model we observe a statistically significant difference in terms of market exposure, as green funds are more exposed to the market in comparison to conventional funds.

Analyzing the additional risk factors of this model, the size (SMB) factor is still the most relevant one. All betas associated with this risk factor are positive and statistically significant for both green and conventional funds, regardless of the benchmark. This means that both green and conventional funds are more exposed to small caps, in line with the results of four-factor model. At the individual fund level, the majority of the funds show a positive and statistically significant coefficient associated with the size (SMB) factor. As in previous results, there is no statistically significant difference between the two portfolios in terms of the size coefficient.

The betas of the book-to-market (HML) factor are positive and statistically significant for green funds, indicating that green funds are more exposed to value stocks. Though, for conventional funds the betas of the HML factor are negative and statistically significant, meaning that conventional funds are more exposed to growth stocks than to value stocks, as in the previous model. Besides that, the book-to-market factor associated with the difference portfolio is positive and statistically significant, meaning that green funds are more exposed to value stocks than conventional funds, also in line with the previous model.

The two additional risk factors, the profitability (RMW) and the investment (CMA) factors, do not present significant coefficients for green funds. However, for conventional funds, these two factors are statistically significant and negative. This means that conventional funds are more exposed to companies with weak profitability and high investment firms. Furthermore, looking at the difference portfolio, the betas associated with these two additional factors are positive and

statistically significant, meaning that green funds are more exposed to firms with robust profitability and low investments than conventional funds.

5.2 Fund performance using conditional models

The conditional approach proposed by Ferson and Schadt (1996) only allows betas to be time-varying but alpha remains constant. The full conditional approach of Christopherson et al. (1998) allows for time-varying betas and alphas. As argued by Ferson et al. (2008), using the model that allows for betas to vary over time but forcing alphas to be constant will generated bias results. So, as mentioned in section 3, the full conditional specification of the multi-factor models is applied. In this model two public information variables are used: the short-term rate (ST) and the dividend yield (DY).

5.2.1 Conditional Carhart (1997) four-factor model

Table 6 presents the results of the full conditional four-factor model of Carhart (1997). Appendixes 5 and 6 contain the detailed results for individual funds.

Analyzing the R^2s adj. of the models, they are not much different from those obtained with the unconditional approach. However, the R^2 s adj. are now slightly higher, so we conclude that the explanatory power of the conditional models increases in relation to the unconditional models, demonstrating the importance of including public information variables.

The results show that both green and conventional portfolios present a neutral performance compared to the market, as in the previous findings. Analyzing the difference portfolio, there is no statistically significant difference between the performance of green and conventional funds. Thus, US green funds do not perform differently from conventional funds. At the individual level, in panel A, none of the green or conventional funds outperform the market. However, four green funds and three conventional funds perform worse than the market. In panel B, one green fund outperforms the market benchmark, but two green and two conventional funds underperform the market. Overall, the majority of the funds present a neutral performance.

In panel A, the alphas associated with the dividend yield and the short-term rate present a neutral influence in explain the performance of green and conventional funds. However, in panel B, the alpha associated with the dividend yield present a negative and statistically significant value at 10% level, meaning that green funds present a lower performance in times of higher dividends.

Table 6 – The conditional Carhart (1997) four-factor model

Panel A: S&P500							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0003	7[4]	6[0]	-0.0003	16[3]	10[0]	0.0000
α_{ST}	-0.1392	12[2]	1[0]	0.0304	13[1]	13[0]	-0.1696
α_{DY}	-0.0042	7[5]	6[1]	-0.0044	18[1]	8[2]	0.0001
β_{p*rm}	1.0000***	0[0]	13[13]	0.9881***	0[0]	26[26]	0.0119
β_{ST*rm}	1.5481	4[0]	9[1]	-6.7592***	17[6]	9[1]	8.3073**
β_{DY*rm}	-0.0860	8[2]	5[0]	0.0198	16[1]	10[2]	-0.1059
β_{SMB}	0.2987***	0[0]	13[11]	0.3379***	2[0]	24[21]	-0.0391
β_{ST*SMB}	-17.0800***	12[4]	1[0]	1.3505	15[3]	11[2]	-18.4304**
β_{DY*SMB}	0.1385	5[0]	8[1]	0.1622	8[0]	18[2]	-0.0238
β_{HML}	-0.0016	7[3]	6[2]	-0.1154***	14[12]	12[8]	0.1138***
β_{ST*HML}	-6.3906	7[1]	6[0]	12.3202***	13[2]	13[9]	-18.7108**
β_{DY*HML}	-0.2095	8[1]	5[1]	-0.1912***	16[8]	10[2]	-0.0182
β_{MOM}	-0.0752***	10[5]	3[1]	0.0399***	11[2]	15[5]	-0.1151***
β_{ST*MOM}	-2.3958	10[0]	3[0]	0.4628	16[2]	10[2]	-2.8586
β_{DY*MOM}	-0.2001**	10[3]	3[0]	-0.0548	20[4]	6[3]	-0.1453
w_1	0.2194			0.2951			
w_2	0.0118			0.0000			
w_3	0.0000			0.0000			
R^2 **adj.**	97.86%			98.28%			55.69%
Panel B: MSCI KLD 400							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0001	6[2]	7[1]	-0.0001	11[2]	15[0]	0.0000
α_{ST}	-0.1186	12[2]	1[0]	0.0384	13[1]	13[0]	-0.1570
α_{DY}	-0.0061*	8[4]	5[1]	-0.0076	18[2]	8[0]	0.0015
$\beta_{p* rm}$	1.0011***	0[0]	13[13]	0.9808***	0[0]	26[26]	0.0203
β_{ST*rm}	-0.9024	5[0]	8[0]	-8.4328**	20[3]	6[0]	7.5303*
β_{DY*rm}	0.0246	5[0]	8[1]	0.1814*	6[0]	20[5]	-0.1567
β_{SMB}	0.2575***	1[1]	12[10]	0.2982***	3[1]	23[18]	-0.0407
β_{ST*SMB}	-12.1497	10[3]	3[0]	6.6362	11[2]	15[3]	-18.7858**
β_{DY*SMB}	0.2729**	1[0]	11[3]	0.2908	3[0]	23[3]	-0.0180
β_{HML}	0.0570**	4[2]	9[4]	-0.0596**	13[12]	13[8]	0.1165***
β_{ST*HML}	9.1343	3[1]	10[3]	27.3568***	8[0]	18[11]	-18.2224**
β_{DY*HML}	-0.1923	7[1]	6[1]	-0.2143	19[7]	7[2]	0.0220
β_{MOM}	-0.0527***	8[5]	5[2]	0.0611***	10[1]	16[6]	-0.1138***
β_{ST*MOM}	1.0435	7[0]	6[1]	3.8120	12[1]	14[3]	-2.7686
β_{DY*MOM}	-0.0970	8[2]	5[0]	0.0489	11[2]	15[8]	-0.1459
w_1	0.1712			0.3525			
w_2	0.0061			0.0000			
w_3	0.0009			0.0000			
R^2 **adj.**	97.48%			96.65%			55.67%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained by from the conditional four-factor model regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports estimates of performance ($\boldsymbol{\alpha_p}$), systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj.*). The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented. w1, w2, and w3 correspond to p values of Wald tests on the null hypothesis of no time-varying alphas, no time-varying betas, and no time-varying alphas and betas, respectively.

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Analyzing the Wald test, we cannot reject the null hypothesis of the time-varying alphas being equal to zero, meaning that the performance of green and conventional funds doesn't vary with time. Cortez et al. (2012) argue that this fact is not a surprise for green funds, since there are more restrictions in terms of the security selection process. For the conditional betas, the null hypothesis that conditional betas are equal to zero is rejected for both green and conventional funds, meaning that risk varies over time according to the public information variables.

Regarding the risk factors, the coefficients are all statistically significant, except the book-to-market (HML) for green funds when the benchmark is S&P500. The size (SMB) factor is still the most relevant one.

Analyzing the differences portfolio, we can see interesting results about the investment styles of green funds. The difference of the market coefficient is positive but statistically insignificant in both benchmarks, meaning that there is no difference between green and conventional funds in terms of exposure to the market. Individually, all market coefficients are positive and statistically significant, as in previous results. The difference of the size (SMB) factor is also statistically insignificant, so there is no difference in terms of exposure to size between green and conventional funds. Despite the book-to-market (HML) coefficient being statistically insignificant for green funds when the benchmark is S&P500, the difference portfolio presents a positive and statistically significant coefficient, meaning that green funds are more exposed to value stocks than conventional funds. Finally, the difference of the momentum (MOM) coefficient is negative and statistically significant, so green funds are more exposed to companies with poor performance than conventional funds, as in previous results.

5.2.2 Conditional Fama and French (2015) five-factor model

Table 7 presents the results of the full conditional five-factor model of Fama and French (2015). Appendixes 7 and 8 report the detailed results for individual funds.

Comparing the R^2s adj. of this model with those of the conditional four-factor model of Carhart (1997), they are not much different. However there is a slightly increase of the R^2s adj. for conventional funds and a slightly decrease for green funds, meaning that this model explains better the performance of conventional funds compared to the conditional four-factor model of Carhart (1997). These results are consistent with the previous results using the unconditional approach.

Using the full conditional five-factor model, both green and conventional portfolios still present a neutral performance. Individually, the majority of the funds shows a neutral performance. Once again, we observe that in general there is no statistical significant difference between the performance of green and conventional funds.

In panel A, we observe that the alpha coefficient associated with the short-term rate for green funds is negative and statistically significant at 10% level, meaning that these funds show a lower performance in times of higher short-term interest rates. Besides that, the alpha coefficient associated with the short-term rate for the difference portfolio is negative and statistically significant, so green funds show a lower performance comparing to conventional funds in times of higher short-term interest rates.

As in previous results, we cannot reject the null hypothesis of the conditional alphas being equal to zero, for both green and conventional funds. For the conditional betas, the null hypothesis that conditional betas are equal to zero is rejected, meaning that risk varies over time according to the public information variables.

Regarding market risk, green funds present higher values of beta when the benchmark is the green benchmark (MSCI KLD 400), whereas the conventional funds show higher betas when the benchmark is the conventional benchmark (S&P500). This means that green funds are more exposed to the green benchmark and conventional funds to the conventional benchmark. At the individual level, all coefficients associated with the market risk are positive and statistically significant for both funds.

Table 7- Conditional Fama and French (2015) five-factor model performance

Benchmark	Panel A: S&P500						
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0001	7[2]	6[3]	-0.0001	12[1]	14[0]	0.0000
α_{ST}	-0.2216*	11[2]	2[0]	0.0920	13[0]	13[1]	-0.3136**
α_{DY}	0.0036	6[1]	7[4]	-0.0045	14[3]	12[0]	0.0080
β_{p*rm}	1.0123***	0[0]	13[13]	0.9753***	0[0]	26[26]	0.0369**
β_{ST*rm}	-0.0749	6[1]	7[1]	-3.0779	15[3]	11[1]	3.0030
β_{DY*rm}	0.0149	7[0]	6[0]	-0.0538	19[3]	7[2]	0.0687
β_{SMB}	0.3207***	0[0]	13[10]	0.3177***	4[0]	22[20]	0.0031
β_{ST*SMB}	-23.6121**	12[5]	1[0]	-1.6636	18[2]	8[0]	-21.9486**
β_{DY*SMB}	0.2633	4[0]	9[2]	0.0545	10[0]	16[2]	0.2089
β_{HML}	0.0443	5[2]	8[3]	-0.0935***	16[11]	10[8]	0.1378***
β_{ST*HML}	-13.1765*	10[2]	3[1]	15.1378***	9[3]	17[4]	-28.3143***
β_{DY*HML}	-0.4220***	8[2]	5[0]	-0.0099	15[5]	11[3]	-0.4121**
β_{RMW}	0.0056	6[0]	7[1]	-0.1082***	17[9]	9[3]	0.1138**
β_{ST*RMW}	2.7524	6[0]	7[0]	-6.1075	11[2]	15[2]	8.8599
β_{DY*RMW}	-0.1918	8[3]	5[0]	-0.0593	13[0]	13[0]	-0.1325
β_{CMA}	-0.0018	8[1]	5[1]	-0.1292***	19[10]	7[2]	0.1274*
β_{ST*CMA}	5.7585	6[1]	7[1]	9.3184	10[0]	16[3]	-3.5600
β_{DY*CMA}	0.4810*	4[0]	9[2]	-0.2651	16[4]	10[1]	0.7461**
w_1	0.0563			0.1628			
w_2	0.0000			0.0000			
w_3	0.0001			0.0000			
R^2 adj.	97.17%			98.52%			45.60%
Benchmark	**Panel B: MSCI KLD 400**						
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0000	6[2]	7[3]	0.0001	11[1]	15[0]	-0.0001
α_{ST}	-0.1535	10[2]	3[0]	0.1561	11[0]	15[1]	-0.3096**
α_{DY}	-0.0017	7[2]	6[3]	-0.0093	21[2]	5[0]	0.0076
β_{p*rm}	1.0125***	0[0]	13[13]	0.9619***	0[0]	26[26]	0.0506***
β_{ST*rm}	-0.9909	7[1]	6[1]	-4.0096	15[3]	11[1]	3.0187
β_{DY*rm}	0.1152	4[1]	9[0]	0.0403	9[0]	17[3]	0.0750
β_{SMB}	0.2846***	1[1]	12[10]	0.2873***	3[0]	23[17]	-0.0027
β_{ST*SMB}	-15.7540*	11[2]	2[0]	6.3421	9[0]	17[3]	-22.0961**
β_{DY*SMB}	0.3874**	1[0]	12[3]	0.1855	4[0]	22[4]	0.2020
β_{HML}	0.1076***	3[2]	10[5]	-0.0314	15[10]	11[8]	0.1390***
β_{ST*HML}	-1.4126	8[1]	5[2]	25.1739***	5[1]	21[8]	-26.5865***
β_{DY*HML}	-0.4806***	9[4]	4[0]	-0.0801	16[5]	10[2]	-0.4005**
β_{RMW}	0.0416	4[0]	9[1]	-0.0818*	16[7]	10[3]	0.1234**
β_{ST*RMW}	10.1834	2[1]	11[0]	1.6455	9[1]	17[3]	8.5379
β_{DY*RMW}	0.0354	4[1]	8[0]	0.1380	10[0]	16[0]	-0.1027
β_{CMA}	-0.0528	9[1]	4[1]	-0.1817***	20[14]	6[1]	0.1288**
β_{ST*CMA}	15.7079	3[1]	10[2]	20.0954	5[0]	21[6]	-4.3875
β_{DY*CMA}	0.5876**	6[0]	7[2]	-0.1557	14[2]	12[1]	0.7434**
w_1	0.4924			0.1557			
w_2	0.0009			0.0000			
w_3	0.0000			0.0000			
R^2 adj.	97.18%			96.86%			46.62%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds as well as the difference between these two portfolios, obtained from the five-factor model regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports estimates performance ($\boldsymbol{\alpha_p}$), the systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented. w1, w2, and w3 correspond to p values of Wald tests on the null hypothesis of no time-varying alphas, no time-varying betas, and no time-varying alphas and betas, respectively.

Regarding the additional risk factors, as in previous results both green and conventional funds have statistically significant coefficients associated to the size (SMB) factor, meaning that these funds are more exposed to small stocks. At the individual fund level, the majority of the funds are also more exposed to small stocks and there is no statistically significant difference between green and conventional funds in terms of the size (SMB) factor.

The book-to-market (HML) factor is statistically significant for green funds in panel B and for conventional funds in panel A. However, this coefficient is positive for green funds and negative for conventional funds. Therefore, the results indicate that green funds are more exposed to value stocks and conventional to growth stocks.

Furthermore, the coefficients of the risk factors on the differences portfolio between green and conventional funds are all positive and statistically significant, except for size (SMB) factor. So, green funds are more exposed to the market and to value stocks.

Regarding the two additional factors, profitability (RMW) and investment (CMA) factors, none of these factors is statistically significant for green funds. The profitability (RMW) factor presents a negative and statistically significant value for conventional funds, meaning that conventional funds are more exposed to companies with weak profitability. Furthermore, there is a statistically significant difference between green and conventional funds, indicating that green funds are more exposed to companies with robust profitability than conventional funds. The investment (CMA) factor presents a negative and statistically significant coefficient for conventional funds, implying that these funds are more exposed to companies with high investments. The difference portfolio suggests that green funds are more exposed to companies with low investments than conventional funds.

5.3. Selectivity and timing abilities

This section evaluates the timing and selectivity abilities of US green fund managers and compares them with those of conventional fund managers.

5.3.1 The unconditional four-factor version of the Treynor and Mazuy (1966) model

Table 8 presents the results for the Treynor and Mazuy (1966) model extended to a four-factor setting. Appendixes 9 and 10 detail the results for individual funds, for the full period time (2004-2019).

The portfolio's alpha measures fund manager's ability to select stocks that outperform other securities with a similar level of non-diversifiable risk. The results show that all the alphas are statistically insignificant, except the alpha of the conventional portfolio in panel B. In fact, the alpha of the conventional portfolio in Panel B is positive and statistically significant but only at the 10% level, meaning that there is a slight evidence that conventional fund managers present positive selectivity abilities, in the case of the MSCI KLD 400. At the individual fund level, the majority of the fund managers present a lack of stock-picking ability.

None of the coefficients of the market squared risk factors are statistically significant for the green portfolio, meaning that green fund managers do not exhibit market timing abilities. Yet, for the conventional portfolio the coefficient of the market squared risk factor is negative and statistically significant, meaning that conventional fund managers times the market in the wrong direction.

Regarding investment styles, conventional fund managers present a negative and statistically significant coefficient associated with the size squared factor, in the case of the S&P500. This means that conventional fund managers present a poor ability to time the size style. Green fund managers show a proper ability to time the book-to-market and the momentum styles. Additionally, the difference portfolio shows that green fund managers present a better ability to time the momentum style than conventional fund managers.

Table 8 – The unconditional four-factor version of the Treynor and Mazuy (1966) model

Panel A: S&P500							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0002	9[1]	4[1]	0.0004	13[0]	13[2]	-0.0006
β_{p*rm}	1.0010***	0[0]	13[13]	1.0000***	0[0]	26[26]	0.0011
β_{p*rm2}	-0.1266	5[3]	8[0]	-0.3399**	18[5]	8[0]	0.2133
β_{SMB}	0.2997***	0[0]	13[11]	0.3317***	3[0]	23[22]	-0.0320
β_{SMB2}	-0.8193	8[1]	5[0]	-1.0044**	19[4]	7[0]	0.1851
β_{HML}	0.0071	8[3]	5[3]	-0.1431***	16[12]	10[7]	0.1502***
β_{HML2}	0.6586**	4[0]	9[3]	0.4546	10[0]	16[2]	0.2040
β_{MOM}	-0.0726***	9[6]	4[0]	0.0304*	13[3]	13[5]	-0.1031***
β_{MOM2}	0.2630***	3[0]	10[5]	0.0639	10[0]	16[4]	0.1991**
R^2 **adj.**	97.55%			98.03%			46.76%
Panel B: MSCI KLD 400							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	0.0006	5[1]	8[2]	0.0015*	6[0]	20[3]	-0.0009
β_{p*rm}	1.0075***	0[0]	13[13]	0.9911***	0[0]	26[26]	0.0164
β_{p*rm2}	-0.5323	11[2]	2[0]	-0.8174**	24[12]	2[0]	0.2851*
β_{SMB}	0.2459***	1[1]	12[9]	0.2859***	4[1]	22[17]	-0.0400
β_{SMB2}	-1.0774*	11[1]	2[0]	-1.2716	19[5]	7[0]	0.1942
β_{HML}	0.0413*	5[3]	8[3]	-0.1100**	16[12]	10[7]	0.1513***
β_{HML2}	0.7031*	3[0]	10[3]	0.4129	8[0]	18[1]	0.2903
β_{MOM}	-0.0509***	7[6]	6[2]	0.0466*	12[1]	14[5]	-0.0975***
β_{MOM2}	0.3098***	2[0]	11[7]	0.1159	7[3]	19[5]	0.1938**
R^2 **adj.**	97.39%			95.88%			47.05%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability ($\boldsymbol{\alpha_p}$), systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2, HML2 and MOM2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented.

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Overall the results suggest that there are no statistically significant differences in terms of stock-picking abilities between green and conventional managers. In terms of differences to time the investments styles, conventional fund managers are less skilled in timing the momentum style than green fund managers.

5.3.2 The unconditional five-factor version of the Treynor and Mazuy (1966) model

Table 9 presents the results for the Treynor and Mazuy (1966) extended to a five-factor setting. Appendixes 11 and 12 detail the results for individual funds, for the full period time, 2004-2019.

The results suggest that conventional fund managers have a successful stock-picking ability, while green fund managers do not present this ability. Additionally, the differences portfolio shows that conventional fund managers have better selectivity abilities than green fund managers. At the individual level, the majority of the green and conventional funds exhibit neutral selectivity abilities. It is worth noting that although at the portfolio level conventional fund managers present this security selection skills, at the individual fund level only 3 funds present a positive and statistically significant alpha. The portfolio results seem to be driven by these three funds. The type of evidence reinforces the relevance of analyzing performance at the individual fund level to complement the analysis at the aggregate level.

With respect to investment styles the only successful style-timing ability for green fund managers is the ability to time the book-to-market style. Besides that, there is a statistically significant difference between the two portfolios, as green fund managers are better in timing the book-to-market style than conventional fund managers.

At the individual level, most of the conventional and green funds managers do not present selectivity and timing abilities. And although conventional fund managers present better selectivity abilities, green fund managers are better in timing, namely timing the book-to-market style.

Table 9 – The unconditional five-factor version of the Treynor and Mazuy (1966) model

Panel A: S&P500							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0008	8[0]	5[1]	0.0014**	8[0]	18[3]	-0.0023*
β_{p*rm}	1.0391***	0[0]	13[13]	0.9654***	0[0]	26[26]	0.0737***
β_{p*rm2}	0.2894	4[2]	9[0]	-0.1809	15[3]	11[0]	0.4703
β_{SMB}	0.2937***	0[0]	13[10]	0.3108***	3[0]	23[21]	-0.0171
β_{SMB2}	0.2677	6[0]	7[0]	-0.7008	15[3]	11[0]	0.9685
β_{HML}	0.0861**	5[1]	8[4]	-0.1206***	15[11]	11[7]	0.2067***
β_{HML2}	1.6497***	2[0]	11[6]	0.3773	13[0]	13[3]	1.2724**
β_{RMW}	0.0335	5[0]	8[2]	-0.0873***	18[7]	8[5]	0.1208**
β_{RMW2}	-1.4061	9[0]	4[0]	-3.7887***	20[6]	6[0]	2.3826
β_{CMA}	-0.0344	9[1]	4[0]	-0.1130***	19[9]	7[2]	0.0786
β_{CMA2}	-4.1600	9[4]	4[0]	0.9402	9[1]	17[1]	-5.1001
R^2 **adj.**	96.72%			98.30%			32.94%
Panel B: MSCI KLD 400							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0005	10[1]	3[1]	0.0020**	7[0]	19[3]	-0.0026**
β_{p*rm}	1.0389***	0[0]	13[13]	0.9494***	0[0]	26[26]	0.0895***
β_{p*rm2}	-0.0285	7[1]	6[0]	-0.6049*	21[4]	5[0]	0.5764
β_{SMB}	0.2503***	1[1]	12[7]	0.2770***	3[1]	23[16]	-0.0268
β_{SMB2}	-0.0894	7[0]	6[0]	-0.9336	18[3]	8[0]	0.8442
β_{HML}	0.1134***	5[2]	8[4]	-0.0919*	15[10]	11[7]	0.2053***
β_{HML2}	1.3692**	3[0]	10[3]	0.0890	15[1]	11[3]	1.2801**
β_{RMW}	0.0449	4[0]	9[1]	-0.0848*	18[9]	8[5]	0.1297***
β_{RMW2}	-0.7985	7[1]	6[0]	-3.3919*	20[3]	6[0]	2.5933
β_{CMA}	-0.0804*	10[2]	3[0]	-0.1589**	21[10]	5[2]	0.0785
β_{CMA2}	-1.1092	6[1]	7[1]	3.9388	2[0]	24[4]	-5.0481
R^2 **adj.**	96.72%			96.15%			35.95%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained by from the Treynor and Mazuy (1966) extended to a unconditional multifactor setting regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability ($\boldsymbol{\alpha_p}$), systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj)*. rm2, SMB2 HML2, RMW2 and CMA2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented.

5.3.3 The conditional four-factor version of the Treynor and Mazuy (1966) model

Table 10 presents the results for the Treynor and Mazuy (1966) extended to a conditional four-factor setting. Appendixes 13 and 14 detail the results for individual funds, for the full period time (2004-2019).

Regarding fund managers stock-picking ability, green fund managers do not present this ability, while conventional fund managers present a successful stock-picking ability, in the case of the MSCI KLD 400. Besides, there is a little evidence (only at the 10% level), that conventional fund managers are better in terms of selectivity than green fund managers (panel B).

Regarding the coefficient of the market squared risk factor, it is statistically insignificant for the green portfolio, while for the conventional portfolio is negative and statistically significant in Panel B. This means that conventional fund managers time the market incorrectly. It is worth mentioning that at the individual level, the number of conventional funds with a significant negative market timing coefficient decreases compared to the unconditional model. This is consistent with Ferson and Schadt (1996) who claim that negative timing observed when using unconditional models tends to decrease when using models that allow for time-varying risk.

In relation to investment styles, the only successful style-timing ability is the ability of green fund managers to time the momentum style, in the case of the MSCI KLD 400. The conventional portfolio presents a negative and statistically significant coefficient associated with the size and book-to-market squared risk factors, meaning that conventional fund managers time these styles but in the wrong direction. Additionally, the difference portfolio shows that green fund managers are better than conventional fund managers in timing the book-to-market style, as in the results presented in tables 8 and 9.

Table 10 – The conditional four-factor version of the Treynor and Mazuy (1966) model

Panel A: S&P500							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0004	8[1]	5[1]	0.0008	8[1]	18[2]	-0.0012
β_{p*rm}	1.0030***	0[0]	13[13]	0.9820***	0[0]	26[26]	0.0210
β_{p*rm2}	-0.0384	7[3]	6[0]	-0.1411	15[4]	11[1]	0.1027
β_{SMB}	0.3022***	0[0]	13[10]	0.3419***	3[0]	23[22]	-0.0397
β_{SMB2}	-0.5294	8[1]	5[0]	-1.1050**	19[3]	7[0]	0.5756
β_{HML}	-0.0043	7[3]	6[3]	-0.1053***	14[12]	12[8]	0.1009***
β_{HML2}	0.4594	4[0]	9[1]	-0.6779**	18[5]	8[2]	1.1373*
β_{MOM}	-0.0698***	9[5]	4[1]	0.0384**	11[2]	15[5]	-0.1082***
β_{MOM2}	0.1007	7[1]	6[2]	0.0204	14[3]	12[4]	0.0803
R^2 **adj.**	97.83%			98.32%			56.08%
Panel B: MSCI KLD 400							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	0.0007	4[1]	9[1]	0.0020**	4[0]	22[5]	-0.0013*
β_{p*rm}	1.0017***	0[0]	13[13]	0.9716***	0[0]	26[26]	0.0301
β_{p*rm2}	-0.4207	10[3]	3[0]	-0.6236***	22[7]	4[0]	0.2029
β_{SMB}	0.2560***	1[1]	12[9]	0.2958***	4[1]	22[20]	-0.0398
β_{SMB2}	-0.8058	9[1]	4[0]	-1.2475*	19[5]	7[0]	0.4417
β_{HML}	0.0614**	4[2]	9[4]	-0.0412	13[12]	13[10]	0.1026***
β_{HML2}	-0.0864	7[0]	6[1]	-1.3639**	21[7]	5[2]	1.2775**
β_{MOM}	-0.0462***	8[5]	5[2]	0.0592**	11[1]	15[5]	-0.1054***
β_{MOM2}	0.2107**	3[1]	10[5]	0.1260	9[0]	17[4]	0.0847
R^2 **adj.**	97.53%			96.87%			56.41%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability ($\boldsymbol{\alpha_p}$), systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj).* rm2, SMB2 HML2 and MOM2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented.

5.3.4 The conditional five-factor version of the Treynor and Mazuy (1966) model

Finally, table 11 presents the results for the Treynor and Mazuy (1966) extended to a conditional five-factor setting. Appendixes 15 and 16 detail the results for individual funds, for the full period time (2004-2019).

Once again, in terms of selectivity green fund managers do not exhibit this ability, while conventional fund managers present a successful stock-picking ability. Additionally, conventional fund managers are better in terms of selectivity than green fund managers. However at the individual level, only few conventional funds present a positive and statistically significant alpha coefficient.

The difference portfolio shows that green fund managers are better than conventional fund managers in timing the market, since the coefficient associated with the market squared risk factor is positive and statistically significant.

In terms of investment styles, conventional fund managers do not show ability to time the book-to-market and the profitability factors correctly, since the squared coefficients associated with these risk factors are negative and statistically significant. In panel B, conventional fund managers are able to time the investment style. Focusing on differences between portfolios, green fund managers are better in timing the book-to-market and the profitability styles. Though they are worse in timing the investment style.

Table 11 – The conditional five-factor version of the Treynor and Mazuy (1966) model

Panel A: S&P500							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0011	9[0]	4[1]	0.0013*	8[0]	18[1]	-0.0024**
β_{p*rm}	1.0239***	0[0]	13[13]	0.9652***	0[0]	26[26]	0.0587***
β_{p*rm2}	0.4785*	4[2]	9[2]	-0.1176	14[2]	12[0]	0.5961**
β_{SMB}	0.3125***	0[0]	13[11]	0.3212***	3[0]	23[20]	-0.0086
β_{SMB2}	0.0700	5[1]	8[0]	-0.6080	16[2]	10[0]	0.6780
β_{HML}	0.0422	5[3]	8[3]	-0.0757***	15[10]	11[9]	0.1179***
β_{HML2}	1.8657**	1[1]	12[5]	-0.5991*	18[3]	8[1]	2.4649***
β_{RMW}	0.0096	5[0]	8[1]	-0.0784**	16[10]	10[2]	0.0880**
β_{RMW2}	-0.1030	7[0]	6[0]	-4.3414***	20[7]	6[0]	4.2384***
β_{CMA}	-0.0268	8[1]	5[1]	-0.1259***	18[9]	8[2]	0.0991
β_{CMA2}	-4.4089*	10[5]	3[0]	2.1394	8[1]	18[1]	-6.5483**
R^2 adj.	97.32%			98.65%			52.67%
Panel B: MSCI KLD 400							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0007	10[1]	3[1]	0.0019**	4[0]	21[2]	-0.0026***
β_{p*rm}	1.0170***	0[0]	13[13]	0.9489***	0[0]	26[26]	0.0680***
β_{p*rm2}	0.1993	4[2]	9[0]	-0.5034**	19[5]	7[0]	0.7028**
β_{SMB}	0.2843***	1[1]	12[8]	0.2972***	3[0]	23[18]	-0.0129
β_{SMB2}	-0.0306	5[1]	8[0]	-0.6005	14[2]	12[0]	0.5699
β_{HML}	0.1033***	3[2]	10[5]	-0.0190	15[10]	11[7]	0.1224***
β_{HML2}	0.7693	3[0]	10[3]	-1.6549***	21[9]	5[0]	2.4242***
β_{RMW}	0.0419	4[0]	9[1]	-0.0494	14[7]	12[4]	0.0913**
β_{RMW2}	-0.0970	7[1]	6[0]	-4.4077**	19[5]	7[0]	4.3107***
β_{CMA}	-0.0655	10[1]	3[1]	-0.1581***	18[9]	8[1]	0.0926
β_{CMA2}	-0.3326	7[0]	6[0]	6.0698***	2[0]	24[7]	-6.4024**
R^2 adj.	97.14%			97.20%			54.29%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability ($\boldsymbol{\alpha_p}$), systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj).* rm2, SMB2 HML2, RMW2 and CMA2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented.

5.4. Fund performance in different market states

This study also analyzes the fund performance in different market states. This is performed by adding a dummy variable to distinguish periods of recessions and expansions periods. The dummy variable, which assumes a value of 1 in recession periods and 0 expansion periods, is added to the Carhart (1997) four-factor model and the Fama and French (2015) five-factor model. This analysis includes only 10 US green funds and the respective conventional funds, since the other funds were in existence mostly through only one market state.

Table 12 reports the results for the Carhart (1997) four-factor model with the dummy variable. Appendixes 17 and 18 detail the results for individual funds, for the full period time (2004-2019).

The alphas of the green and conventional portfolios and the coefficients of the dummy variables, that represent performance differentials in recession periods, are both statistically insignificant. This means that both green and conventional funds present a neutral performance in expansion periods, and there is no significant change of performance in recession periods. At the individual level, the majority of green and conventional funds also present a neutral performance in expansions, with no significant changes in recessions.

An interesting result is how funds change systematic risk in periods of recession. While conventional funds significantly increase market risk in recessions, green funds tend to reduce their exposure to market risk in troubled times, since the coefficient for the dummy of the market risk is negative and even statistically significant in the case of the S&P500. This evidence is supported by the results at the individual fund level: in recessions periods several green funds significantly increase their exposure to the market, while several conventional funds significantly increase their level of systematic risk.

Furthermore, in expansion periods conventional funds are more exposed to small stocks than green funds. Yet, in recession periods green funds not only significantly increase their exposure to small stocks, but they do so in a statistically different way than conventional funds.

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Table 12- Fund performance in different market states - Carhart (1997) four-factor model with a dummy variable

Panel A: S&P500							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0006	8[2]	2[0]	-0.0000	12[1]	8[2]	-0.0006
α_D	-0.0016	6[1]	4[1]	-0.0013	12[0]	6[2]	-0.0004
β_p	1.0243***	0[0]	10[10]	0.9887***	0[0]	20[20]	0.0356**
β_D	-0.1416***	9[6]	1[0]	0.0720***	6[1]	14[6]	-0.2136***
β_{SMB}	0.2514***	1[0]	9[8]	0.3320***	2[0]	18[17]	-0.0806**
β_{SMB*D}	0.4171***	0[0]	10[6]	0.0413	6[1]	14[0]	0.3758**
β_{HML}	0.0187	6[2]	4[3]	-0.1096***	11[11]	9[7]	0.1282***
β_{HML*D}	-0.0458	5[1]	5[1]	-0.1866***	19[10]	1[0]	0.1408***
β_{MOM}	-0.0857***	8[4]	2[0]	0.0432**	9[1]	11[4]	-0.1289***
β_{MOM*D}	-0.0456**	7[2]	3[1]	-0.0268	10[4]	10[0]	-0.0189
R^2 **adj.**	97.83%			98.13%			58.96%
Panel B: MSCI KLD 400							
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0001	6[2]	4[1]	0.0006	7[1]	13[2]	-0.0007
α_D	-0.0024	6[1]	4[1]	-0.0024	17[0]	3[1]	0.0000
β_p	1.0179***	0[0]	10[10]	0.9727***	0[0]	20[20]	0.0453***
β_D	-0.0815	8[3]	2[1]	0.1445***	0[0]	20[11]	-0.2260***
β_{SMB}	0.2129***	2[1]	8[7]	0.2999***	3[1]	17[16]	-0.0870**
β_{SMB*D}	0.3212**	2[0]	8[5]	-0.0815	13[2]	7[0]	0.4027**
β_{HML}	0.0838***	2[1]	8[4]	-0.0476	11[11]	9[8]	0.1314***
β_{HML*D}	-0.1407**	8[3]	2[0]	-0.2835***	20[14]	0[0]	0.1428***
β_{MOM}	-0.0614***	6[4]	4[4]	0.0646**	8[1]	12[5]	-0.1260***
β_{MOM*D}	-0.0539**	8[3]	2[1]	-0.0314	9[3]	11[0]	-0.0224
R^2 **adj.**	97.36%			96.30%			58.87%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained from the conditional four-factor model regressions with a dummy for both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance ($\boldsymbol{\alpha_p}$), the systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj.*). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented.

Regarding the HML factor, green funds are more exposed to value stocks than conventional funds in expansion periods. In troubled times, green funds reduce their exposure to value stocks only when the benchmark is the MSCI KLD 400. In the case of the S&P500, conventional funds

tend to become even more exposed to growth stocks in recession periods, in a statistically different way than green funds. These results are supported at the individual level, since several conventional funds significantly increase their exposure to growth stocks in troubled times.

Regarding the MOM factor, in expansion periods green funds are more exposed to companies with recent poor performance than conventional funds. In recession periods, green funds become even more exposed to companies with recent poor performance.

Table 13 reports the estimates of performance for the conditional Fama and French (2015) five-factor model with a dummy variable. Appendixes 19 and 20 detail the results for individual funds, for the full period time (2004-2019).

Once again, comparing the R^2s adj. of this model with the previous one, the R^2s adj. are slightly higher for conventional funds and slightly lower for green funds.

In the case of the S&P500, in expansion periods the alpha coefficient of the green portfolio is negative and statistically significant at 10% level, so there is evidence that green funds tend to underperform the market, while conventional funds perform similarly to the market. Additionally, green funds perform worse than conventional funds in expansions periods, regardless of the benchmark used. Yet, the performance of conventional funds decreases significantly in troubled times, and in a statistically different way than green funds. These results are supported at the individual fund level. The majority of green and conventional funds present a neutral performance in expansion periods, but in recession periods green funds do not experience any significant decrease in performance, while several conventional funds do experience a worse performance in troubled times.

With respect to systematic risk, in expansion periods green funds are more exposed to this risk than conventional funds. In troubled times, differently from the results in table 12, both green and conventional funds do not decrease or increase their exposure to market risk, since the coefficient for the dummy associated with market risk is statistically insignificant.

As in the results in table 12, in expansion periods conventional funds are more exposed to small stocks than green funds. In troubled periods both green and conventional funds become even more exposed to small stocks, in the case of the S&P500.

Table 13 - Fund performance in different market states- Fama and French (2015) five-factor model with a dummy variable

Benchmark	**Panel A: S&P500**						
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0009*	8[3]	2[0]	0.0006	9[1]	11[2]	-0.0015**
α_D	0.0027	2[0]	8[3]	-0.0057***	13[9]	6[2]	0.0084***
β_p	1.0375***	0[0]	10[10]	0.9693***	0[0]	20[20]	0.0682***
β_D	-0.0371	9[2]	1[0]	0.0040	11[3]	9[7]	-0.0410
β_{SMB}	0.2400***	0[0]	10[8]	0.3031***	2[0]	18[15]	-0.0631*
β_{SMB*D}	0.4746**	0[0]	10[6]	0.1119***	7[0]	13[5]	0.3627
β_{HML}	0.0457	4[3]	6[3]	-0.0833***	13[10]	7[7]	0.1290***
β_{HML*D}	-0.0162	5[0]	5[1]	-0.1379***	17[8]	3[0]	0.1217
β_{RMW}	-0.0072	5[1]	5[2]	-0.1427***	15[10]	5[2]	0.1355***
β_{RMW*D}	0.0408	4[2]	6[0]	0.2634***	6[2]	14[7]	-0.2225
β_{CMA}	0.0556	3[0]	7[2]	-0.1388***	15[8]	5[1]	0.1944***
β_{CMA*D}	0.0176	5[0]	5[2]	-0.4037***	16[10]	4[2]	0.4213**
R^2 adj.	97.05%			98.50%			49.01%
Benchmark	**Panel B: MSCI KLD 400**						
Portfolios	**Green (1)**	**N-**	**N+**	**Conventional (2)**	**N-**	**N+**	**Difference (1)-(2)**
α_p	-0.0004	7[2]	3[0]	0.0011	4[0]	16[2]	-0.0016***
α_D	-0.0014	6[0]	3[2]	-0.0099***	18[10]	2[0]	0.0086***
β_p	1.0292***	0[0]	10[10]	0.9503***	0[0]	20[20]	0.0789***
β_D	0.0102	5[0]	5[1]	0.0432	8[0]	12[5]	-0.0330
β_{SMB}	0.2076***	1[1]	9[6]	0.2772***	2[0]	18[14]	-0.0697**
β_{SMB*D}	0.3742*	0[0]	10[4]	0.0215	9[1]	11[2]	0.3527
β_{HML}	0.1215***	3[2]	7[4]	-0.0118	12[9]	8[7]	0.1333***
β_{HML*D}	-0.0960	7[1]	3[0]	-0.2048***	18[10]	2[0]	0.1088
β_{RMW}	0.0132	3[0]	7[1]	-0.1285***	15[10]	5[2]	0.1418***
β_{RMW*D}	0.2271	2[0]	8[1]	0.4287***	3[0]	17[12]	-0.2016
β_{CMA}	-0.0085	7[0]	3[1]	-0.1998***	16[12]	4[0]	0.1913***
β_{CMA*D}	-0.2289*	7[3]	3[1]	-0.6692***	18[15]	2[1]	0.4403***
R^2 adj.	96.87%			96.92%			50.18%

This table presents regression estimates for the equally weighted portfolios of US green and conventional funds, as well as the difference between these two portfolios, obtained from the conditional five-factor model regressions with a dummy for both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019.The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj.*). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*). N+ and N- indicate the number of the funds that have positive and negative estimates, respectively. Within brackets the number of funds whose estimates are statistically significant at a 5% significance level are presented.

Moreover, in expansion periods green funds are more exposed to value stocks than conventional funds. Yet, in recession periods conventional funds increase their exposure to growth stocks.

Regarding the two additional factors, profitability (RMW) and investment (CMA) factors, they present a neutral influence in explaining the performance of green funds in expansion periods. In this state of the market, conventional funds are more exposed to companies with weak profitability and with high investments than green funds. In recession periods, conventional funds reduce their exposure to companies with weak profitability and become even more exposed to companies with high investments.

5.5 An overview of the empirical results of all models

Table 14 summarizes the results of the all the models, with exception of the ones of timing and selectivity abilities and the ones with the dummy variable.

Regarding the performance of the portfolios, regardless of the model used, the alphas present a neutral performance compared to the market, in line with previous studies (e.g. Muñoz et al., 2014; Climent and Soriano, 2011). Even when applying conditional models the performance estimates for green funds remain neutral, unlike Silva and Cortez (2016), who find that green funds underperform the market. Furthermore, there are no statistically significant differences between the performance of green funds compared to their conventional peers.

Table 14 – An overview of the empirical results

		Panel A: S&P500			**Panel B: MSCI KLD 400**		
		α_p	β_p	R^2 adj.	α_p	β_p	R^2 adj.
Unconditional Carhart (1997) four-factor model	**Green**	0.0002	0.9910***	97.44%	0.0003	1.0026***	97.23%
	Conventional	-0.0003	1.0030***	97.99%	0.0000	1.0000***	95.68%
	Difference (1)-(2)	0.0005	-0.0120	45.77%	0.0004	0.0026	45.64%
Conditional Carhart (1997) four-factor model	**Green**	-0.0003	1.0000***	97.86%	-0.0001	1.0011***	97.48%
	Conventional	-0.0003	0.9881***	98.28%	-0.0001	0.9808***	96.65%
	Difference (1)-(2)	0.0000	0.0119	55.69%	0.0000	0.0203	55.67%
Unconditional Fama and French (2015) five-factor model	**Green**	-0.0002	1.0246***	96.53%	0.0000	1.0293***	96.71%
	Conventional	0.0003	0.9724***	98.20%	0.0006	0.9579***	95.93%
	Difference (1)-(2)	-0.0005	0.0522***	29.02%	-0.0007	0.0714***	31.15%
Conditional Fama and French (2015) five-factor model	**Green**	-0.0001	1.0123***	97.17%	-0.0000	1.0125***	97.18%
	Conventional	-0.0001	0.9753***	98.52%	0.0001	0.9619***	96.86%
	Difference (1)-(2)	-0.0000	0.0369**	45.60%	-0.0001	0.0506***	46.62%

This table presents a summary for the results of this study, for the equally weighted portfolios of green and conventional funds, as well as the difference between these two portfolios, with both the S&P500 (Panel A) and MSCI KLD 400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports estimates of performance (α_p), the systematic risk (β_p) and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Table 15 – An overview of the empirical results – Selectivity and timing abilities

		Panel A: S&P500				Panel B: MSCI KLD 400			
		α_p	β_{p*rm}	β_{p*rm2}	R^2 adj.	α_p	β_{p*rm}	β_{p*rm2}	R^2 adj.
The unconditional four-factor version of the Treynor and Mazuy (1966) model	**Green**	-0.0002	1.0010***	-0.1266	97.55%	0.0006	1.0075***	-0.5323	97.39%
	Conventional	0.0004	1.0000***	-0.3399**	98.03%	0.0015*	0.9911***	-0.8174**	95.88%
	Difference (1)-(2)	-0.0006	0.0011	0.2133	46.76%	-0.0009	0.0164	0.2851*	47.05%
The conditional four-factor version of the Treynor and Mazuy (1966) model	**Green**	-0.0004	1.0030***	-0.0384	97.83%	0.0007	1.0017***	-0.4207	97.53%
	Conventional	0.0008	0.9820***	-0.1411	98.32%	0.0020**	0.9716***	-0.6236***	96.87%
	Difference (1)-(2)	-0.0012	0.0210	0.1027	56.08%	-0.0013*	0.0301	0.2029	56.41%
The unconditional five-factor version of the Treynor and Mazuy (1966) model	**Green**	-0.0008	1.0391***	0.2894	96.72%	-0.0005	1.0389***	-0.0285	96.72%
	Conventional	0.0014**	0.9654***	-0.1809	98.30%	0.0020**	0.9494***	-0.6049*	96.15%
	Difference (1)-(2)	-0.0023*	0.0737***	0.4703	32.94%	-0.0026**	0.0895***	0.5764	35.95%
The conditional five-factor version of the Treynor and Mazuy (1966) model	**Green**	-0.0011	1.0239***	0.4785*	97.32%	-0.0007	1.0170***	0.1993	97.14%
	Conventional	0.0013*	0.9652***	-0.1176	98.65%	0.0019**	0.9489***	-0.5034**	97.20%
	Difference (1)-(2)	-0.0024**	0.0587***	0.5961**	52.67%	-0.0026***	0.0680***	0.7028**	54.29%

This table presents a summary for the selectivity and timing models with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p) and the adjusted coefficient of determination (R^2 *adj*). rm2 refers to squared risk factor that represents the timing ability. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Regarding to the sensitivity to the market, US green funds are more exposed to the socially responsible benchmark (MSCI KLD400) than to the conventional benchmark. US conventional funds are more exposed to the conventional benchmark, in line with Climent and Soriano (2011). Using the four-factor model there is no statistically significant difference between green and conventional funds in terms of exposure to the market. However, in the five-factor model green funds are more exposed to market risk than conventional funds.

Concerning the explanatory power of the models, in Panel A the values of the R^2 adj. are higher for conventional funds, while in Panel B the values are higher for green funds. Comparing the unconditional models with the conditional models, as in Cortez et al. (2009), the conditional approach slightly improves the R^2 adj., meaning that these models explain better the performance of the funds. In this study, the conditional Carhart (1997) four-factor model presents the highest explanatory power for green funds, with a R^2 adj. of 97.86% and the conditional Fama and French (2015) five-factor model for conventional funds, with a R^2 adj. of 98.52%.

Table 15 summarizes the timing and selectivity abilities of US fund managers and compare them with those of conventional fund managers.

Overall, in the four-factor version of the Treynor and Mazuy (1966) model, we observe a slight evidence of selectivity abilities of conventional fund managers in panel B, however, we observe that they time the market in the wrong direction. Regarding the five-factor version of the Treynor and Mazuy (1966), there is evidence of better selectivity abilities of conventional fund managers, but in the conditional approach green fund managers present a better timing ability. From the results of table 14, we conclude that, overall, green and conventional funds present a similar performance. The good selectivity ability and poor market-timing ability of conventional fund managers combined with the successful market-timing and other style timing skills of green fund managers, could be the explanation for the similar combined performance between the two types of funds.

Comparing the R^2 adj., once again using public information variables increases the R^2 adj. Furthermore, the conditional four-factor version of the Treynor and Mazuy (1966) model presents the highest explanatory power for green funds, with a R^2 adj. of 97.83%, while the conditional five-factor version of the Treynor and Mazuy (1966) model is better able to explain the returns of conventional funds, with a R^2 adj. of 98.65%.

Table 16 present a summary of the general results of the models with the dummy variable to distinguish between recession and expansion periods.

Regarding the performance of green and conventional funds in different market states, the results of the five-factor model show that in expansion periods conventional funds perform better than green funds. Yet, in troubled times conventional funds reduce their performance, while the performance of green funds remains unchanged. In the conditional Carhart (1997) four-factor

model, there are no statistically significant differences between green and conventional funds and both portfolios present a neutral performance.

Table 16 – An overview of the empirical results of the models with the dummy variable

		Panel A: S&P500					Panel B: MSCI KLD 400				
		α_p	α_D	β_p	β_D	R^2 adj.	α_p	α_D	β_p	β_D	R^2 adj.
Conditional Carhart (1997) four-factor model with dummy	**Green**	-0.0006	-0.0016	1.0243***	-0.1416***	97.83%	-0.0001	-0.0024	1.0179***	-0.0815	97.36%
	Conventional	-0.0000	-0.0013	0.9887***	0.0720***	98.13%	0.0006	-0.0024	0.9727***	0.1445***	96.30%
	Difference (1)-(2)	-0.0006	-0.0004	0.0356**	-0.2136***	58.96%	-0.0007	0.0000	0.0453***	-0.2260***	58.87%
Conditional Fama and French (2015) five-factor model with dummy	**Green**	-0.0009*	0.0027	1.0375***	-0.0371	97.05%	-0.0004	-0.0014	1.0292***	0.0102	96.87%
	Conventional	0.0006	-0.0057***	0.9693***	0.0040	98.50%	0.0011	-0.0099***	0.9503***	0.0432	96.92%
	Difference (1)-(2)	-0.0015**	0.0084***	0.0682***	-0.0410	49.01%	-0.0016***	0.0086***	0.0789***	-0.0330	50.18%

This table presents a summary of models with the dummy variable applied in this study for the equally weighted portfolios of US green and conventional funds, as well as the difference these two portfolios, with both S&P500 (Panel A) and MSCI KLD 400 (Panel B) as benchmarks, from February 2004 - September 2019. The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p) and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

In term of market exposure, in all models, green funds are more exposed to market risk than conventional funds in expansion periods. In the conditional four-factor model, conventional funds significantly increase their exposure to the market risk in troubled times, while green funds tend to reduce their exposure to this source of risk when the benchmark is the S&P500.

With respect to the explanatory power of the models, once again, the four-factor model presents the highest explanatory power for green funds, with a R^2 adj. of 97.83%, and five-factor model for conventional funds, with a R^2 adj. of 98.50%.

6. Conclusion

A growing number of investors introduce environmental screens into their investment decision process. In theory, environmental funds are subject to higher risks, since they limit the pool of investments, so it is important to study the issue of whether the inclusion of environmental screens punishes or improves the performance. This dissertation evaluates the performance of US green conventional funds, using unconditional and conditional models. Furthermore, analyzes fund managers' abilities. Additionally, this study distinguishes the performance of these funds in expansion and recession periods. Varma and Nofsinger (2014) state that SRI attributes of companies make them less risky in recession periods, so it is important control for crisis periods.

This study analyzed the performance of 13 US green funds and 26 matched US conventional funds relative to the market, using a conventional benchmark and socially responsible benchmark. Overall, both green and conventional funds present a neutral performance compared to the market. The results also indicate that green funds do not perform differently from conventional funds. So, focusing in the overall period the answer to the question "Did it pay to be a green investor?" is that for US domestic green funds, from 2004 to 2019 it does not pay, but it also doesn't hurt. In terms of fund characteristics, green funds are more exposed to the socially responsible benchmark and conventional funds to the conventional benchmark. Regarding the size (SMB) factor, both funds seem to be more exposed to small stocks and there is no statistically significant difference in terms of this factor. In relation to the book-to-market (HML) factor, the results are not consistent among the models but, overall, green funds seem to be more exposed to value stocks and conventional funds to growth stocks. In terms of the difference portfolio, green funds are more exposed to value stocks than their conventional peers. Furthermore, the results also show that green funds are more exposed to companies with poor past performance, while conventional funds are more exposed to companies with a good past performance. Finally, the profitability and the investment factors from the five-factor model, in general, are only statistically significant for conventional funds, indicating that these funds are more exposed to companies with weak profitability and to high investments firms. In spite of the neutral performance of green funds in terms of these two additional risk factors, the results for the difference portfolio show that green funds are more exposed to companies with robust profitability and low investments compared to conventional funds.

One possible explanation for the similar performance between green and conventional funds may be the possibility that SRI funds may not be much different from conventional funds, as

questioned by Leite et al. (2018). These authors argue that there are no strong boundaries between SRI and conventional funds. Investors who are willing to incorporate social concerns in their investment's decisions cannot know more than the simple information contained in the prospectuses of the funds. It would be useful for investors to know more about the holdings of the funds that they invest in, more than the simple classification of the fund as being environmentally friendly. In fact, there is some evidence that SRI funds may not be much different from conventional funds (e.g., Utz and Wimmer, 2014), so in the same line or reasoning one might question whether green funds are 'truly green'. The fact that there is no clear criteria to define what is a green fund further motivates this debate.

As expected, the application of the conditional approach leads to an increase of the explanatory power of the models, as in Cortez et al. (2009). However, the performance remains neutral for both green and conventional funds. By applying conditional models, the results show evidence of time-varying betas, for both green and conventional funds, meaning that risk varies over time according to the public information variables. For the alphas, we cannot reject the null hypothesis of the time-varying alphas being equal to zero. Cortez et al. (2012) argue that this is not a surprise since green funds may lead to a more stable performance over time, since funds with social concerns could be more protected from a stock price drops, and consequently presenting more stability.

This paper also analyzes timing and selectivity abilities of fund managers. Overall comparing the two types of funds, the results show a better selectivity ability for conventional fund managers, whereas green funds managers present better timing abilities. The combination of these abilities for each type of fund cancel out and result in a similar overall performance between the two type funds.

When controlling the analysis for expansion and recession periods, there are some differences in terms of financial performance using the conditional Fama and French (2015) five-factor model. Using this model, green funds underperform conventional funds in expansion periods. In recession periods conventional funds reduce their performance, while the performance of green funds remains unchanged. This means that in recession periods it is better to invest in green funds than in conventional funds since they maintain their performance, while in expansions periods is better to invest in conventional funds. However, using the conditional four-factor model,

there are not statistically significant differences between green and conventional funds, and both funds present a neutral performance in both periods.

The results of this study are in line with the majority of the studies on the performance of green funds in the sense that green investors may expect no superior or inferior risk-adjusted returns by investing in green funds. The general evidence on the performance of conventional funds documents neutral or negative performance compared to the market, which is also in accordance with this study, since conventional funds also present a neutral performance compared to the market.

In sum, investing in US green funds does not seems to punish the financial performance of investors compared to conventional funds. This conclusion has important implications for US investors, they can do well by choosing green funds, without sacrificing financial performance. Besides that, as mentioned by Silva and Cortez (2016) conventional investors can include environmental funds to diversify their portfolios. The results show some evidence that in expansion periods green funds underperform conventional funds, but in recession periods conventional funds reduce their performance while the performance of green funds do not increase or reduce, so invest in green funds is a good way to diversify and protect conventional investors in recessions periods.

Regarding the limitations of this study, it is important to mention that since there is no clear definition of what a green fund is, this study makes the selection of green funds based on the "environmental" category defined by US SIF. As mentioned by Chang et al. (2012), the list of the US SIF may not be complete, we might have missed other green funds that are not listed in this source. Likewise, we did not consider funds that ceased to exist, so the results may be influenced by survivorship bias. Since selecting the green funds is one of the most important steps for this study, this is the main limitation of the study. Another limitation is associated to the socially responsible benchmark used (KLD400) that is oriented to socially responsible stocks in general and not green stocks specifically. The fact is that environmental equity indexes are more recent and using one of them would imply shortening the evaluation period in a considerable way.

Since this study only has 13 US green funds, for further investigation, it would be interesting to extend the number of green funds and extend the analysis to a global scale, comparing the performance of green funds in different countries. In addition, since the Carhart (1997) four-factor model presents higher explanatory power for green funds and the Fama and

French (2015) for conventional funds, a suggestion for further investigation would be the use of a six-factor model, as in Fama and French (2018).

REFERENCES

Adamo, R., Federico, D., & Notte, A. (2014). Performance and risk of green funds. *Investment Management and Financial Innovations*, (11, Iss. 1 (contin.)), 134-145.

Adcock, C. J., Cortez, M. C., Armada, M. J. & F. Silva, F. (2012). Time varying betas and the unconditional distribution of asset returns. *Quantitative Finance*, 12(6), 951–967.

Ambec, S., & Lanoie, P. (2008). Does it pay to be green? A systematic overview. *The Academy of Management Perspectives*, 45-62.

Ang, W. R., Gregoriou, G. N., & Lean, H. H. (2014). Market-timing skills of socially responsible investment fund managers: The case of North America versus Europe. *Journal of Asset Management*, 15, 366–377.

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(4), 397-429.

Aupperle, K. E., Carroll, A. B., & Hatfield, J. D. (1985). An empirical examination of the relationship between corporate social responsibility and profitability. *Academy of Management Journal*, 28(2), 446-463.

Baum, C. F. (2006). *An Introduction to Modern Econometrics Using Stata*. Texas: Stata Press.

Bernhardt, I., & Jung, B. S. (1979). The interpretation of least squares regression with interaction or polynomial terms. *The Review of Economics and Statistics*, 481-483.

Boulatoff, C., & Boyer, C. M. (2009). Green recovery: how are environmental stocks doing?. *The Journal of Wealth Management*, 12(2), 9-20.

Busch, T., & Lewandowski, S. (2018). Corporate Carbon and Financial Performance: A Meta-analysis. *Journal of Industrial Ecology*, 22(4), 745-759.

Carhart, M.M., (1997). On Persistence in Mutual Fund Performance. *Journal of Finance*, 52(1), pp.57–82.

Chang, C. E., Nelson, W. A., & Doug Witte, H. (2012). Do green mutual funds perform well?. *Management Research Review*, 35(8), 693-708.

Christopherson, J.A., Ferson, W.E. & Glassman, D.A., (1998). Alphas on Economic Information: Another Look at the Persistence of Performance. *Review of Financial Studies*, 11(1), pp.111–142.

Chung, H., Lee, H. H., & Tsai, P. C. (2012). Are green fund investors really socially responsible*?. Review of Pacific Basin Financial Markets and Policies*, 15(04), 1250023.

Climent, F. & Soriano, P., (2011). Green and Good? The Investment Performance of US 40 Environmental Mutual Funds. *Journal of Business Ethics*, 103(2), pp.275–287.

Cordeiro, J. & Sarkis, J. (1997). "Environmental proactivism and firm performance: Evidence from security analyst earnings forecasts". *Business Strategy and the Environment*, 6(1), 104-114.

Cortez, M. C., Silva, F., & Areal, N. (2009). The performance of European socially responsible funds. *Journal of Business Ethics*, *87*(4), 573-588.

Cortez, M. C., Silva, F., & Areal, N. (2012). Socially responsible investing in the global market: The performance of US and European funds. *International Journal of Finance & Economics*, 17(3), 254-271.

Derwall, J., Guenster, N., Bauer, R. & Koedijk, K. (2005). "The Eco-Efficiency premium. *Financial Analysts Journal*, 61(2), 51-63.

Elton, E. J., Gruber, M. J., Das, S., & Hlavka, M., (1993). Efficiency with costly information: A reinterpretation of evidence from managed portfolios. *The Review of Financial Studies*, 6(1), 1-22.

Entreat, J., Guenther, E., & Hoppe, H. (2014). Making sense of conflicting empirical findings: A meta-analytic review of the relationship between corporate environmental and financial performance. *European Management Journal*, 32(5), 735-751.

Eurosif, (2018). European SRI Study

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

Fama, E. F., & French, K. R. (2018). Choosing factors. *Journal of Financial Economics*, 128(2), 234-252.

Fama, E.F. & French, K.R., (2015). A five-factor asset pricing model. *Journal of Financial Economics*, 116(1), pp.1–22.

Feldman, S., Soyka, P., & Ameer, P. (1997). Does improving a firm's environmental management system and environmental performance result in a higher stock price? *Journal of Investing*, 6(4), 87-97.

Ferruz, L., Muñoz, F., & Vargas, M. (2010). Stock picking, market timing and style differences between socially responsible and conventional pension funds: Evidence from the United Kingdom. *Business Ethics: A European Review*, 19, 408–422.

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

Ferson, W. E., & Warther, V. A. (1996). Evaluating fund performance in a dynamic market. *Financial Analysts Journal*, 52(6), 20-28.

Ferson, W. E., Sarkissian, S., & Simin, T. (2008). Asset pricing models with conditional betas and alphas: The effects of data snooping and spurious regression. *Journal of Financial and Quantitative Analysis*, 43(2), 331-353.

Ferson, W., Sarkissian, S., & Simin, T. (2003). Is stock return predictability spurious. *Journal of Investment Management*, *1*(3), 1-10.

Freeman, R. E.,(1984). Strategic management: *A Stakeholder Approach*. Pitman.

Friedman, M., (1970). The Social Responsibility of Business Is to Increase its profits. *New York Times Magazine*, September 13, pp.112-6.

Haan, M., Dam, L., & Scholtens, B. (2012). The drivers of the relationship between corporate environmental performance and stock market returns. *Journal of Sustainable Finance & Investment*, 2(3-4), 338-375.30-37.

Hart, S.L. & Ahuja, G. (1996). Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance. *Business Strategy and the Environment*, 5(1), 30-37.

Ibikunle, G., & Steffen, T. (2017). European green mutual fund performance: A comparative analysis with their conventional and black peers. *Journal of Business Ethics*, *145*(2), 337-355.

Jensen, M.C., (1968). The Performance of Mutual Funds in the Period 1945-1964. *The Journal of Finance*, 23(2), pp.389–416.

Jo, H., Kim, H., & Park, K. (2015). Corporate environmental responsibility and firm performance in the financial services sector. *Journal of business Ethics*, 131(2), 257-284.

Keefe, J.F., (2007). From Socially Responsible Investing to Sustainable Investing. *Green Money Journal*, 6(2).

King, A. A. & Lenox, M. J. (2001). Does it really pay to be green? An empirical study of firm environmental and financial performance. *Journal of Industrial Ecology*, 5(1), 105-116.

Klassen, R. D. & McLaughlin, C. P. (1996). The impact of environmental management on firm performance. *Management Science*, 42(8), 1199-1214.

Konar, S. & Cohen, M. A. (2001). Does the market value environmental performance?. *Review of Economics and Statistics*, 83(2), 2814–2890.

Leite, C., Cortez, M. C., Silva, F., & Adcock, C. (2018). The performance of socially responsible equity mutual funds: Evidence from Sweden. *Business Ethics: A European Review*, *27*(2), 108-126.

Leite, P., & Cortez, M. C. (2014). Selectivity and timing abilities of international socially responsible funds. *Applied Economics Letters*, *21*(3), 185-188.

Lesser, K., Rößle, F., & Walkshäusl, C. (2016). Socially responsible, green, and faith-based investment strategies: Screening activity matters!. *Finance Research Letters*, 16, 171-178.

Lioui, A., & Sharma, Z. (2012). Environmental corporate social responsibility and financial performance: Disentangling direct and indirect effects. *Ecological Economics*, 78, 100-111.

Mallett, J. E., & Michelson, S. (2010). Green investing: is it different from socially responsible investing*?. International Journal of Business*, 15(4).

Manrique, S., & Martí-Ballester, C. P. (2017). Analyzing the effect of corporate environmental performance on corporate financial performance in developed and developing countries*. Sustainability*, 9(11), 1957.

Marti-Ballester, C. P. (2019a). The role of mutual funds in the sustainable energy sector. *Business Strategy and the Environment*, 28(6), 1107-1120.

Martí-Ballester, C. P. (2019b). Do European renewable energy mutual funds foster the transition to a low-carbon economy?. *Renewable Energy*, 143, 1299-1309.

McGuire, J., Sundgren, A. & Schneeweis, T. (1988), Corporate social responsibility and firm financial performance*. Academy of Management Journal*, Vol. 31 No. 4, pp. 854-72.

Moskowitz, M.R., (1972) Choosing Socially Responsible Stocks. *Business & Society Review*, 1, pp.71–75.

Muñoz, F., Vargas, M. & Marco, I., (2014). Environmental Mutual Funds: Financial Performance and Managerial Abilities*. Journal of Business Ethics,* 124(4), pp.551–569.

Nakao, Y., Amano, A., Matsumura, K., Genba, K., & Nakano, M. (2007). Relationship between environmental performance and financial performance: an empirical analysis of Japanese corporations*. Business Strategy and the Environment*, 16(2), 106-118.

Newey, W., & West, K. (1987). A simple, positive-definite, heteroskedascity and autocorrelation consistent covariance matrix*. Econometrica,* 55, 703-708.

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

Pekovic, S., Grolleau, G., & Mzoughi, N. (2018). Environmental investments: too much of a good thing?. *International Journal of Production Economics*, 197, 297-302.

Puopolo, G. W., Teti, E., & Milani, V. (2015). Does the market reward for going green?. *Journal of Management Development*, 34(6), 729-742.

Ramanathan, R. (2018). Understanding complexity: The curvilinear relationship between environmental performance and firm performance*. Journal of Business Ethics,* 149(2), 383-393.

Reboredo, J. C., Quintela, M., & Otero, L. A. (2017). Do investors pay a premium for going green? Evidence from alternative energy mutual funds. *Renewable and Sustainable Energy Reviews*, 73, 512-520.

Silva, F., & Cortez, M. C. (2016). The performance of US and European green funds in different market conditions. *Journal of Cleaner Production*, *135*, 558-566.

Solomon, R., & Hansen, K. (1985). It's good business. *New York: Atheneum*.

Stanwick, P. & Stanwick, S. (1998). The relationship between corporate social performance, and organizational size, financial performance, and environmental performance: An empirical examination. *Journal of Business Ethics,* 17(2), 195-204.

Treynor, J., & Mazuy, K. (1966). Can mutual funds outguess the market? *Harvard Business Review*, 44, 131–136.

Ullmann, A. A. (1985). Data in search of a theory: A critical examination of the relationships among social performance, social disclosure, and economic performance of US firms. *Academy of Management Review*, *10*(3), 540-557.

US SIF, (2018). Report on Socially Responsible Investing Trends in the United States, Available at: The Forum for Sustainable and Responsible Investment.

Wahba, H. (2008). Does the market value corporate environmental responsibility? An empirical examination. *Corporate Social Responsibility and Environmental Management*,15(2), 89-99.

Walley, N., & Whitehead, B. (1994). It's not easy being green. *Reader in Business and the Environment,* 36, 81.

White, M., (1995). The performance of environmental mutual funds in the United States and Germany: Is there economic hope for green investors? In J. Post, D. Collins, & M. Starik, eds. Research in corporate social performance and policy. *Greenwich, CT: JAI Press*, pp. 323–344.

Appendixes

Appendix 1 - Performance estimates using the unconditional the Carhart (1997) four-factor model- Green funds

	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12	x13
Panel A: Standard & Poor`s 500													
α_p	-0.0019*	-0.0027	0.0019	0.0021	0.0007	0.0014	-0.0005	-0.0008*	0.0019**	-0.0009	-0.0010	0.0006	-0.0003
β_p	0.9975***	1.2189***	0.9795***	1.0145***	1.0176***	0.8550***	0.9908***	0.9753***	0.8444***	1.1114***	1.1962***	0.8915***	0.9725***
β_{SMB}	0.2113***	0.3218***	0.1205**	0.2082***	0.3721***	0.2704***	0.1592***	0.0463**	0.0602	0.4326***	0.6306***	0.7842***	0.5388***
β_{HML}	0.1551***	-0.0306	-0.2917***	-0.0615	-0.0624	-0.1137***	-0.0072	-0.0529**	-0.0258	0.0958	0.1724***	-0.0031	0.0945**
β_{MOM}	-0.1640***	-0.1637**	0.1305**	-0.2003***	-0.1413***	-0.1217***	-0.0117*	-0.0210*	0.0042	-0.2033***	-0.2306***	0.0095	0.0142
R^2 **adj.**	0.9309	0.8725	0.8957	0.8961	0.8689	0.8994	0.9886	0.9769	0.9150	0.9219	0.9218	0.9321	0.9251
Panel B: MSCI KLD 400													
α_p	-0.0019*	-0.0026	0.0018	0.0020	0.0008	0.0014	-0.0004	-0.0008***	0.0021***	-0.0007	-0.0008	0.0008	-0.0003
β_p	1.0073***	1.1915***	0.9663***	1.0355***	1.0345***	0.8600***	0.9995***	1.0018***	0.8531***	1.1209***	1.2054***	0.8903***	0.9549***
β_{SMB}	0.1552**	0.2771**	0.0734	0.1482***	0.3131***	0.2261***	0.1059***	-0.0155***	0.0140	0.3729***	0.5669***	0.7406***	0.4933***
β_{HML}	0.1778***	-0.0057	-0.2740***	-0.0302	-0.0222	-0.0867**	0.0322	-0.0147***	0.0077	0.1400**	0.2200***	0.0214	0.1104**
β_{MOM}	-0.1506***	-0.1666**	0.1197**	-0.1783***	-0.1159***	-0.1064***	0.0110	0.0060	0.0239	-0.1779***	-0.2035***	0.0163	0.0018
R^2 **adj.**	0.9233	0.8592	0.9022	0.9036	0.8724	0.8897	0.9819	0.9984	0.9106	0.9170	0.9166	0.9276	0.9245

This table presents regression estimates for the US green funds obtained from the four-factor model regressions with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p) , factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 2 - Performance estimates using the unconditional the Carhart (1997) four-factor model – Standard & Poor's 500 - Conventional funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0025***	-0.0013	0.0011	-0.0028***	-0.0007	-0.0007	0.0021***	0.0001	0.0011	-0.0032**	-0.0023**	-0.0001	-0.0005
β_p	0.9340***	1.1677***	0.6898***	1.0430***	1.0042***	1.0304***	0.8260***	0.9541***	1.1359***	1.1231***	0.8729***	1.0210***	0.9337***
β_{SMB}	0.1301***	0.3184***	-0.0732	0.0949**	0.0899**	0.2055***	0.3006***	-0.0180	0.3421***	0.5341***	0.1123***	0.2776***	0.2043***
β_{HML}	-0.1851***	-0.4805***	-0.0089	0.0737*	0.0866*	-0.4576***	0.1742***	0.1061***	-0.4569***	-0.3890***	-0.0470	0.0247	-0.1409***
β_{MOM}	-0.0770***	0.0528*	0.0659	0.1005***	-0.0447	0.0373	-0.0636**	-0.0064	0.0623*	0.2601***	-0.0224	-0.0110**	-0.0741***
R^2 **adj.**	0.9518	0.9018	0.8200	0.9696	0.9275	0.8956	0.9352	0.9674	0.8844	0.8816	0.9209	0.9947	0.9605

This table presents regression estimates for the US conventional funds, obtained by the regression of the four-factor model with the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify the existence of statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 2 - Performance estimates using the unconditional the Carhart (1997) four-factor model - Standard & Poor's 500 - Conventional funds - continued

	Standard & Poor`s 500												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	-0.0002	-0.0004	0.0003	0.0002	0.0012*	0.0007	-0.0012	-0.0013	-0.0007	0.0010	-0.0015	-0.0015	0.0015
β_p	0.9551***	1.0884***	1.1183***	0.9526***	0.8500***	1.0026***	1.0670***	1.0214***	1.0650***	0.9995***	1.0364***	0.9381***	0.8431***
β_{SMB}	-0.0403	0.2051***	0.2007***	0.0676**	0.0033	0.9810***	0.5133***	0.4796***	0.8798***	0.4353***	0.5560***	0.8733***	0.2441***
β_{HML}	0.0381	-0.4045***	-0.4123***	0.1172***	0.1612***	0.1855***	-0.0759	-0.3058***	-0.4381***	-0.2793***	-0.4022***	0.3555***	-0.0289
β_{MOM}	-0.0407	0.0608***	0.0492	-0.0059	0.0548**	-0.0549*	-0.0648	0.0191	0.2242***	-0.0591**	0.0950***	0.0277	-0.0198
R^2 **adj.**	0.9396	0.9215	0.8918	0.9582	0.9477	0.9657	0.9074	0.9207	0.9012	0.9395	0.9169	0.9090	0.8549

This table presents regression estimates for the US conventional funds, obtained by the regression of the four-factor model with the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify the existence of statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 2 - Performance estimates using the unconditional the Carhart (1997) four-factor model – MSCI KLD 400 – Conventional funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0025**	-0.0014	0.0013	-0.0026**	-0.0004	-0.0007	0.0021**	0.0002	0.0013	-0.0029	-0.0023	0.0000	-0.0003
β_p	0.9349***	1.1696***	0.6630***	1.0145***	0.9764***	1.0118***	0.8349***	0.9511***	1.1330***	1.1119***	0.8716***	1.0253***	0.9443***
β_{SMB}	0.0827*	0.2579***	-0.0866	0.0507	0.0487	0.1607***	0.2554***	-0.0632	0.2877***	0.4847***	0.0721	0.2272***	0.1528***
β_{HML}	-0.1707***	-0.4622***	-0.0019	0.0869**	0.1009*	-0.4420***	0.2040***	0.1366***	-0.4113***	-0.3438***	-0.0257	0.0503*	-0.1039***
β_{MOM}	-0.0691**	0.0631*	0.0619	0.0830***	-0.0606	0.0205	-0.0457	0.0084	0.0850**	0.2804***	-0.0118	0.0032	-0.0521**
R^2 **adj.**	0.9256	0.8762	0.7864	0.9545	0.9093	0.8980	0.9307	0.9415	0.8629	0.8519	0.8519	0.8519	0.9577

This table presents regression estimates for US conventional funds, obtained by the regression of the four-factor model with KLD400 as benchmark, during the period from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify the existence of statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 2 - Performance estimates using the unconditional the Carhart (1997) four-factor model- MSCI KLD 400 - Conventional funds - continued

	MSCI KLD 400												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0000	-0.0002	0.0005	0.0005	0.0013*	0.0009	-0.0009	-0.0012	-0.0004	0.0008	-0.0018	-0.0011	0.0016
β_p	0.9536***	1.0973***	1.1201***	0.9443***	0.8489***	1.0020***	1.0524***	1.0242***	1.0613***	1.0129***	1.0512***	0.9147***	0.8324***
β_{SMB}	-0.0865**	0.1469***	0.1447**	0.0250	-0.0380	0.9320***	0.4684***	0.4278***	0.8293***	0.3847***	0.4958***	0.8370***	0.2058***
β_{HML}	0.0764	-0.3613***	-0.3676***	0.1555***	0.1952***	0.2256***	-0.0328	-0.2650***	-0.3954***	-0.2634***	-0.3905***	0.3705***	-0.0115
β_{MOM}	-0.0214	0.0856***	0.0728	0.0116	0.0721***	-0.0343	-0.0466	0.0410*	0.2452***	-0.0539*	0.1045***	0.0082	-0.0272
R^2 **adj.**	0.9177	0.9138	0.8748	0.9269	0.9259	0.9545	0.8775	0.9075	0.8836	0.9310	0.9062	0.8992	0.8580

This table presents regression estimates for the US conventional funds, obtained by the regression of the four-factor model with KLD400 as benchmark, during the period from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify the existence of statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 3 - Performance estimates using the unconditional the Fama and French (2015) five-factor model – Green funds

Panel A: Standard & Poor`s 500

	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12	x13
α_p	-0.0020*	-0.0022	0.0027**	0.0014	0.0011	0.0009	-0.0006	-0.0008	0.0014*	-0.0015	-0.0020	-0.0004	-0.0002
β_p	1.0393***	1.2562***	0.9127***	1.0732***	1.0370***	0.9014***	0.9937***	0.9817***	0.8646***	1.1764***	1.2708***	0.9229***	0.9576***
β_{SMB}	0.2163***	0.3154**	0.0596	0.2349***	0.3332***	0.2762***	0.1609***	0.0431**	0.0884**	0.4334***	0.6436***	0.8332***	0.5756***
β_{HML}	0.2605***	0.1518	-0.2248***	0.1166	0.0275	-0.0799	0.0071	-0.0478*	-0.0473	0.2128***	0.3316***	-0.0663	0.1080**
β_{RMW}	-0.0391	-0.1894	-0.1181	0.1263	-0.1789	0.0031	0.0102	-0.0132	0.1459**	0.0367	0.1032	0.2409***	0.1386
β_{CMA}	0.0139	-0.1715	-0.3960***	-0.1335	0.0046	0.1474	-0.0230	0.0281	0.0605	0.0426	-0.0421	0.2011*	-0.0800
R^2 **adj.**	0.9132	0.8667	0.9054	0.8717	0.8581	0.8869	0.9884	0.9764	0.9182	0.9009	0.9012	0.9403	0.9267

Panel B: MSCI KLD 400

α_p	-0.0019*	-0.0021	0.0025**	0.0013	0.0012	0.0010	-0.0004	-0.0008***	0.0015**	-0.0013	-0.0018	-0.0002	-0.0003
β_p	1.0430***	1.2197***	0.9018***	1.0904***	1.0476***	0.9003***	0.9925***	0.9992***	0.8642***	1.1803***	1.2751***	0.9215***	0.9423***
β_{SMB}	0.1521*	0.2905*	0.0304	0.1698**	0.2753***	0.2269***	0.1094***	-0.0142***	0.0434	0.3706***	0.5758***	0.7833***	0.5463***
β_{HML}	0.2859***	0.1819*	-0.1952***	0.1454*	0.0671	-0.0495	0.0490**	-0.0128**	-0.0110	0.2606***	0.3832***	-0.0558	0.1396***
β_{RMW}	-0.0588	-0.1112	-0.0663	0.1328	-0.1657	-0.0024	0.0142	0.0050	0.1497**	0.0454	0.1127	0.2220**	0.1937*
β_{CMA}	-0.0242	-0.1931	-0.4171***	-0.1715*	-0.0499	0.1057	-0.0813**	-0.0196*	0.0101	-0.0236	-0.1136	0.2287*	-0.1045
R^2 **adj.**	0.9085	0.8515	0.9134	0.8856	0.8656	0.8796	0.9824	0.9984	0.9129	0.9010	0.9014	0.9356	0.9286

This table presents regression estimates for the US green funds, obtained by the regression of the five-factor model with both S&P500 (Panel A) and KLD400 (Panel B) as benchmarks, during the period from February 2004 - September 2019. It reports estimates performance ($\boldsymbol{\alpha_p}$), the systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 4 - Performance estimates using the unconditional the Fama and French (2015) five-factor model – Standard & Poor's 500 - Conventional funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0019**	0.0007	0.0005	-0.0024**	-0.0008	-0.0003	0.0016**	0.0001	0.0028***	-0.0021	-0.0018*	-0.0001	-0.0001
β_p	0.9266***	1.0757***	0.6853***	0.9678***	1.0123***	0.9840***	0.8586***	0.9584***	1.0430***	1.0256***	0.8597***	1.0233***	0.9314***
β_{SMB}	0.1095***	0.2518***	-0.0011	0.0890**	0.0653	0.1330***	0.3113***	-0.0180	0.2726***	0.5222***	0.0834**	0.2802***	0.1773***
β_{HML}	-0.0926*	-0.3732***	-0.1892***	0.1004**	0.1535**	-0.2675***	0.1785***	0.0990***	-0.3633***	-0.5067***	-0.0293	0.0406**	-0.0585*
β_{RMW}	-0.1557***	-0.3503***	0.3390***	0.0388	-0.0845	-0.1697*	0.0472	-0.0033	-0.3733***	-0.1044	-0.1663**	0.0131	-0.1286***
β_{CMA}	-0.1348**	-0.4612***	0.2599**	-0.2962***	-0.0736	-0.5094***	0.1208*	0.0352	-0.4431***	-0.1616	-0.0179	-0.0250	-0.1161***
R^2 adj.	0.9504	0.9216	0.8616	0.9726	0.9273	0.9227	0.9326	0.9673	0.9040	0.8414	0.9233	0.9946	0.9582

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.).Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 4 - Performance estimates using the unconditional the Fama and French (2015) five-factor model – Standard & Poor's 500 - Conventional funds- continued

	Standard & Poor`s 500												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	-0.0002	0.0008	0.0019*	0.0005	0.0008*	0.0001	-0.0009	-0.0006	0.0014	0.0019	-0.0004	-0.0017	0.0010
β_p	0.9639***	1.0298***	1.0420***	0.9487***	0.8587***	1.0261***	1.0605***	0.9784***	0.9389***	0.9834***	0.9724***	0.8963***	0.8734***
β_{SMB}	-0.0433	0.1611***	0.1337**	0.0525	0.0267	1.0060***	0.4870***	0.4505***	0.8150***	0.4003***	0.5103***	0.9504***	0.3157***
β_{HML}	0.0711	-0.3867***	-0.3562***	0.1070**	0.0802**	0.2542***	0.0082	-0.2364***	-0.5014***	-0.1995***	-0.4202***	0.3672***	-0.1270*
β_{RMW}	-0.0097	-0.2390***	-0.3570***	-0.0764	0.1139***	0.1370***	-0.1271	-0.1559***	-0.3729***	-0.2051**	-0.2111**	0.2859**	0.2094**
β_{CMA}	-0.0233	-0.1870**	-0.2887***	0.0485	0.1529***	-0.1160**	-0.1418*	-0.2722***	-0.2629**	-0.1485*	-0.1526*	-0.1730	0.2589**
R^2 **adj.**	0.9377	0.9261	0.9059	0.9589	0.9484	0.9659	0.9067	0.9274	0.8855	0.9420	0.9156	0.9150	0.8718

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.).Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 4 - Performance estimates using the unconditional the Fama and French (2015) five-factor model – MSCI KLD 400 - Conventional funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0018	0.0008	0.0006	-0.0023**	-0.0007	-0.0005	0.0018**	0.0003	0.0031***	-0.0017	-0.0015	0.0002	0.0000
β_p	0.9211***	1.0676***	0.6580***	0.9446***	0.9860***	0.9680***	0.8602***	0.9455***	1.0279***	0.9942***	0.8498***	1.0171***	0.9352***
β_{SMB}	0.0552	0.1886***	-0.0058	0.0554	0.0383	0.1061**	0.2637***	-0.0663*	0.2233***	0.4793***	0.0390	0.2249***	0.1274***
β_{HML}	-0.0773	-0.3557***	-0.1749**	0.1333***	0.1878**	-0.2326***	0.2098***	0.1359***	-0.3145***	-0.4532***	-0.0012	0.0721**	-0.0209
β_{RMW}	-0.1907***	-0.3928***	0.3730***	0.0649	-0.0350	-0.1121	0.0482	-0.0173	-0.3798***	-0.1234	-0.1891**	-0.0101	-0.1212***
β_{CMA}	-0.1581**	-0.4859***	0.2410*	-0.3208***	-0.1004	-0.5429***	0.0803	-0.0165	-0.5117***	-0.2377	-0.0638	-0.0751	-0.1682***
R^2 **adj.**	0.9273	0.8992	0.8319	0.9614	0.9075	0.9264	0.9293	0.9411	0.8849	0.8077	0.8998	0.9786	0.9593

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with the KLD400 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 4 - Performance estimates using the unconditional the Fama and French (2015) five-factor model – MSCI KLD 400 - Conventional funds - continued

	MSCI KLD 400												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0001	0.0010	0.0022*	0.0009	0.0011	0.0004	-0.0004	-0.0004	0.0018	0.0018	-0.0005	-0.0015	0.0011
β_p	0.9532***	1.0261***	1.0313***	0.9292***	0.8456***	1.0172***	1.0361***	0.9711***	0.9174***	0.9953***	0.9803***	0.8775***	0.8648***
β_{SMB}	-0.0900**	0.1086**	0.0829	0.0096	-0.0137	0.9555***	0.4399***	0.4019***	0.7733***	0.3423***	0.4481***	0.9275***	0.2875***
β_{HML}	0.1150*	-0.3424***	-0.3090***	0.1533**	0.1206***	0.3001***	0.0608	-0.1931***	-0.4548***	-0.1977***	-0.4207***	0.4014***	-0.1004
β_{RMW}	-0.0132	-0.2368***	-0.3600***	-0.0867	0.1081**	0.1352**	-0.1405	-0.1567**	-0.3848***	-0.2419***	-0.2444**	0.3268***	0.2503**
β_{CMA}	-0.0849	-0.2487***	-0.3548***	-0.0169	0.0961*	-0.1803***	-0.2162**	-0.3329***	-0.3288**	-0.1199	-0.1378	-0.1985	0.2468***
R^2 **adj.**	0.9175	0.9175	0.8901	0.9273	0.9220	0.9564	0.8797	0.9158	0.8655	0.9348	0.9046	0.9078	0.8774

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with the KLD400 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 5 - Performance estimates using the conditional the Carhart (1997) four-factor model - Standard & Poor`s 500- Green funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0030***	-0.0026	0.0019	0.0009	0.0001	0.0016	-0.0006*	-0.0009**	0.0017**	-0.0021**	-0.0018	0.0007	0.0004
α_{ST}	-0.2144	-0.9359	0.6181	-0.5058***	-0.1253	-0.1633	-0.0856	-0.0253	-0.2755***	-0.1629	-0.0629	-0.0953	-0.0140
α_{DY}	-0.0157***	-0.0949**	0.0309*	0.0072	0.0048	-0.0045	-0.0042**	0.0015	-0.0017	-0.0171**	-0.0192**	0.0050	0.0340**
β_{p*rm}	1.0448***	1.0428***	0.9895***	1.0535***	0.9996***	0.8263***	0.9874***	0.9830***	0.8646***	1.1346***	1.1855***	0.9157***	0.9673***
β_{ST*rm}	14.1434**	56.6236	-3.6361	2.0242	-4.2290	-8.0170	0.0297	1.6447	-1.8722	6.4068	8.9394	12.4173	2.4021
β_{DY*rm}	-0.2144	2.3964	0.1611	-0.2650*	0.0436	-0.0536	0.0426	-0.1295**	-0.3097***	-0.0799	0.1348	-0.0772	-0.5457
β_{SMB}	0.2403***	0.2970	0.1734**	0.1513***	0.3341***	0.2838***	0.1545***	0.0316*	0.0732**	0.4397***	0.6000***	0.7676***	0.5942***
β_{ST*SMB}	-2.1714	-14.7640	-28.0821	1.2797	-23.1274**	-11.4838	-1.2740	-5.9193*	-11.0732	-47.3430***	-41.1089**	-5.7369	-55.6024***
β_{DY*SMB}	0.7589***	-0.3295	0.9331	-0.0332	0.3553*	0.2723*	0.0206	-0.1194	0.2354	0.3819	0.0512	-0.1055	-0.6790
β_{HML}	0.1597***	-0.0649	-0.2341***	-0.0211	-0.0249	-0.1279***	0.0013	-0.0785***	-0.0217	0.1057*	0.1514***	0.0747	0.0804
β_{ST*HML}	10.9287	15.5859	-1.8999	-20.7353	-29.2846*	-0.9120	2.5395	-18.5789***	8.4506	4.3532	-15.0677	13.2927	-3.4939
β_{DY*HML}	0.2306	1.6293	1.0001	-0.2350	-1.0833***	-0.1032	-0.0469	-0.0436	0.3652**	-0.5107*	-0.5951*	0.2146	-0.1234
β_{MOM}	-0.2137***	-0.3002*	0.1818***	-0.1585***	-0.0370	-0.0772**	-0.0095	-0.0110	0.0019	-0.1658***	-0.1504***	-0.0048	0.0253
β_{ST*MOM}	-5.8963	30.4044	-19.4328	-9.9214	-8.2150	4.2562	-2.3556*	-2.5780	-4.8177	-3.1059	1.9361	-9.4262	-14.9270
β_{DY*MOM}	0.0433	0.5893	0.5648	-0.4963***	-0.5260***	-0.0345	-0.0836***	-0.1202*	-0.1169	-0.2159	-0.3647	-0.1559	-0.4635
R^2 **adj.**	0.9438	0.8824	0.8927	0.9073	0.8854	0.9020	0.9888	0.9799	0.9242	0.9356	0.9304	0.9344	0.9290

This table presents regression estimates for the US green funds, obtained by the regression of the conditional four-factor model with the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 5 - Performance estimates using the conditional the Carhart (1997) four-factor model - MSCI KLD 400 – Green funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0026***	-0.0018	0.0022	0.0011	0.0003	0.0017	-0.0005	-0.0008***	0.0018***	-0.0018*	-0.0015	0.0010	0.0006
α_{ST}	-0.1287	-1.4357	0.4422	-0.5064***	-0.1116	-0.1675	-0.0738	-0.0235	-0.2607**	-0.1306	-0.0306	-0.0302	-0.1227
α_{DY}	-0.0168**	-0.1165***	0.0233	0.0057	0.0029	-0.0066	-0.0067**	-0.0004	-0.0034	-0.0193**	-0.0219*	0.0067	0.0265
β_{p*rm}	1.0420***	0.9670***	0.9582***	1.0539***	1.0038***	0.8229***	0.9897***	1.0002***	0.8672***	1.1365***	1.1779***	0.9170***	0.9385***
β_{ST*rm}	11.9583*	67.0220	4.1361	-3.1272	-8.0848	-11.1958	-1.7366	0.3456	-2.5054	5.0814	5.5884	11.0844	4.9609
β_{DY*rm}	-0.1290	2.2769	0.1294	-0.1514	0.1566	0.0406	0.1780**	0.0028	-0.2142*	0.0235	0.2788	-0.0650	-0.4382
β_{SMB}	0.2046***	0.2898	0.1366**	0.1079**	0.2913***	0.2512***	0.1126***	-0.0179***	0.0349	0.3945***	0.5571***	0.7385***	0.5608***
β_{ST*SMB}	3.3161	-15.1738	-27.3071	8.7581	-16.9041	-5.1989	3.2401	-1.9940**	-7.2806	-43.1009**	-35.7007**	-3.0322	-55.0396**
β_{DY*SMB}	0.9226***	0.7702	1.3725*	0.1164	0.4898**	0.3940**	0.1426	-0.0119	0.3520	0.5342	0.2099	0.0159	-0.0953
β_{HML}	0.2084***	-0.1420	-0.2587***	0.0344	0.0308	-0.0864*	0.0592***	-0.0184***	0.0302	0.1744***	0.2209***	0.1061	0.0620
β_{ST*HML}	22.4485***	39.8493	11.1571	-6.8993	-14.0125	9.9453	18.4251***	-1.9988**	21.7483**	22.6094*	3.5865	19.6057	7.6280
β_{DY*HML}	0.2194	0.5669	0.2403	-0.2640	-1.0837***	-0.1245	-0.0396	-0.0216	0.3909**	-0.4540	-0.5849*	0.2592	-0.8022
β_{MOM}	-0.2027***	-0.3754**	0.1476**	-0.1386***	-0.0146	-0.0634*	0.0138	0.0147***	0.0203	-0.1402***	-0.1230***	0.0015	-0.0038
β_{ST*MOM}	-4.7106	53.5063	-5.7005	-8.1517	-5.5429	5.5960	1.3421	1.5067***	-1.4502	1.5466	6.1683	-6.3754	-2.4790
β_{DY*MOM}	0.1198	0.6323	0.6549	-0.4067***	-0.4245**	0.0339	0.0249	-0.0053	-0.0296	-0.0973	-0.2388	-0.0485	-0.2693
R^2 **adj.**	0.9373	0.8755	0.8972	0.9105	0.8867	0.8943	0.9850	0.9985	0.9183	0.9299	0.9227	0.9296	0.9245

This table presents regression estimates for the US green funds, obtained by the regression of the conditional four-factor model with the KLD400 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 6 - Performance estimates using the conditional the Carhart (1997) four-factor model - Standard & Poor`s 500 - Conventional funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0028***	-0.0014	0.0008	-0.0038**	-0.0004	-0.0026	0.0017*	0.0002	0.0010	-0.0041***	-0.0011	-0.0002	-0.0007
α_{ST}	-0.2794	-0.0259	0.2853	0.0319	-0.7665	0.6410	0.0304	-0.1167	0.0954	0.5040*	0.0215	-0.0471	0.0676
α_{DY}	-0.0081	-0.0147	0.0262	-0.0233*	0.0055	-0.0216	0.0033	0.0057**	-0.0102	-0.0124	-0.0014	-0.0015	-0.0043
β_{p*rm}	0.9191***	1.1161***	0.6910***	1.0768***	0.9893***	1.0329***	0.8475***	0.9715***	1.1076***	1.1278***	0.7951***	1.0239***	0.9247***
β_{ST*rm}	-9.0352**	-13.0708*	5.6132	-17.3707	5.5557	9.1555	1.4948	2.8388	-15.800***	-3.6153	-33.208***	1.4117	-2.6475
β_{DY*rm}	0.0068	-0.0197	-0.2245	0.1993	-0.7071**	-0.2410	-0.1292	0.1281**	-0.1819	-0.0043	-0.2055*	0.0580	-0.1121
β_{SMB}	0.1261***	0.3289***	-0.0642	0.1085**	0.0896*	0.2292***	0.3048***	0.0014	0.3612***	0.5656***	0.1615***	0.2724***	0.1826***
β_{ST*SMB}	-8.1371	7.3889	1.2583	-8.0581	-13.3244	-23.9042	-4.6853	-7.5756*	-9.7117	-4.8711	10.1893	-3.0541	2.3860
β_{DY*SMB}	0.0508	0.3997	0.5237	0.8990**	-0.6282	0.5165	0.0553	-0.0559	0.1727	0.2722	0.2653	-0.0047	0.0666
β_{HML}	-0.1535***	-0.5379***	0.0906	0.1438**	0.1102	-0.3558***	0.1847***	0.1461***	-0.4662***	-0.3185***	-0.0306	0.0368***	-0.1324***
β_{ST*HML}	16.4178**	-23.7437	-31.1576	-46.9546*	-15.7156	-36.9685	3.5251	33.8700***	-7.0597	41.0642***	18.6695***	2.9877	-12.6188**
β_{DY*HML}	-0.1461	-0.6270***	0.7619	0.1198	0.6166	1.2231	0.0821	0.4850***	-0.5268**	-0.2569	0.0261	-0.0895	-0.3512***
β_{MOM}	-0.0672***	0.0195	0.1433*	0.1503***	-0.0436	0.0689	-0.0801**	-0.0276	0.0710	0.2396***	0.0007	-0.0065	-0.0282
β_{ST*MOM}	1.1095	-16.5517**	-49.7161	-28.4914	0.0767	-5.3352	-4.0993	4.3903	-11.1136	-3.8704	-0.4925	0.3682	0.2121
β_{DY*MOM}	-0.0159	-0.2351	0.4221	0.1697	-1.3197***	-0.5525	-0.0195	0.2540***	-0.2891*	-0.0994	-0.0402	-0.0107	-0.2805***
R^2 **adj.**	0.9571	0.9026	0.8109	0.9717	0.9284	0.8981	0.9334	0.9750	0.8879	0.8935	0.9493	0.9947	0.9637

This table presents regression estimates for the US conventional funds, obtained by the regression of the conditional four-factor model with the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 6 - Performance estimates using the conditional the Carhart (1997) four-factor model - Standard & Poor`s 500 - Conventional funds - continued

	Standard & Poor`s 500												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0002	-0.0001	-0.0000	-0.0002	0.0011*	0.0010	-0.0019	-0.0011	-0.0005	0.0011	-0.0020	0.0003	0.0020
α_{ST}	-0.0913	0.0809	-0.0334	-0.1725*	0.1525	-0.1534	0.2147	-0.0758	-0.2356	0.0559	0.1257	-1.3612***	-0.0410
α_{DY}	-0.0042	-0.0031	-0.0060	0.0068*	0.0044	-0.0008	-0.0151*	-0.0067	-0.0182**	-0.0011	-0.0104	0.0225	0.0154
β_{p*rm}	0.9257***	1.0454***	1.1147***	0.9922***	0.8721***	0.9733***	1.0329***	0.9822***	1.0290***	0.9676***	1.0266***	0.9065***	0.8436***
β_{ST*rm}	-5.8773	-11.6739	-7.2462	8.3405***	3.3048	-8.1849**	-7.6083	-9.5430	-11.2201*	-20.5871***	-8.5640	8.1982	-4.7654
β_{DY*rm}	0.1034	-0.0009	-0.1110	0.1011	-0.0371	0.1332	0.4051**	0.1822	-0.0796	0.0216	-0.0376	-0.3620	-0.5443
β_{SMB}	-0.0402	0.2006***	0.2063***	0.0904***	0.0338	1.0017***	0.5302***	0.4661***	0.8793***	0.4179***	0.5393***	0.7873***	0.2605***
β_{ST*SMB}	-0.3415	18.2563**	-2.0518	-14.0350***	-16.9594***	2.4172	1.5098	19.8527**	11.8902	-47.3320**	14.2532	30.5388	-29.6098
β_{DY*SMB}	-0.1376	0.3801**	0.1551	0.1389	-0.0930	0.3697*	0.4475	0.1460	0.2507	-0.0807	0.1208	-2.3830	-1.0585
β_{HML}	0.0387	-0.3942***	-0.3754***	0.1505***	0.1460***	0.2145***	0.0486	-0.2825***	-0.4338***	-0.2853***	-0.3995***	0.3731***	-0.0856
β_{ST*HML}	16.1791**	-19.5941**	15.6636	25.0040***	16.0187***	16.3189**	56.6089***	-12.5746	-0.0776	5.2747	-16.6300	-19.1498	-7.6029
β_{DY*HML}	0.2262	-0.6603***	-0.2294	0.1585	0.3456***	-0.0199	-0.6043**	-0.7009***	-0.2741	-0.6390***	-0.7471***	-0.0483	-1.5540
β_{MOM}	0.0027	0.0916***	0.0950**	-0.0213	0.0216	-0.0494*	-0.0188	0.0315	0.2591***	-0.0301	0.0570	0.0381	-0.0201
β_{ST*MOM}	11.8718***	-6.4216	8.3073	9.2054***	3.3685	-3.6540	6.5912	-7.1858	1.2725	-8.5964	-23.4834***	-18.3712	-29.4446
β_{DY*MOM}	0.0200	-0.2451**	-0.0760	0.3994***	0.2786***	-0.0130	-0.1045	-0.2020*	-0.2258	-0.1347	-0.4260**	-1.2354	-0.4119
R^2 **adj.**	0.9475	0.9239	0.8941	0.9692	0.9520	0.9684	0.9359	0.9235	0.9031	0.9557	0.9212	0.9124	0.8518

This table presents regression estimates for the US conventional funds, obtained by the regression of the conditional four-factor model with the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates of performance ($\boldsymbol{\alpha_p}$), systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj**.**). The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 6 - Performance estimates using the conditional the Carhart (1997) four-factor model - MSCI KLD 400 - Conventional funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0027**	-0.0014	0.0017	-0.0026	0.0003	-0.0024	0.0019*	0.0004	0.0013	-0.0038**	-0.0010	0.0001	-0.0006
α_{ST}	-0.2705	-0.0405	0.0197	-0.2851	-0.9328	0.4685	0.0513	-0.1133	0.0966	0.5139	0.0023	0.0047	0.0745
α_{DY}	-0.0118	-0.0202	0.0186	-0.0325**	0.0026	-0.0297	0.0020	0.0027	-0.0142	-0.0163	-0.0051	-0.0042	-0.0067
β_{p*rm}	0.9127***	1.1148***	0.6387***	1.0286***	0.9499***	1.0009***	0.8518***	0.9613***	1.0963***	1.1132***	0.7935***	1.0167***	0.9277***
β_{ST*rm}	-9.5439	-10.2666	10.9926	-13.0689	7.3824	16.2305	-0.0774	-0.0828	-16.8464**	-5.1685	-33.5374***	-0.7208	-3.9559
β_{DY*rm}	0.1507	0.1922	0.0657	0.4553	-0.5658	-0.3257	-0.0618	0.2541**	0.0175	0.2037	-0.0393	0.1987**	0.0210
β_{SMB}	0.0923*	0.2821***	-0.0751	0.0580	0.0664	0.1944***	0.2707***	-0.0320	0.3149***	0.5225***	0.1248***	0.2387***	0.1414***
β_{ST*SMB}	-1.4181	13.6774	-0.2707	0.9405	-13.5818	-23.9552	-0.7183	-1.9262	-3.3188	0.6438	18.1602**	3.8388	6.7427
β_{DY*SMB}	0.1861	0.5443	1.1903	2.0154***	0.1655	0.9810	0.1719	0.0785	0.3204	0.4162	0.3837	0.1511	0.1811
β_{HML}	-0.1235***	-0.4962***	0.0593	0.1012*	0.0888	-0.3977***	0.2356***	0.1975***	-0.4045***	-0.2536***	0.0040	0.0855***	-0.0780***
β_{ST*HML}	23.8773**	-13.2683	-18.6758	-23.8591	-1.3514	-19.9949	17.0881*	47.4672***	9.0759	58.2217***	27.9362***	15.4962**	1.9822
β_{DY*HML}	-0.2307	-0.7180**	0.3257	-0.4551	-0.0165	0.2845	0.1281	0.4651***	-0.5692**	-0.2981	-0.0486	-0.1327	-0.3497***
β_{MOM}	-0.0602*	0.0320	0.1129	0.0932***	-0.0749	0.0241	-0.0614**	-0.0095	0.0927	0.2642***	0.0098	0.0077	-0.0068
β_{ST*MOM}	1.5751	-14.2866	-36.6197	-5.2021	15.7615	11.0862	-0.9828	6.8084	-7.4699	0.2824	0.3789	1.9507	3.6738
β_{DY*MOM}	0.0461	-0.1472	0.7160	0.6062	-1.0618**	-0.5131	0.0662	0.3428**	-0.1776	0.0219	0.0247	0.0757	-0.1804***
R^2 **adj.**	0.9331	0.8780	0.7645	0.9630	0.9063	0.9050	0.9299	0.9556	0.8672	0.8740	0.9295	0.9802	0.9612

This table presents regression estimates for the US conventional funds, obtained by the regression of the conditional four-factor model with the KLD400 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 6 - Performance estimates using the conditional the Carhart (1997) four-factor model - MSCI KLD 400 - Conventional funds - continued

MSCI KLD 400													
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0004	0.0000	0.0002	0.0002	0.0014*	0.0012	-0.0018	-0.0009	-0.0003	0.0012	-0.0019	0.0011	0.0024
α_{ST}	-0.0845	0.0666	-0.0355	-0.1358	0.1818	-0.1417	0.2198	-0.0792	-0.2356	0.1892	0.1783	-1.6145***	-0.1234
α_{DY}	-0.0073	-0.0072	-0.0097	0.0045	0.0029	-0.0038	-0.0195*	-0.0103	-0.0219**	-0.0009	-0.0131	0.0157	0.0115
β_{p*rm}	0.9185***	1.0504***	1.1091***	0.9779***	0.8629***	0.9723***	1.0255***	0.9774***	1.0149***	0.9770***	1.0290***	0.8677***	0.8259***
β_{ST*rm}	-8.0698	-11.5550*	-9.0936	5.5395	0.0381	-9.8636*	-9.0099	-12.2613*	-13.5893*	-25.2739***	-12.2364	9.0379	-4.1120
β_{DY*rm}	0.2590	0.2098*	0.1045	0.2104**	0.0493	0.2579	0.5869***	0.3706**	0.1261	0.1423	0.1307	-0.2261	-0.3528
β_{SMB}	-0.0768**	0.1501***	0.1579**	0.0588*	0.0035	0.9618***	0.4904***	0.4248***	0.8379***	0.3852***	0.4964***	0.7715***	0.2379***
β_{ST*SMB}	4.8958	22.9454***	3.8716	-9.4585	-12.0277**	7.6409	6.6407	25.8770***	18.3305	-46.0339**	19.6412	29.1258	-30.1201
β_{DY*SMB}	-0.0182	0.4913**	0.2898	0.2826	0.0379	0.4988**	0.5724	0.2649	0.3856	0.0357	0.2601	-1.7062	-0.3660
β_{HML}	0.0903**	-0.3334***	-0.3114***	0.2083***	0.1957***	0.2690***	0.1061*	-0.2287***	-0.3772***	-0.2589***	-0.3687***	0.3343***	-0.0927
β_{ST*HML}	30.2862***	-2.4803	32.6984**	40.1043***	28.7572***	31.5000***	73.2499***	2.5258	14.7506	18.9596	-5.1621	-3.7796	3.2054
β_{DY*HML}	0.1963	-0.6882***	-0.2800	0.1704	0.3507***	-0.0124	-0.6267*	-0.7537***	-0.3423	-0.6558**	-0.8443***	-0.7865	-1.9956
β_{MOM}	0.0230	0.1168***	0.1204**	-0.0000	0.0395**	-0.0287	0.0047	0.0540	0.2804***	-0.0197	0.0679	-0.0049	-0.0376
β_{ST*MOM}	14.8138***	-2.0886	12.2224	12.6564***	5.8730**	-0.4403	10.3261*	-4.2636	4.3139	-4.4162	-22.8600**	-1.9377	-17.7145
β_{DY*MOM}	0.1181	-0.1222	0.0463	0.4991***	0.3614***	0.0874	0.0114	-0.0940	-0.1198	0.0304	-0.3322	-1.0263	-0.1132
R^2 **adj.**	0.9329	0.9201	0.8843	0.9437	0.9337	0.9611	0.9212	0.9165	0.8893	0.9523	0.9140	0.8967	0.8533

This table presents regression estimates for the US conventional funds, obtained by the regression of the conditional four-factor model with the KLD400 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 7 - Performance estimates using the conditional the Fama and French (2015) five-factor model - Standard & Poor`s 500 - Green funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0028***	-0.0034	0.0043***	0.0015	0.0014	0.0022**	-0.0006	-0.0006	0.0015**	-0.0022**	-0.0018	-0.0001	0.0006
α_{ST}	-0.2480	-1.1545	0.2520	-0.6277***	-0.4065	-0.4068	-0.1088	-0.0823	-0.3137***	-0.1139	-0.0739	0.5725	-0.1349
α_{DY}	-0.0107*	-0.0794**	0.0536***	0.0260**	0.0187**	0.0062	-0.0017	0.0048	-0.0018	-0.0067	-0.0045	0.0067	0.0432***
β_{p*rm}	1.0684***	1.2386***	0.8891***	1.0730***	0.9989***	0.8301***	0.9888***	0.9840***	0.8770***	1.1626***	1.2193***	0.9365***	0.9564***
β_{ST*rm}	15.4572**	14.2609	3.2326	-1.6905	-0.8250	-13.3837***	-0.0495	-0.2815	4.4172	4.9666	1.2711	-9.3404	5.3695
β_{DY*rm}	-0.0433	2.5820*	-0.6436*	-0.1032	0.0699	0.0074	0.0483	-0.1129*	-0.1934*	0.0966	0.2969	-0.0186	-0.3182
β_{SMB}	0.2307***	0.2406	0.1040	0.1999***	0.3410***	0.3148***	0.1551***	0.0278	0.1100***	0.4664***	0.6751***	0.8387***	0.6285***
β_{ST*SMB}	-10.1250	2.6627	-30.3128	-12.5343	-32.4818**	-8.1324	-3.1638	-8.5936***	-14.6756**	-60.1566***	-49.7136**	-20.0993	-40.0086
β_{DY*SMB}	1.0190***	-0.7073	-0.2792	0.1244	0.3568	0.4287***	-0.0087	-0.1165	0.2120	0.6258	0.4880	0.1053	0.0285
β_{HML}	0.3068***	0.3982	-0.2678***	0.1213	-0.0303	-0.1469***	0.0068	-0.0825***	-0.0374	0.2141***	0.2211***	0.0132	0.0959
β_{ST*HML}	-7.7163	-131.7988	52.0857	-23.3220	-19.7448	-17.6047	4.5913	-13.7863**	-0.1701	-15.1251	-26.7352**	62.1480***	-0.3315
β_{DY*HML}	-0.4593	3.2765	0.1679	-0.5023	-0.6588**	-0.5871**	-0.0048	0.0452	0.1541	-1.0335***	-0.7948**	0.5744*	-0.9605
β_{RMW}	-0.1236	-0.3582	-0.1621	0.0394	-0.1631	0.0039	-0.0003	-0.0377	0.0905*	0.0259	0.1425	0.2175**	0.0854
β_{ST*RMW}	-2.7099	77.9758	-10.4991	-4.1895	13.3927	24.5583	-3.5573	-5.6262	11.6498	-9.7804	7.2954	6.3796	40.8719
β_{DY*RMW}	0.0472	2.9490	-1.8524**	-0.8057	-0.5230	-0.7173**	-0.2170**	-0.2056	0.0300	-0.1596	0.2323	0.4246	-0.1374
β_{CMA}	-0.0128	-0.3926	-0.3656**	-0.1199	0.0614	0.2611***	-0.0040	0.0279	0.0731	-0.0295	-0.0129	0.1357	-0.1168
β_{ST*CMA}	30.0791	164.1164	-57.4539	-5.5091	-1.8558	1.0445	-3.8093	-11.7752	36.2088***	31.3113*	2.5810	-91.7363***	36.1816
β_{DY*CMA}	1.2525**	0.4556	0.1814	0.4152	-0.3442	0.8816**	-0.1300	-0.0961	0.8504*	0.7855	0.1893	-0.4757	2.4827*
R^2 **adj.**	0.9262	0.8701	0.9096	0.8831	0.8781	0.9014	0.9886	0.9794	0.9281	0.9206	0.9130	0.9451	0.9338

This table presents regression estimates for the US green funds, obtained by the regression of the five-factor model with the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the term spread (TS) and the short-term rate (ST). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 7 - Performance estimates using the conditional the Fama and French (2015) five-factor model - MSCI KLD 400 - Green funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0027**	-0.0043	0.0041***	0.0015	0.0014	0.0022**	-0.0006	-0.0007***	0.0016**	-0.0021*	-0.0017	0.0001	0.0004
α_{ST}	-0.1376	-1.2349	0.2353	-0.5956**	-0.3357	-0.3781	-0.0432	-0.0156	-0.2542**	-0.0341	0.0030	0.4966	-0.2047
α_{DY}	-0.0152**	-0.1126**	0.0464**	0.0199**	0.0137*	0.0008	-0.0069**	-0.0003	-0.0054	-0.0124*	-0.0119	0.0061	0.0330**
β_{p*rm}	1.0650***	1.1870***	0.8766***	1.0778***	1.0035***	0.8262***	0.9875***	0.9981***	0.8751***	1.1635***	1.2148***	0.9341***	0.9345***
β_{ST*rm}	14.3326***	19.1087	1.6234	-4.3336	-2.6447	-13.7570**	-0.2983	-0.2573	4.3109	4.3102	-0.2255	-9.7290	5.0668
β_{DY*rm}	0.0643	2.4999	-0.7069**	0.0527	0.1592	0.1289	0.1465*	-0.0101	-0.1378	0.1862	0.4592*	0.0250	-0.2910
β_{SMB}	0.1898***	0.2383	0.0714	0.1552**	0.3039***	0.2832***	0.1209***	-0.0133***	0.0802**	0.4270***	0.6338***	0.7949***	0.5965***
β_{ST*SMB}	-4.0021	6.2295	-23.4158	-3.7752	-24.4029**	-1.1169	4.2695	-1.4190*	-8.1818	-51.5819***	-40.3755*	-13.4985	-34.2839
β_{DY*SMB}	1.1387***	0.3221	0.0611	0.2341	0.4768*	0.5170***	0.1131	-0.0046	0.3328**	0.7728*	0.6266	0.2069*	0.3712
β_{HML}	0.3649***	0.3588	-0.2501***	0.1836**	0.0306	-0.0958*	0.0696***	-0.0207***	0.0186	0.2872***	0.2970***	0.0362	0.1135
β_{ST*HML}	0.5067	-121.9793	50.3437	-12.6148	-7.7354	-11.4843	15.8887***	-1.7153**	10.1568	-0.9803	-12.4524	57.8092***	-4.0717
β_{DY*HML}	-0.5910	2.0637	-0.2505	-0.6591*	-0.7122**	-0.7338**	-0.0604	0.0025	0.1517	-1.0634***	-0.9163***	0.3659	-1.4770*
β_{RMW}	-0.1051	-0.3139	-0.1361	0.0839	-0.1249	0.0297	0.0332	0.0047	0.1188*	0.0662	0.1862	0.1943**	0.1144
β_{ST*RMW}	-0.9231	119.1959	11.1028	0.2007	19.4172	28.9682	4.5848	1.5149	19.9865**	0.1910	15.7415	14.1065	64.3030
β_{DY*RMW}	0.1590	4.0036	-1.8949**	-0.6055	-0.2999	-0.5667*	0.0070	0.0428	0.2293	0.1052	0.4981	0.3926	-0.1680
β_{CMA}	-0.0580	-0.3010	-0.3735***	-0.1664	0.0122	0.2166**	-0.0551	-0.0203	0.0296	-0.0873	-0.0738	0.1552	-0.1263
β_{ST*CMA}	39.4884*	128.1913	-60.0717	5.4801	7.4629	16.1401	6.6531	-1.9006	43.5877***	41.7101**	14.3241	-86.1270***	35.3365
β_{DY*CMA}	1.4156***	-0.0213	-0.1205	0.6348	-0.2396	1.1139**	-0.0205	-0.0086	0.8782*	0.8794	0.3807	-0.0335	2.1709*
R^2 **adj.**	0.9236	0.8569	0.9165	0.8940	0.8825	0.8953	0.9852	0.9984	0.9243	0.9200	0.9111	0.9410	0.9329

This table presents regression estimates for the US green funds, obtained by the regression of the five-factor model with the KLD400 as benchmark, from February 2004 - September 2019. It reports estimates performance ($\boldsymbol{\alpha_p}$), the systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the term spread (TS) and the short-term rate (ST). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 8 - Performance estimates using the conditional the Fama and French (2015) model - Standard & Poor`s 500 - Conventional funds

Standard & Poor`s 500													
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0023***	-0.0005	0.0017	-0.0025	-0.0006	-0.0015	0.0019*	-0.0000	0.0014	-0.0046**	-0.0010	-0.0002	0.0001
α_{ST}	-0.1899	0.5374	0.0983	-0.0525	-0.5223	0.8410*	-0.1525	-0.1130	0.2434	0.8328**	-0.0901	-0.0256	-0.0422
α_{DY}	-0.0034	-0.0180*	0.0104	-0.0268***	0.0122	0.0033	0.0066	0.0015	-0.0120	-0.0256**	-0.0012	-0.0003	0.0049
β_{p*rm}	0.9150***	1.1070***	0.6476***	0.9781***	0.9948***	1.0052***	0.8580***	0.9710***	1.0793***	1.1020***	0.7962***	1.0233***	0.9201***
β_{ST*rm}	-7.7957	5.6149	18.6565	-10.6472	7.5834	-11.1049	0.6994	3.1097	-6.3951	6.7399	-27.4612***	1.3212	-4.4547
β_{DY*rm}	-0.0087	-0.0616	-0.5724	-0.0098	0.0156	-0.3815	-0.0014	0.1066*	-0.3492**	-0.1786	-0.2417*	0.0674*	-0.0828
β_{SMB}	0.1073***	0.2332***	-0.0197	0.1171*	0.0652	0.1562***	0.3163***	-0.0160	0.2623***	0.5327***	0.1608***	0.2768***	0.1867***
β_{ST*SMB}	-13.5571*	-18.9643	18.0017	-15.0678	9.5150	-7.4748	-6.7655	-2.4680	-26.3589***	-9.4347	12.5638*	-4.2632	-6.0697
β_{DY*SMB}	0.1121	0.0205	0.3179	0.7137*	0.5939	1.2793*	0.1373	0.0060	-0.2205	-0.1626	0.2668*	-0.0086	0.1452
β_{HML}	-0.0536	-0.3640***	-0.2871***	0.0435	0.1983**	-0.1148*	0.2132***	0.1467***	-0.3450***	-0.3645***	-0.0723	0.0598***	-0.0677**
β_{ST*HML}	8.8349	-8.0454	79.1841**	20.1543	-38.3537	-55.8633**	-5.7470	25.5736***	20.1891	66.6580***	19.0286	0.0308	-13.5167**
β_{DY*HML}	-0.3322	-0.2399	-0.9457	-0.2588	0.5194	2.8160***	-0.3494	0.2885**	0.2790	0.6069*	0.2631	-0.1939***	-0.3622**
β_{RMW}	-0.1436***	-0.3767***	0.3564**	0.0942	-0.1714*	-0.1886*	0.0067	-0.0259	-0.3653***	-0.0832	-0.0607	0.0129	-0.1324***
β_{ST*RMW}	-4.8408	-56.6273**	33.0574	-6.5281	85.3782*	15.2379	10.0985	7.6511	-49.2835***	-35.4665	18.1274	-0.8698	2.2712
β_{DY*RMW}	-0.1047	0.0503	-0.0754	1.2628*	-0.4243	0.4274	-0.2378	0.2638	-0.1583	0.4276	0.1657	-0.1001	-0.2152
β_{CMA}	-0.1568**	-0.5132***	0.4019**	-0.2154	-0.0793	-0.6232***	0.0980	0.0516	-0.5384***	-0.3102**	0.0973	-0.0435*	-0.1331***
β_{ST*CMA}	13.4309	48.1634**	-87.8624	-65.8098	37.3288	35.0190	5.6227	7.9824	-7.6698	11.3555	16.0226	3.5021	-3.9003
β_{DY*CMA}	0.2255	-0.2103	-1.5745	-1.6240*	1.3049	-1.3631	0.9859*	0.1714	-1.4333***	-1.0903**	-0.3063	0.1531	0.3396
R^2 **adj.**	0.9562	0.9258	0.8582	0.9715	0.9259	0.9265	0.9317	0.9728	0.9147	0.8706	0.9522	0.9948	0.9588

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the term spread (TS) and the short-term rate (ST). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 8 - Performance estimates using the conditional the Fama and French (2015) model - Standard & Poor`s 500 - Conventional funds- continued

Standard & Poor`s 500													
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0004	0.0005	0.0007	0.0002	0.0009*	0.0003	-0.0016	-0.0012	0.0008	0.0019*	-0.0013	0.0004	0.0015
α_{ST}	0.0196	0.0780	0.2083	-0.2461*	0.0787	-0.0668	0.3214	-0.0414	-0.2297	0.0135	0.5266	-0.6443	0.4911
α_{DY}	0.0009	-0.0016	-0.0055	0.0020	-0.0021	0.0001	-0.0074	-0.0053	-0.0251**	0.0041	-0.0084	0.0232	0.0094
β_{p*rm}	0.9225***	1.0215***	1.0768***	0.9753***	0.8711***	0.9897***	1.0264***	0.9713***	0.9768***	0.9568***	1.0115***	0.8679***	0.8855***
β_{ST*rm}	-14.1216***	-4.6490	-5.4746	11.4246***	3.4533	-8.9243	-5.2080	-0.9307	3.7283	-14.5768***	11.1390*	-3.2271	-17.5182
β_{DY*rm}	-0.0048	-0.0943	-0.3807***	0.0593	-0.0330	0.2723**	0.3492**	0.0813	-0.3623*	-0.0598	-0.0178	0.3051	-0.2219
β_{SMB}	-0.0195	0.1587***	0.1395**	0.0625**	0.0426	1.0243***	0.5463***	0.4398***	0.8285***	0.4025***	0.4812***	0.9207***	0.3590***
β_{ST*SMB}	6.1247	9.4750	-6.9090	-6.6804	-6.7117	-4.3311	-2.4776	13.4146*	10.5667	-41.8165***	-5.5663	9.6643	-34.1759
β_{DY*SMB}	0.0597	0.0505	0.0251	0.1742	-0.0849	0.3665**	0.4804**	-0.1095	-0.1359	-0.1532	-0.3972*	-1.4003	-0.0509
β_{HML}	-0.0098	-0.3709***	-0.3236***	0.1969***	0.0942***	0.2893***	0.1128*	-0.2221***	-0.5051***	-0.2000***	-0.3237***	0.3106***	-0.2041*
β_{ST*HML}	15.4826	-6.6047	28.5907*	5.4276	11.0936	3.0641	41.9933***	-0.6035	28.1085**	16.3610	-2.6949	77.3390	73.3486*
β_{DY*HML}	0.4417	-0.2719	0.4514	-0.3859**	0.1361	-0.5999***	-0.7574**	-0.2470	0.9386**	-0.3567	-0.3901	0.8162	-0.9011
β_{RMW}	0.0331	-0.2131**	-0.3336***	-0.1107**	0.0950**	0.1280**	-0.0425	-0.0864	-0.3587***	-0.1142	-0.2373**	0.3349*	0.2331*
β_{ST*RMW}	3.9372	-18.4329	-24.8533*	28.1733***	21.3207***	-15.4173	5.8291	-10.5116	9.8376	21.4057	-43.3550	1.2778	25.6502
β_{DY*RMW}	0.0706	-0.5687*	0.0979	0.1650	0.2200	-0.2597	-0.2862	-0.2526	0.4662	-0.1482	-0.8189*	0.9847	2.0236*
β_{CMA}	0.1082	-0.2008**	-0.3438***	-0.0234	0.1404***	-0.0993	-0.1352*	-0.2833***	-0.2528*	-0.1602*	-0.2680***	-0.0819	0.3107
β_{ST*CMA}	-16.8356	4.1162	-3.9777	23.6563***	-0.5796	16.8745	31.2620**	4.7878	13.7107	-8.4461	31.9749	-133.0232	-110.3488
β_{DY*CMA}	-0.8583*	-0.3423	-1.3986**	1.0151***	0.4189	1.0167*	0.0666	-1.0230**	-1.1912*	-0.3238	-0.1644	-2.3490	-1.7969
R^2 **adj.**	0.9440	0.9257	0.9121	0.9676	0.9506	0.9704	0.9352	0.9318	0.8945	0.9589	0.9237	0.9169	0.8685

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with the S&P500 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the term spread (TS) and the short-term rate (ST). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 8 - Performance estimates using the conditional the Fama and French (2015) model - MSCI KLD 400 - Conventional funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0023**	-0.0006	0.0019	-0.0025	-0.0003	-0.0018	0.0020*	0.0001	0.0016	-0.0042**	-0.0010	-0.0000	0.0001
α_{ST}	-0.0954	0.6352	-0.0656	-0.1730	-0.6969	0.8299**	-0.0993	-0.0841	0.3143	0.9038**	-0.0435	0.0585	0.0175
α_{DY}	-0.0089	-0.0236*	-0.0034	-0.0402**	0.0067	-0.0065	0.0022	-0.0038	-0.0167	-0.0299*	-0.0067	-0.0058	-0.0001
β_{p*rm}	0.9117***	1.1043***	0.6097***	0.9685***	0.9599***	0.9891***	0.8599***	0.9553***	1.0621***	1.0750***	0.7929***	1.0132***	0.9219***
β_{ST*rm}	-4.6143	11.1253	21.5878	-17.6202	7.7683	-11.8830	1.2633	1.6307	-6.0611	4.7827	-24.6956**	1.2318	-4.4172
β_{DY*rm}	0.1432	0.0814	-0.3861	-0.0109	0.0366	-0.4440	0.0690	0.2079*	-0.2618	-0.1016	-0.1010	0.1960**	0.0281
β_{SMB}	0.0648	0.1818***	-0.0222	0.0568	0.0372	0.1283**	0.2860***	-0.0450	0.2285***	0.5042***	0.1275***	0.2421***	0.1516***
β_{ST*SMB}	-10.5929	-17.2312	14.9760	2.4897	15.2887	-1.8403	-0.9020	5.0271	-17.5951	-0.3764	19.5020**	3.2617	0.9980
β_{DY*SMB}	0.1753	0.1038	0.6070	1.3906***	1.0230	1.6774**	0.2399*	0.1254	-0.0646	0.0042	0.3524*	0.1116	0.2539*
β_{HML}	-0.0213	-0.3260***	-0.2912***	0.0771	0.2130*	-0.0949	0.2703***	0.2064***	-0.2740***	-0.2946***	-0.0222	0.1215***	-0.0090
β_{ST*HML}	4.8646	-11.9684	78.4074**	11.4245	-41.9827	-59.4168**	4.0149	34.6222***	30.3290**	78.5305***	20.7776	7.3220	-3.4721
β_{DY*HML}	-0.6406***	-0.5345	-1.4569	-0.6612	-0.0862	2.3104**	-0.3811	0.1816	0.2248	0.5668	0.0666	-0.3528**	-0.4356***
β_{RMW}	-0.1563**	-0.3966***	0.3779**	0.0641	-0.1647	-0.1444	0.0401	0.0009	-0.3402***	-0.0589	-0.0489	0.0304	-0.0990**
β_{ST*RMW}	-7.7126	-55.9308*	50.9054	35.3715	114.0564**	34.4717	18.9999	15.6466	-39.1180**	-25.3008	20.8089	2.7392	9.0769
β_{DY*RMW}	-0.0971	0.0652	0.3039	1.7311	-0.7219	0.4904	-0.0353	0.4230	0.0649	0.6297	0.2865	0.0216	-0.0005
β_{CMA}	-0.1742**	-0.5244***	0.4066**	-0.2141	-0.0843	-0.6512***	0.0532	0.0041	-0.5995***	-0.3657***	0.0458	-0.1001**	-0.1815***
β_{ST*CMA}	42.3442***	79.4521***	-95.0677	-68.8155	35.5227	37.0006	16.2104	18.2727	5.9861	19.2153	38.5269**	16.2776	7.0836
β_{DY*CMA}	0.6810	0.2503	-1.8037	-1.9146	1.2060	-1.7961	1.0957**	0.3542	-1.3476**	-1.0367*	-0.0242	0.3669	0.4560*
R^2 **adj.**	0.9370	0.9078	0.8253	0.9672	0.9061	0.9342	0.9300	0.9521	0.8956	0.8465	0.9349	0.9807	0.9602

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with the KLD400 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the term spread (TS) and the short-term rate (ST). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 8 - Performance estimates using the conditional the Fama and French (2015) model - MSCI KLD 400 - Conventional funds- continued

MSCI KLD 400													
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0005	0.0005	0.0009	0.0006	0.0011	0.0003	-0.0015	-0.0011	0.0012	0.0018*	-0.0014	0.0008	0.0016
α_{ST}	0.0793	0.1422	0.2799	-0.1799	0.1382	-0.0000	0.3890	0.0215	-0.1648	0.0473	0.6382	-0.8323	0.3578
α_{DY}	-0.0047	-0.0073	-0.0100	-0.0017	-0.0057	-0.0062	-0.0138	-0.0106	-0.0283**	0.0017	-0.0134	0.0161	0.0038
β_{p*rm}	0.9120***	1.0189***	1.0633***	0.9530***	0.8564***	0.9857***	1.0142***	0.9635***	0.9514***	0.9620***	1.0134***	0.8457***	0.8686***
β_{ST*rm}	-14.6802**	-3.7611	-7.8815	8.6060**	1.8534	-8.9253	-6.6279	-2.6276	0.8706	-18.0604**	11.3202	-6.5975	-15.5039
β_{DY*rm}	0.1226	0.0298	-0.2740*	0.1067	0.0206	0.3856**	0.4720**	0.1961	-0.3016	0.0517	0.1258	0.2859	-0.1897
β_{SMB}	-0.0516	0.1219***	0.1024*	0.0393	0.0183	0.9909***	0.5149***	0.4076***	0.8020***	0.3551***	0.4294***	0.8992***	0.3283***
β_{ST*SMB}	14.1147**	17.0467*	2.7319	1.3200	0.4508	3.4349	5.9230	21.3443***	19.3089	-36.7951*	-3.2986	16.2765	-29.6895
β_{DY*SMB}	0.1711	0.1747	0.1738	0.3216	0.0414	0.4815**	0.6034**	0.0098	0.0180	-0.0556	-0.3135	-0.9579	0.2337
β_{HML}	0.0493	-0.3042***	-0.2566***	0.2570***	0.1489***	0.3526***	0.1772***	-0.1618***	-0.4443***	-0.1829***	-0.3015***	0.3231***	-0.1909*
β_{ST*HML}	23.7390*	4.1231	39.5314**	17.0386*	20.7713**	13.2351	52.8012***	10.2427	38.3304**	15.3253	-1.0911	72.9754	68.2999*
β_{DY*HML}	0.3153	-0.3521*	0.3670	-0.3997	0.1098	-0.6961***	-0.8703**	-0.3365	0.9026**	-0.6699	-0.6330*	0.1996	-1.4247
β_{RMW}	0.0593	-0.1796*	-0.3018***	-0.0878	0.1170**	0.1586**	-0.0127	-0.0544	-0.3372***	-0.1315	-0.2484**	0.3341*	0.2412*
β_{ST*RMW}	9.5987	-9.5296	-18.4041	36.8271**	28.7503***	-7.9776	12.8765	-4.1219	17.4156	27.3373	-46.8598	29.5934	44.7082
β_{DY*RMW}	0.2601	-0.3312	0.3085	0.3386	0.3874	-0.0413	-0.0798	-0.0518	0.6347	-0.1531	-0.8045	0.8644	1.6972
β_{CMA}	0.0543	-0.2562***	-0.3993***	-0.0697	0.0961*	-0.1556**	-0.1912**	-0.3325***	-0.3012**	-0.1435	-0.2585**	-0.0851	0.3134*
β_{ST*CMA}	-2.5499	17.1202	6.3821	28.3541**	6.4352	31.3228**	43.8079***	14.1212	19.9133	1.1582	48.0696*	-134.6156	-105.8092
β_{DY*CMA}	-0.6791	-0.2110	-1.3089*	1.0515***	0.4728	1.1993*	0.2559	-0.8920	-1.1665	0.2078	0.1376	-2.4112	-1.7460
R^2 **adj.**	0.9287	0.9205	0.9008	0.9402	0.9279	0.9646	0.9234	0.9255	0.8777	0.9548	0.9160	0.9050	0.8740

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with the KLD400 as benchmark, from February 2004 - September 2019. It reports estimates performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). The predetermined information variables are the term spread (TS) and the short-term rate (ST). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 9 - Selectivity and timing abilities- Unconditional Carhart (1997) four-factor- Standard & Poor's 500 – Green funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0010	0.0010	0.0013	-0.0006	-0.0005	0.0023*	-0.0005	-0.0014**	0.0020**	-0.0011	-0.0014	-0.0030*	-0.0004
β_{p*rm}	0.9969***	1.1698***	0.9694***	1.0485***	1.0451***	0.8442***	0.9916***	0.9804***	0.8423***	1.1224***	1.2003***	0.9073***	0.9744***
β_{p*rm2}	-0.1248	-5.1291**	0.5290	0.3521	0.2512	-0.7367***	-0.1101	0.2497	-0.5330**	0.0043	0.0417	0.8456*	1.0654*
β_{SMB}	0.2229***	0.2347	0.1412***	0.1879***	0.3664***	0.2714***	0.1574***	0.0427**	0.0456	0.4250***	0.6035***	0.7602***	0.5421***
β_{SMB2}	-1.9507	4.1058	-0.9388	-0.1872	-2.2415	0.1466	-0.1449	0.2910	0.0428	-2.1250	-1.4721	1.4590	-2.8453**
β_{HML}	0.1545***	-0.0135	-0.2607***	-0.0329	-0.0368	-0.1275***	-0.0062	-0.0484**	-0.0217	0.1181**	0.2062***	0.0391	0.0867*
β_{HML2}	0.5725	-4.1025	-1.0001	1.8011**	1.9191**	0.5204	0.2257	-0.0796	0.3118	0.6718	-0.7481	1.0490*	2.1631**
β_{MOM}	-0.1688***	-0.2422**	0.1366**	-0.1350***	-0.0862	-0.1349***	-0.0055	-0.0158	0.0352	-0.1486***	-0.1421***	0.0830*	0.0367
β_{MOM2}	-0.0124	2.7996	1.1744	0.3211***	0.3122**	-0.0451	0.0503	0.0084	0.2890***	0.4297***	0.7830***	0.2540*	-0.7474
R^2 **adj.**	0.9302	0.8881	0.8958	0.8998	0.8712	0.9001	0.9885	0.9768	0.9175	0.9234	0.9280	0.9374	0.9266

This table presents regression estimates for the US green funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 9 - Selectivity and timing abilities- Unconditional Carhart (1997) four-factor- Standard & Poor's 500 – Green funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	0.0001	0.0007	0.0013	0.0001	0.0003	0.0030**	0.0003	-0.0008***	0.0027***	-0.0001	-0.0004	-0.0024	-0.0003
β_{p*rm}	0.9988***	1.1629***	0.9570***	1.0618***	1.0557***	0.8467***	0.9954***	1.0025***	0.8487***	1.1257***	1.2027***	0.9030***	0.9544***
β_{p*rm2}	-0.5857	-5.2218*	-0.0662	-0.0504	-0.1463	-1.1387***	-0.4850	-0.0474	-0.9058**	-0.4236	-0.4014	0.7841	0.4470
β_{SMB}	0.1696***	0.1696	0.0900*	0.1279**	0.3078***	0.2287***	0.1057***	-0.0182***	0.0003	0.3667***	0.5418***	0.7209***	0.4932***
β_{SMB2}	-2.3346	3.8620	-0.7994	-0.4105	-2.5176*	-0.0128	-0.4040	0.0433	-0.1614	-2.4229	-1.7929	1.2536	-2.7468**
β_{HML}	0.1698***	0.0198	-0.2545***	-0.0064	-0.0007	-0.1072**	0.0281	-0.0134**	0.0069	0.1568**	0.2477***	0.0582	0.0895*
β_{HML2}	0.5339	-3.5000	-0.6634	1.8709**	1.9920**	0.5220	0.2393	0.0451	0.3597	0.6847	-0.7477	1.0365*	2.5073***
β_{MOM}	-0.1627***	-0.2480***	0.1146**	-0.1159***	-0.0616	-0.1241***	0.0151	0.0114**	0.0532*	-0.1254***	-0.1176***	0.0784*	0.0123
β_{MOM2}	0.0115	3.1405	1.4756**	0.3488***	0.3554***	-0.0066	0.0928	0.0444***	0.3365***	0.4766***	0.8309***	0.1840	-0.4352
R^2 **adj.**	0.9237	0.8745	0.9031	0.9066	0.8746	0.8930	0.9825	0.9984	0.9154	0.9188	0.9231	0.9311	0.9245

This table presents regression estimates for the US green funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 10 - Selectivity and timing abilities- Unconditional Carhart (1997) four-factor- Standard & Poor's 500 – Conventional funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0015	0.0022	0.0014	-0.0016	0.0009	-0.0006	0.0023**	0.0004	0.0031**	-0.0020	-0.0007	0.0001	-0.0003
β_{p*rm}	0.9296***	1.1366***	0.6698***	1.0465***	0.9997***	1.0265***	0.8244***	0.9478***	1.1180***	1.1215***	0.8515***	1.0223***	0.9371***
β_{p*rm2}	-0.3830	-0.8411**	-0.9330	-0.1745	0.1432	0.3812	-0.4940**	0.0312	-0.5014	-0.8283*	-0.8884*	-0.0101	-0.1608
β_{SMB}	0.1310***	0.3304***	-0.0833	0.0944**	0.1004***	0.2173***	0.3048***	-0.0144	0.3578***	0.5461***	0.1070**	0.2810***	0.2027***
β_{SMB2}	-1.8240*	-2.5822**	-0.9087	-0.7236	-3.5048*	0.2131	0.5715	0.5140	-1.6815	-1.9960	-0.1097	-0.4946	-1.1604
β_{HML}	-0.1790***	-0.4869***	-0.0142	0.0875	0.1183**	-0.4238***	0.1581***	0.0983***	-0.4650***	-0.3958***	-0.0539	0.0254*	-0.1333***
β_{HML2}	0.2849	-0.9709	0.2191	-0.1486	-0.0893	-1.8047*	1.0943**	-0.4825	-0.3930	1.7415	-0.4748	0.2351	0.5164
β_{MOM}	-0.0564**	0.0472	0.0317	0.1074***	-0.0323	0.0453	-0.0892***	-0.0264	0.0501	0.2624***	-0.0166	-0.0107	-0.0512**
β_{MOM2}	0.2261**	0.1997	1.0912*	-0.2393	0.2802	0.4210	-0.2235**	-0.1315*	0.0328	0.0395	0.1930*	-0.0027	0.1890***
R^2 **adj.**	0.9528	0.9042	0.8157	0.9679	0.9294	0.8922	0.9381	0.9674	0.8837	0.8831	0.9246	0.9947	0.9610

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 10 - Selectivity and timing abilities- Unconditional Carhart (1997) four-factor- Standard & Poor's 500 – Conventional funds - continued

	Standard & Poor`s 500												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	-0.0002	-0.0003	0.0005	0.0007	0.0010	0.0009	0.0013	-0.0006	0.0004	0.0018	-0.0022	-0.0026	0.0008
β_{p*rm}	0.9475***	1.0918***	1.1187***	0.9640***	0.8487***	0.9958***	1.0584***	1.0252***	1.0616***	0.9963***	1.0550***	0.9383***	0.8455***
β_{p*rm2}	-0.4018**	-0.1307	-0.0083	0.2319	-0.1725	-0.7668**	-1.5893***	0.2783	-0.3986	-0.5191	0.5489*	0.7185	1.0166
β_{SMB}	-0.0623*	0.2079***	0.1949***	0.0965***	0.0084	0.9621***	0.5323***	0.4969***	0.8847***	0.4421***	0.5681***	0.8884***	0.2460***
β_{SMB2}	0.6317	-0.4257	-0.9261	-2.3655***	1.4014	0.6000	-3.4860**	-2.4549**	-2.0304	-0.5712	-1.7209	1.3422	-2.3000
β_{HML}	0.0456	-0.4054***	-0.4009***	0.1145***	0.1443***	0.1856***	-0.0884	-0.2979***	-0.4329***	-0.2897***	-0.3942***	0.3853***	-0.0489
β_{HML2}	-0.7272*	0.6690	-0.2186	1.5651***	0.4956	0.1744	2.6638	0.2855	0.4627	1.0474	0.9668	-1.9139	2.4990
β_{MOM}	-0.0025	0.0614**	0.0780*	-0.0312*	0.0187	-0.0246	-0.0574	0.0215	0.2449***	-0.0811*	0.0966**	0.0368	-0.0041
β_{MOM2}	0.3929***	-0.0186	0.2659*	-0.2925***	-0.3320***	0.3111***	0.1418	0.0168	0.2257*	-0.1319	-0.0808	0.6451	-0.5539
R^2 **adj.**	0.9446	0.9202	0.8910	0.9651	0.9519	0.9676	0.9175	0.9208	0.9005	0.9404	0.9174	0.9065	0.8542

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 10 - Selectivity and timing abilities – Unconditional Carhart (1997) four-factor - MSCI KLD 400 - Conventional funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0004	0.0034*	0.0018	-0.0012	0.0015	-0.0004	0.0029***	0.0014	0.0043***	-0.0008	0.0002	0.0011	0.0005
β_{p*rm}	0.9232***	1.1324***	0.6454***	1.0134***	0.9725***	1.0085***	0.8310***	0.9366***	1.1094***	1.1061***	0.8461***	1.0178***	0.9433***
β_{p*rm2}	-0.8095*	-1.3408**	-1.2602	-0.9618**	-0.5970	-0.3707	-0.7975***	-0.4018	-1.0346**	-1.3010**	-1.3206**	-0.4429	-0.5511*
β_{SMB}	0.0876*	0.2754***	-0.1061	0.0381	0.0551	0.1672***	0.2614***	-0.0571	0.3061***	0.4989***	0.0690	0.2332***	0.1523***
β_{SMB2}	-2.2872**	-3.1014*	-1.1300	-0.8438	-3.4972*	0.2558	0.3004	0.2997	-1.9758	-2.2900	-0.2130	-0.6673	-1.4007**
β_{HML}	-0.1718***	-0.4770***	-0.0104	0.0902*	0.1274**	-0.4191***	0.1833***	0.1213***	-0.4278***	-0.3577***	-0.0405	0.0432	-0.1013***
β_{HML2}	0.1712	-1.0835	0.5657	0.2785	0.0354	-1.4361	1.1027*	-0.5697	-0.4340	1.6164	-0.5725	0.1144	0.5624
β_{MOM}	-0.0572	0.0476	0.0178	0.0709**	-0.0594	0.0150	-0.0740***	-0.0178	0.0684	0.2778***	-0.0137	-0.0046	-0.0309
β_{MOM2}	0.2465*	0.2297	1.2402**	0.1358	0.6736	0.7801	-0.1873**	-0.1039	0.0926	0.0943	0.2197	0.0101	0.2344***
R^2 **adj.**	0.9284	0.8819	0.7871	0.9543	0.9113	0.8941	0.9348	0.9420	0.8645	0.8550	0.8550	0.8550	0.9593

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 10 - Selectivity and timing abilities – Unconditional Carhart (1997) four-factor - MSCI KLD 400 - Conventional funds - continued

MSCI KLD 400													
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0009	0.0007	0.0017	0.0020*	0.0019**	0.0020	0.0024	0.0004	0.0016	0.0024	-0.0014	-0.0018	0.0010
β_{p*rm}	0.9408***	1.0945***	1.1119***	0.9453***	0.8419***	0.9909***	1.0439***	1.0195***	1.0513***	1.0075***	1.0591***	0.9107***	0.8322***
β_{p*rm2}	-0.8583**	-0.6108*	-0.5909**	-0.3660	-0.5851**	-1.3281***	-2.0468**	-0.1975	-0.9708**	-0.8970	0.1750	-0.0399	0.6079
β_{SMB}	-0.1064***	0.1512***	0.1411**	0.0558*	-0.0311	0.9145***	0.4890***	0.4472***	0.8362***	0.3930***	0.5118***	0.8470***	0.2067***
β_{SMB2}	0.3824	-0.7115	-1.2314	-2.6475***	1.1721	0.3506	-3.7415**	-2.7426**	-2.3133	-0.5351	-2.1843	1.1297	-2.4079
β_{HML}	0.0771*	-0.3686***	-0.3645***	0.1443***	0.1723***	0.2178***	-0.0522	-0.2639***	-0.3985***	-0.2842***	-0.3888***	0.3903***	-0.0394
β_{HML2}	-0.7548	0.7025	-0.2124	1.5232***	0.4709	0.1880	2.5307	0.2769	0.4392	1.1041	0.9438	-1.6317	2.7578*
β_{MOM}	0.0132	0.0837**	0.0979*	-0.0180	0.0328*	-0.0077	-0.0443	0.0403	0.2618***	-0.0943*	0.0974**	0.0031	-0.0186
β_{MOM2}	0.4440***	0.0351	0.3263**	-0.2367**	-0.2881***	0.3776***	0.2032	0.0632	0.2880*	-0.1945	-0.0883	0.9669	-0.3094
R^2 **adj.**	0.9245	0.9134	0.8749	0.9335	0.9310	0.9583	0.8898	0.9074	0.8845	0.9345	0.9056	0.8951	0.8568

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 11 - Selectivity and timing abilities- Unconditional Fama and French (2015) - Standard & Poor`s 500 - Green funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0015	0.0032	0.0025	-0.0016	-0.0005	0.0017	-0.0004	-0.0009	0.0029**	-0.0021	-0.0028	-0.0035*	-0.0011
β_{p*rm}	1.0640***	1.2612***	0.9136***	1.1150***	1.0631***	0.8995***	0.9965***	0.9835***	0.8629***	1.1996***	1.2850***	0.9261***	0.9544***
β_{p*rm2}	0.2494	-3.3349**	0.3999	1.0039	0.8537	-0.4609	-0.0357	0.3260*	-0.4311**	0.7218	1.1037	0.5998*	0.8266
β_{SMB}	0.1896***	0.3283**	0.0669	0.1837***	0.3106***	0.2641***	0.1556***	0.0316*	0.0723*	0.4054***	0.6017***	0.8199***	0.5816***
β_{SMB2}	-0.8350	-1.1006	-0.1400	1.1299	-0.3189	0.5689	0.0037	0.4505	0.4904	-0.1433	1.4216	1.3655	-2.6949*
β_{HML}	0.3128***	0.1456	-0.2318***	0.1732**	0.0719	-0.0800	0.0133	-0.0337	-0.0378	0.2596***	0.3822***	-0.0546	0.0952
β_{HML2}	2.5434***	-3.6652	-0.7701	3.9615***	3.0886***	1.3821**	0.4972***	0.1818	0.7335	2.6061**	1.4494	0.5720	0.9086
β_{RMW}	-0.0435	-0.2169	-0.1299	0.0983	-0.1649	0.0269	0.0119	-0.0098	0.1555***	0.0413	0.1085	0.2175**	0.1240
β_{RMW2}	2.5675	-7.3109	-5.6340	0.7806	-2.7734	-3.7195	-0.0859	-1.5721	-0.8003	-1.5766	-4.3304	3.0109	0.8737
β_{CMA}	-0.0261	-0.0615	-0.3778***	-0.2213*	-0.0727	0.1602*	-0.0260	0.0168	0.0785	-0.0147	-0.0944	0.1546	-0.0861
β_{CMA2}	-14.0215***	12.7959	6.3578*	-11.4756**	-5.8564	-2.4399	-2.3402***	-2.2241	-6.8131**	-9.5579*	-8.5476	0.8241	3.7669
R^2 **adj.**	0.9178	0.8708	0.9047	0.8859	0.8638	0.8876	0.9884	0.9768	0.9199	0.9041	0.9037	0.9412	0.9264

This table presents regression estimates for the US green funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2, RMW2 and CMA2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 11 - Selectivity and timing abilities- Unconditional Fama and French (2015) - MSCI KLD 400 – Green funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0012	-0.0001	0.0017	-0.0016	-0.0002	0.0020	-0.0000	-0.0007***	0.0032***	-0.0018	-0.0025	-0.0035*	-0.0019
β_{p*rm}	1.0606***	1.2580***	0.9117***	1.1209***	1.0650***	0.8980***	0.9933***	0.9978***	0.8626***	1.1947***	1.2777***	0.9262***	0.9477***
β_{p*rm2}	-0.1233	-3.0893*	-0.0065	0.7071	0.5880	-0.8095	-0.4083	-0.0081	-0.7939***	0.4601	0.9113	0.4247	0.3812
β_{SMB}	0.1396*	0.2624	0.0293	0.1303*	0.2642***	0.2264***	0.1158***	-0.0144***	0.0379	0.3558***	0.5483***	0.7776***	0.5441***
β_{SMB2}	-1.2533	-1.5815	-0.0248	0.7409	-0.7478	0.3972	-0.2886	0.1003	0.2765	-0.6136	0.8664	1.0341	-2.6048*
β_{HML}	0.3216***	0.1414	-0.2177***	0.1899***	0.0989	-0.0638	0.0397	-0.0132**	-0.0153	0.2938***	0.4204***	-0.0607	0.1102*
β_{HML2}	2.1474***	-2.7302	-0.6424	3.6369***	2.7891***	1.1269	0.2394	-0.0018	0.5372	2.2202*	0.9932	0.2955	1.0748
β_{RMW}	-0.0559	-0.2259	-0.0906	0.1065	-0.1527	0.0316	0.0218	0.0100	0.1661**	0.0505	0.1161	0.1953*	0.1667
β_{RMW2}	3.0708	0.1722	-3.5903	1.5080	-2.1152	-3.3505	0.4862	-0.7166**	-0.2694	-1.0223	-3.8284	3.6010	3.0205
β_{CMA}	-0.0554	-0.0820	-0.3916***	-0.2586**	-0.1195	0.1284	-0.0698*	-0.0196*	0.0419	-0.0723	-0.1591	0.1844	-0.1043
β_{CMA2}	-9.8052**	17.0091	8.6309**	-7.8435	-2.7618	0.5912	0.6216	0.5325	-4.2668	-6.0059	-4.7348	3.8881	5.9802
R^2 **adj.**	0.9100	0.8573	0.9132	0.8953	0.8686	0.8810	0.9826	0.9984	0.9152	0.9016	0.9015	0.9361	0.9294

This table presents regression estimates for the US green funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2, RMW2 and CMA2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 12 - Selectivity and timing abilities - Unconditional Fama and French (2015) - Standard & Poor`s 500 - Conventional funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0023*	0.0026	0.0024	-0.0011	0.0002	-0.0002	0.0013	0.0004	0.0049***	0.0020	-0.0010	-0.0000	-0.0006
β_{p*rm}	0.9311***	1.0574***	0.6969***	0.9704***	1.0091***	0.9784***	0.8667***	0.9563***	1.0268***	1.0064***	0.8371***	1.0241***	0.9458***
β_{p*rm2}	0.0674	-0.4278	-1.4230*	-0.5397	0.3261	0.6619	-0.5939***	-0.0416	-0.0994	-1.2014*	-0.5460	0.0365	0.2239
β_{SMB}	0.1078***	0.2759***	-0.0088	0.0908**	0.0737*	0.1455***	0.3050***	-0.0206	0.2864***	0.5574***	0.0922**	0.2865***	0.1615***
β_{SMB2}	-0.1351	-1.0648	0.4560	0.2825	-3.6499**	0.4303	0.1440	0.2181	-1.0828	-2.8931	1.0774	-0.5581	0.0430
β_{HML}	-0.0887	-0.3966***	-0.1969**	0.0977*	0.1643**	-0.2565***	0.1787***	0.0992***	-0.3574***	-0.5185***	-0.0644	0.0408**	-0.0384
β_{HML2}	0.7879	-1.2410*	-1.1314	-0.0277	-0.2893	-1.0854	1.5610***	-0.3760	-0.3635	0.2579	-0.8743	0.2957	1.4378***
β_{RMW}	-0.1449***	-0.3259***	0.3403***	0.0550	-0.0909	-0.1590*	0.0488	-0.0091	-0.3121***	-0.0317	-0.1353**	0.0256	-0.1392***
β_{RMW2}	-1.2521	-2.4739	-4.2944	-4.7570	0.2661	-3.7224	2.3368	0.6031	-6.1977*	-3.2660	-6.0020***	-1.0638*	0.9688
β_{CMA}	-0.1487**	-0.4148***	0.3158**	-0.2685***	-0.0718	-0.5081***	0.1077	0.0439	-0.4301***	-0.1128	0.0256	-0.0299	-0.1412***
β_{CMA2}	0.2092	4.5559	4.5044	0.2133	3.6113	1.6193	-2.2166	-1.0653	1.7708	-0.0576	7.6090**	1.0342	-5.7883**
R^2 adj.	0.9496	0.9218	0.8596	0.9713	0.9295	0.9200	0.9344	0.9666	0.9040	0.8454	0.9288	0.9947	0.9600

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2, RMW2 and CMA2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 12 - Selectivity and timing abilities - Unconditional Fama and French (2015) - Standard & Poor`s 500 - Conventional funds - continued

	Standard & Poor`s 500												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0001	0.0014	0.0034**	0.0010	0.0015	-0.0007	0.0017	0.0004	0.0042**	0.0029*	0.0004	-0.0025	0.0022
β_{p*rm}	0.9564***	1.0224***	1.0281***	0.9625***	0.8535***	1.0233***	1.0652***	0.9763***	0.9104***	0.9817***	0.9663***	0.9027***	0.8675***
β_{p*rm2}	-0.0088	-0.0009	0.5131	0.0596	-0.6385**	-0.4413	-1.1534**	0.5748*	-0.3667	-0.1983	0.5549*	0.6186	0.3295
β_{SMB}	-0.0676*	0.1649***	0.1215**	0.0748***	0.0329	1.0016***	0.5017***	0.4707***	0.8448***	0.3893***	0.5353***	0.9656***	0.3230***
β_{SMB2}	2.0113	-0.2413	0.4274	-3.0332***	-0.0391	1.2101	-2.6716*	-2.3786**	-1.5032	-0.1213	-2.1711	1.8757	-2.3351*
β_{HML}	0.0766	-0.3821***	-0.3281***	0.1212***	0.0639*	0.2368***	0.0172	-0.2134***	-0.5102***	-0.1916***	-0.4209***	0.3674***	-0.1312*
β_{HML2}	-0.2751	0.3093	-0.1471	1.6598***	-0.0213	0.4828	3.6563*	0.4388	-1.2114	1.6368*	0.0278	-2.9465	0.6857
β_{RMW}	-0.0046	-0.1970***	-0.2931***	-0.0567	0.1156***	0.1413***	-0.0510	-0.0968*	-0.2905***	-0.1713*	-0.1591*	0.2908**	0.1999**
β_{RMW2}	-2.9446	-4.9064	-9.4632***	1.0809	1.1129	-0.9997	-3.7095	-5.7317***	-7.9050*	-7.0785**	-7.4015**	-3.8366	-6.9154**
β_{CMA}	-0.0116	-0.1924**	-0.2970***	0.0196	0.1774***	-0.1132*	-0.1473	-0.3019***	-0.2308*	-0.1436*	-0.1579	-0.1460	0.2716**
β_{CMA2}	-2.3817	2.2139	-1.1632	-1.7879	0.6532	3.7672	-4.6240	1.9750	6.4339	-0.1181	5.9388	6.9844	3.7801
R^2 **adj.**	0.9387	0.9257	0.9096	0.9627	0.9497	0.9662	0.9164	0.9296	0.8880	0.9449	0.9177	0.9136	0.8718

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2, RMW2 and CMA2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 12 - Selectivity and timing abilities - Unconditional Fama and French (2015) - MSCI KLD 400 - Conventional funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0022	0.0027	0.0016	-0.0021	0.0001	-0.0010	0.0017	0.0008	0.0055***	0.0028	-0.0007	0.0004	-0.0003
β_{p*rm}	0.9223***	1.0503***	0.6820***	0.9553***	0.9937***	0.9698***	0.8695***	0.9401***	1.0097***	0.9795***	0.8287***	1.0143***	0.9455***
β_{p*rm2}	-0.2192	-0.7914	-1.6055*	-0.9057***	-0.2971	0.2033	-0.9375***	-0.4899	-0.5182	-1.7499**	-0.8657	-0.3918	-0.0762
β_{SMB}	0.0693	0.2312***	-0.0287	0.0398	0.0378	0.1101**	0.2684***	-0.0565	0.2502***	0.5278***	0.0588	0.2437***	0.1222***
β_{SMB2}	-0.5569	-1.4515	0.1478	-0.0859	-3.6735**	0.4363	-0.1414	0.0514	-1.3482	-3.0123	1.0116	-0.7043	-0.2753
β_{HML}	-0.0941	-0.4041***	-0.1931*	0.1161**	0.1840**	-0.2378***	0.1976***	0.1187**	-0.3265***	-0.4850***	-0.0520	0.0542	-0.0137
β_{HML2}	0.3161	-1.7460***	-0.8581	0.4390	-0.3061	-0.8301	1.3612**	-0.6903	-0.6826	-0.0506	-1.2010	-0.0884	1.1860**
β_{RMW}	-0.1731***	-0.3569***	0.3477***	0.0510	-0.0525	-0.1161	0.0619	-0.0116	-0.3098***	-0.0336	-0.1469**	0.0123	-0.1288***
β_{RMW2}	-0.9084	-2.0374	-1.4814	-0.5523	1.9747	-1.5092	2.6830	0.9362	-5.8018	-3.0217	-5.7310**	-0.5742	1.5274
β_{CMA}	-0.1583*	-0.4213***	0.3039*	-0.2953***	-0.0821	-0.5350***	0.0767	0.0063	-0.4798***	-0.1637	-0.0078	-0.0671	-0.1828***
β_{CMA2}	4.7346	9.7440**	6.7832	2.7447	5.9602	3.7825	0.3923	2.3080	4.9567	3.1743	10.7886**	4.7809**	-3.0091
R^2 **adj.**	0.9262	0.9025	0.8351	0.9614	0.9096	0.9222	0.9324	0.9412	0.8861	0.8159	0.9091	0.9794	0.9596

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2, RMW2 and CMA2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 12 - Selectivity and timing abilities - Unconditional Fama and French (2015) - MSCI KLD 400 - Conventional funds -continued

	MSCI KLD 400												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0006	0.0019	0.0041**	0.0018	0.0021*	-0.0002	0.0022	0.0009	0.0050**	0.0028	0.0003	-0.0024	0.0018
β_{p*rm}	0.9423***	1.0166***	1.0106***	0.9396***	0.8424***	1.0149***	1.0437***	0.9632***	0.8893***	0.9936***	0.9694***	0.8905***	0.8671***
β_{p*rm2}	-0.3465	-0.4595	0.0670	-0.5585	-1.1675***	-0.9031*	-1.4611*	0.1559	-0.9024	-0.5591	0.1278	0.0519	-0.0977
β_{SMB}	-0.1022**	0.1251**	0.0843	0.0437	0.0034	0.9635***	0.4669***	0.4341***	0.8157***	0.3401***	0.4874***	0.9344***	0.2879***
β_{SMB2}	1.7372	-0.5135	0.1280	-3.2043***	-0.1612	0.9735	-2.9114	-2.6757**	-1.6529	-0.2398	-2.5116	1.6161	-2.3511*
β_{HML}	0.1057	-0.3560***	-0.2993***	0.1470***	0.0862*	0.2650***	0.0562	-0.1873***	-0.4838***	-0.2081***	-0.4426***	0.3894***	-0.1177*
β_{HML2}	-0.5826	0.0609	-0.4592	1.4111**	-0.2033	0.2234	3.2619	0.1577	-1.4613*	1.3867	-0.3263	-2.8806	0.7010
β_{RMW}	-0.0018	-0.1876**	-0.2911***	-0.0567	0.1214**	0.1494**	-0.0514	-0.0928	-0.2903**	-0.2019**	-0.1888*	0.3201**	0.2298**
β_{RMW2}	-2.5931	-4.2698	-8.9674***	1.6132	1.6301	-0.4557	-3.6306	-5.1976**	-7.4988*	-6.9294*	-6.4169*	-2.5338	-5.1971
β_{CMA}	-0.0587	-0.2356***	-0.3445***	-0.0217	0.1422**	-0.1586**	-0.2075**	-0.3454***	-0.2723*	-0.1052	-0.1326	-0.1588	0.2698***
β_{CMA2}	0.5604	5.2873	2.0365	1.2958	3.2948	6.8660*	-1.3068	4.9798	9.3361	3.5529	10.2229**	9.2905	5.9492
R^2 **adj.**	0.9178	0.9181	0.8921	0.9316	0.9285	0.9581	0.8891	0.9172	0.8709	0.9382	0.9066	0.9047	0.8770

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2, RMW2 and CMA2 refers to squared risk factors. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 13 - Selectivity and timing abilities - Conditional Carhart (1997) four-factor - Standard & Poor`s 500 - Green funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0012	0.0045	0.0010	-0.0000	-0.0001	0.0022	-0.0006	-0.0016***	0.0019**	-0.0014	-0.0023	-0.0026*	0.0014
β_{p*rm}	1.0412***	1.2104***	0.9907***	1.0647***	1.0009***	0.8259***	0.9891***	0.9866***	0.8709***	1.1255***	1.1808***	0.9375***	0.9697***
β_{p*rm2}	-0.6364**	-6.5045***	0.5657	-0.1809	0.4859	-0.3362	-0.0699	0.2622*	-0.6785**	0.2981	0.6609	0.5656	-0.1355
β_{SMB}	0.2415***	0.3406	0.2094***	0.1501***	0.3496***	0.2819***	0.1561***	0.0342*	0.0664*	0.4449***	0.6052***	0.7770***	0.5734***
β_{SMB2}	-1.4102	10.2401*	-1.6643	0.3549	-1.0854	0.0773	-0.2213	0.3438	-0.0676	-1.0704	-0.8524	0.4774	-3.3611**
β_{HML}	0.1630***	0.0343	-0.2176***	-0.0394	-0.0276	-0.1354***	-0.0013	-0.0850***	-0.0293	0.1239**	0.1685***	0.0601	0.0360
β_{HML2}	0.0099	-8.4557	-0.6885	1.7520	0.5053	0.5413	0.3523	0.5032	0.9585	-1.6112	-1.6259	2.0652*	3.3984***
β_{MOM}	-0.2282***	-0.2494	0.1690***	-0.1600***	-0.0385	-0.1018**	-0.0107	-0.0119	0.0047	-0.1507***	-0.1111**	0.0407	0.0376
β_{MOM2}	-0.0911	2.0204	1.4984*	-0.0036	-0.1239	-0.3330**	-0.0111	-0.0785	0.1674	0.2435	0.6043***	0.7980***	-0.8989
R^2 **adj.**	0.9444	0.9039	0.8928	0.9063	0.8837	0.9030	0.9887	0.9800	0.9257	0.9362	0.9340	0.9451	0.9310

This table presents regression estimates for the US green funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 13 - Selectivity and timing abilities - Conditional Carhart (1997) four-factor - MSCI KLD 400- Green funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	0.0001	0.0051	0.0011	0.0010	0.0010	0.0031*	0.0004	-0.0009***	0.0028***	-0.0002	-0.0010	-0.0018	0.0015
β_{p*rm}	1.0360***	1.1284***	0.9739***	1.0630***	1.0016***	0.8191***	0.9885***	1.0012***	0.8719***	1.1249***	1.1716***	0.9352***	0.9543***
β_{p*rm2}	-1.0486**	-7.3093***	-0.0376	-0.5984	0.0210	-0.6742*	-0.4448*	-0.0022	-1.0333**	-0.1163	0.2720	0.4153	-0.7381
β_{SMB}	0.2017***	0.2739	0.1745**	0.1017*	0.3005***	0.2459***	0.1091***	-0.0185***	0.0237	0.3950***	0.5564***	0.7451***	0.5420***
β_{SMB2}	-1.6283	10.6198*	-1.7547	0.0744	-1.3115	-0.0839	-0.4190	0.0651	-0.3451	-1.4118	-1.1308	0.6437	-3.4860***
β_{HML}	0.2192***	-0.0586	-0.2554***	0.0233	0.0349	-0.0869*	0.0638***	-0.0194***	0.0300	0.2000***	0.2447***	0.0959	0.0084
β_{HML2}	-0.5566	-7.2541	-0.3180	1.2788	-0.0511	0.0189	-0.2113	0.0803	0.4773	-2.2806	-2.3344*	1.5610	3.7264***
β_{MOM}	-0.2174***	-0.3748**	0.1215**	-0.1378***	-0.0155	-0.0875**	0.0137	0.0164***	0.0241	-0.1250***	-0.0830*	0.0444	-0.0036
β_{MOM2}	0.0114	2.0081	2.0089**	0.1269	-0.0072	-0.2479**	0.0934	0.0288**	0.2683**	0.3481*	0.7141***	0.7556***	-0.4181
R^2 **adj.**	0.9394	0.8985	0.9009	0.9097	0.8844	0.8952	0.9854	0.9985	0.9218	0.9317	0.9275	0.9383	0.9274

This table presents regression estimates for the US green funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 14 - Selectivity and timing abilities - Conditional Carhart (1997) four-factor - Standard & Poor`s 500 - Conventional funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0013	0.0021	0.0006	-0.0023	0.0013	-0.0054**	0.0026**	0.0007	0.0037**	-0.0017	-0.0005	0.0002	0.0001
β_{p*rm}	0.9120***	1.0972***	0.7227***	1.0887***	0.9937***	1.0149***	0.8498***	0.9673***	1.0859***	1.1209***	0.7918***	1.0214***	0.9211***
β_{p*rm2}	-0.0644	-0.7013**	-0.6331	0.2165	-0.6050	1.8820**	-0.9236**	-0.1642	-0.1265	-0.7413	0.0928	-0.0536	-0.0267
β_{SMB}	0.1351***	0.3322***	-0.0577	0.1096***	0.0949**	0.2723***	0.2918***	-0.0039	0.3631***	0.5713***	0.1694***	0.2738***	0.1902***
β_{SMB2}	-1.8188*	-1.6628	-5.6315**	0.8359	-2.3163	2.3505	0.7594	0.3939	-1.3066	-2.4628	-1.2231	-0.3444	-1.2656*
β_{HML}	-0.1324***	-0.4981***	0.0811	0.2117***	0.1280	-0.3076***	0.1727***	0.1497***	-0.4350***	-0.3054***	-0.0170	0.0404***	-0.1260***
β_{HML2}	-1.0446	-2.8173**	3.8743***	-2.3985**	-0.2276	-4.1180***	0.9325	-0.5607	-2.8115**	-0.4375	-0.5984	-0.2531	-0.2714
β_{MOM}	-0.0529**	0.0234	0.1666	0.1791***	-0.0375	0.0573	-0.1108***	-0.0360	0.0578	0.2373***	0.0166	-0.0095	-0.0284
β_{MOM2}	0.2303**	0.1722	0.2737	-0.2449	0.2747	1.4817**	-0.3274**	-0.0991	-0.1550	0.1291	0.2229	-0.0356	0.0143
R^2 adj.	0.9587	0.9052	0.8148	0.9730	0.9276	0.9042	0.9392	0.9749	0.8895	0.8939	0.9500	0.9947	0.9635

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports estimates of performance (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 14 - Selectivity and timing abilities - Conditional Carhart (1997) four-factor - Standard & Poor`s 500 - Conventional funds - continued

	Standard & Poor`s 500												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	-0.0006	0.0002	0.0014	0.0010	0.0005	0.0008	0.0025*	-0.0000	0.0006	0.0012	-0.0022	0.0007	0.0021
β_{p*rm}	0.9299***	1.0421***	1.0962***	0.9913***	0.8787***	0.9785***	1.0192***	0.9722***	1.0254***	0.9642***	1.0260***	0.9037***	0.8404***
β_{p*rm2}	0.1965	0.1064	0.2940	-0.0522	-0.2127	-0.7051**	-1.3937***	0.5413	0.2420	0.3958	0.7495	-0.0247	0.6426
β_{SMB}	-0.0387	0.2030***	0.2065***	0.1070***	0.0274	0.9851***	0.5371***	0.4848***	0.9008***	0.4220***	0.5586***	0.7766***	0.2449***
β_{SMB2}	-0.2869	-0.1458	-0.8160	-1.9688***	1.2430	0.8359	-3.7760***	-2.1771*	-2.7857	-0.4798	-1.7876	2.4054	-3.9440*
β_{HML}	0.0384	-0.3908***	-0.3436***	0.1491***	0.1315***	0.2110***	0.0701	-0.2659***	-0.4260***	-0.2835***	-0.3939***	0.4040***	-0.1408*
β_{HML2}	0.0974	-0.3401	-3.0936***	0.7438	1.1578**	0.2726	-0.7790	-1.1783	-0.0147	-0.2216	0.1014	-1.7965	4.1252**
β_{MOM}	0.0268	0.0858***	0.1063**	-0.0363*	0.0067	-0.0361	-0.0369	0.0352	0.2633***	-0.0426	0.0647	0.0528	-0.0088
β_{MOM2}	0.3927***	-0.1189	0.2000	-0.2572***	-0.2519***	0.3657***	-0.0098	-0.0069	0.0470	-0.3568*	-0.0323	-0.6118	-0.8070
R^2 **adj.**	0.9500	0.9224	0.8971	0.9720	0.9549	0.9700	0.9432	0.9246	0.9024	0.9563	0.9207	0.9085	0.8549

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 14 - Selectivity and timing abilities - Conditional Carhart (1997) four-factor - MSCI KLD 400- Conventional funds

MSCI KLD 400													
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	0.0001	0.0037	0.0018	-0.0010	0.0024	-0.0055**	0.0035***	0.0018*	0.0052***	-0.0004	0.0008	0.0017**	0.0011
β_{p*rm}	0.9024***	1.0923***	0.6806***	1.0499***	0.9706***	0.9935***	0.8513***	0.9537***	1.0705***	1.1042***	0.7866***	1.0104***	0.9218***
β_{p*rm2}	-0.6383*	-1.4306***	-1.3510	-0.9300	-1.5879*	1.2716	-1.2126***	-0.6212**	-0.7050*	-1.1934**	-0.4326	-0.5592**	-0.3920
β_{SMB}	0.0962**	0.2776***	-0.0805	0.0587	0.0723	0.2445***	0.2561***	-0.0429	0.3103***	0.5222***	0.1256***	0.2332***	0.1445***
β_{SMB2}	-1.7933*	-1.5525	-5.5437**	0.7792	-2.5440	2.1322	0.4566	0.3131	-1.4832	-2.6400	-1.2338	-0.3398	-1.4878**
β_{HML}	-0.0929**	-0.4453***	0.0452	0.1562**	0.1057	-0.3754***	0.2304***	0.2086***	-0.3636***	-0.2312***	0.0264	0.0979***	-0.0650**
β_{HML2}	-1.9054**	-3.8645***	4.1898***	-1.7970	-0.0162	-3.5951***	0.5197	-1.2044*	-3.6572**	-1.1819	-1.4399	-1.0335**	-0.7981
β_{MOM}	-0.0494	0.0300	0.1203	0.1056**	-0.0769	-0.0061	-0.0906***	-0.0187	0.0785	0.2623***	0.0231	0.0035	-0.0063
β_{MOM2}	0.3019**	0.2540	0.4574	0.1369	0.7735	2.0985***	-0.2306	-0.0079	-0.0389	0.2495	0.2984*	0.0554	0.1153*
R^2 **adj.**	0.9376	0.8864	0.7724	0.9621	0.9081	0.9112	0.9357	0.9565	0.8717	0.8767	0.9323	0.9812	0.9622

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions wit KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 14 - Selectivity and timing abilities - Conditional Carhart (1997) four-factor - MSCI KLD 400- Conventional funds - continued

	MSCI KLD 400												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0005	0.0013	0.0027*	0.0024**	0.0015*	0.0021	0.0036**	0.0012	0.0019	0.0022	-0.0008	0.0022	0.0023
β_{p*rm}	0.9205***	1.0429***	1.0883***	0.9729***	0.8655***	0.9756***	1.0107***	0.9643***	1.0078***	0.9679***	1.0233***	0.8814***	0.8272***
β_{p*rm2}	-0.2197	-0.4324	-0.2395	-0.6405*	-0.5657*	-1.3595***	-1.8702***	0.0108	-0.2699	-0.0665	0.1515	-1.0742	0.4686
β_{SMB}	-0.0825**	0.1446***	0.1513**	0.0679**	-0.0071	0.9354***	0.4915***	0.4357***	0.8519***	0.3811***	0.5083***	0.7613***	0.2268***
β_{SMB2}	-0.3990	-0.2246	-0.9818	-2.1523**	1.0103	0.7657	-3.8131***	-2.2436*	-2.9330	-0.0211	-1.7338	2.0540	-4.3453**
β_{HML}	0.0972**	-0.3212***	-0.2724***	0.2157***	0.1888***	0.2747***	0.1364**	-0.2051***	-0.3607***	-0.2526***	-0.3550***	0.3661***	-0.1562*
β_{HML2}	-0.5662	-1.0702	-3.8006***	0.0890	0.6405	-0.3783	-1.4233	-1.8562**	-0.7951	-0.8714	-0.6477	-1.4741	4.3588**
β_{MOM}	0.0469	0.1105***	0.1318**	-0.0164	0.0258	-0.0165	-0.0137	0.0568	0.2839***	-0.0390	0.0737	0.0003	-0.0339
β_{MOM2}	0.4872***	-0.0070	0.3258	-0.1457*	-0.1550*	0.4879***	0.1054	0.1025	0.1586	-0.3690*	0.0643	-0.1739	-0.4564
R^2 **adj.**	0.9367	0.9193	0.8901	0.9469	0.9352	0.9650	0.9317	0.9180	0.8891	0.9528	0.9123	0.8910	0.8576

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions wit KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2 HML2 and MOM2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 15 - Selectivity and timing abilities - Conditional Fama and French (2015) - Standard & Poor`s 500 - Green funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0016	0.0076	0.0037	-0.0009	-0.0004	0.0023*	-0.0004	-0.0010	0.0025**	-0.0034*	-0.0041	-0.0026	-0.0003
β_{p*rm}	1.0832***	1.2204***	0.8902***	1.1059***	1.0120***	0.8388***	0.9921***	0.9886***	0.8860***	1.1678***	1.2259***	0.9423***	0.9610***
β_{p*rm2}	0.2681	-7.0778***	0.3561	0.6954	0.7491*	-0.0614	-0.0322	0.2969*	-0.4579**	1.3356**	1.9634**	0.6621*	0.5334
β_{SMB}	0.2113***	0.4194**	0.0867	0.1594**	0.3330***	0.3030***	0.1509***	0.0192	0.0877**	0.4612***	0.6590***	0.8279***	0.6144***
β_{SMB2}	-1.2104	8.3942	-0.9498	1.1847	0.4618	-0.0074	-0.1658	0.2225	0.1135	0.1934	1.2031	0.7916	-3.2661**
β_{HML}	0.3227***	0.3867	-0.2755***	0.1096	-0.0350	-0.1502***	0.0077	-0.0777***	-0.0366	0.2336***	0.2491***	0.0151	0.0711
β_{HML2}	2.9481***	-7.7950**	0.2797	4.5385**	1.7677	1.3196	0.6222**	0.9578**	1.6367*	1.1696	1.7634	1.3481	3.0392***
β_{RMW}	-0.1077	-0.1423	-0.1890*	0.0299	-0.1745	0.0082	0.0050	-0.0323	0.1030*	0.0161	0.1367	0.2068**	0.0650
β_{RMW2}	-2.2461	9.4675	-3.2577	2.0595	1.6034	-0.6795	-0.1931	-0.7692	-0.3436	0.8771	-1.1852	1.0161	0.5929
β_{CMA}	-0.0129	-0.3975	-0.3777**	-0.1513	0.0296	0.2644***	-0.0054	0.0131	0.0817	-0.0744	-0.0850	0.1090	-0.1634
β_{CMA2}	-12.1090***	2.4138	5.9122	-13.6394**	-5.1045	-3.7253	-2.1753**	-3.2854**	-6.8427**	-8.2047	-9.5663	-0.3470	0.9685
R^2 **adj.**	0.9291	0.8940	0.9062	0.8913	0.8775	0.8993	0.9885	0.9799	0.9302	0.9230	0.9185	0.9449	0.9343

This table presents regression estimates for the US green funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2, HML2, RMW2 and CMA2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 15 - Selectivity and timing abilities - Conditional Fama and French (2015) - MSCI KLD 400 – Green funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0010	-0.0005	0.0026	-0.0006	-0.0001	0.0026*	-0.0000	-0.0008***	0.0029***	-0.0031	-0.0037	-0.0020	-0.0012
β_{p*rm}	1.0713***	1.2366***	0.8853***	1.0995***	1.0089***	0.8298***	0.9867***	0.9979***	0.8808***	1.1575***	1.2062***	0.9374***	0.9529***
β_{p*rm2}	0.0209	-6.5151**	0.2314	0.4578	0.4481	-0.3629	-0.3952	0.0040	-0.7265**	1.1419	1.8051*	0.2409	0.0993
β_{SMB}	0.1809***	0.2905	0.0488	0.1253*	0.3035***	0.2784***	0.1233***	-0.0144**	0.0649*	0.4318***	0.6286***	0.7889***	0.5787***
β_{SMB2}	-1.3262	7.6619	-1.2369	0.9639	0.3283	-0.0043	-0.1769	0.0960	0.0309	0.0316	1.0585	1.0949	-3.4837***
β_{HML}	0.3800***	0.3425	-0.2741***	0.1738**	0.0235	-0.1019*	0.0655***	-0.0204**	0.0159	0.3064***	0.3274***	0.0231	0.0735
β_{HML2}	1.7664**	-6.3352	0.4225	3.3936**	0.6995	0.3555	-0.3986	0.0650	0.8223	-0.2007	0.1612	0.0507	3.1305***
β_{RMW}	-0.0902	-0.1419	-0.1717	0.0698	-0.1420	0.0353	0.0395	0.0084	0.1348**	0.0448	0.1636	0.1788*	0.0929
β_{RMW2}	-2.2088	18.9418	-0.6702	2.5076	1.7334	-0.4267	-0.1986	-0.6808**	-0.4238	0.9061	-1.2505	0.8385	3.2718
β_{CMA}	-0.0530	-0.4651	-0.3968***	-0.1957*	-0.0075	0.2295**	-0.0389	-0.0219	0.0518	-0.1245	-0.1406	0.1444	-0.1840
β_{CMA2}	-7.7922*	11.3598	8.8711	-9.7288	-1.1208	-0.2361	1.8713	0.5042	-3.4807	-3.4270	-4.4239	3.7365	3.9255
R^2 **adj.**	0.9233	0.8887	0.9162	0.8973	0.8799	0.8924	0.9854	0.9984	0.9253	0.9201	0.9136	0.9394	0.9360

This table presents regression estimates for the US green funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2, HML2, RMW2 and CMA2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 16 - Selectivity and timing abilities - Conditional Fama and French (2015) - Standard & Poor`s 500 - Conventional funds

	Standard & Poor`s 500												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0026*	0.0023	0.0047	-0.0000	-0.0001	-0.0024	0.0017	0.0006	0.0041**	0.0001	-0.0011	0.0000	-0.0004
β_{p*rm}	0.9108***	1.0840***	0.6779***	1.0000***	0.9828***	0.9727***	0.8723***	0.9656***	1.0535***	1.0821***	0.7880***	1.0208***	0.9307***
β_{p*rm2}	0.4397	-0.6545*	-1.6924	-1.0502**	1.0033	1.8306*	-0.7618**	-0.2016	-0.2027	-1.3738*	0.1294	0.0256	0.4869*
β_{SMB}	0.1120***	0.2512***	-0.0390	0.1255*	0.0513	0.1507**	0.3036***	-0.0163	0.2683***	0.5514***	0.1692***	0.2828***	0.1791***
β_{SMB2}	-0.2342	-0.1806	-3.0458*	2.6454	-2.9494*	1.8214	0.1704	0.0988	-0.5029	-2.8166*	0.1322	-0.3820	-0.1408
β_{HML}	-0.0458	-0.3489***	-0.2881***	0.0256	0.2167**	-0.1079	0.1898***	0.1507***	-0.3069***	-0.3433***	-0.0714	0.0610***	-0.0657*
β_{HML2}	-0.3869	-2.6983***	0.5543	-1.8389	-0.4199	-1.6806	1.4848**	-0.6948	-2.4434*	-1.4005	-1.0531	-0.2048	1.5418*
β_{RMW}	-0.145***	-0.3642***	0.2972	0.1205	-0.1940**	-0.2012*	0.0062	-0.0254	-0.3293***	-0.0114	-0.0580	0.0187	-0.1420***
β_{RMW2}	0.3655	-4.8574	-8.4934	-3.1341	-1.7929	-4.9819	1.9839	-0.7040	-6.3153**	-7.8907*	-2.0905	-1.2399	2.3193
β_{CMA}	-0.1685**	-0.4801***	0.4475**	-0.0627	-0.1046	-0.5830***	0.1122	0.0618	-0.5236***	-0.2634*	0.0975	-0.0422*	-0.1512***
β_{CMA2}	-0.2221	6.2779*	7.6394	-3.2797	4.1173	-0.1946	-1.4322	0.9639	4.1099	7.0552	4.7239*	1.6128*	-7.6430**
R^2 **adj.**	0.9554	0.9281	0.8688	0.9713	0.9261	0.9279	0.9331	0.9724	0.9169	0.8792	0.9520	0.9948	0.9611

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj)*. rm2, SMB2, HML2, RMW2 and CMA2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 16 - Selectivity and timing abilities - Conditional Fama and French (2015) - Standard & Poor`s 500 - Conventional funds - continued

	Standard & Poor`s 500												
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	-0.0001	0.0020	0.0032*	0.0012	0.0010	-0.0000	0.0015	0.0008	0.0034	0.0013	0.0010	0.0014	0.0036*
β_{p*rm}	0.9260***	1.0084***	1.0460***	0.9762***	0.8734***	0.9901***	1.0260***	0.9527***	0.9567***	0.9565***	0.9877***	0.8552***	0.8895***
β_{p*rm2}	0.3840	-0.0804	0.4341	-0.0622	-0.6298*	-0.2703	-0.8943**	0.5889	-0.3531	0.3844	0.3101	0.1527	-0.3686
β_{SMB}	-0.0371	0.1525***	0.1246**	0.0872***	0.0446	1.0168***	0.5512***	0.4563***	0.8428***	0.4065***	0.4998***	0.9132***	0.3470***
β_{SMB2}	0.8889	0.1923	0.9805	-2.3540***	-0.0398	0.7309	-2.5226	-1.5504	-1.4545	-0.0745	-1.3886	1.9880	-4.0749**
β_{HML}	0.0001	-0.3465***	-0.2609***	0.1959***	0.0773**	0.2825***	0.1227**	-0.1802***	-0.4774***	-0.1948***	-0.3068***	0.3039***	-0.2078*
β_{HML2}	1.0001	-0.8814	-2.2776**	0.2735	-0.1539	0.1650	1.1621	-1.1825	-1.2956	-0.1121	-1.5983	-5.0345**	2.1665
β_{RMW}	0.0410	-0.1839**	-0.2854***	-0.0966**	0.0919**	0.1404***	0.0170	-0.0482	-0.2950***	-0.1099	-0.2161**	0.3190	0.2364*
β_{RMW2}	-1.8945	-5.2273	-10.2594***	0.3956	0.9817	-2.5885	-5.1079**	-5.6789**	-9.2478**	0.3401	-10.7406***	-6.6597	-7.5534**
β_{CMA}	0.0885	-0.1987**	-0.3551***	-0.0190	0.1606***	-0.0980	-0.1133	-0.2976***	-0.2444*	-0.1754*	-0.2503***	0.0154	0.2893
β_{CMA2}	-4.0043	1.5153	1.0369	0.7959	3.1673	3.6944	-0.7514	0.7255	7.9073	-0.1746	7.8624*	12.3859**	3.5548
R^2 **adj.**	0.9446	0.9255	0.9181	0.9686	0.9515	0.9702	0.9385	0.9338	0.8972	0.9575	0.9280	0.9185	0.8726

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with S&P500 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2, HML2, RMW2 and CMA2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 16 - Selectivity and timing abilities - Conditional Fama and French (2015) - MSCI KLD 400 - Conventional funds

	MSCI KLD 400												
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**	**x13**
α_p	-0.0024	0.0023	0.0029	-0.0019	0.0002	-0.0040*	0.0021	0.0013	0.0048**	0.0010	-0.0008	0.0007	-0.0002
β_{p*rm}	0.9019***	1.0804***	0.6386***	0.9872***	0.9644***	0.9601***	0.8720***	0.9466***	1.0341***	1.0577***	0.7809***	1.0058***	0.9255***
β_{p*rm2}	0.1267	-1.0213*	-1.9421	-1.4472**	0.0270	1.7015*	-1.0547**	-0.6706*	-0.5854	-1.8368**	-0.2004	-0.4351*	0.2698
β_{SMB}	0.0798*	0.2100***	-0.0476	0.0590	0.0264	0.1213**	0.2812***	-0.0393	0.2421***	0.5300***	0.1412***	0.2539***	0.1513***
β_{SMB2}	-0.1727	-0.0369	-3.1169	2.3432	-3.1855*	1.3919	0.0836	0.2053	-0.5080	-2.8327*	0.3193	-0.1795	-0.2351
β_{HML}	-0.0222	-0.3241***	-0.2857**	0.0678	0.2153*	-0.1118	0.2427***	0.2042***	-0.2424***	-0.2816***	-0.0259	0.1178***	-0.0083
β_{HML2}	-1.5999*	-3.9219***	1.0124	-1.2284	-0.4200	-1.3507	0.7049	-1.7846**	-3.5956***	-2.4108*	-2.1134**	-1.4531***	0.5241
β_{RMW}	-0.1616**	-0.3797***	0.3495**	0.1234	-0.1729	-0.1644	0.0469	0.0050	-0.3006***	0.0268	-0.0453	0.0384	-0.1130***
β_{RMW2}	0.5236	-4.7737	-2.7938	3.1817	0.7834	-1.6225	2.1925	-0.3742	-6.4467*	-8.1421	-2.0685	-1.2081	2.2925
β_{CMA}	-0.1739**	-0.4746***	0.3757	-0.1558	-0.1131	-0.6351***	0.0789	0.0317	-0.5623***	-0.2910*	0.0577	-0.0828*	-0.1903***
β_{CMA2}	4.6140	11.9577***	9.7087	-0.8857	6.6137	2.7596	1.8586	4.8753	8.3876**	11.0751*	8.5083***	5.9423***	-3.8959
R^2 **adj.**	0.9366	0.9149	0.8415	0.9672	0.9049	0.9332	0.9321	0.9543	0.9012	0.8606	0.9372	0.9823	0.9601

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability ($\boldsymbol{\alpha_p}$), systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2, HML2, RMW2 and CMA2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 16 - Selectivity and timing abilities - Conditional Fama and French (2015) - MSCI KLD 400 - Conventional funds - continued

MSCI KLD 400													
	x14	**x15**	**x16**	**x17**	**x18**	**x19**	**x20**	**x21**	**x22**	**x23**	**x24**	**x25**	**x26**
α_p	0.0004	0.0024	0.0039**	0.0021*	0.0017	0.0004	0.0019	0.0013	0.0042*	0.0019	0.0012	0.0018	0.0032
β_{p*rm}	0.9087***	1.0030***	1.0279***	0.9518***	0.8581***	0.9835***	1.0120***	0.9409***	0.9305***	0.9554***	0.9860***	0.8448***	0.8838***
β_{p*rm2}	0.0175	-0.5078	0.0875	-0.6464	-1.1258***	-0.8296*	-1.1923**	0.1882	-0.7131	-0.0994	-0.1119	-0.6070	-0.7228
β_{SMB}	-0.0630	0.1221***	0.0963*	0.0671**	0.0242	0.9882***	0.5282***	0.4296***	0.8233***	0.3612***	0.4538***	0.8903***	0.3132***
β_{SMB2}	0.9381	0.2519	0.8341	-2.2908***	0.0093	0.9094	-2.5170	-1.5562	-1.5723	0.2077	-1.1774	1.6479	-4.2347**
β_{HML}	0.0559	-0.2871***	-0.1988***	0.2489***	0.1247***	0.3371***	0.1823***	-0.1255**	-0.4215***	-0.1862***	-0.2970***	0.3090***	-0.2052*
β_{HML2}	-0.1533	-1.9310*	-3.3856***	-0.7716	-0.9997	-0.9302	0.0474	-2.2566**	-2.2512	-1.4018	-2.7737**	-5.0884**	2.1604
β_{RMW}	0.0644	-0.1481*	-0.2545***	-0.0698	0.1218**	0.1748**	0.0528	-0.0190	-0.2673**	-0.1354	-0.2358**	0.3257*	0.2448**
β_{RMW2}	-1.9144	-5.2702	-10.3113***	0.4227	0.9606	-2.4965	-5.2495**	-5.6294**	-9.4161**	-0.0093	-10.6396***	-5.0796	-5.2930
β_{CMA}	0.0516	-0.2324**	-0.3915***	-0.0396	0.1410**	-0.1274*	-0.1509*	-0.3284***	-0.2718*	-0.1395	-0.2226**	0.0085	0.2865*
β_{CMA2}	0.0324	5.7390	4.9156	4.7012	6.5990**	8.1583*	3.5159	4.6336	11.2972*	4.2076	12.8470***	15.0536**	6.0612
R^2 **adj.**	0.9272	0.9225	0.9082	0.9435	0.9335	0.9660	0.9277	0.9284	0.8830	0.9538	0.9227	0.9065	0.8792

This table presents regression estimates for the US conventional funds, obtained by from the Treynor and Mazuy (1966) extended to a conditional multifactor setting regressions with KLD400 as benchmark, from February 2004 - September 2019. It reports the alpha coefficient that represents stock-picking ability (α_p), systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML), profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 *adj*). rm2, SMB2, HML2, RMW2 and CMA2 refers to squared risk factors. The predetermined information variables are the short-term rate (ST) and the dividend yield (DY). The time-varying alphas and betas associated with the risk factors are omitted. Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 17 - Performance estimates using the conditional the Carhart four-factor model with a dummy - Standard & Poor`s 500 - Green funds

	x1	x4	x5	x6	x7	x8	x9	x10	x11	x12
α_p	-0.0028***	-0.0003	-0.0005	0.0012	-0.0007*	-0.0011**	0.0009	-0.0019*	-0.0013	-0.0000
α_D	-0.0028	0.0100**	-0.0038	-0.0021	0.0011	-0.0001	0.0040	-0.0081*	-0.0119**	0.0104
β_p	1.0667***	1.0914***	1.0705***	0.8517***	0.9910***	0.9909***	0.8733***	1.1818***	1.2244***	0.9223***
β_D	-0.2443***	-0.1838**	-0.2323**	-0.0300	0.0134	-0.0763***	-0.0740	-0.3059***	-0.2501***	-0.3791
β_{SMB}	0.1642***	0.1440**	0.2794***	0.2391***	0.1495***	0.0266	-0.0019	0.3358***	0.5527***	0.7613***
β_{SMB*D}	0.3811	0.2347	0.7730***	0.2914	0.0899***	0.1393**	0.4799***	0.9303***	0.7960**	0.0517
β_{HML}	0.1226***	-0.0408	-0.0222	-0.1105**	-0.0032	-0.0809***	-0.0363	0.1416**	0.1657***	0.0452
β_{HML*D}	0.0299	0.0188	-0.1733*	-0.0139	-0.0257	0.1090***	0.0223	-0.2566**	-0.0368	0.2581
β_{MOM}	-0.2406***	-0.1434***	-0.0665	-0.0676*	-0.0111	-0.0107	0.0274	-0.1827***	-0.1546***	0.0295
β_{MOM*D}	0.1021**	-0.0833	-0.1320**	-0.0785	0.0125	-0.0144	0.0046	-0.0550	-0.1520**	-0.0543
R^2 **adj.**	0.9396	0.9044	0.8791	0.9017	0.9886	0.9787	0.9256	0.9337	0.9300	0.9336

This table presents regression estimates for the US green funds, obtained by the regression of the four-factor model with a dummy for the S&P500 as benchmark, from February 2004 - September 2019. The dummy variable is added in order to distinguish recession from expansion periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 17 - Performance estimates using the conditional the Carhart four-factor model with a dummy - MSCI KLD 400 – Green funds

	x1	x4	x5	x6	x7	x8	x9	x10	x11	x12
α_p	-0.0023**	0.0001	-0.0000	0.0016	-0.0002	-0.0008***	0.0013**	-0.0013	-0.0007	0.0002
α_D	-0.0040	0.0101**	-0.0041	-0.0028	0.0004	-0.0001	0.0028	-0.0097*	-0.0131**	0.0098
β_p	1.0602***	1.0889***	1.0656***	0.8409***	0.9849***	1.0016***	0.8694***	1.1745***	1.2098***	0.9215***
β_D	-0.2016*	-0.0977	-0.1615	0.0294	0.0835**	-0.0075**	-0.0408	-0.2722**	-0.1836*	-0.3802
β_{SMB}	0.1242**	0.1020*	0.2382***	0.2107***	0.1122***	-0.0194***	-0.0356	0.2914***	0.5102***	0.7243***
β_{SMB*D}	0.3072	0.1152	0.6742***	0.1959	-0.0281	0.0263***	0.4077***	0.8635***	0.6961**	-0.0003
β_{HML}	0.1664***	0.0184	0.0460	-0.0649	0.0598***	-0.0164**	0.0194	0.2168***	0.2430***	0.0708
β_{HML*D}	-0.0402	-0.0739	-0.2713**	-0.0870	-0.1229***	0.0112*	-0.0583	-0.3583***	-0.1460	0.2468
β_{MOM}	-0.2346***	-0.1246***	-0.0408	-0.0548	0.0124	0.0162***	0.0484**	-0.1547***	-0.1271***	0.0291
β_{MOM*D}	0.1066**	-0.0766	-0.1377**	-0.0769	0.0082	-0.0171***	-0.0081	-0.0757	-0.1642**	-0.0573
R^2 **adj.**	0.9299	0.9080	0.8790	0.8905	0.9830	0.9985	0.9159	0.9266	0.9221	0.9288

This table presents regression estimates for the US green funds, obtained by the regression of the four-factor model with a dummy for the KLD400 as benchmark, from February 2004 - September 2019. The dummy variable is added in order to distinguish recession from expansion periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 18 - Performance estimates using the conditional the Carhart four-factor model with a dummy - Standard & Poor`s 500 - Conventional funds

	x1	x2	x7	x8	x9	x10	x11	x12	x13	x14
α_p	-0.0024***	-0.0002	0.0018**	-0.0002	0.0016	-0.0025*	-0.0008	-0.0001	-0.0006	0.0001
α_D	0.0019	-0.0052*	0.0000	0.0048**	-0.0025	-0.0075	-0.0019	0.0001	-0.0025	0.0005
β_p	0.9123***	1.1320***	0.8447***	0.9562***	1.1085***	1.1082***	0.7739***	1.0252***	0.9397***	0.9134***
β_D	0.1147***	0.0785	-0.0445	0.0526	0.0957*	0.0638	0.3283***	-0.0040	-0.0623*	0.1134***
β_{SMB}	0.1277***	0.3226***	0.2729***	-0.0116	0.3351***	0.5353***	0.1433***	0.2734***	0.1920***	-0.0296
β_{SMB*D}	0.0152	0.1437	0.2742*	-0.1239	0.2469	0.2476	-0.0842	0.0319	0.0751	-0.1613***
β_{HML}	-0.1012**	-0.5003***	0.1756***	0.1225***	-0.4443***	-0.2750***	0.0253	0.0443***	-0.1312***	0.0525
β_{HML*D}	-0.2678***	-0.0151	-0.0620	-0.0393	-0.1326	-0.5355***	-0.2583***	-0.0709***	-0.0155	0.0072
β_{MOM}	-0.0366	0.0160	-0.0993***	-0.0161	0.0419	0.2269***	0.0435	-0.0094	-0.0310	0.0535
β_{MOM*D}	-0.0489	0.0748	0.0739	0.0289	0.0661	0.0386	-0.0663*	-0.0043	-0.0927***	-0.1574***
R^2 **adj.**	0.9566	0.9012	0.9370	0.9682	0.8842	0.8929	0.9455	0.9949	0.9616	0.9503

This table presents regression estimates for the US conventional funds, obtained by the regression of the four-factor model with a dummy for the S&P500 as benchmark, from February 2004 - September 2019.The dummy variable is added in order to distinguish recession from expansion periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 18 - Performance estimates using the conditional the Carhart four-factor model with a dummy - Standard & Poor`s 500 - Conventional funds - continued

	x15	x16	x17	x18	x19	x20	x21	x22	x23	x24
α_p	0.0001	0.0002	-0.0007	0.0013**	0.0010	-0.0004	-0.0011	-0.0002	0.0016	-0.0008
α_D	-0.0006	-0.0005	0.0058*	-0.0021	0.0010	-0.0064	-0.0000	-0.0023	-0.0037	-0.0050
β_p	1.0576***	1.1005***	0.9971***	0.8570***	0.9691***	1.0102***	1.0103***	1.0332***	0.9653***	1.0338***
β_D	0.1179*	0.0828	-0.0629	-0.0319	0.1438**	0.2363***	0.0479	0.0773	0.1460*	-0.0071
β_{SMB}	0.2097***	0.1825***	0.0589***	0.0071	0.9794***	0.5076***	0.4954***	0.8814***	0.4304***	0.5928***
β_{SMB*D}	0.0600	0.1530	-0.0657	0.0316	0.0714	0.3132	-0.1205	0.0427	0.1300	-0.2150*
β_{HML}	-0.3824***	-0.3031***	0.1648***	0.1542***	0.2311***	0.1337***	-0.2936***	-0.4262***	-0.2148***	-0.3669***
β_{HML*D}	-0.1213	-0.3992***	-0.1436**	-0.0048	-0.1914**	-0.8813***	-0.0440	-0.0520	-0.2926**	-0.1372*
β_{MOM}	0.0636**	0.1281**	-0.0356	0.0194	-0.0259	-0.0120	0.0124	0.2679***	-0.0199	0.0646
β_{MOM*D}	0.0177	-0.1362**	0.0407	0.0524	-0.0221	-0.0906**	0.0075	-0.0673	-0.0428	0.0031
R^2 **adj.**	0.9216	0.8982	0.9657	0.9482	0.9674	0.9379	0.9192	0.9007	0.9432	0.9192

This table presents regression estimates for the US conventional funds, obtained by the regression of the four-factor model with a dummy for the S&P500 as benchmark, from February 2004 - September 2019. The dummy variable is added in order to distinguish recession from expansion periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 18 - Performance estimates using the conditional the Carhart four-factor model with a dummy - MSCI KLD 400 - Conventional funds

	x1	x2	x7	x8	x9	x10	x11	x12	x13	x14
α_p	-0.0020**	0.0002	0.0022**	0.0003	0.0022	-0.0018	-0.0004	0.0004	-0.0002	0.0006
α_D	0.0007	-0.0072	-0.0004	0.0039**	-0.0042	-0.0091	-0.0031	-0.0008	-0.0031	-0.0004
β_p	0.9034***	1.1247***	0.8384***	0.9371***	1.0917***	1.0848***	0.7674***	1.0127***	0.9351***	0.8966***
β_D	0.1674***	0.1157	0.0197	0.1296**	0.1636***	0.1385	0.3850***	0.0698	0.0026	0.1926***
β_{SMB}	0.0962**	0.2805***	0.2422***	-0.0402	0.2986***	0.5021***	0.1185***	0.2419***	0.1560***	-0.0581*
β_{SMB*D}	-0.0943	0.0375	0.1756	-0.2461	0.1184	0.1186	-0.2134	-0.0914	-0.0283	-0.2890***
β_{HML}	-0.0740*	-0.4652***	0.2267***	0.1733***	-0.3747***	-0.2060**	0.0584	0.0892***	-0.0713**	0.1096**
β_{HML*D}	-0.3276***	-0.0864	-0.1410*	-0.1237*	-0.2404**	-0.6419***	-0.3268***	-0.1502***	-0.1057**	-0.0845
β_{MOM}	-0.0375	0.0166	-0.0813***	-0.0032	0.0661	0.2497***	0.0496	-0.0014	-0.0085	0.0727*
β_{MOM*D}	-0.0353	0.0821	0.0734*	0.0332	0.0567	0.0307	-0.0578	0.0059	-0.0970***	-0.1582***
R^2 **adj.**	0.9333	0.8766	0.9322	0.9445	0.8646	0.8697	0.9265	0.9798	0.9592	0.9318

This table presents regression estimates for the US conventional funds, obtained by the regression of the four-factor model with a dummy for the KLD400 as benchmark, from February 2004 - September 2019. The dummy variable is added in order to distinguish recession from expansion periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 18 - Performance estimates using the conditional the Carhart four-factor model with a dummy - MSCI KLD 400 - Conventional funds - continued

	x15	x16	x17	x18	x19	x20	x21	x22	x23	x24
α_p	0.0006	0.0008	-0.0000	0.0019**	0.0015*	0.0002	-0.0006	0.0004	0.0018	-0.0007
α_D	-0.0013	-0.0014	0.0046	-0.0027	-0.0002	-0.0079	-0.0007	-0.0038	-0.0071	-0.0065
β_p	1.0527***	1.0874***	0.9707***	0.8383***	0.9574***	0.9886***	0.9969***	1.0155***	0.9675***	1.0351***
β_D	0.2004***	0.1714***	0.0135	0.0451	0.2109**	0.3169***	0.1323	0.1428**	0.2161**	0.0666
β_{SMB}	0.1691***	0.1443**	0.0319	-0.0182	0.9459***	0.4776***	0.4611***	0.8483***	0.3902***	0.5502***
β_{SMB*D}	-0.0833	0.0080	-0.1753	-0.0754	-0.0545	0.1673	-0.2527	-0.0772	0.0237	-0.3046**
β_{HML}	-0.3150***	-0.2337***	0.2264***	0.2075***	0.2922***	0.1966***	-0.2300***	-0.3615***	-0.1880***	-0.3382***
β_{HML*D}	-0.2290**	-0.5089***	-0.2359***	-0.0867*	-0.2887***	-0.9843***	-0.1440*	-0.1520	-0.3853***	-0.2240**
β_{MOM}	0.0890**	0.1528***	-0.0162	0.0369	-0.0041	0.0087	0.0349	0.2900***	-0.0196	0.0646
β_{MOM*D}	0.0155	-0.1384**	0.0361	0.0525	-0.0276	-0.0941*	0.0064	-0.0756	-0.0438	0.0227
R^2 **adj.**	0.9178	0.8868	0.9352	0.9276	0.9584	0.9176	0.9090	0.8847	0.9388	0.9135

This table presents regression estimates for the US conventional funds, obtained by the regression of the four-factor model with a dummy for the KLD400 as benchmark, from February 2004 - September 2019. The dummy variable is added in order to distinguish recession from expansion periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and momentum (MOM) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 19 - Performance estimates using the conditional the Fama and French (2015) five-factor model with a dummy - Standard & Poor`s 500 - Green funds

	x1	x4	x5	x6	x7	x8	x9	x10	x11	x12
α_p	-0.0032***	-0.0008	-0.0001	0.0007	-0.0007*	-0.0011**	0.0007	-0.0025**	-0.0020	-0.0005
α_D	0.0017	0.0191***	0.0020	0.0064	0.0005	0.0035**	0.0008	-0.0050	-0.0055	0.0159***
β_p	1.0905***	1.1118***	1.0637***	0.8698***	0.9932***	0.9914***	0.8799***	1.2057***	1.2510***	0.9302***
β_D	-0.1388*	-0.0299	-0.1764	0.1040	-0.0100	-0.0510	-0.1283**	-0.1570*	-0.0071	-0.0177
β_{SMB}	0.1270**	0.1417**	0.2168***	0.2374***	0.1501***	0.0201	0.0293	0.3008***	0.5427***	0.8033***
β_{SMB*D}	0.4669	0.3048	0.9266***	0.3045	0.0988***	0.1247***	0.4657***	1.1035**	0.9524*	0.0441
β_{HML}	0.2762***	0.0771	-0.0100	-0.1717***	0.0059	-0.0903***	-0.0970**	0.2229***	0.2318***	0.0125
β_{HML*D}	-0.0664	0.0001	-0.0188	0.0598	-0.0159	0.0970**	0.1070	-0.1605	0.0719	-0.1116
β_{RMW}	-0.1359	0.0373	-0.2387**	-0.0072	0.0088	-0.0240	0.1170**	-0.0587	0.0348	0.1840**
β_{RMW*D}	0.1884	-0.1738	0.0104	-0.1992	0.0020	-0.1961***	0.0337	0.4162	0.3363	-0.4530**
β_{CMA}	-0.0283	-0.0789	0.0640	0.2549***	-0.0078	0.0417	0.1256**	0.0537	0.0540	0.0605
β_{CMA*D}	0.1154	0.2536	-0.3642	0.2032	-0.1143*	0.2333**	-0.4184	-0.4603	-0.2251	1.6903***
R^2 **adj.**	0.9179	0.8841	0.8724	0.8963	0.9885	0.9791	0.9277	0.9151	0.9113	0.9472

This table presents regression estimates for the US green funds, obtained by the regression of the five-factor model with a dummy for the S&P500 as benchmark, from February 2004 - September 2019. The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 19 - Performance estimates using the conditional the Fama and French (2015) five-factor model with a dummy - MSCI KLD 400 - Green funds

	x1	x4	x5	x6	x7	x8	x9	x10	x11	x12
α_p	-0.0026**	-0.0004	0.0004	0.0012	-0.0002	-0.0008***	0.0012*	-0.0019*	-0.0014	-0.0002
α_D	-0.0024	0.0152***	-0.0014	0.0024	-0.0036*	-0.0000	-0.0027	-0.0094*	-0.0105	0.0049***
β_p	1.0826***	1.1080***	1.0553***	0.8554***	0.9845***	0.9989***	0.8723***	1.1976***	1.2354***	0.9286***
β_D	-0.1131	0.0630	-0.1026	0.1468	0.0299	-0.0031	-0.1275*	-0.1265	0.0695	0.2229***
β_{SMB}	0.0846	0.1022*	0.1835***	0.2110***	0.1194***	-0.0169***	0.0020	0.2626***	0.5058***	0.7621***
β_{SMB*D}	0.3970	0.1664	0.8196***	0.2085	0.0043	0.0232***	0.4195***	1.0161**	0.8150*	0.0035
β_{HML}	0.3372***	0.1492	0.0677	-0.1137**	0.0784***	-0.0189**	-0.0327	0.3109***	0.3235***	0.0330
β_{HML*D}	-0.1220	-0.0991	-0.1149	0.0024	-0.0890*	0.0128	0.0569	-0.2438	-0.0309	-0.3832***
β_{RMW}	-0.1395	0.0559	-0.2177*	0.0033	0.0280	0.0022	0.1341**	-0.0343	0.0570	0.1654
β_{RMW*D}	0.3651	0.0885	0.2103	-0.0201	0.1772**	-0.0053	0.1280	0.5859	0.5865	0.0666
β_{CMA}	-0.0789	-0.1366	-0.0017	0.2073***	-0.0692*	-0.0181	0.0712	-0.0206	-0.0238	0.0712
β_{CMA*D}	-0.1560	0.0400	-0.5315	-0.0645	-0.3680***	0.0267*	-0.6467*	-0.7370**	-0.5161**	1.3643***
R^2 **adj.**	0.9106	0.8932	0.8746	0.8846	0.9843	0.9984	0.9187	0.9128	0.9078	0.9428

This table presents regression estimates for the US green funds, obtained by the regression of the five-factor model with a dummy for the KLD400 as benchmark, from February 2004 - September 2019.The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 20 - Performance estimates using the conditional the Fama and French (2015) five-factor model with a dummy - Standard & Poor`s 500 - Conventional funds

	x1	x2	x7	x8	x9	x10	x11	x12	x13	x14
α_p	-0.0021***	0.0014	0.0012	-0.0002	0.0030***	-0.0012	-0.0006	-0.0001	-0.0003	0.0003
α_D	0.0006	-0.0207***	0.0082**	0.0029	-0.0161***	-0.0281***	-0.0054***	-0.0000	0.0025	0.0016
β_p	0.9038***	1.0860***	0.8635***	0.9584***	1.0623***	1.0580***	0.7680***	1.0257***	0.9320***	0.9075***
β_D	0.1220**	-0.0876	0.0432	0.0651**	-0.1035	-0.1285	0.2587***	-0.0022	0.0056	0.2092**
β_{SMB}	0.0915**	0.2291***	0.2769***	-0.0171	0.2365***	0.5272***	0.1278***	0.2755***	0.1545***	-0.0206
β_{SMB*D}	0.1318	0.3412**	0.1941	-0.1115	0.4254***	0.2777	-0.0022	0.0424	0.1494	-0.1137
β_{HML}	-0.0415	-0.3249***	0.2107***	0.1176***	-0.2910***	-0.2693***	-0.0566	0.0672***	-0.0755**	-0.0108
β_{HML*D}	-0.2031***	-0.0302	-0.2120**	-0.0402	-0.1434*	-0.5354***	-0.0626	-0.0753**	-0.0012	0.1377
β_{RMW}	-0.1617***	-0.4209***	0.0447	-0.0232	-0.4321***	-0.1404	-0.0873	0.0142	-0.1426***	0.0081
β_{RMW*D}	0.3133	1.0231***	-0.4233**	0.2024*	0.8238***	0.9740***	0.2243	0.0174	-0.0545	0.1674
β_{CMA}	-0.1094*	-0.4957***	0.0619	0.0343	-0.4869***	-0.3601***	0.1282	-0.0411*	-0.1066**	0.0920
β_{CMA*D}	-0.4104**	-0.9438***	0.8254***	-0.0924	-0.8403***	-0.7776**	-0.7837***	-0.0359	0.1412	-0.2120
R^2 **adj.**	0.9579	0.9302	0.9376	0.9681	0.9105	0.8739	0.9492	0.9948	0.9583	0.9453

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with a dummy for the S&P500 as benchmark, from February 2004 - September 2019.The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 20 - Performance estimates using the conditional the Fama and French (2015) five-factor model with a dummy - Standard & Poor`s 500 - Conventional funds - continued

	x15	x16	x17	x18	x19	x20	x21	x22	x23	x24
α_p	0.0009	0.0017	-0.0006	0.0011**	0.0005	-0.0003	-0.0006	0.0019	0.0020*	0.0003
α_D	-0.0049	-0.0066**	0.0084***	-0.0012	-0.0038	-0.0050	-0.0070*	-0.0193***	-0.0158***	-0.0157***
β_p	1.0304***	1.0493***	0.9963***	0.8654***	0.9801***	1.0056***	0.9923***	0.9603***	0.9567***	1.0016***
β_D	-0.0940	-0.0584	-0.1287***	-0.0274	0.2381***	0.1914**	-0.0941	-0.2196**	0.1145**	-0.1460**
β_{SMB}	0.1694***	0.1114*	0.0363	0.0405	1.0019***	0.4930***	0.4581***	0.8228***	0.3950***	0.5494***
β_{SMB*D}	0.1119	0.3116**	-0.0624	-0.0703	0.1233	0.4058*	-0.0047	0.1535	0.3519***	-0.0960
β_{HML}	-0.3574***	-0.2661***	0.1912***	0.1074***	0.2779***	0.2011***	-0.2016***	-0.4836***	-0.1784***	-0.3009***
β_{HML*D}	-0.0640	-0.2542**	-0.1616***	-0.0689	-0.1868**	-0.7963***	0.0082	0.1320	-0.1477	-0.1049
β_{RMW}	-0.2019**	-0.3636***	-0.0787*	0.1310***	0.1137**	-0.0516	-0.1589***	-0.3835***	-0.1553*	-0.2007**
β_{RMW*D}	-0.0811	0.3438**	-0.2789**	-0.2251	0.5754**	-0.0819	0.3380*	0.6456**	1.4601***	0.4903*
β_{CMA}	-0.1668*	-0.2991**	-0.0191	0.1001**	-0.0870	-0.1662**	-0.2716***	-0.2531*	-0.0795	-0.2822***
β_{CMA*D}	-0.5131	-0.7711***	0.0559	0.3663***	-0.2676	-0.3850	-0.7189***	-1.2395***	-2.2057***	-0.7040***
R^2 **adj.**	0.9269	0.9124	0.9668	0.9499	0.9699	0.9382	0.9292	0.8915	0.9531	0.9276

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with a dummy for the S&P500 as benchmark, from February 2004 - September 2019. The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 20 - Performance estimates using the conditional the Fama and French (2015) five-factor model with a dummy - MSCI KLD 400 - Conventional funds

	x1	x2	x7	x8	x9	x10	x11	x12	x13	x14
α_p	-0.0016*	0.0019	0.0017*	0.0003	0.0036***	-0.0005	-0.0002	0.0005	0.0001	0.0009
α_D	-0.0037	-0.0252***	0.0044	-0.0015	-0.0205***	-0.0325***	-0.0098***	-0.0045*	-0.0012	-0.0030
β_p	0.8940***	1.0786***	0.8553***	0.9363***	1.0440***	1.0298***	0.7581***	1.0102***	0.9256***	0.8862***
β_D	0.1480	-0.1010	0.0734	0.1109*	-0.0815	-0.1049	0.2828***	0.0412	0.0554	0.2742***
β_{SMB}	0.0565	0.1838***	0.2493***	-0.0437	0.2071***	0.5018***	0.1033**	0.2431***	0.1250***	-0.0435
β_{SMB*D}	0.0480	0.2975	0.1111	-0.2090	0.3521**	0.2095	-0.0951	-0.0523	0.0495	-0.2392**
β_{HML}	-0.0063	-0.2853***	0.2724***	0.1823***	-0.2128***	-0.1909**	-0.0100	0.1305***	-0.0075	0.0563
β_{HML*D}	-0.2311**	-0.0451	-0.2709***	-0.1013	-0.2093*	-0.5980***	-0.1009	-0.1370**	-0.0763	0.0659
β_{RMW}	-0.1776***	-0.4402***	0.0628	-0.0138	-0.4154***	-0.1282	-0.0888	0.0117	-0.1238***	0.0199
β_{RMW*D}	0.5122*	1.1759***	-0.2703	0.3846***	0.9643***	1.1042***	0.4064*	0.2167**	0.1288	0.3867**
β_{CMA}	-0.1301	-0.5136***	0.0119	-0.0194	-0.5535***	-0.4274***	0.0848	-0.0990**	-0.1641***	0.0346
β_{CMA*D}	-0.7408***	-1.3178***	0.5756***	-0.3786***	-1.1177***	-1.0549***	-1.0945***	-0.3122***	-0.0828	-0.5009***
R^2 **adj.**	0.9399	0.9141	0.9314	0.9453	0.8970	0.8528	0.9344	0.9812	0.9587	0.9282

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with a dummy for the KLD400 as benchmark, from February 2004 - September 2019.The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance (α_p), the systematic risk (β_p), factor loadings associated to size (SMB), book-to-market (HML) and profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).

Appendix 20 - Performance estimates using the conditional the Fama and French (2015) five-factor model with a dummy - MSCI KLD 400 - Conventional funds - continued

	x15	x16	x17	x18	x19	x20	x21	x22	x23	x24
α_p	0.0014	0.0023*	0.0001	0.0016**	0.0011	0.0003	-0.0001	0.0026	0.0022*	0.0005
α_D	-0.0088**	-0.0107***	0.0043	-0.0049*	-0.0088*	-0.0102	-0.0106**	-0.0229***	-0.0216***	-0.0202***
β_p	1.0218***	1.0318***	0.9675***	0.8436***	0.9673***	0.9825***	0.9775***	0.9354***	0.9588***	1.0025***
β_D	-0.0570	0.0039	-0.0951	0.0132	0.2852***	0.2351**	-0.0327	-0.2025*	0.2194***	-0.0918
β_{SMB}	0.1373***	0.0822	0.0133	0.0193	0.9732***	0.4675***	0.4297***	0.7995***	0.3511***	0.5040***
β_{SMB*D}	0.0255	0.2048	-0.1335	-0.1502	-0.0001	0.2914	-0.1041	0.1052	0.2711**	-0.1408
β_{HML}	-0.2822***	-0.1889**	0.2652***	0.1715***	0.3497***	0.2755***	-0.1288**	-0.4125***	-0.1583***	-0.2795***
β_{HML*D}	-0.1392	-0.3383***	-0.2252***	-0.1297**	-0.2573**	-0.8630***	-0.0738	0.0754	-0.2417**	-0.1621*
β_{RMW}	-0.1818**	-0.3470***	-0.0682	0.1415***	0.1308**	-0.0383	-0.1423**	-0.3721***	-0.1733**	-0.2200**
β_{RMW*D}	0.0824	0.5393***	-0.1454	-0.0794	0.7939***	0.1204	0.5212***	0.7426**	1.7805***	0.7152**
β_{CMA}	-0.2305**	-0.3648***	-0.0826	0.0452	-0.1480**	-0.2298***	-0.3335***	-0.3141**	-0.0670	-0.2697***
β_{CMA*D}	-0.7512*	-1.0047***	-0.1896	0.1419	-0.6029***	-0.7288***	-0.9198***	-1.4589***	-2.4315***	-0.9434***
R^2 **adj.**	0.9237	0.9035	0.9368	0.9257	0.9641	0.9222	0.9232	0.8765	0.9500	0.9243

This table presents regression estimates for the US conventional funds, obtained by the regression of the five-factor model with a dummy for the KLD400 as benchmark, from February 2004 - September 2019.The dummy variable is added in order to distinguish recessions from expansions periods. It reports for both periods, estimates of performance ($\boldsymbol{\alpha_p}$), the systematic risk ($\boldsymbol{\beta_p}$), factor loadings associated to size (SMB), book-to-market (HML) and profitability (RMW) and investment (CMA) factors and the adjusted coefficient of determination (R^2 adj.). Standard errors are corrected for autocorrelation and heteroscedasticity following Newey and West (1987). The asterisks are used to identify statistical significance of the coefficients to a level of significance of 1% (***), 5% (**) and 10% (*).