Universidade do Minho
Escola de Economia e Gestão

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Financial performance of US green mutual funds

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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. I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

Desempenho financeira de fundos mútuos verdes dos EUA

Resumo

A crescente preocupação com os problemas ambientais tornou alguns investidores mais conscientes e motivou-os a incorporar as preocupações ambientais nas suas decisões de investimento.Este estudo avalia o desempenho financeiro dos fundos mútuos verdes dos EUA. Para tal, os fundos mútuos verdes dos EUA (domésticos e globais) são analisados entre o período de janeiro de 2000 a outubro de 2020. Os fundos mútuos verdes são comparados com fundos mútuos convencionais por meio de uma abordagem de pares combinados. São utilizados modelos incondicionais, modelos condicionais e modelos que levam em consideração diferentes condições de mercado, especificamente, períodos de crise e períodos de não crise. Em geral, os resultados sugerem que os fundos verdes não têm um desempenho significativamente diferente dos fundos convencionais. Os resultados também mostram que os fundos verdes e convencionais são positivamente expostos ao mercado e, em geral, também são expostos a ações de capitalização baixa. No modelo condicional, mais especificamente, no modelo condicional de seis fatores de Fama e French (2018), os fundos globais verdes apresentam um desempenho significativamente melhor em comparação aos fundos globais convencionais em épocas de taxas de juros mais altas. O teste de Wald reporta evidências de betas que variam no tempo e evidencias de betas e alfas que variam no tempo, demonstrando que os fundos variam ao longo do tempo com condições econômicas, apoiando, dessa forma, o uso de modelos condicionais. Relativamente aos modelos que têm em consideração diferentes condições de mercado, nomeadamente, períodos de crise e períodos de não crise, os resultados indicam que o desempenho em períodos de crise não é significativamente diferente do desempenho em períodos de não crise. No entanto, várias carteiras apresentam exposições significativamente diferentes a alguns fatores de risco entre os períodos de crise e não crise, apoiando, assim, a utilização destes modelos.

Palavras-chave: análise de pares combinados, diferentes condições de mercado, fundos mútuos verdes, modelos condicionais, modelos incondicionais.

Financial performance of US green mutual funds

Abstract

The growing concern with environmental problems made some investors more aware and motivated them to incorporate environmental concerns into their investment decisions. This study evaluates the financial performance of US green mutual funds. For this purpose, US green mutual funds (domestic and global), are analysed between the period of January 2000 to October 2020. Green mutual funds are compared with conventional mutual funds through a matching-pair approach. Unconditional models, conditional models and models that take into account different market conditions, specifically, periods of crisis and periods of non-crisis are used. In general, the findings suggest that green funds do not perform significantly different from conventional funds. The results also show that green and conventional funds are positively exposed to the market and, in general, they are also exposed to small-cap stocks. In the conditional model, more specifically, in the conditional Fama and French (2018) six-factor model, the green global funds present a significantly better performance in comparison to the conventional global funds in times of higher interest rates. The Wald test reports evidence of time-varying betas and evidence of time-varying betas and alphas demonstrating that funds vary over time with economical conditions, supporting in this way the use of conditional models. Regarding models that take into account different market conditions, specifically, periods of crisis and periods of non-crisis the results report that the performance in periods of crisis is not significantly different from the performance in periods of non-crisis. However, several portfolios present significantly different exposure to some risk factors between crisis and non-crisis periods, supporting in this way the use of these models.

Keywords: conditional models, different market conditions, green mutual funds, matching-pair analysis, unconditional models.

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1. Introduction

Socially responsible investments do not have a clear definition. Although, it can generally be view as an investment process that applies environmental, social and corporate governance criteria (Ibikunle & Steffen, 2017). Over the past decades, socially responsible investments have grown rapidly. The total US-domiciled assets under management adopting sustainable investing strategies increase from $12.0 trillion at the beginning of 2018 to $17.1 trillion at the beginning of 2020, a growth of 42 per cent. This express 33 per cent of the $51.4 trillion in total US assets under professional management (US SIF Foundation, 2020). Green investments can be treated as a subset of socially responsible investments (Muñoz et al., 2014). There is also no clear definition of green investments. According to Ibikunle and Steffen (2017) green funds investments are based on environmental principles, thus, the companies selected for green mutual funds tend to be characterised by their friendly environmental approach, natural resources safeguarding, clean technology, alternative and renewable energy, energy efficiency, lower environmental impacts, and other forms of environmental responsibility.

There is a large body of studies concerning the financial performance of socially responsible investments. The specific area of green mutual funds has been more cast aside and little research were conducted (Muñoz et al., 2014). Despite the efforts, no consensus in the results was found in socially responsible investments researches as well as in green investments researchers. Science advances when researchers find consensus in the results that are supported by a body of evidence (Combs et al., 2011). Also, authors such as Climent and Soriano (2011) accentuate the importance of extending these types of studies to different periods of analysis. There is also a lack of consensus in what is the more adequate methodology used to evaluate the funds' performance. For instants, the multifactor models are widely used to evaluate funds performance. Differently, Silva and Cortez (2016) report evidence supporting the use of conditional models to evaluate fund performance. Additionally, Nofsinger and Varma (2014) show evidence supporting the use of models that take into account different market conditions, specifically, periods of crisis and periods of non-crisis. Thus, it is relevant to keep studying and exploring this subject.

Furthermore, environmental and social corporate scandals have been reported which has been leading to an increasing interest in these subjects on the part of managers and shareholders (Guenster et al.,

2011). Additionally, large institutions of asset managers publicly demonstrate an interest in investing in firms with social, moral and environmental responsibility, also, a few governmental organisations took interest in the matter (Guenster et al., 2011). Managing environmental performance has become a strategic issue for organizations (Henri & Journeault, 2008). The growing concern about environmental problems such as climate changes, global warming and shortage of energy resources has encouraged investors to seek green investments, therefore, the demand for green funds has been increasing (Silva & Cortez, 2016). Motivated by these circumstances and by personal concern with the environment, an interest in the field of green investment research has emerged.

All this context sparks the following research question: does invest in green funds implies a financial sacrifice for investors? Aiming to provide an answer to this question, the main goal of this dissertation is to evaluate the financial performance of US green mutual funds. The main goal is further decomposed in the following secondary goals: (i) to analyse green funds' performance, comparing green funds with conventional funds; (ii) and to analyse green funds' performance considering alternative unconditional models, conditional models and models that account for different market conditions, particularly periods of crisis and periods of non-crisis.

This work will contribute to further develop the scarce green investment literature. First, it will extend the prior empirical evidence of the financial performance of green mutual funds with a more recent period. Second, a matching pair analysis is used to compared green funds with conventional funds. Third, unconditional models, conditional models and models that take into account different market conditions, specifically, periods of crises and periods of non-crisis are used in this study allowing a discussion of what model better explains the green financial performance.

The remainder of this study is organized as follow. Section 2 outlines and discusses the literature related to the financial performance of socially responsible investments and green investments. Section 3 presents and discusses the methodologies used. Section 4 describes the data. Section 5 reports and discusses the empirical results. Finally, section 6 summarises the main conclusions and section 7 the main limitations of this study.

2. Literature review

2.1 Performance of socially responsible investment funds

There are alternative theories about the impact that socially responsible criteria can have on financial performance. On one hand, some authors defend that socially responsible investments may worsen financial performance. The underlying arguments suggest that the lack of diversification will damage financial performance (Markowitz, 1952). Additionally, Kurtz (1997) reports costs related to socially responsible mutual funds' investments. On the other hand, some authors argue that social criteria may improve financial performance. The supporters of this theory argue that by restricting investments it will be possible to find companies with growth potential and with good management (Chegut et al., 2011). Additionally, socially responsible companies are able to benefit from competitive advantages (Frynas & Yamahaki, 2016), and lower costs or increase revenues (Flammer, 2015) which, consequently, may improve the financial performance.

The empirical literature of socially responsible effects on financial performance has mixed evidence. Hamilton et al. (1993) formulate three alternative hypotheses concerning the returns of socially responsible and conventional portfolios. The first hypothesis claims that the expected returns of socially responsible portfolios are equal to the conventional portfolios expected returns. The second hypothesis states that the expected returns of socially responsible portfolios are inferior to the expected returns of conventional portfolios. Finally, the third hypothesis states that the expected returns of socially responsible portfolios are superior to the expected returns of conventional portfolios. The authors use a single factor model to evaluate funds performance and conclude that the performance of socially responsible mutual funds is not statistically different from the performance of conventional mutual funds. Cortez et al. (2012) evaluate the financial performance of US and European global socially responsible funds, providing evidence that European funds perform similar to both conventional funds and socially responsible benchmarks, however, the US and Austrian funds underperform. The evidence from these studies may reinforce the idea that investors do not experience better or worse financial performance when investing in socially responsible funds.

Chang et al. (2019) evaluate the socially responsible funds in the US, from 2007 to 2016. The empirical evidence demonstrates that socially responsible funds underperform the average of all mutual funds

with the same category, due to socially responsible fund expenses. Renneboog et al. (2008) when examining socially responsible investments funds across the world, the authors find evidence that socially responsible funds underperform their domestic benchmarks. However, for a few countries such as France, Japan and Sweden, socially responsible funds performance is not statistically different from conventional funds. The authors point out that the reason for investors paying to invest in socially responsible funds is based on discontent and disagreement with companies that have unethical behaviours. Another reason pointed out is that investors expect that socially responsible funds will outperform based on relevant information not completely incorporated in share price. The results of these studies may be consistent with the idea that investors pay a price to invest in socially responsible funds.

Gil-Bazo et al. (2010) study the US socially responsible mutual funds and reached different conclusions. The authors consider fees and the role of fund management companies. They find evidence that US socially responsible funds obtain higher performance than their matched conventional funds, before and after fees, when management companies are specialized in socially responsible investment. However, socially responsible funds tend to underperform their conventional funds when run by a generalist company. The authors mention that the low diversification of socially responsible funds does not obstruct financial performance. These results showed that it is possible to obtain higher performance with socially responsible funds compared to their similar conventional funds and that management company characteristics can have an important role. Similarly, Lean et al. (2015) find evidence that European and North American socially responsible funds present a higher performance than the market benchmark, which suggests that socially responsible investors from these regions do not need to sacrifice financial performance in order to pursue environmental, ethical and social concerns. The findings of these studies may be consistent with the idea that investors can do well when investing in socially responsible funds.

Although there is no consensus on the results of the literature that focus on the relationship between socially responsible investments and financial performance, most studies show evidence of neutral performance (e.g., Statman, 2000; Bello, 2005; Bauer et al., 2007). Revelli and Viviani (2015) conducted meta-analysis research concerning socially responsible portfolio performance researches and found that socially responsible funds performance is similar to conventional funds.

The fact that the results point out mostly for a similar relationship between socially responsible funds and conventional funds may raise an uncertainty of whether there is really a distinction between these two types of funds. There are no clear boundaries between socially responsible funds and conventional funds (Statman & Glushkov, 2016). Bauer et al. (2006) question if ethical funds are truly ethical or if they are just conventional funds in disguise. The fact that a fund is classified as socially responsible does not completely ensure that the firms in the fund are truly socially responsible. Socially responsible labels cannot guarantee the exclusion of unethical companies (Utz & Wimmer, 2014). Wimmer (2013) finds evidence that ESG-score is not very persistent in the long term. Utz and Wimmer (2014) claim that socially responsible investments might be becoming an instrument to sell instead of an instrument to pursue ethical preferences. Furthermore, the lack of clarification in the definition of the criteria to distinguish socially responsible funds may result in inconsistency, making it more difficult to measure the performance of socially responsible funds (Statman & Glushkov, 2016) and affecting research results (Durán-Santomil et al., 2019).

Socially responsible funds tend to be considered a homogenous group. Although, it would be expected that stocks taken by environmental funds would perform differently from stocks chosen by religious funds (Matallín-Sáez et al., 2019). According to Galema et al. (2008), the empirical literature may produce few significant relations between socially responsible investment and expected returns, due to the aggregation of different dimensions of socially responsible investment that can have different effects on performance. Thus, this work will focus on the green dimension of socially responsible investment.

2.2 Performance of green funds

Similarly to socially responsible literature, green literature has arguments in favour of and against the implementation of environmental criteria. A more traditional view argues that the adoption of environmental criteria will damage financial performance. Molina-Azorín et al. (2009) claim that companies concern with environmental performance may deviate efforts from the main business activity. Also, social costs may appear from these practices (King & Lenox, 2002). The costs that incur from the environmental performance will exceed the financial benefits associated with it (Jaffe et al., 1995).

Later, a more contemporary view started to emerge suggesting that environmental criteria may enhance financial performance. According to some authors, the improvement of environmental performance

can lower costs or increase revenues (Ambec & Lanoie, 2008). Corporate environmental performance can enhance reputation (Brammer & Pavelin, 2004). The implementation of a proactive environmental strategy can bring competitive advantages (Hart & Dowell, 2011). Additionally, environmental technologies and environmental policies can boost the innovation process and consequently, may increase production efficiency (Surroca et al., 2010).

Several studies have been analysing green funds financial performance. However, the results found are mixed.

Chang et al. (2012) evaluate the performance of green mutual funds from the US. The green mutual funds are compared to the average of all traditional mutual funds taking into consideration the respective Morningstar categories. The findings indicate that green mutual funds underperform. Ibikunle and Steffen (2017) study European green funds between 1991 and 2014 and compared them with conventional and black funds. The results show that green mutual funds significantly underperform compared to conventional funds. However, green and black mutual funds exhibit no significant risk-adjusted-performance differences and in some periods green funds significantly outperform their black peers, especially during the 2012-2014 window. The results of these studies may reinforce the idea that investors might pay a premium for investing in green funds.

Climent and Soriano (2011) analyse US green mutual funds, between 1987 to 2009. A matched approach is used to compare the green funds with conventional funds and with socially responsible funds. The authors use age, size and investment objectives as criteria for the matching. A sample of 7 green funds, 14 matched socially responsible funds and 28 matched conventional funds is analysed. This is a relatively small sample, probably conditioned by the number of funds' existent at the time. The results show that green funds adjusted returns are not significantly different from those of conventional and socially responsible funds in the sub-period of 2001-2009. Although, in the sub-period of 1987-2001 green funds seem to exhibit lower returns than the matched conventional funds. The authors claim that maybe the question should be who, when and in which sense does it pay to be green instead of the more common question: does it pay to be green? Chung et al. (2012) evaluate the performance of US green funds. The authors find no significant difference between the performance of green and conventional funds. The results of these studies may be

consistent with the idea that investors do not experience better or worse performance when investing in green funds.

Ito et al. (2013) study environmentally friendly funds of the US, Europe and Japan and compare them with conventional funds. The authors apply a dynamic mean-variance model using the shortage function approach to measure financial performance, allowing risk and return to be considered simultaneously. The evidence suggests that environmentally friendly funds obtain equal or higher performance than conventional funds. These results show that it may be possible to outperform conventional funds by investing in green funds.

Although there is no consensus in the relationship between green funds and financial performance, literature review studies reveal that the predominant relationship in the green literature is the positive one (e.g., Dixon-Fowler et al., 2013; Endrikat et al., 2014).

Despite the predominance of these findings, some lack of consensus remains. Several authors have been trying to identify the reasons for the prevalence of these mixed results, suggesting that they are mainly related to methodological and theoretical problems. Precisely, Peloza (2009) states that there is a lack of consideration for intermediate and mediating variables. Furthermore, a clear theoretical foundation is absent (Wagner, 2009); there are still problems with inconsistency (Busch & Hoffmann, 2011); and a struggle with the direction of causality (Surroca et al., 2010).

2.3 Market conditions

A vast number of studies regarding socially responsible investments evaluate the funds' performance for an entire period without taking into consideration different market conditions (Leite et al., 2018). However, there are several studies that find evidence that funds performance changes over different market conditions, specifically, periods of crisis and periods of non-crisis.

Areal et al. (2013) analyse the performance of US mutual funds over different market regimes, taking into account religious, socially responsible and irresponsible criteria. To distinguish the different market states, Markov-switching conditional Capital Asset Pricing Model approach is applied. The findings

demonstrate that socially and morally responsible funds present different performances depending on the different market conditions. The authors claim that these results support the use of performance evaluation models that consider different market regimes. Nofsinger and Varma (2014) evaluate US socially responsible mutual funds considering different market conditions. For this proposal, two dummy variables to capture the different market conditions are added to the Capital Asset Pricing Model, the Fama and French (1993) three-factor model and the Carhart (1997) four-factor model. According to Nofsinger and Varma (2014) results, socially responsible funds underperform conventional funds during non-crisis periods while during crisis periods socially responsible funds outperform. Nofsinger and Varma (2014) state that companies with socially responsible characteristics are less risky in times of crisis. Thus, in this way, investors may want to reduce their downside risk by investing in these types of funds to be more protected in times of crisis. Slightly different results are obtained in the research of Leite and Cortez (2015) that analyse 40 French socially responsible mutual funds from January 2001 to December 2012, providing evidence that socially responsible funds significantly underperformed their matched conventional funds during non-crisis periods but match the performance during crisis periods. More recently, Matallín-Sáez et al. (2019) study US socially responsible funds taking into account business cycles. A sample of 202 socially responsible mutual funds is analysed between the period of January 3, 2000, to June 30, 2017. The findings show that socially responsible funds significantly underperform in expansion periods and in recession periods no significant differences were found. Differently, Leite et al. (2018) investigate the performance of socially responsible funds from Sweden taking into account different market states between November 2002 and October 2012. To evaluate the performance considering different market states, the authors add one dummy variable to the Fama and French (1993) three-factor model. The results indicate that most funds perform similarly in periods of crisis and periods of non-crisis.

In the green literature, there are also researches evaluating the financial performance considering different market conditions. Muñoz et al. (2014) evaluate the performance of the US and European green mutual funds, in different market conditions. The period of the analysis is between January 1994 and January 2013, and matched approach is used to compare green funds with conventional funds. The results, for the US funds, suggest that the US green domestic funds do not perform statistically different from conventional funds in periods of crisis and periods of non-crisis. The US green global funds perform similar to conventional

funds in crisis periods, however, in non-crisis periods the US green global funds significantly underperform their conventional funds. The European green funds significantly underperform conventional funds in crisis periods and perform similar to conventional funds in non-crisis periods. Silva and Cortez (2016) evaluate the performance of US and European green funds taking into account different market conditions. A sample of 9 US green global funds and 95 European green global funds during the period of August 1996 to March 2015 is analysed. The findings indicate that green funds performed better in periods of crisis compared to periods of non-crisis. Additionally, Us green funds exhibit a higher performance compared to socially responsible funds in times of crisis, while European green funds perform worse than socially responsible funds in non-crisis periods.

The results of these studies show, in general, that socially responsible funds and green funds exhibit different performances in periods of crisis and periods of non-crisis, which may support the use of models that consider different market conditions. Furthermore, we are currently living in a crisis, which also encourages this work to evaluate green mutual funds' performance considering different market conditions.

3. Methodology

To evaluate the financial performance of green mutual funds, unconditional models, conditional models and models that account for different market conditions, specifically, periods of crisis and periods of non-crisis are applied. Concerning unconditional models, (i) Carhart (1997) four-factor model, a widely used model in the literature to assess mutual funds' performance, will be applied as well as (ii) Fama and French (2018) six-factor model, a recent model that has not been extensively tested yet. Regarding conditional models, (iii) Christopherson et al. (1998) model with the risk factors of Carhart (1997) four-factor model and (iv) with the risk factors of Fama and French (2018) six-factor model, are used to account for the state of the economy with public information variables. To account for different market conditions, specifically, periods of crisis and periods of non-crisis (v) Carhart (1997) four-factor model as well as (vi) Fama and French (2018) six-factor model with a dummy variable to distinguishing crisis periods from non-crisis periods are applied.

3.1 Unconditional models

Jensen (1968) developed an unconditional single-factor model that accounts for the excess return of the market portfolio, the model was based on the Capital Asset Pricing Model. Jensen (1968) single-factor has received much criticism. For instance, Bauer et al. (2007) mention that the single-index model does not take into account risk related to non-index holdings. The Jensen (1968) single-factor model regression is the following one:

$$R_{p,t} - R_{f,t} = \alpha_{0,p} + \beta_{1,p}(R_{m,t} - R_{f,t}) + \varepsilon_{p,t} \quad (1)$$

Where $R_{p,t}$ is the return of the portfolio p on period t, $R_{f,t}$ is the risk-free rate on period t, $\alpha_{0,p}$ is the abnormal return, $R_{m,t}$ is the return of the market portfolio on period t, $\varepsilon_{p,t}$ is a residual term and the beta is the factor coefficient.

Fama and French (1993) propose the three-factor model, by adding two new risk factors to the single-factor model, specifically, the risk factors size and the risk factors book-to-market. Small firms usually have inferior earnings on assets in comparison to big firms, however, small firms can experience a long earnings depression that bypasses large firms indicating that size is related with a common risk factor that may explain

the negative relationship between size and average returns (Fama & French, 1993). Companies with high book-to-market equity values usually obtain low earnings on assets, while companies with low book-to-market equity values tend to obtain high earnings, however, the relationship between book-to-market equity and earnings indicates that relative profitability is the source of a common risk factor in returns wich may explain the positive relationship between book-to-market equity and average return (Fama & French, 1993). These two risk factors were able to capture the strong common variation of the returns, suggesting that size and book-to-market are a good proxy for common risk factors in stock returns (Fama & French, 1993). Fama and French (1993) three-factor model regression is exhibit bellow:

$$R_{p,t} - R_{f,t} = \alpha_{0,p} + \beta_{1,p}(R_{m,t} - R_{f,t}) + \beta_{2,p}(SMB_t) + \beta_{3,p}(HML_t) + \varepsilon_{p,t} \quad (2)$$

Where SMB_t (size) is the difference in returns between a portfolio of small stocks and a portfolio of large stocks and the HML_t (book-to-market) is the difference in returns between a portfolio of high book-to-market stocks and a portfolio of low book-to-market stocks.

Authors such as Brown and Goetzmann (1995), show evidence of persistence in mutual funds' performance. Carhart (1997) proposed to add the risk factor momentum to the Fama and French (1993) three-factor model, to capture the tendency in returns. The author provides evidence that the four-factor model created is able to explain considerable variation in returns. Carhart (1997) four-factor model is a very used model to assess financial performance. Therefore, the performance of green and conventional funds is initially measured with Carhart (1997) four-factor model:

$$R_{p,t} - R_{f,t} = \alpha_{0,p} + \beta_{1,p}(R_{m,t} - R_{f,t}) + \beta_{2,p}(SMB_t) + \beta_{3,p}(HML_t) + \beta_{4,p}(MOM_t) + \varepsilon_{p,t} \quad (3)$$

Where MOM_t (momentum) is the difference in returns between a portfolio of past winners and a portfolio of past losers.

Later, Fama and French (2015) develop a five-factor model, by adding two more risk factors to the Fama and French (1993) three-factor model. These two new risk factors are the profitability risk factor and

the investment risk factor. Novy-Marx (2013) find a proxy for expected profitability that is related to average return. Aharoni et al. (2013) find a relationship between investment and average return. The Fama and French (2015) five-factor model can perform better than the Fama and French (1993) three-factor model (Fama & French, 2015). However, Carhart (1997) four-factor model proved to be a good model to evaluate performance. The Fama and French (2015) five-factor model fell in disuse. The regression of Fama and French (2015) five-factor model is the following:

$$R_{p,t} - R_{f,t} = \alpha_{0,p} + \beta_{1,p}(R_{m,t} - R_{f,t}) + \beta_{2,p}(SMB_t) + \beta_{3,p}(HML_t) + \beta_{4,p}(RMW_t) + \beta_{5,p}(CMA_t) + \varepsilon_{p,t} \quad (4)$$

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

Recently, Fama and French (2018) propose the six-factor model, adding up the momentum risk factor to the previously mentioned five-factor model of Fama and French (2015). Fama and French (2018) six-factor model is very recent and maybe, for this reason, it has not been extensively tested in the literature yet. Therefore, this work will test this model and compare him with Carhart (1997) four-factor model, to see which one has more explanatory power. The regression of the Fama and French (2018) six-factor model is the following one:

$$R_{p,t} - R_{f,t} = \alpha_{0,p} + \beta_{1,p}(R_{m,t} - R_{f,t}) + \beta_{2,p}(SMB_t) + \beta_{3,p}(HML_t) + \beta_{4,p}(RMW_t) + \beta_{5,p}(CMA_t) + \beta_{6,p}(MOM_t) + \varepsilon_{p,t} \quad (5)$$

3.2 Conditional models

The models presented previously are considered unconditional models because they do not consider that the expected return and risk can vary over time depending on the state of the economy. To face this limitation, conditional models can be used. Ferson and Schadt (1996) suggest a conditional approach to performance evaluation where beta is allowed to be time-varying as a linear function of a vector of prearranged

information variables, z_{t-1}, that represents the public information variables available at time t-1 for predicting returns at time t, leading to the following regression:

$$R_{p,t} = \alpha_{0,p} + \beta_{1,p} R_{m,t} + \beta'_{z,p}(z_{t-1} R_{m,t}) + \varepsilon_{p,t} \quad (6)$$

Where $\alpha_{0,p}$ is an average alpha, $\beta_{1,p}$ is the average conditional beta, $\beta'_{z,p}$ is the vector of conditional betas and z_{t-1} is the vector of predetermined public information variables.

Since Ferson and Schadt (1996) assume that alphas are constant, this model is considered a partial conditional model. Christopherson et al. (1998) extend the model of Ferson and Schadt (1996) by allowing alpha to be time-varying as a linear function of a vector of prearranged information variables, z_{t-1}, that represents the public information variables available at time t-1 for predicting returns at time t, presenting the following regression:

$$R_{p,t} = \alpha_{0,p} + A'_{z,p} z_{t-1} + \beta_{1,p} R_{m,t} + \beta'_{z,p}(z_{t-1} R_{m,t}) + \varepsilon_{p,t} \quad (7)$$

Where $\alpha_{0,p}$ is an average alpha, $A'_{z,p}$ is the vector of conditional alphas, $z_{t-1}$is the vector of predetermined public information variables, $\beta_{1,p}$ is the average conditional beta and $\beta'_{z,p}$ is the vector of conditional betas.

As Cortez et al. (2012) showed, it is possible to combine conditional models with multifactor models, by substituting the market return with factor returns, then we obtain the following regression:

$$R_{p,t} = \alpha_{0,p} + A'_{z,p} z_{t-1} + \beta_{1,p} F_{k,t} + \beta'_{z,p}(z_{t-1} F_{k,t}) + \varepsilon_{p,t} \quad (8)$$

Where $F_{k,t}$ is the vector of factor returns.

Then, the third model use is the conditional model of Christopherson et al. (1998) with the risk factors of Carhart (1997) four-factor model:

$$R_{p,t} = \alpha_{0,p} + A'_{z,p} z_{t-1} + \beta_{1,p} R_{m,t} + \beta_{2,p}(SMB) + \beta_{3,p}(HML) + \beta_{4,p}(MOM) + \beta'_{z,p}(z_{t-1} R_{m,t}) + s'_{z,p}(z_{t-1} SMB_t) + h'_{z,p}(z_{t-1} HML_t) + m'_{z,p}(z_{t-1} MOM_t) + \varepsilon_{p,t} \quad (9)$$

Where $s'_{z,p}$, $h'_{z,p}$ and $m'_{z,p}$ are the vectors of the conditional coefficients of the risk factors SMB, HML and MOM respectively.

The fourth model use is the conditional model of Christopherson et al. (1998), with the risk factors of Fama and French (2018) six-factor model:

$$R_{p,t} = \alpha_{0,p} + A'_{z,p} z_{t-1} + \beta_{1,p} R_{m,t} + \beta_{2,p}(SMB) + \beta_{3,p}(HML) + \beta_{4,p}(RMW) + \beta_{5,p}(CMA) + \beta_{6,p}(MOM) + \beta'_{z,p}(z_{t-1} R_{m,t}) + s'_{z,p}(z_{t-1} SMB_t) + h'_{z,p}(z_{t-1} HML_t) + r'_{z,p}(z_{t-1} RMW_t) + c'_{z,p}(z_{t-1} CMA_t) + m'_{z,p}(z_{t-1} MOM_t) + \varepsilon_{p,t} \quad (10)$$

Where s'$_{z,p}$, $h'_{z,p}$, $r'_{z,p}$, $c'_{z,p}$ and $m'_{z,p}$ are the vectors of the conditional coefficients of the risk factors SMB, HML, RMW, and CMA respectively.

3.3 Performance evaluation under different economic conditions

The conditional model of Christopherson et al. (1998) has some limitations as it assumes that the relationship between the time-varying alphas and public variables is linear and, similarly, also assumes that the relationship between the time-varying betas and the public variables is linear. An alternative approach to evaluating funds performance, taking into account different market conditions, is to use models with a dummy variable that allows distinguishing crisis periods from non-crisis periods.

Inspired by Leite et al. (2018), to evaluate funds performance this work use models that account for different market conditions, specifically, periods of crisis and periods of non-crisis. To accomplish this, a dummy variable is used to distinguish between crisis periods and non-crisis periods. This dummy assumes the value 1 in crisis periods and 0 in non-crisis periods. In this way, it will be possible to observe if funds performance and risk factors exposure is significantly different between periods of crisis and periods of non-

crisis. Thus, the fifth and sixth model to evaluate funds' performance, is Carhart (1997) four-factor model with the dummy variable and Fama and French (2018) six-factor model with the dummy variable, respectively:

$$R_{p,t} - R_{f,t} = \alpha_{0,p} + \alpha_{0rec,p}D_t + \beta_{1,p}(R_{m,t} - R_{f,t}) + \beta_{1rec,p}(R_{m,t} - R_{f,t})D_t + \beta_{2,p}SMB_t + \beta_{2rec,p}SMB_tD_t + \beta_{3,p}HML_t + \beta_{3rec,p}HML_tD_t + \beta_{4,p}MOM_t + \beta_{4rec,p}MOM_tD_t + \varepsilon_{p,t} \quad (11)$$

$$R_{p,t} - R_{f,t} = \alpha_{0,p} + \alpha_{0rec,p}D_t + \beta_{1,p}(R_{m,t} - R_{f,t}) + \beta_{1rec,p}(R_{m,t} - R_{f,t})D_t + \beta_{2,p}SMB_t + \beta_{2rec,p}SMB_tD_t + \beta_{3,p}HML_t + \beta_{3rec,p}HML_tD_t + \beta_{4,p}CMA_t + \beta_{4rec,p}CMA_tD_t + \beta_{5,p}RMW_t + \beta_{5rec,p}RMW_tD_t + \beta_{6,p}MOM_t + \beta_{6rec,p}MOM_tD_t + \varepsilon_{p,t} \quad (12)$$

Where D_t is a dummy variable that assumes the value 0 in non-crisis periods and 1 in crisis periods.

3.4 Matching pair

Numerous studies analyse funds financial performance using an index as a benchmark to compare funds with the index chosen. These studies face the issue of what is the appropriate index (Durán-Santomil et al., 2019). Furthermore, Roll (1978) states that the assessment of portfolio performance can be different depending on the benchmark chose. To avoid these problems matched-pair analysis can be used. Climent and Soriano (2011) state that funds characteristics such as size, age, managers, style, country, industry or investment universe are important when comparing funds, and that these biases can be corrected using a matched-pair analysis. The matched-pair analysis approach has been used in other studies, such as Muñoz et al. (2014) and Nofsinger and Varma (2014). Following these studies, the matched-pair approach consists in, first, for each green funds select conventional funds with the same investment objective; second, from the conventional funds with the same investment objective, chose the funds with the same age as the green funds; third, for each green fund, select the three conventional funds with the closest size to each green fund.

Although the matched-pair analysis is a very used procedure in the literature to compare the performance of green and conventional funds, this approach has some limitations. In the matching procedure, a sizable amount of monthly return data is lost. Even when funds are highly similar in age and size, the matched-pairs return data is not able to fully overlap and so the non-contracted monthly returns are lost (Ibikunle & Steffen, 2017).

4. Data

The US market is used in this work for being an important reference market, that facilitates access to data. Furthermore, several studies evaluate the financial performance of green mutual funds from the US market which will provide the opportunity to compare results. The US green mutual funds use in this research are global and domestic, inspired by Muñoz et al. (2014); and also to have a larger sample. The funds are identified in Refinitiv Eikon. Recently Refinitiv Eikon allows its users to filter mutual funds by green criteria. Following Silva and Cortez (2016), and to increase the number of green mutual funds, this work uses a list present in Muñoz et al. (2014) to identify a few more green mutual funds to join the dataset. Muñoz et al. (2014) identify the funds in Morningstar. This database defines socially conscious funds as investments based on environmental responsibility, human rights or religious views, avoiding investing in companies involved in promoting alcohol, tobacco, or gambling or in the defense industry (Muñoz et al., 2014). Muñoz et al. (2014) considered the socially conscious funds with an environmental focus. Although there is no consensus in a clear and unique green investments definition, there may be a general agreement that green investments are investments in companies that do good for the environment or reduce the negative impacts on the environment.

To be included in the dataset, green funds are required to have at least 36 monthly observations. From the funds with different share classes, just the oldest one is selected. If the ages are equal, the class with the highest total net assets is picked. Only funds classified as equity were chosen. ETFs, index funds and bonds were excluded. Unfortunately, in the green dataset, it was not possible to include dead funds, meaning that the results may be biased by survivorship bias. The prospectus of each fund is analysed to guarantee that the funds are in fact, green. The funds that do not have an available prospectus or that the prospectus was not found, were excluded from the sample. Refinitiv Eikon is used to obtain monthly returns, in US dollars, which then are computed discretely. The final sample includes 13 green mutual funds. Of those, 7 are domestic and 6 are global funds. The analysis period is defined from 31 January 2000 to 31 October 2020, which consists of a considerable period that accounts for three different crises.

In this work, inspired by Nofsinger and Varma (2014), to create the matched portfolio, first, all US conventional funds in the Refinitiv Eikon (excluding green funds) are identified. Then, the conventional funds

with the same classification as the green funds are chosen, after, from these conventional funds, funds with the same age[1] as the green funds in the dataset are selected. Finally, for each green fund, the three conventional funds (chosen before) with the closest total net asset[2] are chosen to do the match. As Nofsinger and Varma (2014), for each green fund, the three matched conventional funds came from different fund families to ensure that the matched conventional funds performance is not affected by a few large fund families.

Green and conventional funds' performance is analysed considering individual funds, equally weighted portfolios[3] and portfolios of differences. Therefore, this work constructs four equally weighted portfolios: the first, referred as green domestic portfolio, is formed by US green domestic funds; the second, referred as conventional domestic portfolio, is formed by US conventional domestic matched funds; the third, referred as green global portfolio, is formed by US green global funds; the fourth, referred as conventional global portfolio, is formed by US conventional global matched funds. Additionally, two portfolios of differences are constructed: the first, referred as the domestic portfolio of differences, consists of subtracting the conventional domestic portfolio from the green domestic portfolio; the second, referred as global portfolio of differences, consists of subtracting the conventional global portfolio from the green global portfolio. The analysis of individual funds' performance is considered taking into account that the aggregate results may cover significant performance of the individual funds. Moreover, investors are more interested in the individual funds' performance (Silva & Cortez, 2016).

The risk factors, size, value, profitability, investment and momentum and the risk-free rate are collected from Professor Kenneth French's website (domestic and global). For the market, the S&P 500 index is used as a benchmark for domestic funds and the MSCI World index is used as a benchmark for global funds.

[1] Following Nofsinger and Varma (2014) approach, when three matched conventional funds are not found due to the one year age criteria, this restriction is relaxed within three years. When it is still not possible to do the match, the age criteria is completely relaxed (Nofsinger & Varma, 2014).

[2] Refinitiv Eikon has many missing total net assets therefore, this work used CRSP in order to get the total net assets. Unfortunately, this work did not has access to the total net assets of 2020 in CRSP therefore, the total net assets of 2019 are used as a proxy. Furthermore, CRSP has no update date for two funds of the data set. One funds is green and CRSP just have the total net asset until 2013, when the fund is still active. The other fund, is a conventional fund and CRSP have the total net asset until one month before the fund die.

[3] Unfortunately, it was not possible to analyse value weighted portfolios, since the total net assets that this work was able to obtain are from 2019 and not from 2020.

Following the approach of Cortez et al. (2012), the public information variables for the conditional models are short-term rate and dividend yield. The short-term rate corresponds to the yield on a constant-maturity 3-month US Treasury Bill and is used for domestic funds and as a proxy for global funds. The dividend yield is based on the FTSE United States for the domestic funds and on the FTSE All World for the global funds. These variables are treated as measures of the state of the economy. The data of the short-term rate is obtained from the federal reserve website and the data of the dividend yield is obtained from Refinitiv Eikon. Ferson et al. (2003) suggest subtracting the 12-months moving average of the series in order to avoid bias resulting from spurious regressions, as these public variables tend to be persistent. To attenuate possible scale effects on the results, these variables have their corresponding mean zero values (Bernhardt & Jung, 1979).

This work considers the US business cycle of NBER to identify the periods of non-crisis and the periods of crisis. NBER has a chronology of US business cycles identifying the peaks and troughs that frame economic non-crisis and crisis periods, the crisis periods begin at the peak of a business cycle and end at the trough and between a trough and a peak is, therefore, the non-crisis periods (National Bureau of Economic Research, n.d.). NBER considers that the crisis period involves a significant drop in the economic activity that is spread and has a duration longer than a few months (National Bureau of Economic Research, n.d.). Therefore, three crisis periods are identified: (i) March 2001 to November 2001; (ii) December 2007 to June 2009 and (iii) February 2020 to October 2020. In the last crisis period, from February 2020 to October 2020, NBER just considers the peak, which corresponds to February 2020, meaning that the crisis period continued. For this reason, this work considers the period between February 2020 to October 2020 because October 2020 is the last period of the analysis of this work, which does not mean that the crisis ends in October 2020. These consider periods are used for domestic and global funds.

Table 1 reports the descriptive statistics for the equally weighted portfolios, benchmarks, and risk factors. Panel A reports the results for the domestic funds and panel B reports the results for the global funds. The descriptive statistics in this table includes the number of observations, mean excess returns (%), standard deviation (%), excess kurtosis, skewness, minimum, maximum, the probability value of the Jarque-Bera test and p-value. This, concerning the period of January 2000 to October 2020.

Table 1. Descriptive statistics

Panel A: US domestic funds									
	Obervations	Mean excess returns (%)	Standard deviation (%)	Excess Kurtosis	Skewness	Min	Max	Adj. x2	P-value
Green portfolio	250	0.3348	4.6360	0.9864	-0.4363	-17.35	13.26	18.07	1.0E-04
Conventional portfolio	250	0.2593	5.2374	1.3232	-0.5310	-20.08	16.96	29.99	3.1E-07
S&P 500	250	0.5779	4.3472	1.0543	-0.5432	-16.80	12.82	23.87	6.5E-06
SMB	250	0.1134	3.0890	5.6337	0.3323	-15.33	17.62	335.21	2.2E-16
HML	250	-0.0489	3.2428	2.9827	0.0431	-14.23	12.22	92.75	2.2E-16
RMW	250	0.2705	2.8996	9.7065	-0.5836	-18.91	12.87	995.61	2.2E-16
CMA	250	0.1080	2.0270	2.6625	0.8439	-7.09	9.18	103.52	2.2E-16
MOM	250	0.1130	5.2754	9.3501	-1.4717	-34.40	17.93	1000.90	2.2E-16
Panel B: US global funds									
	Obervations	Mean excess returns (%)	Standard deviation (%)	Excess Kurtosis	Skewness	Min	Max	Adj. x2	P-value
Green portfolio	250	0.3317	5.0055	2.4608	-0.9641	-20.94	13.40	138.72	2.2E-16
Conventional portfolio	250	0.1699	5.2229	0.9896	-0.5371	-20.43	12.22	32.48	8.9E-08
MSCI World	250	0.4906	4.4455	1.4313	-0.6700	-18.93	11.32	40.05	2.0E-09
SMB	250	0.0404	1.8906	3.0357	-0.3275	-9.15	7.93	100.46	2.2E-16
HML	250	0.0931	2.5558	4.1992	0.4759	-10.51	11.69	193.12	2.2E-16
RMW	250	0.2463	1.5317	2.2736	-0.2174	-6.17	5.66	55.82	7.6E-13
CMA	250	0.1329	1.8664	3.9753	1.1013	-5.25	9.04	215.15	2.2E-16
MOM	250	0.3012	4.1518	6.3285	-1.1278	-24.27	17.34	470.18	2.2E-16

This table reports descriptive statistics for the equally weighted portfolios, for the benchmarks used and for the risk factors. Panel A reports the results for the domestic funds and Panel B reports the results for the global funds. The statistic that is presented in this table includes the number of observations, mean excess returns (%), standard deviation (%), excess kurtosis, skewness, minimum, maximum, the probability value of the Jarque-Bera test and p-value. This, for the period of January 2000 to October 2020.

The mean excess returns are all close to zero and positive except for the book-to-market in panel A, which has a negative mean excess return. Comparing green funds with conventional funds, the green domestic portfolio and the green global portfolio have higher mean excess return and lower standard deviation compared to the conventional domestic portfolio and the conventional global portfolio, respectively. This suggests that the returns of the green portfolios are higher compared to the conventional portfolios and that the conventional portfolios have higher volatility than the green portfolios, meaning that the conventional portfolios are riskier. These standard deviations may not be very common, since usually green portfolios have higher standard deviations comparing to conventional portfolios due to the restrictions in the diversification of green funds. The S&P 500 benchmark has a higher mean excess return and a lower standard deviation

comparing to the green domestic portfolio and the conventional domestic portfolio. Similarly, the MSCI World benchmark has higher mean excess returns and lower standard deviation compared to the green global portfolio and the conventional global portfolio.

The four equally weighted portfolios and the two benchmarks have negative skewness meaning that the left tail of the distribution is longer than the right tail. The risk factors have a variety of positive and negative skewness. All portfolios and benchmarks represent in Table 1 have excess kurtosis, meaning that the distribution is leptokurtic. The risk factors also have excess kurtosis.

Jarque-Bera test is a test to verify if the data follows a normal distribution. The test is performed for the equally weighted portfolios, for the benchmarks and the risk factors. The results support that they do not follow a normal distribution, since the null hypothesis of normality is reject for all levels of significance. The rejection of the normal distribution of the funds excess returns supports the use of conditional models instead of unconditional models (Adcock et al., 2012).

5. Results

Next, the results for the financial performance of US green mutual funds are presented and discussed. The analysis starts with unconditional models, specifically Carhart (1997) four-factor model and Fama and French (2018) six-factor model. Then, the results for the conditional version of the models are reported and analysed. The Wald test for the conditional models is also reported and discussed. Finally, the results for Carhart (1997) four-factor model and Fama and French (2018) six-factor model with a dummy variable, that allows to distinguishing crisis periods from non-crisis periods, are also presented and discussed. These models are applied to four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), to funds individually (in the results, when it is mentioned that individual funds are statistically significant, means that they are statistically significant at a 5% significance level) and to two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences).

5.1 Unconditional models

Table 2 presented below reports the results of the unconditional Carhart (1997) four-factor model for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds (more detailed results presented in the appendices D and E), and two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the result for domestic funds and panel B reports the results for global funds. This, during the period of January 2000 to October 2020.

Table 2. Unconditional Carhart (1997) four-factor model.

Panel A: US domestic funds							
Portfolios	Green (1)	N+	N-	Conventional (2)	N+	N-	Portfolio of Differences (1)-(2)
α_p	-0.0028***	3(0)	4(1)	-0.0042***	6(0)	15(6)	0.0014
β_p	0.9698***	7(7)	0(0)	1.0687***	21(20)	0(0)	-0.0989***
β_{SMB}	0.1859***	7(5)	0(0)	0.3136***	18(14)	3(0)	-0.1277***
β_{HML}	0.1045***	4(1)	3(3)	0.0027	11(4)	10(8)	0.1018***
β_{MOM}	-0.0007	2(0)	5(1)	-0.0469**	5(1)	16(7)	0.0462*
Adj. R^2	88.84%			90.97%			12.55%
Panel B: US global funds							
Portfolios	Green (3)	N+	N-	Conventional (4)	N+	N-	Portfolio of Differences (3)-(4)
α_p	-0.0032**	2(0)	4(1)	-0.0030***	3(0)	15(5)	2.887E-05
β_p	1.0237***	6(6)	0(0)	1.0811***	18(18)	0(0)	-0.0517
β_{SMB}	0.2491***	6(5)	0(0)	0.1667***	14(10)	4(0)	0.1479*
β_{HML}	-0.1645***	2(0)	4(2)	-0.3562***	8(1)	10(5)	0.1428**
β_{MOM}	-0.0760**	1(0)	5(1)	-0.0281	12(3)	6(1)	-0.0212
Adj. R^2	86.76%			91.98%			3.33%

This table reports the regression estimates obtained from the unconditional Carhart (1997) four-factor model, for four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the results for domestic funds and Panel B the results for global funds. S&P500 is used as the domestic benchmark and MSCI World as the global benchmark. N+ and N- report the number of individual funds with positive and negative coefficients, respectively, and between the parentheses the number of funds with statistically significant coefficients (positive or negative, respectively) at the significant level of 5%. This table reports the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). For the four equally weighted portfolios and the two portfolios of differences the level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

The explanatory power of this model is above 85% for the green domestic portfolio (88.84%) and the green global portfolio (86.76%) and is above 90% for the conventional domestic portfolio (90.97%) and the conventional global portfolio (91.98%). The explanatory power of this model is higher for the conventional portfolios in comparison to green portfolios.

Concerning panel A, the green domestic and the conventional domestic portfolios exhibit negative and statistically significant alphas at a 1% significance level, which means that these two portfolios underperform the market. At the individual fund level, just 1 green domestic fund out of 7, and 6 conventional

domestic funds out of 21 present negative and statistically significant alphas, suggesting that these funds underperform the market. Similarly, in panel B the green global and the conventional global portfolios preset negative and statistically significant alphas at a 5% and 1% significance level, respectively, meaning that these two portfolios also underperform the market. Observing funds individually, only 1 green global fund out of 6 and 5 conventional global funds out of 18 exhibit negative and statistically significant alphas, suggesting that these funds underperform the market. Similarly, Climent and Soriano (2011) find that their green funds underperform the market. Comparing green funds with conventional funds, for the domestic portfolio of differences and the global portfolio of differences the alphas are not statistically significant, meaning that the green funds do not perform significantly different from the conventional funds. The same conclusion is reached by Muñoz et al. (2014) when analysing the portfolio of differences (concerning green and conventional funds) of the US domestic funds. However, when analysing the portfolio of differences (regarding green and conventional funds) of the US global funds Muñoz et al. (2014) concludes that US green global funds perform significantly worse than their conventional counterparts.

Regarding the market risk, the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio exhibit positive and statistically significant betas at the 1% significance level which means that these four portfolios are positively exposed to the market. In addition, all the individual funds present positive and statistically significant market betas, except for one domestic conventional fund, meaning that these funds are also positively exposed to the market. As for the domestic portfolio of differences, still concerning the market risk, the beta is negative and statistically significant at the 1% significance level, meaning that the conventional domestic funds are significantly more positively exposed to the risk market than the green domestic funds.

In relation to the risk factor size, the four equally weighted portfolios present positive and statistically significant betas at a 1% significance level, meaning that the four portfolios are more exposed to small-cap stocks. At the individual fund level, the majority of the green funds and more than half of the conventional funds exhibit positive and statistically significant betas. Therefore, these funds, the funds that present positive and statistically significant betas, are more exposed to small-cap stocks. Climent and Soriano (2011) also found that their green funds are more exposed to small-cap stocks. Regarding the domestic portfolio of differences, still concerning the risk factor size, the beta is negative and statistically significant at a 1%

significance level, which means that the conventional domestic funds are significantly more exposed to small-cap stocks than the green domestic funds.

Concerning the risk factor book-to-market, the green domestic portfolio exhibits a positive and statistically significant beta at a 1% significance level, which means that this portfolio is more exposed to value stocks. However, at the individual funds level, just 1 green domestic fund out of 7 exhibits a positive and statistically significant beta while 3 out of 7 green domestic funds present negative and statistically significant betas, meaning that these 3 funds are more exposed to growth stocks than to value stocks. Differently, still regarding the risk factor book-to-market, the green global and the conventional global portfolios present negative and statistically significant betas at a 1% significance level. Therefore, these two portfolios are more exposed to growth stocks. At the individual fund level, 2 out of 6 green global funds and 5 out of 18 conventional global funds exhibit negative and statistically significant betas, suggesting that these funds are more exposed to growth stocks. The betas of the domestic portfolio of differences and the global portfolio of differences are both positive and statistically significant at a 1% and 5% significance level, respectively, meaning that the green funds are significantly more exposed to value stocks than the conventional funds.

With respect to the momentum risk factor, the conventional domestic and the green global portfolios are more exposed to poor past performance since the betas are negative and statistically significant at a 5% significance level. Observing funds individually, 7 out of 21 conventional domestic funds and just 1 green global fund out of 6 exhibit negative and statistically significant betas, indicating that these funds are more exposed to poor past performance.

Next, Table 3 reports the results for the unconditional Fama and French (2018) six-factor model with respect to the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds (more detailed results presented in the appendices F and G), and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the result for domestic funds and panel B reports the results for global funds. The considered period is from January 2000 to October 2020.

Table 3. Unconditional Fama and French (2018) six-factor model.

Panel A: US domestic funds							
Portfolios	Green (1)	N+	N-	Conventional (2)	N+	N-	Portfolio of Differences (1)-(2)
α_p	-0.0035***	3(0)	4(2)	-0.0043***	6(0)	15(6)	0.0009
β_p	0.9890***	7(7)	0(0)	1.0721***	21(21)	0(0)	-0.0830**
β_{SMB}	0.2236***	7(5)	0(0)	0.3118***	17(11)	4(1)	-0.0883*
β_{HML}	0.0418	4(0)	3(2)	-0.012	9(5)	12(7)	0.0538
β_{RMW}	0.0921**	3(1)	4(1)	-0.0017	7(4)	14(5)	0.0938
β_{CMA}	0.0661	3(0)	4(2)	0.0390	9(1)	12(8)	0.0271
β_{MOM}	-0.0093	2(0)	5(1)	-0.0488**	5(0)	16(7)	0.0395
Adj. R^2	88.97%			90.91%			12.78%
Panel B: US global funds							
Portfolios	Green (3)	N+	N-	Conventional (4)	N+	N-	Portfolio of Differences (3)-(4)
α_p	-0.0026**	1(0)	5(1)	-0.0015	3(1)	15(6)	-0.0006
β_p	1.0122***	6(6)	0(0)	1.0436***	18(18)	0(0)	-0.0360
β_{SMB}	0.2455***	6(5)	0(0)	0.0829	14(8)	4(0)	0.1601*
β_{HML}	-0.1934**	3(0)	3(2)	-0.3038***	11(0)	7(5)	0.1315
β_{RMW}	-0.2054*	1(0)	5(1)	-0.3434***	8(2)	10(5)	0.1625
β_{CMA}	0.0176	2(1)	4(0)	-0.0261	8(3)	10(4)	0.0548
β_{MOM}	-0.0526	1(0)	5(1)	-0.0069	12(3)	6(1)	-0.0460
Adj. R^2	86.86%			92.71%			3.29%

This table reports the regression estimates obtained from the unconditional Fama and French (2018) six-factor model, for four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the results for domestic funds and Panel B the results for global funds. S&P500 is used as the domestic benchmark and MSCI World as the global benchmark. N+ and N- report the number of individual funds with positive and negative coefficients, respectively, and between the parentheses the number of funds with statistically significant coefficients (positive or negative, respectively) at the significant level of 5%. This table reports the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML), profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). For the four equally weighted portfolios and the two portfolios of differences the level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

The explanatory power of this model is similar to the explanatory power of the unconditional Carhart (1997) four-factor model. Therefore, by adding the two risk factors, the profitability risk factor and the investment risk factor, the explanatory power of this model did not change much. The conventional portfolios

have higher explanatory power than the green portfolios, like in the unconditional Carhart (1997) four-factor model.

In panel A, the green domestic and the conventional domestic portfolios present negative and statistically significant alphas at a 1% significance level, meaning that these two portfolios underperform the market, as in the unconditional Carhart (1997) four-factor model. At the individual level, for 2 out of 7 green domestic funds and for 6 out of 21 conventional domestic funds the alphas are negative and statistically significant, suggesting that these funds underperform the market. For panel B, the green global portfolio exhibits a negative and statistically significant alpha at a 5% significance level, meaning that this portfolio underperforms the market, like in the unconditional Carhart (1997) four-factor model. Observing the green global funds individually, just 1 green global fund out of 6 exhibits a negative and statistically significant alpha, meaning that this fund underperforms the market. As for the conventional global portfolio, the alpha loses its statistical significance, in comparison to the unconditional Carhart (1997) four-factor model. The alphas of the domestic portfolio of differences and the global portfolio of differences are not statistically significant, indicating that green funds do not perform significantly different from the conventional funds, as in the unconditional Carhart (1997) four-factor model.

Concerning the market risk, as in the unconditional Carhart (1997) four-factor model, all the equally weighted portfolios are positively exposed to the market since the betas are positive and statistically significant at a 1% significance level. At the individual fund level, all funds present positive and statistically significant market betas, suggesting that all funds are positively exposed to the market. Still regarding the market risk, the domestic portfolio of differences presents a negative and statistically significant beta at a 5% significance level, implying that the conventional domestic funds are significantly more positively exposed to the market in comparison to the green domestic funds.

Regarding the risk factor size, for the green domestic and the conventional domestic portfolios, the betas are positive and statistically significant at the 1% significance level. Therefore, these two portfolios are more exposed to small-cap stocks, as in the unconditional Carhart (1997) four-factor model. Observing funds individually, 5 out of 7 green domestic funds and 11 out of 21 conventional domestic funds present positive and statistically significant betas, meaning that these funds are more exposed to small-cap stocks. Still

concerning the risk factor size, the green global portfolio also exhibits a positive and statistically significant beta at a 1% significant level, indicating that this portfolio is more exposed to small-cap stocks, as in the unconditional Carhart (1997) four-factor model. At the individual fund level, the majority of the green global funds are more exposed to small-cap stocks since the betas are positive and statistically significant. Concerning the conventional global portfolio, the risk factor size loses its statistical significance, in comparison to the unconditional Carhart (1997) four-factor model.

Concerning the risk factor book-to-market, for the green domestic portfolio, this factor loses its statistical significance, in comparison to the unconditional Carhart (1997) four-factor model. The green global portfolio exhibits a negative beta, but now only statistically significant at the 5% significance level, in comparison to the unconditional Carhart (1997) four-factor model. The conventional global portfolios present a negative and statistically significant beta at the 1% significance level, as in the previous model. Therefore, the green global portfolio and the conventional global portfolio are more exposed to growth stocks. At the individual fund level, for 2 out of 6 green global funds and for 5 out of 18 conventional global funds the betas are negative and statistically significant, suggesting that these funds are more exposed to growth stocks.

With respect to the profitability risk factor, the green domestic portfolio is more exposed to companies with robust profitability since the beta is positive and statistically significant at a 5% significance level. At the individual fund level, just 1 out of 7 green domestic funds present a positive and statistically significant beta, meaning that this fund is more exposed to companies with robust profitability. Differently, still regarding the profitability risk factor, the conventional global portfolio is more exposed to companies with weak profitability as the beta is negative and statistically significant at a 1% significance level. Observing funds individually, 5 out of 18 conventional global funds exhibit negative and statistically significant betas, suggesting that these 5 funds are more exposed to companies with weak profitability.

Regarding the investment risk factor, the betas of the four equally weighted portfolios are not statistically significant. Therefore, the investment risk factor seems irrelevant in this model.

As for the momentum risk factor, the conventional domestic portfolio presents a negative and statistically significant beta at the 5% significance level, indicating that this portfolio is more exposed to

companies with weak past performance, as in the unconditional Carhart (1997) four-factor model. At the individual fund level, for 7 out of 21 conventional domestic funds, the betas are negative and statistically significant, indicating that these funds are more exposed to companies with weak past performance. Concerning the green global portfolio, the momentum risk factor loses its statistical significance, in comparison to the unconditional Carhart (1997) four-factor model.

5.2 Conditional models

Table 4 presented below reports the results of the conditional Carhart (1997) four-factor model for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds (more detailed results presented in the appendices H and J), and the two portfolios of differences (the domestic and the global portfolios of differences). Panel A reports the result for domestic funds and panel B reports the results for global funds. This, during the period of January 2000 to October 2020.

Table 4. Conditional Carhart (1997) four-factor model.

Panel A: US domestic funds							
Portfolios	Green (1)	N+	N-	Conventional (2)	N+	N-	Portfolio of Differences (1)-(2)
α_p	-0.0034***	3(0)	4(2)	-0.0041***	8(0)	13(6)	0.0007
α_{ST}	0.0013	3(0)	4(1)	-0.0014	10(0)	11(2)	0.0027
α_{DY}	-0.0011	2(0)	5(1)	0.0032	3(1)	18(1)	-0.0043
β_{p*rm}	0.9851***	7(7)	0(0)	1.0650***	21(21)	0(0)	-0.0799**
β_{ST*rm}	0.0552	5(0)	2(0)	0.0012	12(2)	9(3)	0.0540
β_{DY*rm}	-0.0609	5(1)	2(0)	-0.0286	10(5)	11(2)	-0.0322
β_{SMB}	0.2188***	7(5)	0(0)	0.2946***	19(13)	2(1)	-0.0758*
β_{ST*SMB}	-0.0420	3(0)	4(2)	0.0457	9(2)	12(3)	-0.0877
β_{DY*SMB}	0.3488	3(0)	4(1)	0.2696	16(6)	5(2)	0.0792
β_{HML}	0.0962***	4(2)	3(2)	0.0259	10(5)	11(7)	0.0702
β_{ST*HML}	0.0448	3(1)	4(1)	0.0245	13(3)	8(2)	0.0203
β_{DY*HML}	-0.0732	3(0)	4(0)	0.0147	7(2)	14(3)	-0.0880
β_{MOM}	0.0065	3(1)	4(1)	-0.0304	10(2)	11(5)	0.0369
β_{ST*MOM}	-0.0403	1(0)	6(1)	0.0463	5(2)	16(5)	-0.0866*
β_{DY*MOM}	-0.0841	3(0)	4(2)	-0.0151	9(0)	12(3)	-0.0691
Adj. R^2	88.90%			90.81%			12.96%
Panel B: US global funds							
Portfolios	Green (3)	N+	N-	Conventional (4)	N+	N-	Portfolio of Differences (3)-(4)
α_p	-0.0040***	2(0)	4(2)	-0.0035***	2(0)	16(6)	2.277E-06
α_{ST}	0.0021	0(0)	6(2)	-0.0016	10(2)	8(2)	0.0044*
α_{DY}	-0.0034	5(0)	1(0)	-0.0035	7(0)	11(3)	0.0012
β_{p*rm}	1.0199***	6(6)	0(0)	1.0693***	18(18)	0(0)	-0.0494
β_{ST*rm}	0.0473	5(1)	1(0)	-0.0131	10(3)	8(4)	0.0453
β_{DY*rm}	-0.0264	3(2)	3(0)	-0.0824	9(1)	9(2)	0.0284
β_{SMB}	0.2139**	6(5)	0(0)	0.1168**	15(8)	3(2)	0.1312
β_{ST*SMB}	-0.1273	0(0)	6(1)	0.1276	5(2)	13(4)	-0.2751*
β_{DY*SMB}	-0.1058	4(1)	2(0)	-0.1486	10(7)	8(1)	-0.0328
β_{HML}	-0.1250*	3(0)	3(2)	-0.2850***	7(2)	11(4)	0.1075
β_{ST*HML}	0.1077	0(0)	6(2)	0.0478	7(0)	11(3)	-0.0249
β_{DY*HML}	-0.1335	5(2)	1(0)	-0.3427	6(1)	12(3)	0.2431
β_{MOM}	-0.0340	2(1)	4(0)	0.0112	13(3)	5(0)	-0.0268
β_{ST*MOM}	0.0658	2(1)	4(3)	0.0696	5(1)	13(2)	0.0254
β_{DY*MOM}	-0.1170	3(1)	3(1)	-0.1754*	8(0)	10(4)	0.0555
Adj. R^2	86.57%			92.30%			3.21%

This table reports the regression estimates obtained from the conditional Carhart (1997) four-factor model, for four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds and the two portfolios of differences

(the domestic portfolio of differences and the global portfolio of differences). Panel A reports the results for domestic funds and Panel B the results for global funds. S&P500 is used as the domestic benchmark and MSCI World as the global benchmark. N+ and N- report the number of individual funds with positive and negative coefficients, respectively, and between the parentheses the number of funds with statistically significant coefficients (positive or negative, respectively) at the significant level of 5%. This table reports the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$) and the public information variables short-term rate (ST) and dividend yield (DY). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). For the four equally weighted portfolios and the two portfolios of differences the level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

The explanatory power of this model is very similar to the explanatory power of the unconditional models used in this work, namely, the unconditional Carhart (1997) four-factor model and the unconditional Fama and French (2018) six-factor model. Once more, this model has higher explanatory power for the conventional portfolios in comparison to the green portfolios.

Concerning the conditional alphas associated with the public variables, short-term rate and dividend yield, for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio) there is no evidence of time-varying alphas. At the individual fund level, just 9 out of all funds, that is 52 funds, exhibit evidence of time-varying alphas dependent on the short-term rate, and only 6 out of 52 funds exhibit evidence of time-varying alphas associated with the dividend yield.

Regarding the conditional betas dependent on the short-term rate and the dividend yield, there is no evidence of time-varying betas for the four equally weighted portfolios (for the 5% and 1% significance level). At the individual fund level, in general, less than half of the funds exhibit evidence of time-varying betas.

With respect to the alpha, the results are similar to the results of the unconditional Carhart (1997) four-factor model, with one exception, the green global portfolio gains statistical significance in comparison to the unconditional Carhart (1997) four-factor model, changing from a 5% significance level to the 1% significance level. In relation to the risk factors, the results are also similar to the unconditional Carhart (1997) four-factor model, with some exceptions, specifically, for the conventional domestic portfolios, the momentum risk factor loses all its statistical significance, changing from a 5% significance level to no statistical significance. For the green global portfolio, the risk factors size and book-to-market loss statistical significance, going from 1% significance level to 5% significance level and from 1% significance level to 10% significance level, respectively, while the momentum risk factor loses all its statistical significance, going from 5% significance level to no statistical significance. Finally, for the conventional global portfolio, the risk factor

size loses statistical significance, going from 1% significance level to 5% significance level. In the conditional Carhart (1997) four-factor model the momentum risk factor becomes irrelevant.

Table 5 presented next reports the results of the Wald test for the conditional Carhart (1997) four-factor model for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio). The w1 is for the Wald test on the null hypothesis of no time-varying alphas, the w2 for the Wald test on the null hypothesis of no time-varying betas and the w3 for the Wald test on the null hypothesis of no time-varying alphas and betas. As for the individual funds, the results of the Wald test for the conditional Carhart (1997) four-factor model can be found in appendices I and K.

Table 5. Wald test for the conditional Carhart (1997) four-factor model

Panel A: US domestic funds		
	Green	Conventional
w_1	0.7245	0.593
w_2	0.2013	0.7838
w_3	0.3328	0.8241
Panel B: US global funds		
	Green	Conventional
w_1	0.4112	0.5527
w_2	0.7525	0.0130**
w_3	0.7386	0.0325**

This table reports the Wald test results of the conditional Carhart (1997) four-factor model for four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio). Panel A shows the results for domestic funds and Panel B the results for global funds. W1, w2 and w3 correspond to the p-value of the Wald test on the null hypothesis of no time-varying alphas, no time-varying betas and no time-varying alphas and betas, respectively. The considered period is from January 2000 to October 2020. The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

In Table 5 the results show that there is no evidence of time-varying alphas. For the conventional global portfolio, there is evidence of time-varying betas and evidence of time-varying alphas and betas, at a 5% level of significance. The results support the use of conditional models. Cortez et al. (2012) state that the lack of evidence for time-varying alphas, concerning their socially responsible funds, may not be very

surprising since the investment restrictions imposed by social criteria might contribute to a more constant performance over time. This is consistent with the results reported in this table.

Table 6 presented below shows the results of the conditional Fama and French (2018) six-factor model for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds (more detailed results presented in the appendices L and N), and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A presents the result for domestic funds and panel B presents the results for global funds. This, during the period of January 2000 to October 2020.

Table 6. Conditional Fama and French (2018) six-factor model.

Panel A: US domestic funds							
Portfolios	Green (1)	N+	N-	Conventional (2)	N+	N-	Portfolio of Differences (1)-(2)
α_p	-0.0031***	3(0)	4(1)	-0.0044***	6(0)	15(5)	0.0014
α_{ST}	-0.0009	0(0)	7(2)	-0.0010	8(0)	13(2)	0.0001
α_{DY}	-0.0036	2(1)	5(1)	0.0031	4(1)	17(0)	-0.0067
β_{p^*rm}	0.9890***	7(7)	0(0)	1.0733***	21(21)	0(0)	-0.0843**
β_{ST^*rm}	0.0311	4(0)	3(0)	0.0014	8(0)	13(1)	0.02967
β_{DY^*rm}	0.0167	3(0)	4(0)	-0.0335	8(0)	13(3)	0.0502
β_{SMB}	0.2803***	6(4)	1(0)	0.2818***	16(11)	5(1)	-0.0015
β_{ST^*SMB}	0.0429	2(0)	5(2)	0.0386	12(1)	9(1)	0.0043
β_{DY^*SMB}	0.5312**	3(1)	4(1)	0.2245	14(5)	7(0)	0.3068
β_{HML}	0.0522	5(2)	2(1)	-0.0430	11(6)	10(6)	0.0953
β_{ST^*HML}	-0.0344	2(0)	5(1)	0.1381	10(2)	11(4)	-0.1725*
β_{DY^*HML}	-0.3554	3(0)	4(1)	0.4219	9(1)	12(6)	-0.7772**
β_{RMW}	0.0428	4(1)	3(0)	0.0036	6(2)	15(4)	0.0392
β_{ST^*RMW}	0.3091***	3(1)	4(1)	-0.0275	12(5)	9(2)	0.3366***
β_{DY^*RMW}	0.4822*	5(0)	2(0)	0.2410	11(1)	10(2)	0.2412
β_{CMA}	0.0498	2(1)	5(3)	0.1155	6(2)	15(7)	-0.0657
β_{ST^*CMA}	-0.0909	3(2)	4(0)	-0.1695	10(3)	11(0)	0.0786
β_{DY^*CMA}	0.8576**	5(1)	2(0)	-0.9061**	9(2)	12(1)	1.7636***
β_{MOM}	0.0277	2(1)	5(1)	-0.0504*	8(1)	13(7)	0.0781**
β_{ST^*MOM}	-0.0701	2(0)	5(2)	0.0710	7(2)	14(4)	-0.1411***
β_{DY^*MOM}	-0.2159*	2(0)	5(2)	0.0684	6(0)	15(3)	-0.2843*
Adj. R^2	89.69%			90.88%			19.72%
Panel B: US global funds							
Portfolios	Green (3)	N+	N-	Conventional (4)	N+	N-	Portfolio of Differences (3)-(4)
α_p	-0.0039***	2(0)	4(0)	-0.0023**	4(0)	14(6)	-0.0010
α_{ST}	0.0035	0(0)	6(1)	-0.0017	9(3)	9(2)	0.0057**
α_{DY}	-0.0058	4(2)	2(0)	-0.0005	9(2)	9(0)	-0.0060
β_{p^*rm}	0.9953***	6(6)	0(0)	1.0291***	18(18)	0(0)	-0.0397
β_{ST^*rm}	0.0755	6(0)	0(0)	-0.0403	12(3)	6(2)	0.1110
β_{DY^*rm}	0.0794	4(0)	2(0)	-0.1024	8(2)	10(4)	0.1774
β_{SMB}	0.2210**	6(4)	0(0)	0.0780	12(7)	6(1)	0.1206
β_{ST^*SMB}	-0.1482	1(1)	5(0)	0.1117	9(2)	9(1)	-0.2891*
β_{DY^*SMB}	0.0552	4(1)	2(1)	0.0048	8(4)	10(2)	0.0039
β_{HML}	-0.1528	4(2)	2(2)	-0.2449***	8(0)	10(7)	0.0916
β_{ST^*HML}	-0.1368	0(0)	6(1)	-0.0670	8(1)	10(4)	-0.0987
β_{DY^*HML}	-0.6160*	3(0)	3(0)	-0.6425**	7(1)	11(3)	0.0899
β_{RMW}	-0.1520	4(1)	2(1)	-0.3227***	9(3)	9(6)	0.1685
β_{ST^*RMW}	-0.3556*	5(1)	1(0)	-0.0587	11(3)	7(3)	-0.3027
β_{DY^*RMW}	-0.0730	3(1)	3(0)	-0.6750**	7(1)	11(3)	0.7493
β_{CMA}	0.0699	2(0)	4(2)	-0.0064	8(4)	10(5)	0.0554
β_{ST^*CMA}	0.4184*	6(2)	0(0)	0.2158	12(7)	6(2)	0.2370
β_{DY^*CMA}	1.0124**	6(3)	0(0)	0.4080	12(3)	6(2)	0.6787
β_{MOM}	0.0018	3(1)	3(0)	0.0489	9(2)	9(0)	-0.0486
β_{ST^*MOM}	0.1038	2(0)	4(4)	-0.0008	6(1)	12(2)	0.1028
β_{DY^*MOM}	0.2634*	3(1)	3(2)	-0.2544**	6(1)	12(3)	-0.0269
Adj. R^2	86.85%			93.08%			4.16%

This table reports the regression estimates obtained from the conditional Fama and French (2018) six-factor model, for four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the results for domestic funds and Panel B the results for global funds. S&P500 is used as the domestic benchmark and MSCI World as the global benchmark. N+ and N- report the number of individual funds with positive and negative coefficients, respectively, and between the parentheses the number of funds with statistically significant coefficients (positive or negative, respectively) at the significant level of 5%. This table reports the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$) and the public information variables short-term rate (ST) and dividend yield (DY). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). For the four equally weighted portfolios and the two portfolios of differences the level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

The explanatory power of this model is very similar to the explanatory power of the previous models used, specifically, the unconditional Carhart (1997) four-factor model, the unconditional Fama and French (2018) six-factor and the conditional Carhart (1997) four-factor model. The only exception is the conventional global portfolio that has a considerable higher explanatory power in comparison to the explanatory power of the conventional global portfolio of the unconditional Carhart (1997) four-factor model. This model also has higher explanatory power for the conventional portfolios than for the green portfolios.

As for the public variables, short-term rate and dividend yield, observing the time-varying alphas coefficients, for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), there is no evidence that the performance of green and conventional funds changes with economic conditions, as measured by the short-term rate and dividend yield, as in the conditional Carhart (1997) four-factor model. At the individual fund level, just 10 out of 52 funds have evidence of time-varying alphas associated with short-term rate and only 7 out of 52 funds exhibit evidence of time-varying alphas dependent on the dividend yield. The conditional alpha associated with the short-term rate, for the global portfolio of differences, is positive and statistically significant at a 5% significance level. This means that the green global funds perform significantly better than the conventional global funds in times of higher interest rates.

Regarding the risk factor size, for the green domestic portfolio, the conditional beta associated with the dividend yield is positive and statistically significant at a 5% significance level. This means that this portfolio is more exposed to small-cap stocks in times of higher dividend yield. At the individual fund level, just 1 green domestic fund out of 7, exhibits a positive and statistically significant conditional beta associated with the dividend yield, indicating that just this fund is more exposed to small-cap stocks in times of higher dividend yield.

Regarding the risk factor book-to-market, the conventional global portfolio is more exposed to growth stocks in times of higher dividend yield since the conditional beta associated with the dividend yield is negative and statistically significant at a 5% significance level. Observing funds individually, for 3 out of 18 conventional global funds, the conditional beta associated with the dividend yield is negative and statistically significant. Therefore, these 3 funds are more exposed to growth stocks in times of higher dividend yield. Still concerning the risk factor book-to-market, comparing green funds with conventional funds, for the domestic portfolio of differences, the conditional beta associated with the dividend yield is negative and statistically significant at a 5% significance level, indicating that the conventional domestic funds are significantly more exposed to value stocks than the green domestic funds in times of higher dividend yield.

Concerning the profitability risk factor, for the green domestic portfolio, the conditional beta associated with the short-term rate is positive and statistically significant at a 1% significance level. This means that this portfolio is more exposed to companies with robust profitability in times of higher interest rates. Concerning the individual fund level, just 1 green domestic fund out of 7 exhibits a positive and statistically significant conditional beta associated with the short-term rate, meaning that this fund is more exposed to companies with robust profitability in times of higher interest rates. Still concerning the profitability risk factor, for the conventional global portfolio, the conditional beta associated with the dividend yield is negative and statistically significant at a 5% significance level, meaning that the conventional global portfolio is more exposed to companies with weak profitability in times of higher dividend yield. At the individual fund level, for 3 out of 18 conventional global funds, the conditional betas associated with the dividend yield are negative and statistically significant, meaning that these 3 funds are more exposed to companies with weak profitability in times of higher dividend yield. As for the domestic portfolio of differences, still concerning the profitability risk factor, the conditional beta associated with the short-term rate is positive and statistically significant at a 1% significance level, indicating that the green domestic funds are significantly more exposed to companies with robust profitability than the conventional domestic funds in times of higher interest rates.

With respect to the investment risk factor, the green domestic and green global portfolios are more exposed to low investments firms in times of higher dividend yield since the conditional betas associated with the dividend yield are positive and statistically significant at a 5% significance level. Observing funds individually, just 1 green domestic fund out of 7 and 3 green global funds out of 6 exhibit positive and

statistically significant conditional betas associated with the dividend yield, meaning that these funds are more exposed to low investments firms in times of higher dividend yield. Differently, still concerning the investment risk factor, the conventional domestic portfolio, is more exposed to high investments firms in times of higher dividend yield since the conditional beta associated with the dividend yield is negative and statistically significant at a 5% significance level. At the individual fund level, just for 1 conventional domestic fund, out of 21, the conditional beta associated with the dividend yield is negative and statistically significant, meaning that this fund is more exposed to high investments firms in times of higher dividend yield. As for the domestic portfolio of differences (still for the investment risk factor), the conditional beta associated with the dividend yield is positive and statistically significant at a 1% significance level. This indicates that the green domestic funds are significantly more exposed to low investments firms in comparison to the conventional domestic funds in times of higher dividend yield.

As for the risk factor momentum, the conditional beta associated with the dividend yield, for the conventional global portfolio, is negative and statistically significant at the 5% significance level. Therefore, the conventional global portfolio is more exposed to poor past performance in times of higher dividend yield. At the individual fund level, 3 out of 18 conventional global funds exhibit negative and statistically significant conditional betas associated with the dividend yield, meaning that these 3 funds are more exposed to poor past performance in times of higher dividend yield. Comparing green funds with conventional funds, still concerning the momentum risk factor, the domestic portfolio of differences present a conditional beta associated with the short-term rate negative and statistically significant at a 1% significance level, meaning that the conventional domestic funds are significantly more exposed to good past performance than the green domestic funds in times of higher interest rate.

These results differ a bit from the results of the conditional Carhart (1997) four-factor model since, in this model, there is evidence of time-varying betas at the aggregate level.

Silva and Cortez (2016) state that it is important to evaluate the green funds' performance considering conditional models once several of their risk factor coefficients change due to the information variables. In this model, diverse risk factor coefficients also change with the information variables, supporting in this way, the use of conditional models.

Concerning the alphas, the results are similar to the results of the unconditional Fama and French (2018) six-factor model, except for the green global portfolio that gains statistical significance, changing from 5% significance level to 1% significance level, and for the conventional global portfolio that gains statistical significance, going from no statistical significance to the 5% significance level. With respect to the risk factors, the results are similar to the results in the unconditional Fama and French (2018) six-factor model, however, there are some exceptions. Explicitly, for the green domestic portfolio, the profitability risk factor loses all its statistical significance, changing from a 5% significance level to no statistical significance. For the conventional domestic portfolio, the momentum risk factor loses statistical significance, going from 5% significance level to 10% significance level. Regarding the green global portfolio, the risk factor size, loss statistical significance, going from 1% significance level to 5% significance level, while the risk factor book-to-market loss all of its statistical significance, changing from 5% significance level to no statistical significance.

Table 7 reports the results of the Wald test for the conditional Fama and French (2018) six-factor model for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio). Once again, the w1 is for the Wald test on the null hypothesis of no time-varying alphas, the w2 for the Wald test on the null hypothesis of no time-varying betas and the w3 for the Wald test on the null hypothesis of no time-varying alphas and betas. Concerning the individual funds, the results of the Wald test for the conditional Fama and French (2018) six-factor model can be found in appendices M and O.

Table 7. Wald test for the conditional Fama and French (2018) six-factor model

Panel A: US domestic funds		
	Green	Conventional
w_1	0.8129	0.741
w_2	0.0041***	0.4467
w_3	0.0080***	0.5152
Panel B: US global funds		
	Green	Conventional
w_1	0.1466	0.5819
w_2	0.4126	0.0204**
w_3	0.4686	0.0257**

This table reports the Wald test results of the conditional Fama and French (2018) six-factor model for four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio). Panel A shows the results for domestic funds and Panel B the results for global funds. W1, w2 and w3 correspond to the p-value of the Wald test on the null hypothesis of no time-varying alphas, no time-varying betas and no time-varying alphas and betas, respectively. The considered period is from January 2000 to October 2020. The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

In Table 7 it is possible to observe that there is no evidence of time-varying alphas. However, the green domestic portfolio exhibits evidence of time-varying betas and evidence of time-varying alphas and betas at a 1% significance level and the conventional global portfolio exhibits evidence of time-varying betas and evidence of time-varying alphas and betas at a 5% significance level, these results support the use of conditional models to evaluate funds' performance.

5.3 Performance evaluation under different economic conditions

Table 8 presented next reports the results of the Carhart (1997) four-factor model with a dummy variable that allows us to distinguish between crisis periods and non-crisis periods[4], for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds (more detailed results presented in the appendices P and Q), and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the result for domestic funds and panel B reports the results for global funds. The considered period is from January 2000 to October 2020.

[4] For the models that take into account different market conditions, specifically, periods of crisis and periods of non-crisis, three green domestic funds and their respective matched conventional funds as well as two green global funds and their respective matched conventional funds were excluded from these analyses since these funds exist in just one economic cycle.

Table 8. Carhart (1997) four-factor model with a dummy variable

Panel A: US domestic funds							
Portfolios	Green (1)	N+	N-	Conventional (2)	N+	N-	Portfolio of Differences (1)-(2)
α_p	-0.0028**	0(0)	4(1)	-0.0044***	2(0)	10(4)	0.0017
α_{D*p}	-0.0008	2(0)	2(0)	0.0021	9(2)	3(1)	-0.0029
β_{p*rm}	0.9873***	4(4)	0(0)	1.0891***	12(12)	0(0)	-0.1018**
β_{D*rm}	-0.0433	2(0)	2(0)	-0.0323	4(1)	8(2)	-0.0111
β_{SMB}	0.1586***	4(3)	0(0)	0.2848***	10(8)	2(1)	-0.1261***
β_{D*SMB}	0.2381**	3(0)	1(0)	-0.0533	9(4)	3(2)	0.2914**
β_{HML}	0.1181***	2(2)	2(1)	0.0179	7(4)	5(4)	0.1002**
β_{D*HML}	-0.1270*	2(1)	2(2)	-0.0796	3(0)	9(3)	-0.0475
β_{MOM}	0.0263	1(0)	3(0)	0.0059	3(0)	9(1)	0.0204
β_{D*MOM}	-0.0111	1(0)	3(0)	-0.1365***	6(2)	6(2)	0.1254**
Adj. R^2	88.69%			89.86%			12.90%
Panel B: US global funds							
Portfolios	Green (3)	N+	N-	Conventional (4)	N+	N-	Portfolio of Differences (3)-(4)
α_p	-0.0030**	0(0)	4(2)	-0.0029***	3(0)	9(6)	3.643E-05
α_{D*p}	-0.0061	4(2)	0(0)	-0.0002	6(3)	6(0)	-0.0049
β_{p*rm}	1.0479***	4(4)	0(0)	1.1018***	12(12)	0(0)	-0.0447
β_{D*rm}	-0.1085	1(0)	3(1)	-0.0701	3(0)	9(4)	-0.0423
β_{SMB}	0.1866**	4(4)	0(0)	0.2168***	10(7)	2(1)	0.0429
β_{D*SMB}	0.1553	3(0)	1(0)	-0.1594	8(3)	4(1)	0.2500
β_{HML}	-0.1092	1(0)	3(2)	-0.3499***	1(0)	11(5)	0.1564*
β_{D*HML}	-0.2575*	2(1)	2(0)	0.0560	8(4)	4(0)	-0.1917
β_{MOM}	-0.0171	0(0)	4(0)	-0.0377	5(0)	7(1)	0.0619
β_{D*MOM}	-0.1534*	1(1)	3(0)	-0.0778	8(3)	4(0)	-0.1074
Adj. R^2	87.41%			92.92%			1.40%

This table reports the regression estimates obtained from the Carhart (1997) four-factor model with a dummy variable, for four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the results for domestic funds and Panel B the results for global funds. S&P500 is used as the domestic benchmark and MSCI World as the global benchmark. N+ and N- report the number of individual funds with positive and negative coefficients, respectively, and between the parentheses the number of funds with statistically significant coefficients (positive or negative, respectively) at the significant level of 5%. This table reports the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$) and the dummy variable (D) that assumes the value 1 in crisis periods and 0 in non-crisis periods. The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). For the four equally weighted portfolios and the two portfolios of differences the level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

The explanatory power of this model is similar to the explanatory power of the unconditional and conditional models used in this work, namely, the unconditional Carhart (1997) four-factor model, the unconditional Fama and French (2018) six-factor, the conditional Carhart (1997) four-factor model and the conditional Fama and French (2018) six-factor. However, the explanatory power seems to depend on the

portfolios used, and some portfolios in this model have considerable lower explanatory power in comparison to previous models used. Specifically, the explanatory power of this model is considerably lower for the green domestic portfolio in comparison to the green domestic portfolio of the conditional Fama and French (2018) six-factor model. The conventional domestic portfolio also has substantially lower explanatory power in comparison to the explanatory power of the conventional domestic portfolio of the unconditional models and the conditional Fama and French (2018) six-factor model. Once more, the conventional portfolios have higher explanatory power than the green portfolios.

As for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), the alphas associated with the dummy variable are not statistically significant, meaning that the performance in periods of crisis is not statistically different from the performance in periods of non-crisis. At the individual fund level, 8 out of all funds used in this analysis, that is 32 funds, present statistically significant alphas, meaning that the performance of these 8 funds in periods of crisis is significantly different from the performance in periods of non-crisis. Concerning the two portfolios of differences, both, the domestic portfolio of differences and de global portfolio of differences, exhibit not statistically significant alphas, indicating that the differences in periods of crisis do not differ significantly from the differences in periods of non-crisis.

Regarding the risk factor size, for the green domestic portfolio, the beta associated with the dummy variable is positive and statistically significant at a 5% significance level. This indicates that the green domestic portfolio has a significantly different exposure to small-cap stocks in crisis periods in comparison to non-crisis periods. However, observing the green domestic funds individually, still concerning the risk factor size, there are no statistically significant differences between crisis and non-crisis periods. Comparing green funds with conventional funds, for the risk factor size, the domestic portfolio of differences presents a positive and statistically significant beta associated with the dummy variable at a 5% significance level, meaning that the differences in periods of crisis differ significantly from the differences in periods of non-crisis.

The conventional domestic portfolio has a significantly different exposure to poor past performance in crisis periods in comparison to non-crisis periods since the beta associated with the dummy variable is negative and statistically significant at a 1% significance level. At the individual fund level, 2 out of 12

conventional domestic funds exhibit negative and statistically significant betas associated with the dummy variable, meaning that these 2 funds have significantly different exposure to poor past performance in periods of crisis compared to periods of non-crisis. As for the domestic portfolio of differences, for the momentum risk factor, the beta associated with the dummy variable is positive and statistically significant at a 5% significance level. This suggests that the differences in periods of crisis differ significantly from the differences in periods of non-crisis.

As for the alphas, the results reported in this model are similar to the results of the unconditional Carhart (1997) four-factor model. However, for the green domestic portfolio, the alpha loses statistical significance, changing from the 1% significance level to the 5% significance level. Concerning the risk factor, the results reported are also similar to the results of the unconditional Carhart (1997) four-factor model, with some exceptions, namely, for the conventional domestic portfolio, in this model, the risk factor momentum losses all the statistical significance, changing from 5% significance level to no statistical significance. For the green global portfolio, the risk factor size losses statistical significance, going from the 1% significance level to the 5% significance level, while the risk factors book-to-market and momentum losses all the statistical significance, going from 1% significance level to no statistical significance and from 5% significance level to no statistical significance, respectively.

Table 9 presented below reports the results of the Fama and French (2018) six-factor model with a dummy variable that allows us to distinguish between crisis periods and non-crisis periods, for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds (more detailed results presented in the appendices R and S), and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the result for domestic funds and panel B reports the results for global funds. This, during the period of January 2000 to October 2020.

Table 9. Fama and French (2018) six-factor model with a dummy variable

Panel A: US domestic funds							
Portfolios	Green (1)	N+	N-	Conventional (2)	N+	N-	Portfolio of Differences (1)-(2)
α_p	-0.0032***	0(0)	4(1)	-0.0046***	2(0)	10(5)	0.0014
α_{D^*p}	0.0012	2(1)	2(0)	0.0044	9(4)	3(1)	-0.0032
β_{p^*rm}	1.0034***	4(4)	0(0)	1.0938***	12(12)	0(0)	-0.0904**
β_{D^*rm}	-0.0117	2(0)	2(0)	0.0059	9(3)	3(1)	-0.0177
β_{SMB}	0.2118***	4(3)	0(0)	0.2802***	10(8)	2(0)	-0.0683
β_{D^*SMB}	0.2229**	2(0)	2(0)	-0.0173	7(1)	5(1)	0.2402*
β_{HML}	0.0732	2(1)	2(1)	-0.0184	7(4)	5(3)	0.0916
β_{D^*HML}	-0.1714*	2(1)	2(1)	-0.1169	6(2)	6(2)	-0.0545
β_{RMW}	0.1079**	3(1)	1(0)	0.0037	6(3)	6(3)	0.1042
β_{D^*RMW}	-0.2846*	1(0)	3(0)	-0.2225	4(2)	8(5)	-0.0621
β_{CMA}	-0.0090	2(0)	2(2)	0.0766	4(1)	8(5)	-0.0856
β_{D^*CMA}	0.4244**	2(0)	2(0)	0.3181	7(2)	5(2)	0.1063
β_{MOM}	0.0168	1(0)	3(0)	0.0041	2(1)	10(3)	0.0126
β_{D^*MOM}	-0.0042	2(1)	2(0)	-0.1315**	5(2)	7(4)	0.1273*
Adj. R^2	88.96%			89.92%			12.70%
Panel B: US global funds							
Portfolios	Green (3)	N+	N-	Conventional (4)	N+	N-	Portfolio of Differences (3)-(4)
α_p	-0.0024*	0(0)	4(2)	-0.0015	2(0)	10(4)	-0.0004
α_{D^*p}	-0.0045	4(1)	0(0)	0.0031	6(2)	6(3)	-0.0075
β_{p^*rm}	1.0282***	4(4)	0(0)	1.0466***	12(12)	0(0)	-0.0282
β_{D^*rm}	-0.0927	0(0)	4(1)	-0.0467	2(0)	10(3)	-0.0345
β_{SMB}	0.1712*	4(4)	0(0)	0.1078*	9(5)	3(0)	0.0600
β_{D^*SMB}	0.1665	3(0)	1(0)	-0.1445	6(3)	6(1)	0.2473
β_{HML}	-0.2027**	2(0)	2(2)	-0.3422***	4(0)	8(4)	0.1277
β_{D^*HML}	-0.1154	3(0)	1(0)	0.2760**	9(4)	3(0)	-0.3004
β_{RMW}	-0.2285*	2(1)	2(1)	-0.3574***	6(2)	6(4)	0.1026
β_{D^*RMW}	-0.0820	0(0)	4(1)	-0.1147	3(2)	9(5)	0.2491
β_{CMA}	0.1854	3(1)	1(0)	0.0873	4(2)	8(1)	0.0836
β_{D^*CMA}	-0.2932	0(0)	4(1)	-0.4771***	2(0)	10(8)	0.1691
β_{MOM}	0.0203	1(0)	3(0)	-0.0134	6(0)	6(1)	0.0429
β_{D^*MOM}	-0.1339	3(0)	1(0)	0.0268	11(5)	1(0)	-0.1757*
Adj. R^2	87.59%			93.87%			1.12%

This table reports the regression estimates obtained from Fama and French (2018) six-factor model with a dummy variable, for four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), individual funds and the two portfolios of differences (the domestic portfolio of differences and the global portfolio of differences). Panel A reports the results for domestic funds and Panel B the results for global funds. S&P500 is used as the domestic benchmark and MSCI World as the global benchmark. N+ and N- report the number of individual funds with positive and negative coefficients, respectively, and between the parentheses the number of funds with statistically significant coefficients (positive or negative, respectively) at the significant level of 5%. This table reports the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML), profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$) and the dummy variable (D) that assumes the value 1 in crisis periods and 0 in non-crisis periods. The considered period is from January 2000 to October 2020. Standard errors

are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). For the four equally weighted portfolios and the two portfolios of differences the level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

The explanatory power of this model is similar to the explanatory power of the previous models used (the unconditional Carhart (1997) four-factor model, the unconditional Fama and French (2018) six-factor model, the conditional Carhart (1997) four-factor model, the conditional Fama and French (2018) six-factor model and the Carhart (1997) four-factor model with a dummy variable). Nevertheless, the explanatory power appears to depend on the portfolios used and in this model, it is possible to observe that some portfolios have considerable different explanatory power in comparison to the prior models used. Specifically, the conventional domestic portfolio has a substantially lower explanatory power compared to the conventional domestic portfolio of the unconditional Carhart (1997) four-factor model. The green global portfolio has a considerable higher explanatory power compared to the green global portfolio of the conditional Carhart (1997) four-factor model. Finally, the conventional global portfolio has a considerable higher explanatory power in comparison to the conventional global portfolios of the unconditional models and the conditional Carhart (1997) four-factor model. Once again, the explanatory power is higher for the conventional portfolios in comparison to the green portfolios.

The alphas associated with the dummy variable, for the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), are not statistically significant meaning that the performance in periods of crisis is not statistically different from the performance in periods of non-crisis, as in the Carhart (1997) four-factor model with a dummy variable. Observing funds individually, for 12 out of 32 funds the alphas associated with the dummy variable are statistically significant. This suggests that the performance of these 12 funds in periods of crisis is significantly different from the performance in periods of non-crisis. Comparing green funds with conventional funds, for the domestic portfolio of differences and the global portfolio of differences the alphas associated with the dummy variable are not statistically significant, meaning that the differences in periods of crisis do not differ significantly from the differences in periods of non-crisis, like in the Carhart (1997) four-factor model with a dummy variable.

Concerning the risk factor size, for the green domestic portfolio, the beta associated with the dummy variable is positive and statistically significant at a 5% significance level, indicating that this portfolio has a

significantly different exposure to the small-cap stocks between crisis periods and non-crisis periods. However, observing the green domestic fund individually, the results do not show significant differences in crisis periods in comparison to non-crisis periods (still concerning the risk factor size).

Regarding the risk factor book-to-market, the conventional global portfolio has a significantly different exposure to the value stocks between crisis and non-crisis periods since the beta dependent on the dummy variable is positive and statistically significant at a 5% significance level. At the individual fund level, 4 out of 12 conventional global funds present positive and statistically significant betas associated with the dummy variable, meaning that these 4 funds have significantly different exposure to the value stocks between periods of crisis and periods of non-crisis.

With respect to the investment risk factor, for the green domestic portfolio, the beta associated with the dummy variable is positive and statistically significant at a 5% significance level, meaning that the green domestic portfolio, between crisis and non-crisis periods, has a significantly different exposure to low investment firms. Still concerning the investment risk factor, there are no significant differences between crisis and non-crisis periods when observing the green domestic funds individually, since none of them present statistically significant betas dependent on the dummy variable. As for the conventional global portfolio, the beta associated with the dummy variable is negative and statistically significant at a 1% significance level (still concerning the investment risk factor). This indicates that the conventional global portfolio has a significantly different exposure to high investment firms between periods of crisis and periods of non-crisis. At the individual fund level, for 8 out of 12 conventional global funds, the betas associated with the dummy variable are negative and statistically significant meaning that these 8 funds have significantly different exposure to high investment firms between crisis periods and non-crisis periods.

As for the risk factor momentum, the conventional domestic portfolio has a significantly different exposure to poor past performance in periods of crisis in comparison to periods of non-crisis, since the beta dependent on the dummy variable is negative and statistically significant at a 5% significance level. At the individual fund level, 4 out of 12 conventional domestic funds have significantly different exposure to poor past performance between periods of crisis and non-crisis as the betas associated with the dummy variable for these 4 funds are negative and statistically significant.

The results reported in this model for the alphas are similar to the results of the unconditional Fama and French (2018) six-factor model, except for the green global portfolio that losses statistically significance, changing from 5% significance level to 10% significance level. As for the risk factors, the results are also similar to the unconditional Fama and French (2018) six-factor model, although there are two exceptions. First, for the green global portfolio the risk factor size, losses statistical significance, going from 1% significance level to 10% significance level. Second, for the conventional domestic portfolio, the risk factor momentum, losses all the statistical significance, changing from a 5% significance level to no statistical significance.

6. Conclusions

The question of whether invest in green funds implies a financial sacrifice for investors is a debatable one. Empirically, despite the efforts, no consensus in the green literature was found. Evidence on the financial performance of green funds is relevant for investors since the demand for investments that reflect investors environmental values and their commitment to a sustainable economy is increasing (Silva & Cortez, 2016).

In this context, this study evaluates the financial performance of US green mutual funds. For this purpose, thirteen US green mutual funds are analysed, where seven are domestic funds and six are global funds. Green mutual funds are compared to conventional mutual funds through a matching-pair approach, and unconditional models, conditional models and models that take into account different market conditions, specifically, periods of crisis and periods of non-crisis are used to evaluate the financial performance. This, during the period of January 2000 to October 2020.

Concerning the unconditional models, namely, the unconditional Carhart (1997) four-factor model and the unconditional Fama and French (2018) six-factor model, the four equally weighted portfolios (the green domestic portfolio, the conventional domestic portfolio, the green global portfolio, and the conventional global portfolio), underperform the market, except for the conventional global portfolio in the unconditional Fama and French (2018) six-factor model. Evidence of green funds underperforming the market are reported in other studies such as Climent and Soriano (2011). Regarding the risk factors, the four equally weighted portfolios are positively exposed to the market. They also have more exposure to small-cap stocks, except for the conventional global portfolio in the unconditional Fama and Frech (2018) six-factor model. Similar, Climent and Soriano (2011) find that their green funds are more exposed to small-cap stocks. As for the investment risk factor, it seems not to be relevant. Comparing green funds with conventional funds, the results show that green funds do not perform significantly different from conventional funds. Similar, Muñoz et al. (2014) find that their green US domestic funds do not perform significantly different from conventional funds. However, differently, Muñoz et al. (2014) find that the US green global funds performed significantly worse than their conventional counterparts.

Concerning the conditional models, namely, the conditional Carhart (1997) four-factor model and the conditional Fama and French (2018) six-factor model, at the aggregate level, for the conditional alphas

associated with the public variables, short-term rate and dividend yield, there is no evidence of time-varying alphas. As for the risk factor, still concerning the aggregate level, just in the conditional Fama and French (2018) six-factor model, diverse conditional betas associated with short-term rate and dividend yield exhibit evidence of time-varying betas. Silva and Cortez (2016) conclude that it is important to evaluate the green funds' performance considering conditional models since several of their risk factor coefficients change due to the information variables. Comparing green funds with conventional funds, in the conditional Fama and French (2018) six-factor model, for the global portfolio of differences, the conditional alpha associated with the short-term rate, suggest that the green global funds present a significantly better performance in comparison to the conventional global funds in times of higher interest rates. The Wald test results present no evidence of time-varying alphas, for both models, which is consistent with the aggregate results. Furthermore, Cortez et al. (2012) state that the lack of evidence for time-varying alphas, regarding their socially responsible funds, might not be very surprising since socially responsible funds might have a more constant performance over time due to the investment restrictions. The Wald test results present exevidence of time-varying betas and time-varying betas and alphas, for both models. The results suggest that funds vary over time with economical conditions, supporting in this way, the use of conditional models.

Concerning the models that take into account crisis periods and non-crisis periods, specifically, the Carhart (1997) four-factor model with a dummy variable and the Fama and French (2018) six-factor model with a dummy variable, for the four equally weighted portfolios the performance in periods of crisis is not significantly different from the performance in periods of non-crisis. Similarly, Leite et al. (2018) showed that most socially responsible funds from Sweden performed similarly in crisis periods in comparison to non-crisis periods. However, these results are not consistent with other studies such as Nofsinger and Varma (2014), which finds evidence that socially responsible funds perform better in periods of crisis compared to periods of non-crises. Regarding the risk factors, there are portfolios with significantly different exposure to certain risk factors in crisis periods compared to non-crisis periods, supporting in this way the use of these models.

The explanatory power of the six models used in this work (the unconditional Carhart (1997) four-factor model, the unconditional Fama and French (2018) six-factor model, the conditional Carhart (1997) four-factor model, the conditional Fama and French (2018) six-factor model, the Carhart (1997) four-factor model with a dummy variable and the Fama and French (2018) six-factor model with a dummy variable), in

general, is similar. The explanatory power appears to depend on the portfolios used. For all models, the explanatory power of the conventional portfolios is higher in comparison to the explanatory power of the green portfolios.

Controlling for time-varying alphas and time-varying betas (with the conditional models) and also for periods of crisis and periods of non-crisis (with models that incorporate a dummy variable), did not affect much the results. In sum, when comparing green funds with conventional funds, the performance of green funds is not significantly different from the performance of conventional funds, except for the conditional alpha associated with the short-term rate for the global portfolio of differences, in the conditional Fama and French (2018) six-factor model, where the green global funds exhibit significantly better performance than the conventional global funds in times of higher interest rates. A potential explanation for these results could lie in the state of Climent and Soriano (2011) that claim that as fund managers and investors obtain more experience with green investments and more investment opportunities arise we may find returns more close to those obtained in conventional funds.

In general, these results are relevant for investors that wish to align their environmental values with their investment decisions as well as for investors that do not take into account these values, since they will not experience better or worse financial performance, in comparison to conventional funds, by investing in green funds. Additionally, the results of this study are also relevant to the literature since more evidence on the green funds financial performance is present and the results incorporate a more recent period of analysis, with a new and recent crises period. Also, the Fama and French (2018) six-factor model is tested, and more evidence of the importance of using conditional models and models that take into account different market conditions, specific periods of crisis and periods of non-crisis are reported.

For future researches, it would be interesting to also analyse the green funds' environmental performance, as green funds investors are also worried about the environmental impact of their investments.

7. Limitations

This work has some limitations. For start, despite the effort made to obtain a comprehensive and representative sample of green funds, this work is limited to the existing data. Besides, this work is also limited to the analysis period as well as the chosen geographic region. Refinitiv Eikon is used to identify green funds, however, the green classifications of Refinitiv Eikon are from now, there is no way, in Refinitiv Eikon, to know if the funds were green all their lives and it is difficult to find historical data about the funds. Similarly, the classifications of domestic funds and global funds, in Refinitiv Eikon are also from now, the same happens with the classification used to do the match between green funds and conventional funds and Refinitiv Eikon does not have a way to provide historical information about these classifications.

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9. Appendices

Appendix A. List of US green domestic funds and their matched pair

		Name	Classification	Age	Total net asset
US domestic Funds	Green	TORTOISE ENERGY EVOLUTION FD INSTL	Equity Theme - Alternative Energy	30/09/2013	17.8
	Conventional	CLEARBRIDGE ENERGY MLP &. INFRASTRUCTURE FUND CLASS I	Equity sector energy	03/09/2013	6.7
		HENNESSY BP MIDSTREAM FUND INSTITUTIONAL	Equity sector energy	31/12/2013	34.2
		COHEN&STEERS MLP&ENERGY OPPORTUNITY FUND I	Equity sector energy	20/12/2013	193.1
	Green	FIDELITY SELECT ENVIRONMENTAL & ALTERNATIVE ENERGY PORTFOLIO	Equity Sector General Industry	02/08/1989	165.9
	Conventional	FIDELITY SELECT INDUSTRIAL EQUIPMENT PORTFOLIO	Equity sector industrials	14/09/1987	186
		ICON INDUSTRILAS FUND CLASS S	Equity sector industrials	23/05/1997	11.5
		RYDEX SERIES TRUST TRANSPORT INVESTMENTS	Equity sector industrials	13/05/1998	6.3
	Green	SHELTON GREEN ALPHA FUND	Unclassified	12/03/2013	56.6
	Conventional	ABR DYNAMIC BLEND EQUITY & VOLATILITY FUND INST	Unclassified	03/08/2015	38.3
		RIVERBRIDGE ECO LEADERS FUND INVESTOR	Unclassified	31/12/2014	4.9
		AMERICAN GROWTH CANNABIS FUND E	Unclassified	24/02/2011	0.8
	Green	GREAT-WEST ARIEL MID CAP VALUE FUND INVESTOR	Equity US Sm&Mid Cap	07/04/2010	49.9
	Conventional	AMERICAN BEACON ZEBRA SMALL CAP EQUITY FUND Y CLASS	Equity US Sm&Mid Cap	01/06/2010	44
		FORMULA INVESTING US VALUE 1000 FUND CLASS A	Equity US Sm&Mid Cap	04/11/2010	63.6
		CLEARBRIDGE MID CAP GROWTH FUND CLASS I	Equity US Sm&Mid Cap	01/09/2010	35.6
	Green	GREEN CENTURY EQUITY FUND INDIVIDUAL INVESTOR	Equity US	22/09/1997	243.4
	Conventional	COLUMBIA SELECT LARGE CAP VALUE FUND A	Equity US	28/07/1997	237.2
		MANNING &.NAPIER FUND PRO- BLEND MAXIMUM TERM SERIES CLASS S	Equity US	04/04/1997	233
		DELAWARE SELECT GROWTH FUND A	Equity US	09/06/1997	228.8
	Green	DFA UNITED STATES SUSTAINABILITY CORE I PORTFOLIO	Equity US	11/04/2008	2035
	Conventional	JANUS HENDERSON CONTRARIAN FUND D	Equity US	16/02/2010	1988.8
		SEI INST MGD LARGE CAP FUND F	Equity US	05/10/2009	2160
		FEDERATED HERMES KAUFMANN LG CAP FD INST	Equity US	04/12/2007	2212.9
	Green	BROWN ADVISORY WINSLOW SUSTAINABILITY FUND INSTITUTIONAL	Equity US	29/06/2012	861.3
	Conventional	TOUCHSTONE FOCUSED FUND CLASS Y	Equity US	16/04/2012	829.1
		PRINCIPAL FUNDS BLUE CHIP FUND INSTITUTIONAL CLASS	Equity US	15/06/2012	770.8
		FIDELITY ADVISOR SERIES OPPORTUNISTIC INSIGHTS FUND	Equity US	11/12/2012	963.9

This table reports the green domestic funds identified in Refinitiv Eikon and their respective matched conventional funds. For each fund, the name, classification, age and total net assets are shown.

Appendix B. List of US green global funds and their matched pair

		Name	Classification	Age	Total net asset
US global Funds	Green	ESSEX ENVIRONMENTAL OPPORTUNITIES FUND INST	Equity Theme - Alternative Energy	01/09/2017	9.7
	Conventional	ADVISORY RESEARCH MLP & EQUITY FUND I	Equity sector energy	31/08/2015	13.2
		DWS RREEF MLP & ENERGY INFRASTRUCTURE FUND S	Equity sector energy	03/02/2015	4.6
		GOLDMAN SACHS ENERGY INFRASTRUCTURE FUND R6	Equity sector energy	29/09/2017	0.1
	Green	CALVERT GLOBAL WATER FUND I	Unclassified	30/09/2008	179.9
	Conventional	T ROWE PRICE GLOBAL INFRASTRUCTURE FUND	Unclassified	27/01/2010	38.9
		NEBRASKA FUND INSTITUTIONAL	Unclassified	20/09/2012	6.4
		JOHN HANCOCK FUNDS II GLOBAL INFRASTRUCTURE FUND CLASS A	Unclassified	05/01/2009	1.4
	Green	DFA INTERNATIONAL SUSTAINABILITY CORE 1 PORTFOLIO	Equity Global ex US	13/06/2008	1293.5
	Conventional	SCHWAB LAUDUS INTL MARKET MASTERS FUND	Equity Global ex US	02/04/2004	1377.5
		THORNBURG INTERNATIONAL GROWTH FUND I	Equity Global ex US	01/02/2007	1203.9
		TRANSAMERICA INTERNATIONAL GROWTH I2	Equity Global ex US	10/06/2008	1118
	Green	HARTFORD CLIMATE OPPORTUNITIES FUND F	Equity Global	29/02/2016	11.2
	Conventional	JACKSON SQUARE GLOBAL GROWTH FUND IS	Equity Global	19/09/2016	11.4
		MORGAN STANLEY GLOBAL CONCENTRATED PORTFOLIO I	Equity Global	27/05/2016	12.9
		HARDING LOEVNER GLOBAL EQUITY RESEARCH PFLO INS	Equity Global	19/12/2016	6.7
	Green	TRILLIUM ESG GLOBAL EQUITY FUND RETAIL	Equity Global	19/07/2001	229.1
	Conventional	HARTFORD GLOBAL GROWTH FUND CLASS A	Equity Global	03/05/1999	198.8
		GUINNESS ATKINSON GLOBAL INNOVATORS FUND INVESTOR	Equity Global	15/01/1999	127.1
		MASS MUTUAL PREMIER GLOBAL FUND R5	Equity Global	31/12/2004	98.4
	Green	PAX GLOBAL ENVIRONMENTAL MARKETS FD INST	Equity Global	27/03/2008	685.6
	Conventional	RUSSELL INVESTMENTS GLOBAL EQUITY FUND S	Equity Global	01/03/2007	701.6
		PMC DIVERSIFIED EQUITY FUND	Equity Global	26/08/2009	603.2
		JOHN HANCOCK FUNDS III GLOBAL SHAREHOLDER YIELD FUND CLASS I	Equity Global	01/03/2007	781.7

This table reports the green global funds identified in Refinitiv Eikon and their respective matched conventional funds. For each fund, the name, classification, age and total net assets are shown.

Appendix C. Descriptive statistics for US green funds

Panel A: US domestic funds									
Funds	Obervations	Mean excess returns (%)	Standard deviation (%)	Excess Kurtosis	Skewness	Min	Max	Adj. x2	P-value
x1	250	0.5058	5.0371	0.9018	-0.4853	-17.36	15.95	18.28	0.0001
x2	250	0.3520	4.3765	0.6493	-0.3993	-15.56	12.46	11.04	0.0040
x3	250	0.8425	5.0704	1.8339	-0.7639	-19.85	13.57	67.64	2.0E-15
x4	250	1.4072	3.8014	1.6603	0.0822	-8.64	15.84	12.79	0.0017
x5	250	1.4438	5.8818	1.0765	-0.1024	-18.88	16.24	6.95	0.0310
x6	250	1.1279	7.4235	22.8738	2.9732	-21.21	56.18	11036.00	2.2E-16
x7	250	-0.3883	6.3577	1.8734	-0.7814	-26.14	11.07	23.21	9.1E-06
Panel B: US global funds									
Funds	Obervations	Mean excess returns (%)	Standard deviation (%)	Excess Kurtosis	Skewness	Min	Max	Adj. x2	P-value
x8	250	0.5389	4.4075	1.1840	-0.6395	-17.80	11.25	38.68	4.0E-09
x9	250	0.6351	5.3759	3.7710	-1.0364	-25.97	16.16	187.21	2.2E-16
x10	250	0.3441	5.4501	2.1327	-0.7211	-22.56	14.22	57.30	3.6E-13
x11	250	0.6190	4.9325	2.0271	-0.7612	-20.08	14.06	52.33	4.3E-12
x12	250	1.0659	4.6982	2.2667	-0.7727	-16.02	10.68	40.94	1.3E-09
x13	250	0.6841	6.5655	1.9166	-0.9734	-20.86	12.84	23.60	7.5E-06

This table reports descriptive statistics for green funds. Panel A represents the domestic funds and Panel B represents the global funds. The statistic that is showed in this table includes the number of observations, mean excess returns (%), standard deviation (%), excess kurtosis, skewness, minimum, maximum, the probability value of the Jarque-Bera test and p-value for the period of January 2000 to October 2020.

Appendix D. Unconditional Carhart (1997) four-factor model – US green funds

Panel A: US domestic funds						
	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
x1	-0.0014	0.9446 ***	0.2959 ***	0.2594 *	0.0404	75.16%
x2	-0.0021 ***	0.9843 ***	0.0240	-0.0599 ***	-0.0147	97.42%
x3	-0.0005	1.0379 ***	0.2625 ***	0.0104	-0.0149 *	99.33%
x4	0.0018	0.9656 ***	0.1831 ***	-0.2913 ***	0.1056 *	90.33%
x5	0.0021	1.1472 ***	0.5214 ***	-0.2535 **	-0.0780	69.87%
x6	0.0036	1.1071 ***	0.2646	0.4716	-0.3163 *	56.19%
x7	-0.0084 *	0.9040 ***	0.4786 ***	0.3527 **	-0.2951 **	62.83%
Panel B: US global funds						
	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
x8	-0.0007	0.9523 ***	0.1162 **	-0.1602 ***	-0.0425	94.28%
x9	-0.0011	1.0437 ***	0.6099 ***	-0.2432 ***	-0.0423	90.63%
x10	-0.0032 ***	1.0763 ***	0.3024 ***	0.0828 *	-0.0605 **	94.80%
x11	-0.0007	0.9466 ***	0.4636 ***	0.0774	-0.0533	89.50%
x12	0.0004	1.0231 ***	0.3185	-0.0465	0.0230	84.18%
x13	0.0012	1.1352 ***	0.6599 **	-0.0841	-0.0666	79.95%

This table reports the regression estimates, obtained from the unconditional Carhart (1997) four-factor model, for the individual US green funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix E. Unconditional Carhart (1997) four-factor model – US conventional funds

Panel A: US domestic funds						
	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
x1	-0.0017	1.2357 ***	0.3780 ***	0.1028	-0.0521	85.80%
x2	-0.0031 **	1.1075 ***	0.5370 ***	-0.5277 ***	-0.0001	85.82%
x3	-0.0003	0.8496 ***	0.0486	0.0199	-0.0893 ***	85.44%
x4	-0.0030 **	1.0796 ***	0.3605 ***	0.3497 ***	-0.0019	81.62%
x5	-0.0006	1.0333 ***	0.0008	0.4542 ***	-0.0952 **	90.92%
x6	-0.0019	1.0696 ***	0.3181 ***	0.3738 ***	-0.0485	70.83%
x7	-0.0006	1.0130 ***	0.0604	0.0169	-0.0562	93.71%
x8	0.0008	1.0360 ***	0.2373 ***	-0.2991 ***	-0.1125 ***	90.25%
x9	-0.0022 ***	1.0142 ***	0.1126 ***	0.0304	-0.0090	98.35%
x10	-0.0020	0.9845 ***	0.3745 ***	0.0066	-0.0291	82.73%
x11	0.0003	0.8596 ***	0.9128 ***	0.2476 ***	0.0075	92.59%
x12	-0.0013	1.1367 ***	0.5325 ***	-0.2869 ***	0.0248	88.50%
x13	-0.0141 ***	0.9508 ***	-0.0050	-0.4575 ***	-0.0846	37.73%
x14	0.0007	1.1019 ***	0.5759 ***	-0.1815 **	-0.1776 ***	97.27%
x15	0.0009	1.0447 ***	-0.0479	-0.2209 ***	0.0098	93.32%
x16	0.0009	1.0090 ***	0.0589	-0.3907 ***	0.1566 *	83.01%
x17	0.0009	0.9479 ***	0.3843 ***	-0.3352 ***	0.0915 **	88.64%
x18	-0.0081	0.9682 ***	0.4667 ***	-0.0556	-0.6844 ***	59.12%
x19	-0.0109 **	1.2077 ***	0.5023 ***	0.3448 *	-0.4325 ***	67.21%
x20	-0.0135 ***	1.3091 ***	0.4535 **	0.3084	-0.4262 ***	62.32%
x21	-0.0001	0.1922	-0.4843 *	-0.8396	-0.3840	22.79%

Unconditional Carhart (1997) four-factor model – US conventional funds (continuation)

Panel B: US global funds						
	α_p	β_p	β_{SMB}	β_{HML}	β_{MOM}	Adj. R^2
x22	-0.0028	1.0379 ***	-0.3687	-0.3765 **	0.1980 ***	89.27%
x23	-0.0021	1.1553 ***	0.2611 ***	-0.2468 **	0.0954 **	90.75%
x24	0.0008	1.1306 ***	0.0848	-0.5306 ***	-0.1656 ***	87.89%
x25	-0.0021 **	1.1200 ***	0.5183 ***	-0.0822	0.0343	93.92%
x26	-0.0018 *	1.0902 ***	0.1129 **	-0.1805 ***	-0.0409	94.42%
x27	0.0007	1.0063 ***	0.3702 ***	-0.4130 ***	-0.0944	86.02%
x28	-0.0010	0.7821 ***	-0.1468	0.1556 *	0.0893 **	87.75%
x29	-0.0020 ***	1.0484 ***	0.0829 **	-0.0173	-0.0143	97.32%
x30	-0.0032 ***	1.0506 ***	-0.0153	0.0260	0.0185	90.71%
x31	-0.0018 ***	1.0036 ***	0.2431 ***	0.0391	0.0398	96.66%
x32	-0.0012	0.7954 ***	-0.1047	0.0266	0.0211	82.68%
x33	-0.0023	0.7840 ***	0.3148 **	0.1500	0.0704	73.15%
x34	-0.0129 **	1.5479 ***	1.0892 ***	0.5926 **	0.2063	67.02%
x35	-0.0105	1.2850 ***	0.9544	0.5271	-0.1258	44.99%
x36	-0.0010	1.0213 ***	0.2768	-0.0977	0.0208	88.90%
x37	-0.0007	1.0661 ***	0.3121 *	-0.2176	0.1680 *	89.02%
x38	0.0017 *	0.9231 ***	0.2794 ***	-0.0170	0.0019	96.36%
x39	-0.0017	1.4156 ***	1.4725 **	0.5355 *	-0.0690	70.20%

This table reports the regression estimates, obtained from the unconditional Carhart (1997) four-factor model, for the individual US conventional funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix F. Unconditional Fama and French (2018) six-factor model – US green funds

Panel A: US domestic funds								
	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
x1	-0.0032 *	0.9964 ***	0.4052 ***	0.0942	0.2652 ***	0.1519	0.0179	76.38%
x2	-0.0022 ***	0.9865 ***	0.0314 *	-0.0659 ***	0.0171	-0.0022	-0.0156	97.41%
x3	-0.0004	1.0335 ***	0.2591 ***	0.0310	-0.0046	-0.0636 **	-0.0121	99.35%
x4	0.0019	0.9434 ***	0.1152 **	-0.1820 **	-0.1085	-0.3505 ***	0.0831 *	91.62%
x5	0.0021	1.1010 ***	0.3682 **	-0.0333	-0.2712	-0.7098 *	-0.1359	71.98%
x6	0.0031	1.1273 ***	0.3126 ***	0.3266	0.0878	0.4186	-0.3270 *	55.99%
x7	-0.0077 **	1.0149 ***	0.2725	0.3632 *	-0.8574 ***	0.2449	-0.3254 ***	65.41%
Panel B: US global funds								
	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
x8	-0.0002	0.9543 ***	0.1337 ***	-0.2703 ***	-0.2290 ***	0.1762 **	-0.0308	94.84%
x9	-0.0010	1.0410 ***	0.6020 ***	-0.2508 **	-0.0483	-0.0105	-0.0405	90.50%
x10	-0.0026 ***	1.0551 ***	0.2659 ***	0.1428 *	-0.1132	-0.1744	-0.0340	94.86%
x11	-0.0006	0.9585 ***	0.4727 ***	-0.0507	-0.0927	0.2100	-0.0895 **	89.51%
x12	-0.0001	0.9836 ***	0.2706	0.2332	0.3159	-0.4136	0.0624	84.19%
x13	0.0004	1.0997 ***	0.4552 **	0.2753	-0.5199	-1.1850 *	-0.0374	81.24%

This table reports the regression estimates, obtained from the unconditional Fama and French (2018) six-factor model, for the individual US green funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML), profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix G. Unconditional Fama and French (2018) six-factor model – US conventional funds

Panel A: US domestic funds								
	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
x1	-0.0029 *	1.2825 ***	0.4436 ***	-0.0179	0.1624 **	0.1289	-0.0659	86.08%
x2	0.0000	1.0182 ***	0.3584 ***	-0.2383 ***	-0.4360 ***	-0.2949 ***	0.0392	88.57%
x3	-0.0010	0.8737 ***	0.0695 *	-0.0706	0.0598	0.1697 ***	-0.1011 ***	85.78%
x4	-0.0051 ***	1.1386 ***	0.5414 ***	0.2056 ***	0.4238 ***	-0.0677	-0.0216	84.00%
x5	-0.0014	1.0591 ***	0.0253	0.3581 ***	0.0685	0.1751 *	-0.1077 ***	91.18%
x6	-0.0047 **	1.1406 ***	0.5662 ***	0.1928 **	0.5720 ***	-0.1181	-0.0751	74.68%
x7	-0.0006	1.0149 ***	0.0547	0.0171	-0.0233	0.0032	-0.0571	93.58%
x8	0.0023 *	0.9896 ***	0.1799 ***	-0.1538 ***	-0.2677 ***	-0.4485 ***	-0.0951 ***	92.10%
x9	-0.0020 ***	1.0077 ***	0.0969 ***	0.0820 ***	-0.0368	-0.1434 ***	-0.0033	98.52%
x10	-0.0013	0.9680 ***	0.3117 ***	0.1379 *	-0.1920 *	-0.3585 **	-0.0185	83.72%
x11	0.0001	0.8627 ***	0.9346 ***	0.2220 ***	0.0718	0.0721	0.0079	92.54%
x12	-0.0006	1.1133 ***	0.4524 ***	-0.1719 ***	-0.2238 **	-0.3218 ***	0.0209	89.40%
x13	-0.0135 ***	0.9695 ***	-0.1170	-0.4769 **	-0.4760 *	0.1272	-0.1023	38.05%
x14	0.0008	1.1112 ***	0.6049 ***	-0.0533	0.1249 **	-0.1536	-0.1740 ***	97.31%
x15	0.0010	1.0241 ***	-0.0990 ***	-0.1298 ***	-0.0690	-0.2953 ***	-0.0078	94.11%
x16	0.0010	0.9836 ***	-0.0400	-0.2566 ***	-0.3128 ***	-0.3737 ***	0.0986	86.77%
x17	0.0010	0.9236 ***	0.3413 ***	-0.2610 ***	-0.0774	-0.2564 **	0.0706	88.98%
x18	-0.0069	1.0455 ***	0.1522	-0.2188	-1.1552 ***	0.6449	-0.6759 ***	65.24%
x19	-0.0106 **	1.2530 ***	0.4200 *	0.3446	-0.3542	0.1101	-0.4454 **	66.73%
x20	-0.0133 ***	1.3098 ***	0.3554	0.3919	-0.2832	-0.2230	-0.4585 **	61.68%
x21	-0.0008	0.3370 **	-0.4476 *	-1.0556	-0.2942	0.8840	-0.3233	25.57%

Unconditional Fama and French (2018) six-factor model – US conventional funds (continuation)

Panel B: US global funds								
	α_p	β_p	β_{SMB}	β_{HML}	β_{RMW}	β_{CMA}	β_{MOM}	Adj. R^2
x22	-0.0031	1.0440 ***	-0.3673	-0.4087 **	0.0369	0.0957	0.1802 ***	88.59%
x23	-0.0018	1.1472 ***	0.2409 **	-0.2768 **	-0.1434	0.1043	0.0928 **	90.84%
x24	0.0036 ***	1.0472 ***	-0.0796	-0.3374 ***	-0.5689 ***	-0.2364 *	-0.1145 ***	89.65%
x25	-0.0022 **	1.0789 ***	0.4708 ***	0.1399	0.1225	-0.4110 ***	0.0747 **	94.51%
x26	-0.0007	1.0747 ***	0.0781	-0.2412 ***	-0.3372 ***	-0.0437	-0.0265	94.73%
x27	0.0019	0.9343 ***	0.2726 ***	-0.1492	-0.1680	-0.6015 ***	-0.0168	87.16%
x28	-0.0034 ***	0.8556 ***	-0.0179	0.0742	0.6247 ***	0.4851 ***	0.0199	91.12%
x29	-0.0012 *	1.0189 ***	0.0363	0.0479	-0.1726 **	-0.2169 ***	0.0153	97.55%
x30	-0.0027 **	1.0350 ***	-0.0422	0.0693	-0.0845	-0.1274	0.0378	90.65%
x31	-0.0018 ***	1.0055 ***	0.2475 ***	0.0269	0.0085	0.0329	0.0362	96.61%
x32	-0.0033	0.8558 ***	0.0646	0.0172	0.4927 **	0.3022	-0.0723	83.36%
x33	-0.0030 **	0.8432 ***	0.4863 ***	0.0100	0.3031	0.5308 **	0.0195	75.44%
x34	-0.0133 **	1.6705 ***	1.3322 ***	0.0154	0.3256	1.4874 *	0.1041	68.32%
x35	-0.0046	1.2696 ***	0.1875	-1.6538 ***	-3.1040 ***	1.8261 ***	-0.3565	54.75%
x36	-0.0016	1.0112 ***	0.1863	0.0602	-0.2187	-0.4940	0.0727	89.35%
x37	-0.0013	1.0540 ***	0.1678	-0.0784	-0.5352 **	-0.7656 *	0.1549	90.45%
x38	0.0010	0.8967 ***	0.2056 ***	0.1886 *	0.1371	-0.3935 ***	0.0222	96.68%
x39	-0.0013	1.4227 ***	1.4394 **	0.5519	-0.4602	-0.3026	-0.0635	68.41%

This table reports the regression estimates, obtained from the unconditional Fama and French (2018) six-factor model, for the individual US conventional funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML), profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix H. Conditional Carhart (1997) four-factor model – US green funds

Panel A: US domestic funds																
	α_p	α_{ST}	α_{DY}	β_{p*rm}	β_{ST*rm}	β_{DY*rm}	β_{SMB}	β_{ST*SMB}	β_{DY*SMB}	β_{HML}	β_{ST*HML}	β_{DY*HML}	β_{MOM}	β_{ST*MOM}	β_{DY*MOM}	Adj. R^2
x1	-0.0023	0.0018	0.0100	0.9743 ***	-0.0848	-0.3993 *	0.3789 ***	0.0363	0.6219	0.2832 *	0.2348 **	0.0886	0.0621	-0.1126	-0.1587	76.30%
x2	-0.0022 ***	-0.0012	-0.0013	0.9888 ***	0.0048	-0.1005 *	0.0038	-0.0396	-0.2273 ***	-0.0701 ***	-0.0824 ***	0.0611	-0.0193 *	-0.0035	-0.1083 ***	97.67%
x3	-0.0009 ***	0.0000	-0.0046 **	1.0358 ***	0.0071	0.0751 *	0.2516 ***	-0.0451	-0.0440	0.0248 **	0.0564 *	-0.1037 *	-0.0094	-0.0164	-0.0743 **	99.38%
x4	0.0022 *	-0.0004	0.0152	0.9453 ***	0.0772 *	0.8605 **	0.2446 ***	-0.4208 ***	0.6879	-0.2722 ***	-0.0401	-0.3182	0.2000 ***	-0.1554	0.7322	91.71%
x5	0.0031	-0.0311 ***	-0.0597 *	1.1063 ***	-0.0149	0.0761	0.5847 ***	-0.7532 ***	-1.4599	-0.1972 *	-0.5056 *	-0.3719	0.0069	-0.8708 ***	-1.7451	75.34%
x6	0.0143	-0.0651	-0.0112	1.0053 ***	0.4743 *	0.1366	0.1135	0.5897	2.2861	0.5802	-1.1991	-0.6877	-0.3975	0.3922	1.1847	57.93%
x7	-0.0099 *	0.0003	-0.0411	0.9408 ***	0.1239	1.6680 *	0.3754 **	0.5178	-0.3511	0.4255 **	0.2779	1.5059	-0.2575 **	-0.3207	0.9551	61.47%
Panel B: US domestic funds																
	α_p	α_{ST}	α_{DY}	β_{p*rm}	β_{ST*rm}	β_{DY*rm}	β_{SMB}	β_{ST*SMB}	β_{DY*SMB}	β_{HML}	β_{ST*HML}	β_{DY*HML}	β_{MOM}	β_{ST*MOM}	β_{DY*MOM}	Adj. R^2
x8	-0.0013 **	-0.0024 *	0.0005	0.9796 ***	0.0931 **	-0.0386	0.0916 **	-0.0913	-0.0850	-0.1581 ***	-0.0098	0.0702	-0.0141	0.0986 **	-0.0224	94.50%
x9	-0.0011	-0.0007	0.0035	1.0521 ***	0.0293	-0.0140	0.6252 ***	-0.1393	0.4515 *	-0.2041 ***	-0.0952	-0.0878	-0.0280	-0.1899	-0.2017	90.74%
x10	-0.0028 **	-0.0013	0.0036	1.0853 ***	-0.0028	-0.0321	0.3070 ***	-0.1215	0.1183	0.0872	-0.0043	0.2396	-0.0593	0.0909	0.1529	94.60%
x11	-0.0003	-0.0009	0.0000	0.9505 ***	0.1170	0.0593	0.5723 ***	-0.4186 *	0.4931 **	0.0984 *	-0.2069	0.1302	-0.0648	-0.4402 ***	-0.2662 ***	90.22%
x12	0.0054 *	-0.0158 **	0.0376 *	1.0270 ***	0.0801	1.2228 ***	0.3606 *	-0.0653	-0.9849	0.2122 *	-0.4620 **	3.0085 ***	0.3107 ***	-0.8747 ***	3.2640 ***	89.59%
x13	0.0047	-0.0236 **	0.0231	1.0130 ***	0.2716	1.8005 **	0.8105 ***	-1.1935 **	3.6276	-0.0973	-1.3659 ***	3.9760 **	0.1742	-1.5939 ***	4.1435 *	85.36%

This table reports the regression estimates, obtained from the conditional Carhart (1997) four-factor model, for the individual US green funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix I Wald test for the conditional Carhart (1997) four-factor model – US green funds

Panel A: US domestic funds			
Green funds	w_1	w_2	w_3
x1	0.5925	0.0114 **	0.0204 **
x2	0.2957	0.0004 ***	0.0002 ***
x3	0.0484 **	0.0297 **	0.0365 **
x4	0.6152	0.0187 **	0.0088 ***
x5	0.0039 ***	0.1345	0.0039 ***
x6	0.0025 ***	0.2085	0.1489
x7	0.7768	0.5907	0.7034
Panel B: US global funds			
Green funds	w_1	w_2	w_3
x8	0.1276	0.0386 **	0.0506 *
x9	0.7447	0.3617	0.304
x10	0.5675	0.8288	0.9036
x11	0.9803	0.0177 **	0.0358 **
x12	0.0794 *	0.0116 **	0.0015 ***
x13	0.252	0.0714 *	0.0613 *

This table reports the Wald test results, of the conditional Carhart (1997) four-factor model, for US green funds. Panel A shows the results for domestic funds and Panel B the results for global funds. W1, w2 and w3 correspond to the p-value of the Wald test on the null hypothesis of no time-varying alphas, no time-varying betas and no time-varying alphas and betas, respectively. This, from January 2000 to October 2020. The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix J. Conditional Carhart (1997) four-factor model – US conventional funds

Panel A: US domestic funds																
	α_p	α_{ST}	α_{DY}	β_{p^*rm}	β_{ST^*rm}	β_{DY^*rm}	β_{SMB}	β_{ST^*SMB}	β_{DY^*SMB}	β_{HML}	β_{ST^*HML}	β_{DY^*HML}	β_{MOM}	β_{ST^*MOM}	β_{DY^*MOM}	Adj. R^2
x1	-0.0018	-0.0038	-0.0079	1.2397 ***	-0.1132	-0.0124	0.3895 ***	0.0897	0.7911 ***	0.1163 **	0.1194 *	-0.4209	-0.0061	-0.0684	-0.1931	86.22%
x2	-0.0025 **	-0.0021	-0.0092	1.0776 ***	-0.0119	-0.2600 *	0.4192 ***	0.1475 **	0.1037	-0.4502 ***	0.0073	0.1534	0.0442	0.2385 ***	-0.2278 *	87.60%
x3	-0.0007	0.0028 *	-0.0063	0.8284 ***	-0.1065 *	-0.0161	0.0533	-0.0312	0.0186	-0.0081	-0.1350	-0.5794	-0.0735 **	-0.1217 **	-0.3917 **	86.03%
x4	-0.0032 **	-0.0032	-0.0140	1.0911 ***	0.0292	0.0350	0.4415 ***	-0.0262	1.1912 ***	0.3116 ***	0.2366 **	0.3446	0.0074	-0.0976	0.1307	83.51%
x5	-0.0017 *	0.0004	-0.0074	1.0305 ***	0.0736 **	0.3140 **	0.0607 *	0.0171	0.5912 **	0.4540 ***	0.1910 ***	-0.2847	-0.0676	-0.1101 **	-0.2097 *	92.35%
x6	-0.0019	-0.0084 *	-0.0056	1.1231 ***	0.0928	-0.3631	0.3552 ***	0.0660	0.3971	0.3852 ***	0.2392 *	0.9726 **	-0.0812	-0.0184	0.1602	71.43%
x7	0.0004	-0.0079 *	0.0033	1.0006 ***	-0.0351	-1.0952 ***	0.0305	0.1228	-0.9513 **	0.0401	0.0397	-0.3373	-0.1056 ***	0.1225	-1.5298 ***	94.55%
x8	0.0007	-0.0061 ***	-0.0030	1.0245 ***	0.0305	0.1746	0.2109 ***	0.0470	0.0919	-0.3135 ***	-0.2002	-0.1791	-0.0602	0.0643	-0.0644	90.36%
x9	-0.0023 ***	-0.0001	-0.0027	1.0102 ***	0.0334 *	0.0154	0.1474 ***	-0.1918 **	0.1422 *	0.0262	-0.0432	0.2196 *	0.0059	-0.0870 **	0.0214	98.38%
x10	0.0000	-0.0145	-0.0145	0.9009 ***	0.1539 *	-0.3794	0.4569 ***	-0.2603	2.2916 **	0.0485	-0.1807	-0.8121	0.0100	-0.1111	-0.7194 **	83.16%
x11	0.0010	0.0016	0.0441 ***	0.8696 ***	0.0815	-0.0472	0.9180 ***	0.1274	-0.4675	0.2763 ***	0.0110	-0.7563 **	0.0527	-0.1772 **	0.1469	93.90%
x12	-0.0015	-0.0029	-0.0087	1.0833 ***	0.1468	0.7799 ***	0.6191 ***	-0.6365 ***	0.7403	-0.2573 ***	0.0404	-0.4564	0.1305 *	-0.4943 ***	0.0241	90.15%
x13	-0.0146 **	0.0065	-0.0107	0.8817 ***	0.3581 **	1.4738 **	0.0790	-0.2553	3.2939 **	-0.4761 ***	-0.0527	-5.3524 ***	0.0670	-0.5302	1.3006	41.54%
x14	0.0038	-0.0065	-0.0003	1.3222 ***	-3.2862 ***	-0.0611	0.9414 ***	-5.5952 ***	-1.0584 **	-0.4205 *	1.7209	-0.9708	-0.0401	-2.8764 *	0.4020	97.66%
x15	0.0007	0.0022	0.0011	1.0120 ***	-0.0696	-0.1180	-0.0052	-0.1009	0.8896	-0.2200 ***	0.0953	0.4609	0.0150	0.0281	-0.0545	93.54%
x16	0.0009	-0.0094 **	-0.0284	0.9797 ***	0.2412	-0.2983	0.0778	-0.1327	-0.2146	-0.1974 *	-0.2303	2.7806 **	0.2300 **	-0.1394	-1.4253	83.89%
x17	0.0004	0.0002	-0.0098	0.9302 ***	0.0362	0.8321 *	0.3782 ***	-0.0285	0.5700	-0.3037 ***	0.1377	0.3960	0.1335 **	-0.1166	0.5687	87.86%
x18	-0.0115	0.0041	-0.0939	0.9548 ***	-0.0640	0.1875	0.2421	0.9373	1.3041	-0.2254	0.6220	-1.4336	-0.6114 ***	-0.2690	-0.5778	53.77%
x19	-0.0182 **	0.0251 *	-0.0856	1.0133 ***	-0.6974 ***	2.0510 ***	0.6132 ***	-0.5591	4.0282 *	0.1949	-0.7791 **	-1.4964	-0.3470 **	-0.2735	-0.0086	76.60%
x20	-0.0197 ***	0.0198	-0.0804	1.0157 ***	-0.5601 **	2.9625 ***	0.5997 ***	-0.8989 *	6.4556 **	0.1755	-0.9719 ***	-1.7704	-0.2822 *	-0.0064	0.4513	78.61%
x21	-0.0052 *	0.0021	-0.0694 **	0.5288 ***	0.0884	-1.6873 **	-1.0369 ***	2.0513 ***	-3.3592 **	-0.7023 ***	1.2156 ***	-10.2591 ***	-0.5688 ***	1.0726 ***	-1.9627	80.08%

Conditional Carhart (1997) four-factor model – US conventional funds (continuation)

Panel B: US global funds																
	α_p	α_{ST}	α_{DY}	β_{p^*rm}	β_{ST^*rm}	β_{DY^*rm}	β_{SMB}	β_{ST^*SMB}	β_{DY^*SMB}	β_{HML}	β_{ST^*HML}	β_{DY^*HML}	β_{MOM}	β_{ST^*MOM}	β_{DY^*MOM}	Adj. R^2
x22	-0.0085 ***	0.0610 ***	-0.0134 **	1.0708 ***	-0.6625 **	-0.1246	-0.6452 **	-2.6160 **	-0.6872	-0.7792 ***	1.3326 *	-0.8054	0.0332	-0.1846	-0.0833	92.46%
x23	-0.0022	-0.0009	-0.0045	1.1091 ***	-0.1094 **	0.0774	0.2493 ***	0.3958 ***	0.5841 **	-0.2197 *	-0.0415	-0.9647 ***	0.1441 **	-0.1374 *	-0.3347 ***	91.91%
x24	-0.0005	-0.0011	-0.0033	1.1148 ***	0.1250 ***	0.0183	0.0062	0.0629	-0.5903 ***	-0.4306 ***	0.0738	-0.4715 *	-0.1043	0.1508 **	-0.2951 **	88.86%
x25	-0.0022 **	-0.0017	-0.0059	1.1136 ***	0.0133	-0.0076	0.4924 ***	-0.0060	0.4055 ***	-0.0519	0.1156	-0.1098	0.0373	0.0172	-0.0354	93.87%
x26	-0.0027 **	-0.0008	-0.0051	1.1152 ***	0.0734 ***	-0.0898	0.0842	-0.0135	-0.2758	-0.2167 ***	0.1339	0.0947	-0.0586	0.1103 *	0.0132	94.54%
x27	-0.0001	0.0003	-0.0159 ***	0.9677 ***	-0.0209	-0.0053	0.3459 ***	0.1751	-0.0090	-0.4025 ***	0.0348	-0.1712	-0.0784	-0.1585	-0.4375 ***	86.46%
x28	-0.0011	0.0012	0.0073	0.8159 ***	-0.0581	-0.2873 ***	-0.1790 **	-0.4686 ***	-0.3236 *	0.1240	-0.0499	0.4948 ***	0.0698	0.0727	0.1094	88.74%
x29	-0.0017 **	-0.0005	-0.0048 **	1.0321 ***	0.0226	0.1082 *	0.0826 **	0.1311 *	0.5062 ***	-0.0026	0.0311	-0.2659	-0.0160	0.0081	0.0387	97.40%
x30	-0.0014	-0.0120 ***	0.0013	1.0561 ***	-0.0048	0.0811	0.0015	-0.1089	0.3782	0.0322	-0.3895 *	0.1027	0.0006	-0.1816	0.1268	90.95%
x31	-0.0012 *	-0.0059 ***	-0.0053 *	0.9987 ***	0.0363	0.1153	0.2272 ***	-0.1248	0.0565	0.0473	-0.3217 ***	-0.2924	0.0557 **	-0.1066 *	0.0157	96.82%
x32	-0.0120	0.1400 *	0.0252 *	0.9968 ***	-2.1744 **	-0.4793 **	0.0113	-0.7312	-0.0881	-0.3382	3.0536	0.6620	0.3327	-3.8142	-0.3516	81.00%
x33	-0.0058 **	0.0143 *	0.0101	0.7004 ***	0.1209	-0.9361	-0.1108	2.1168 ***	-0.8530	0.1171	-0.4242	-4.0457 ***	0.1502	-0.6195	-1.0644 **	78.26%
x34	-0.0194 ***	0.0203	-0.0138	1.1886 ***	-0.7931 ***	1.0607	0.5769 *	-1.0270	5.2543 **	0.8767 **	-1.6029 ***	-6.5333 **	0.3261	-0.4204	-5.2151	80.63%
x35	-0.0326 *	0.0545	0.0519	1.2171 ***	0.0694	2.0661	1.9307	-2.1864	-2.1315	1.9467 *	-2.4480	5.2197	0.3113	-0.0850	0.3700	37.80%
x36	-0.0010	-0.0119 *	-0.0432 *	1.0113 ***	0.0497	-0.1019	0.2385	-0.1592	0.7999	-0.1002	-0.4513	-1.0334	-0.0050	-0.3819	-1.0199	89.80%
x37	0.0039	0.0021	0.0316	0.9505 ***	0.4170 **	0.5038	0.9045 ***	-0.9456 **	4.9395 **	-0.1400	-0.1572	1.9261	0.4217 ***	-0.5586 **	1.9588	90.28%
x38	0.0015	0.0003	-0.0137	0.8827 ***	0.0941	-0.1435	0.4847 ***	-0.5641 ***	1.6429 **	-0.0097	-0.3539 ***	-0.9412	0.0940	-0.4832 ***	-0.1372	96.73%
x39	-0.0069	0.0254 **	0.0094	1.1273 ***	-0.1618	2.9802 ***	1.3970 **	-0.9900	7.0604 ***	0.7567 ***	-0.7354	-0.7560	0.4650	-0.7832 *	2.4125	82.96%

This table reports the regression estimates, obtained from the conditional Carhart (1997) four-factor model, for the individual US conventional funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix K. Wald test for the conditional Carhart (1997) four-factor model – US conventional funds

Panel A: US domestic funds			
Conventional Funds	w_1	w_2	w_3
x1	0.3988	0.0847 *	0.0951 *
x2	0.4996	1.978E-06 ***	7.304E-06 ***
x3	0.1206	0.0117 **	0.0310 **
x4	0.2916	7.887E-05 ***	1.036E-04 ***
x5	0.4064	5.944E-08 ***	2.005E-07 ***
x6	0.1011	0.2105	0.1360
x7	0.1285	0.0266 **	0.0110 **
x8	0.1365	0.2391	0.3083
x9	0.8018	0.1958	0.2665
x10	0.0998 *	0.2579	0.2293
x11	0.0051 ***	0.0175 **	4.221E-04 ***
x12	0.7488	0.0014 ***	0.0027 ***
x13	0.9257	0.0724 *	0.0855 *
x14	0.9876	0.1806	0.1838
x15	0.8422	0.1386	0.2300
x16	0.4762	0.2151	0.2318
x17	0.9210	0.7409	0.8206
x18	0.4983	0.9792	0.9729
x19	0.1973	6.171E-05 ***	2.060E-04 ***
x20	0.3143	7.343E-08 ***	2.798E-07 ***
x21	0.2242	4.315E-13 ***	1.218E-12 ***

Wald test for the conditional Carhart (1997) four-factor model – US conventional funds (continuation)

Panel B: US global funds			
Conventional Funds	w_1	w_2	w_3
x22	0.0732 *	0.1157	0.0452 **
x23	0.6909	0.0002 ***	0.0005 ***
x24	0.8164	0.0003 ***	0.0009 ***
x25	0.3023	0.5333	0.5772
x26	0.3902	0.1455	0.1842
x27	0.0288 **	0.2458	0.1395
x28	0.2325	0.0050 ***	0.0115 **
x29	0.1967	0.0882 *	0.1484
x30	0.0112 **	0.2966	0.1944
x31	0.0234 **	0.0753 *	0.0955 *
x32	0.1389	0.8292	0.8088
x33	0.1967	0.0055 ***	0.0089 ***
x34	0.5198	0.0003 ***	4.000E-05 ***
x35	0.5757	0.9440	0.8670
x36	0.0354 **	0.6650	0.2073
x37	0.5513	0.0971 *	0.1569
x38	0.7240	0.1134	0.2023
x39	0.4556	0.0546 *	0.0080 ***

This table reports the Wald test results, of the conditional Carhart (1997) four-factor model, for US conventional funds. Panel A shows the results for domestic funds and Panel B the results for global funds. W1, w2 and w3 correspond to the p-value of the Wald test on the null hypothesis of no time-varying alphas, no time-varying betas and no time-varying alphas and betas, respectively. This, from January 2000 to October 2020. The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix L. Conditional Fama and French (2018) six-factor model – US green funds

Panel A: US domestic funds																					
	α_p	α_{ST}	α_{DY}	β_{p^*rm}	β_{ST^*rm}	β_{DY^*rm}	β_{SMB}	β_{ST^*SMB}	β_{DY^*SMB}	β_{HML}	β_{ST^*HML}	β_{DY^*HML}	β_{RMW}	β_{ST^*RMW}	β_{DY^*RMW}	β_{CMA}	β_{ST^*CMA}	β_{DY^*CMA}	β_{MOM}	β_{ST^*MOM}	β_{DY^*MOM}	Adj. R^2
x1	-0.0027	0.0000	0.0056	1.0074 ***	-0.0663	-0.2794	0.4929 ***	0.1333	0.8173 **	0.1826 *	-0.0825	-0.6029	0.2157 ***	0.3236 **	0.4766	0.0984	0.3412 **	1.9211 ***	0.0870	-0.1384 *	-0.3583 *	78.27%
x2	-0.0020 ***	-0.0018 **	-0.0016	0.9890 ***	0.0062	-0.0893	0.0232	-0.0112	-0.1983 **	-0.0849 ***	-0.1204 ***	0.0094	0.0209	0.0873	0.0850	-0.0016	-0.0034	0.0162	-0.0146	-0.0158	-0.1347 ***	97.68%
x3	-0.0006 *	-0.0005	-0.0040 ***	1.0332 ***	-0.0032	0.0597	0.2529 ***	-0.0313	-0.0311	0.0537 ***	0.0491	-0.1506 **	0.0011	0.0806	0.0443	-0.0795 ***	0.0117	0.0736	-0.0064	-0.0351	-0.0899 **	99.39%
x4	0.0027 *	0.0000	0.0331 ***	0.9245 ***	-0.0063	0.8039	0.2076 ***	-0.4612 ***	1.1284	-0.1637 *	0.0102	-0.7714	-0.1543 *	-0.0166	-0.2553	-0.2952 **	-0.2721	1.4465	0.1877 ***	-0.2413 **	0.9890	92.97%
x5	0.0043	-0.0320 ***	-0.0287	0.9954 ***	0.0096	-0.5192	0.4465 ***	-0.8408 **	-0.8680	0.0731	-0.6678 *	-1.3481	-0.1449	-1.0270 **	1.6598	-0.8097 ***	-0.0582	1.4126	-0.0349	-1.1486 ***	-1.6627	77.64%
x6	0.0132	-0.0627	-0.0289	1.0048 ***	0.5828	0.3729	0.2568	-0.0351	1.6979	0.2920	-0.5770	0.8501	0.0991	-0.4130	-0.7473	0.7916 **	-1.4577 *	-1.8688	-0.4386 *	0.4050	1.2129	57.26%
x7	-0.0082	-0.0099	-0.0661 *	0.9464 ***	0.2129	-0.3382	-0.0050	1.0439 *	-3.0514	0.4771 **	-0.4957	2.1125	-0.5093	-0.1020	2.7197	-0.2346	1.8147 **	-8.6123 *	-0.3834 ***	0.0511	-2.1020	64.13%
Panel B: US global funds																						
	α_p	α_{ST}	α_{DY}	β_{p^*rm}	β_{ST^*rm}	β_{DY^*rm}	β_{SMB}	β_{ST^*SMB}	β_{DY^*SMB}	β_{HML}	β_{ST^*HML}	β_{DY^*HML}	β_{RMW}	β_{ST^*RMW}	β_{DY^*RMW}	β_{CMA}	β_{ST^*CMA}	β_{DY^*CMA}	β_{MOM}	β_{ST^*MOM}	β_{DY^*MOM}	Adj. R^2
x8	-0.0008	-0.0024 *	0.0007	0.9659 ***	0.0743 *	-0.0195	0.1153 ***	-0.0803	0.0812	-0.2280 ***	-0.1289	-0.2081	-0.2056 ***	0.0132	-0.2458	0.1601 *	0.1863	0.3725 **	0.0209	0.0702	-0.1186	95.05%
x9	-0.0023 *	-0.0001	-0.0017	1.0519 ***	0.0926	0.1687	0.6631 ***	-0.0122	0.4245	-0.1930 **	-0.0878	-0.9090 *	0.0110	0.8252 **	0.6834	-0.1084	0.7520 ***	2.0400 ***	-0.0281	-0.2889 ***	-0.5767 ***	91.70%
x10	-0.0017	-0.0035	0.0115 **	1.0641 ***	0.0029	-0.1060	0.2701 ***	-0.0782	-0.1655	0.1892 **	-0.1670	0.1715	-0.1762	0.3010	-0.3193 *	-0.3054 ***	0.5143 *	0.5630	-0.0232	0.0624	0.1592 *	94.88%
x11	-0.0013	-0.0002	-0.0060	0.9661 ***	0.1633 *	0.1463	0.5962 ***	-0.3263	0.5298 **	0.0201	-0.2412	-0.1268	0.0085	0.4730	0.8255 **	0.1093	0.5375	0.9521 **	-0.0800	-0.4716 ***	-0.4553 ***	90.34%
x12	0.0038	-0.0129 **	0.0856 ***	1.0580 ***	0.1069 *	0.6748 *	0.2689 *	1.0110 ***	-3.6603 ***	0.9032 ***	-0.8878 *	1.0286	0.8976 ***	0.4195	-0.4555	-0.9666 ***	2.1700 ***	3.6507	0.3645 ***	-0.6563 **	1.9815 **	91.69%
x13	0.0051	-0.0240 *	0.1125 *	0.9311 ***	0.4924	0.7601	0.8005	-0.5435	2.3241	0.7001	-2.9979 ***	3.8027	1.2491	-2.5884	7.8656	-0.9774	2.0379	8.8485	0.3174	-1.7823 ***	2.7221	86.77%

This table reports the regression estimates, obtained from the conditional Fama and French (2018) six-factor model, for the individual US green funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML), profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix M. Wald test for the conditional Fama and French (2018) six-factor model – US green funds

Panel A: US domestic funds			
Green funds	w_1	w_2	w_3
x1	0.8542	0.0014 ***	0.0024 ***
x2	0.1013	0.0005 ***	0.0003 ***
x3	0.1424	0.0502 *	0.0501 *
x4	0.1026	0.2350	0.0116 **
x5	0.0119 **	0.1665	0.0057 ***
x6	0.0038 ***	0.3579	0.2506
x7	0.3993	0.5788	0.6632
Panel B: US global funds			
Green funds	w_1	w_2	w_3
x8	0.1518	0.0540 *	0.0595 *
x9	0.9667	0.0040 ***	0.0038 ***
x10	0.0763 *	0.3577	0.4039
x11	0.6865	0.0204 **	0.0400 **
x12	0.0071 ***	0.0020 ***	0.0003 ***
x13	0.1436	0.1251	0.1100

This table reports the Wald test results, of the conditional Fama and French (2018) six-factor model, for US green funds. Panel A shows the results for domestic funds and Panel B the results for global funds. W1, w2 and w3 correspond to the p-value of the Wald test on the null hypothesis of no time-varying alphas, no time-varying betas and no time-varying alphas and betas, respectively. This, from January 2000 to October 2020. The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix N. Conditional Fama and French (2018) six-factor model – US conventional funds

Panel A: US domestic funds																						
	α_p	α_{ST}	α_{DY}	β_{p^*rm}	β_{ST^*rm}	β_{DY^*rm}	β_{SMB}	β_{ST^*SMB}	β_{DY^*SMB}	β_{HML}	β_{ST^*HML}	β_{DY^*HML}	β_{RMW}	β_{ST^*RMW}	β_{DY^*RMW}	β_{CMA}	β_{ST^*CMA}	β_{DY^*CMA}	β_{MOM}	β_{ST^*MOM}	β_{DY^*MOM}	Adj. R^2
x1	-0.0024	-0.0037	-0.0116	1.2774 ***	-0.1563	0.0862	0.4206 ***	0.1236	0.8839 ***	-0.0372	0.2351 **	-0.1302	0.1284	0.0619	0.8804 **	0.1798	-0.2354	-0.4062	-0.0242	-0.0399	-0.1829	86.49%
x2	-0.0009	-0.0019	-0.0064	1.0189 ***	-0.0229	-0.3776 **	0.2534 ***	0.0276	0.0663	-0.1932 **	0.2070	0.3580	-0.4108 ***	-0.2651 **	-0.4235 *	-0.2435 ***	-0.1099	-0.6936 **	0.0598	0.1942 ***	-0.2157 *	89.77%
x3	-0.0010	0.0026 *	-0.0028	0.8389 ***	-0.1152 **	-0.0462	0.0879 *	-0.0025	-0.0318	-0.1011	-0.1088	-0.3831	0.0679	0.0603	-0.3063	0.1356 **	-0.1239	-0.4072	-0.0844 ***	-0.0917	-0.2789 *	86.13%
x4	-0.0040 ***	-0.0037	-0.0175	1.1223 ***	0.0128	0.1460	0.6025 ***	0.1250	1.2318 ***	0.1380 *	0.1212	0.1940	0.3518 ***	0.3109 **	0.5414	0.0292	-0.1281	0.0006	-0.0014	-0.0894	0.0771	85.11%
x5	-0.0013	-0.0017	-0.0064	1.0363 ***	0.0747 *	0.3207 *	0.0835 **	0.0601	0.7149 **	0.4007 ***	0.0980	-0.4191	-0.0253	0.2237 ***	0.0672	0.1480 **	0.0363	0.5963 **	-0.0498	-0.1302 ***	-0.2567 **	92.73%
x6	-0.0035 *	-0.0075	-0.0050	1.1647 ***	0.0750	-0.2743	0.6017 ***	0.2514 *	0.2736	0.1613 *	0.0437	0.6714	0.5801 ***	0.2550	-0.2945	-0.0361	-0.0653	-0.0088	-0.1035 *	0.0333	0.2259	74.57%
x7	0.0008	-0.0091 **	0.0165	0.9970 ***	-0.0689	-0.9667 ***	0.0086	0.1321	-0.6619	0.0920 **	-0.0935	-0.8568 **	-0.1078	-0.0213	-1.4280 **	-0.0864	0.1955	1.6803	-0.0893 ***	0.0977	-1.4480 ***	94.57%
x8	0.0018	-0.0043 *	-0.0005	0.9900 ***	-0.0039	-0.0123	0.1426 **	-0.0046	0.0213	-0.1912 ***	-0.0476	0.1932	-0.3208 ***	-0.2560 *	0.1392	-0.3988 ***	-0.2849 *	-0.6852	-0.0661 **	0.0650	-0.0186	92.17%
x9	-0.0019 ***	-0.0003	-0.0003	1.0091 ***	0.0117	-0.0162	0.1226 ***	-0.1182	0.0925	0.0750 ***	-0.0938	0.1464	-0.0369	0.0513	0.0994	-0.1434 ***	0.1229	-0.1320	0.0107	-0.0915 **	0.0366	98.46%
x10	0.0004	-0.0149 *	-0.0085	0.9081 ***	0.0663	-0.5157 **	0.3650 ***	0.0087	2.5818 ***	0.2107 ***	-0.5301 *	-1.9222 **	-0.1895	0.1283	0.9810	-0.4267 ***	0.7081 *	1.8041	0.0380	-0.1773	-0.8097 ***	84.14%
x11	0.0008	0.0030	0.0472 ***	0.8869 ***	-0.0447	-0.0956	0.9505 ***	0.2534 *	-0.5923	0.3160 ***	0.2086	-1.0292 **	0.0793	0.6857 ***	-0.7783	-0.1036	-0.2509	0.4940	0.0481	-0.0860	0.0248	94.27%
x12	-0.0003	-0.0049	0.0106	1.0912 ***	-0.0716	0.4166 *	0.5212 ***	-0.3699 **	0.4614	-0.1098	-0.1136	-0.9814	-0.2973 ***	0.7514 ***	-1.3552 **	-0.3668 ***	0.3372	0.8010	0.1274 *	-0.3885 ***	-0.3625	90.94%
x13	-0.0113 *	-0.0054	-0.0118	0.8706 ***	0.5863 *	1.0646 *	-0.2151	0.5975	2.6527 **	-0.3187	-1.1938 **	-4.4021 **	-0.1308	-0.1840	1.5027	-0.4687	2.7484 **	-7.4711	0.0929	-0.3199	0.8475	44.78%
x14	-0.0028	0.0529	-0.0399	1.3298 ***	-2.7818	0.8696	0.8371	-3.6652	-0.5994	-0.8126 ***	7.5145 *	-3.2951 ***	-0.0221	5.2165	1.1062	0.4228	-4.5192	4.1570	-0.0007	-3.9890 **	-0.8324	97.92%
x15	0.0020	0.0005	0.0133	0.9582 ***	-0.0845	-0.3931	-0.0870	-0.0895	0.2722	-0.1095 ***	0.0684	0.6026	-0.1269 **	-0.2058	-0.7000	-0.3519 ***	-0.0302	-1.4373	-0.0174	0.0249	-0.5214	94.68%
x16	-0.0003	-0.0105 **	-0.0044	1.0285 ***	0.1285	-0.7006	-0.0197	-0.2317	-0.2262	0.3057 **	-1.5944 ***	3.0065 ***	0.0045	-1.5255 ***	-0.4639	-0.8221 ***	1.8373 *	4.1641 *	0.3540 ***	-0.8073 ***	-1.6096 *	89.72%
x17	0.0006	0.0006	-0.0048	0.9365 ***	-0.1460 *	0.4138	0.3440 ***	0.1441	0.0306	-0.2358 ***	0.2651	0.3498	-0.1575	0.7789 ***	-0.1196	-0.2611	-0.1758	-0.9265	0.0889	-0.0036	-0.0040	88.07%
x18	-0.0078	-0.0235	-0.1308	0.9564 ***	0.2094	-0.2686	-0.0934	0.9707	-0.5095	0.4646	-2.5974	0.3722	-0.4329	-2.2260	0.0087	-0.7017	5.1231	-1.3890	-0.5168 **	-0.2262	-3.2970	60.64%
x19	-0.0177 **	0.0151	-0.1392 *	0.9833 ***	-0.3426	-0.3810	0.2171	-0.1592	1.1727	0.2077	-1.7876 ***	-1.1066	-0.2214	-1.3684 *	6.0417	-0.2176	2.2494 ***	-9.9038 *	-0.4641 ***	-0.0553	-3.3714 *	80.95%
x20	-0.0182 ***	0.0057	-0.1103	0.9900 ***	-0.1934	0.3812	0.1186	-0.2788	4.1590	0.2997 *	-2.4875 ***	-2.5386	-0.3257	-1.4825 *	5.2040 *	-0.4273	3.2568 ***	-7.3397	-0.3758 ***	0.2001	-3.0186 *	83.89%
x21	-0.0060 **	0.0087 *	-0.0419	0.5732 ***	-0.0181	-0.0658	-0.7636 ***	1.4616 ***	-1.0587	-0.8028 ***	1.8225 ***	-10.0710 ***	-0.0805	0.1604	-2.8630 *	0.4885	-1.5404 *	6.0685 **	-0.4598 ***	0.8125 ***	0.6060	81.69%

Conditional Fama and French (2018) six-factor model – US conventional funds (continuation)

Panel B: US global funds																					
	α_p	α_{ST}	α_{DY}	β_{p^*rm}	β_{ST^*rm}	β_{DY^*rm}	β_{SMB}	β_{ST^*SMB}	β_{DY^*SMB}	β_{HML}	β_{ST^*HML}	β_{DY^*HML}	β_{RMW}	β_{ST^*RMW}	β_{DY^*RMW}	β_{CMA}	β_{ST^*CMA}	β_{DY^*CMA}	β_{MOM}	β_{ST^*MOM}	β_{DY^*MOM}	Adj. R^2
x22	-0.0106 ***	0.0761 ***	-0.0106	1.0958 ***	-0.8001 *	-0.1668	-0.5454 **	-2.9736	-0.2320	-0.9004 ***	3.2382	-1.2500 **	0.2811	2.2387	-0.4394	0.3827	-1.0661	-0.4370	-0.0478	0.1684	-0.0568	90.97%
x23	-0.0020	-0.0004	-0.0018	1.0851 ***	-0.0814	0.0391	0.2329 ***	0.4056 ***	0.7302 ***	-0.2819 ***	-0.3392 ***	-1.2488 ***	-0.1940 *	-0.1212	-0.7092 ***	0.2392	0.5062 **	0.3188	0.1621 ***	-0.1667 ***	-0.3922 ***	92.70%
x24	0.0018	-0.0026	-0.0031	1.0508 ***	0.0843	0.0277	-0.0772	0.0406	-0.4425 **	-0.2792 ***	0.0006	-0.6809 *	-0.4872 ***	0.1468	-0.0001	-0.2417	0.1461	0.5500	-0.0405	0.0033	-0.4639 ***	89.97%
x25	-0.0019	-0.0029 *	0.0020	1.0846 ***	0.1119 **	-0.0287	0.4761 ***	-0.0219	0.1633	0.1744 *	-0.1242	-0.0607	0.1152	0.1037	-0.3377	-0.4388 ***	0.5995 ***	0.4804 *	0.0645 *	0.0217	0.0663	94.62%
x26	-0.0018	0.0000	-0.0046	1.0888 ***	0.0181	-0.1395 **	0.0236	-0.0984	-0.3339 **	-0.2438 ***	0.1584	0.0840	-0.3601 ***	-0.3278 **	-0.1895	-0.1166	-0.2279	-0.0231	-0.0283	0.1583 **	-0.0071	94.92%
x27	0.0009	-0.0028	-0.0094 *	0.9374 ***	0.0111	-0.0165	0.3244 ***	0.2572	-0.2747	-0.1731	0.2367	-0.2747	-0.1383	0.9814 **	-0.0097	-0.5661 ***	0.3232	0.9054 **	-0.0328	-0.1928 *	-0.4716 ***	87.59%
x28	-0.0028 ***	-0.0004	0.0071	0.8795 ***	0.0249	-0.1920 **	0.0021	-0.1675	-0.1236	0.0600	0.0356	0.3085 *	0.6137 ***	0.8317 ***	-0.0384	0.5080 ***	0.4623 **	0.0343	0.0060	-0.0040	0.1147	91.99%
x29	-0.0009	-0.0004	0.0022	1.0067 ***	0.0310	0.0290	0.0439	0.0479	0.2929 **	0.0320	-0.1459	-0.3363 *	-0.1856 **	-0.1327	-0.6951 ***	-0.1647 **	0.2705 **	0.1541	0.0019	0.0218	0.0874	97.67%
x30	0.0011	-0.0177 ***	0.0200 ***	1.0204 ***	0.0163	-0.0851	-0.0463	-0.0132	-0.0590	0.2088	-1.0053 **	0.1418	-0.1537	-0.1314	-1.2906 ***	-0.3739 ***	0.9422 ***	0.2071	0.0564	-0.2511	0.3151 **	91.87%
x31	-0.0021 **	-0.0042 *	-0.0096 *	1.0155 ***	0.0259	0.2514 ***	0.2501 ***	-0.0607	0.1408	-0.0184	-0.2150	-0.4851 *	0.0351	0.1712	0.4326	0.1258	0.0506	1.1482 **	0.0304	-0.0597	-0.0368	96.86%
x32	-0.0257 ***	0.2179 ***	0.0055	1.4785 ***	-5.3401 ***	0.1289	1.6982 ***	-12.2718 **	0.6364	-0.6829 **	6.3384	-0.5879	2.6266 ***	-14.7755 **	1.4823	2.8491 ***	-21.3561 ***	1.4022	-0.1153	-1.1561	-0.6242	84.14%
x33	-0.0074 **	0.0170 ***	0.0013	0.8063 ***	0.0526	-0.4016	0.1171	1.9291 **	-0.9781	-0.2967	0.4504	-6.0594 ***	0.0235	0.9855	-1.8414	0.7103 *	-0.3244	1.2636	-0.0011	-0.0012	-0.7429	79.23%
x34	-0.0152 ***	0.0177	-0.0607	1.2397 ***	-0.6814 ***	2.6120 **	0.6943 **	-2.5496 *	7.0861 ***	-0.9660 ***	-2.1004 *	-1.6058	-1.7815 ***	-1.0880	5.6719	2.5610 ***	-0.5443	0.2674	-0.0870	-0.0686	-2.3651	85.25%
x35	-0.0042	0.0146	0.0003	1.1814 ***	-0.4985	1.7751	-0.8567	1.9358	6.4938 **	-4.0357 ***	6.5953 ***	11.2782 **	-5.8120 **	7.1866	6.2537	6.4823 ***	-11.7600 ***	-16.2932 ***	-1.0945	2.0354	0.9165	51.45%
x36	-0.0035 *	-0.0089 **	-0.0224	1.0514 ***	0.0011	-1.0114 **	-0.0249	0.6450	-2.8824	0.3398	-1.1810 **	-0.4208	0.3370	0.3359	3.5693	-0.9396 **	2.1641 **	-0.4063	0.0119	-0.2642	-2.2713	90.20%
x37	0.0012	0.0083 *	0.0817 ***	1.0858 ***	0.2871 ***	-0.1929	0.8655 ***	-0.2866	2.6371	0.0001	-0.4845	0.6969	0.0409	1.1962 **	4.5985 **	-0.4287	2.1379 ***	6.7505 ***	0.4127 ***	-0.3395 *	0.2417	92.91%
x38	-0.0002	0.0023	0.0087	0.8888 ***	0.1665 ***	-0.7887 ***	0.4408	0.0443	-0.9722	0.4795	-0.4049	0.4860	0.7762 ***	0.5989	4.1220	-0.6924	1.0414	-1.1380	0.1493	-0.3940 **	-0.6329	97.61%
x39	-0.0151	0.0156 *	-0.1966 *	1.0261 ***	-0.7624 *	1.0874	-0.6772	0.2246	-3.0326	0.4588	-5.0198 ***	0.3984	-2.6404 ***	-3.5535 ***	-11.9923	-1.8267	4.7201	-28.4882 ***	-0.0595	-0.7187	-1.5977	86.60%

This table reports the regression estimates, obtained from the conditional Fama and French (2018) six-factor model, for the individual US conventional funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML), profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix O. Wald test for the conditional Fama and French (2018) six-factor model – US conventional funds

Panel A: US domestic funds			
Conventional Funds	w_1	w_2	w_3
x1	0.3879	0.0940 *	0.1343
x2	0.6226	1.354E-04 ***	2.674E-04 ***
x3	0.3335	0.0851 *	0.1393
x4	0.1684	0.0067 ***	0.0065 ***
x5	0.4699	5.379E-08 ***	1.503E-07 ***
x6	0.1711	0.5055	0.5284
x7	0.0869 *	0.0303 **	0.0131 **
x8	0.4285	0.5463	0.3578
x9	0.9865	0.6780	0.7885
x10	0.1143	0.3100	0.2667
x11	0.0020 ***	0.0027 ***	9.967E-05 ***
x12	0.6683	0.0095 ***	0.0066 ***
x13	0.9143	0.0234 **	0.0304 **
x14	0.1752	0.1192	0.1609
x15	0.6013	0.0688 *	0.0697 *
x16	0.5971	0.0098 ***	0.0193 **
x17	0.9871	0.7889	0.8021
x18	0.2517	0.9070	0.9053
x19	0.1183	1.480E-06 ***	4.471E-06 ***
x20	0.2464	4.159E-10 ***	1.166E-09 ***
x21	0.6031	2.430E-11 ***	6.556E-11 ***

Wald test for the conditional Fama and French (2018) six-factor model – US conventional funds (continuation)

Panel B: US global funds			
Conventional Funds	w_1	w_2	w_3
x22	0.3091	0.3438	0.1937
x23	0.9525	3.217E-06 ***	7.903E-06 ***
x24	0.5185	0.0675 *	0.0972 *
x25	0.2486	0.2138	0.2178
x26	0.5874	0.0953 *	0.1162
x27	0.4055	0.1821	0.1681
x28	0.2519	0.0085 ***	0.0099 ***
x29	0.7150	0.0614 *	0.1006
x30	1.572E-05 ***	0.0071 ***	0.0034 ***
x31	0.0212 **	0.0506 *	0.0595 *
x32	0.0765 *	0.3779	0.3567
x33	0.1685	0.0375 **	0.0468 **
x34	0.3485	1.309E-05 ***	4.950E-06 ***
x35	0.9620	0.5865	0.6564
x36	0.3227	0.5701	0.2689
x37	0.0615 *	0.0353 **	0.0527 *
x38	0.7199	0.0300 **	0.0530 *
x39	0.2569	0.0270 **	0.0054 ***

This table reports the Wald test results, of the conditional Fama and French (2018) six-factor model, for US conventional funds. Panel A shows the results for domestic funds and Panel B the results for global funds. W1, w2 and w3 correspond to the p-value of the Wald test on the null hypothesis of no time-varying alphas, no time-varying betas and no time-varying alphas and betas, respectively. This, from January 2000 to October 2020. The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix P. Carhart (1997) four-factor model with a dummy variable – US green funds

Panel A: US domestic funds											
	α_p	α_{D*p}	β_{p*rm}	β_{D*rm}	β_{SMB}	β_{D*SMB}	β_{HML}	β_{D*HML}	β_{MOM}	β_{D*MOM}	Adj. R^2
x1	-0.0022	-0.0002	0.9519 ***	0.0289	0.2733 ***	0.2767 *	0.3564 **	-0.3696 ***	0.0630	-0.0016	75.88%
x2	-0.0025 ***	0.0021	0.9962 ***	-0.0416	0.0140	-0.0026	-0.0793 ***	0.0848 **	-0.0068	-0.0249	97.51%
x3	-0.0006	-0.0005	1.0347 ***	0.0144	0.2590 ***	0.0350	0.0430 ***	-0.0886 ***	-0.0037	-0.0146	99.35%
x5	-0.0027	0.0733	1.1684 ***	-0.1794	0.4025 ***	0.0994	-0.2619	1.0290	-0.1204	0.5122	77.60%
Panel B: US global funds											
	α_p	α_{D*p}	β_{p*rm}	β_{D*rm}	β_{SMB}	β_{D*SMB}	β_{HML}	β_{D*HML}	β_{MOM}	β_{D*MOM}	Adj. R^2
x8	-0.0017 **	0.0037 **	0.9946 ***	-0.1086 ***	0.1101 **	0.1123	-0.1605 ***	0.0377	-0.0217	-0.0480	94.48%
x9	-0.0023 *	0.0039	1.0734 ***	-0.0801 *	0.5352 ***	0.3368	-0.2000 ***	-0.0622	-0.0166	-0.0367	90.63%
x10	-0.0038 ***	0.0022	1.0872 ***	-0.0319	0.2751 ***	0.1261	0.1119	-0.0331	-0.0260	-0.0504	94.68%
x12	-0.0027	0.0346 ***	1.0314 ***	0.0230	0.2742 **	-0.0158	-0.1145	1.0601 ***	-0.1117	0.9900 ***	89.67%

This table reports the regression estimates, obtained from the Carhart (1997) four-factor model with a dummy variable, for the individual US green funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix Q. Carhart (1997) four-factor model with a dummy variable – US conventional funds

Panel A: US domestic funds											
	α_p	α_{D*p}	β_{p*rm}	β_{D*rm}	β_{SMB}	β_{D*SMB}	β_{HML}	β_{D*HML}	β_{MOM}	β_{D*MOM}	Adj. R^2
x1	-0.0019	0.0036	1.1986 ***	0.1908 **	0.3531 ***	0.0735	0.1664 ***	-0.2958 ***	-0.0042	-0.0585	86.43%
x2	-0.0034 **	0.0034	1.0875 ***	0.0250	0.5106 ***	-0.1933 **	-0.5348 ***	0.0671	0.0857	-0.2543 ***	86.72%
x3	-0.0005	0.0005	0.8492 ***	-0.0015	0.0180	0.1730 **	0.0136	-0.0042	-0.0743 **	-0.0102	85.36%
x4	-0.0025	-0.0047	1.0548 ***	0.0470	0.3183 ***	0.2902 **	0.3703 ***	-0.1466	0.0303	-0.0466	81.76%
x5	-0.0014	0.0012	1.0649 ***	-0.0559	0.0139	0.0336	0.5096 ***	-0.1677	-0.1050 *	0.0310	91.10%
x6	-0.0033	0.0071	1.0970 ***	-0.0380	0.3063 ***	0.0554	0.3931 ***	-0.0264	-0.0407	0.0033	70.44%
x8	0.0000	0.0061 **	1.0312 ***	0.0207	0.2339 ***	-0.1172	-0.3329 ***	0.1705	-0.0523	-0.0832	90.45%
x9	-0.0022 ***	-0.0067	1.0179 ***	-0.0195	0.1015 ***	0.4409	0.0043	-0.0434	-0.0137	0.2482	98.46%
x10	-0.0031	0.0129 ***	0.9938 ***	-0.0682	0.3151 ***	0.7027 ***	-0.0114	0.1300	-0.0259	0.3516 **	83.34%
x13	-0.0146 ***	-0.0317 **	1.0550 ***	-0.3246 **	-0.0509	1.5790 ***	-0.4456 ***	-0.5817 **	-0.0583	0.6243 **	36.65%
x17	0.0000	0.0044	0.9548 ***	-0.0218	0.3537 ***	0.2857	-0.3230 ***	-0.0165	0.0905 *	0.1576	88.10%
x21	-0.0047 **	0.0293	0.6380 ***	-0.4842 **	-0.1250 **	-2.9753 ***	0.0744	-1.0797 **	-0.0171	-1.3546 ***	72.70%

Carhart (1997) four-factor model with a dummy variable – US conventional funds (Continuation)

Panel B: US global funds											
	α_p	α_{D*p}	β_{p*rm}	β_{D*rm}	β_{SMB}	β_{D*SMB}	β_{HML}	β_{D*HML}	β_{MOM}	β_{D*MOM}	Adj. R^2
x23	-0.0018	-0.0002	1.1450 ***	0.0562	0.3080 ***	-0.2702	-0.2411 *	-0.0765	0.0772	0.0535	90.63%
x24	0.0001	-0.0003	1.1949 ***	-0.1924 ***	0.1588 ***	-0.3354 **	-0.5202 ***	-0.0161	-0.1532 ***	-0.1275 *	88.25%
x25	-0.0029 ***	0.0029	1.1219 ***	-0.0168	0.4535 ***	0.2532 **	-0.0414	-0.0376	0.0883 *	-0.0766	93.93%
x26	-0.0024 **	-0.0010	1.1366 ***	-0.1298 ***	0.1300 **	0.0217	-0.1709 ***	-0.0950	-0.0277	-0.0775	94.52%
x27	0.0011	-0.0013	0.9817 ***	0.0599	0.4139 ***	-0.2466	-0.4146 ***	0.0301	-0.0470	-0.0769	85.83%
x28	-0.0006	-0.0026	0.7715 ***	-0.0270	-0.2711 ***	0.6160 ***	0.0711	0.2195 *	0.0625	0.0518	88.69%
x29	-0.0020 ***	-0.0001	1.0504 ***	-0.0123	0.0556 *	0.1332	-0.0235	0.0133	-0.0250	0.0192	97.26%
x30	-0.0042 ***	0.0138 ***	1.0772 ***	0.0102	-0.0267	0.0524	-0.0618	0.4560 ***	-0.0353	0.2123 ***	91.13%
x31	-0.0019 ***	0.0029 **	1.0142 ***	-0.0735 ***	0.2390 ***	0.2162 ***	-0.0204	0.3039 ***	0.0346	0.1753 ***	96.81%
x36	-0.0038 **	0.0302 ***	1.0767 ***	-0.0783	0.2214	-0.0559	-0.2279 **	0.9381 ***	-0.0413	0.4605 ***	92.33%
x37	-0.0020	0.0092	1.0911 ***	-0.1122	0.1368	0.5198	-0.3761 ***	0.5017	0.1632	0.1244	89.72%
x38	0.0006	0.0065	0.9488 ***	-0.0519 **	0.2896 ***	0.0522	-0.0834	0.3045 ***	-0.0318	0.2483 *	96.47%

This table reports the regression estimates, obtained from the Carhart (1997) four-factor model with a dummy variable, for the individual US conventional funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix R. Fama and French (2018) six-factor model with a dummy variable – US green funds

Panel A: US domestic funds															
	α_p	α_{D*p}	β_{p*rm}	β_{D*rm}	β_{SMB}	β_{D*SMB}	β_{HML}	β_{D*HML}	β_{RMW}	β_{D*RMW}	β_{CMA}	β_{D*CMA}	β_{MOM}	β_{D*MOM}	Adj. R^2
x1	-0.0034	0.0000	0.9965 ***	0.0196	0.3798 ***	0.2075	0.1859 *	-0.2880	0.2422 ***	-0.1731	0.1341	0.1042	0.0388	0.0022	76.49%
x2	-0.0026 ***	0.0021	1.0006 ***	-0.0415	0.0255	-0.0096	-0.0953 ***	0.0899 *	0.0254	-0.0209	0.0099	0.0223	-0.0092	-0.0246	97.48%
x3	-0.0004	-0.0006	1.0314 ***	0.0099	0.2608 ***	0.0173	0.0873 ***	-0.1147 ***	0.0115	-0.0245	-0.1009 ***	-0.0061	-0.0008	-0.0144	99.39%
x5	-0.0022	0.0748 ***	1.1002 ***	-0.0968	0.2453 **	-0.4037	-0.0121	1.0891 ***	-0.4534 *	0.3836	-0.6304 ***	-0.4065	-0.1943	0.4701 ***	79.67%
Panel B: US global funds															
	α_p	α_{D*p}	β_{p*rm}	β_{D*rm}	β_{SMB}	β_{D*SMB}	β_{HML}	β_{D*HML}	β_{RMW}	β_{D*RMW}	β_{CMA}	β_{D*CMA}	β_{MOM}	β_{D*MOM}	Adj. R^2
x8	-0.0015 **	0.0079 ***	0.9897 ***	-0.0900 **	0.1113 **	0.1125	-0.3056 ***	0.1956 *	-0.1562 **	-0.5197 ***	0.3181 ***	-0.4062 ***	0.0015	0.0277	95.33%
x9	-0.0024 *	0.0060	1.0764 ***	-0.0900	0.5429 ***	0.3187	-0.1964 **	-0.0932	0.0307	-0.4252	0.0082	-0.1108	-0.0185	-0.0038	90.46%
x10	-0.0036 ***	0.0055	1.0778 ***	-0.0507	0.2579 ***	0.1054	0.1554 *	0.0156	-0.0425	-0.3748 *	-0.1185	-0.1652	-0.0137	0.0096	94.77%
x12	-0.0032 *	0.0139	1.0412 ***	-0.0351	0.3927 ***	-0.2594	0.0557	1.2028	0.6534 ***	-0.9747	0.0813	-1.8952	-0.1037	1.3048	90.85%

This table reports the regression estimates, obtained from the Fama and French (2018) six-factor model with a dummy variable, for the individual US green funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML), profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.

Appendix S. Fama and French (2018) six-factor model with a dummy variable – US conventional funds

Panel A: US domestic funds															
	α_p	α_{D^*p}	β_{p^*rm}	β_{D^*rm}	β_{SMB}	β_{D^*SMB}	β_{HML}	β_{D^*HML}	β_{RMW}	β_{D^*RMW}	β_{CMA}	β_{D^*CMA}	β_{MOM}	β_{D^*MOM}	Adj. R^2
x1	-0.0025 *	0.0034	1.2196 ***	0.3707 ***	0.3872 ***	0.0733	0.0810	-0.5227 ***	0.0856 **	0.0885	0.0987	0.6689 **	-0.0139	-0.0793	86.90%
x2	-0.0010	0.0056 **	0.9998 ***	0.0462	0.2912 ***	-0.0547	-0.2111 **	-0.0632	-0.4900 ***	0.1316	-0.2243 ***	-0.1451	0.1340 **	-0.2426 ***	89.53%
x3	-0.0011	0.0019	0.8697 ***	0.0172	0.0285	0.1960 ***	-0.1082	0.0384	0.0579	-0.1517 **	0.2115 **	0.1121	-0.0836 ***	-0.0080	85.80%
x4	-0.0042 ***	-0.0039	1.1232 ***	0.0218	0.5499 ***	0.0810	0.1867 **	-0.0486	0.4659 ***	-0.4041 *	-0.0615	0.2898	-0.0104	-0.0221	84.03%
x5	-0.0019 *	0.0017	1.0841 ***	-0.0599	0.0359	0.0259	0.4095 ***	-0.1013	0.0710	-0.0795	0.1505	-0.0351	-0.1142 **	0.0350	91.17%
x6	-0.0055 **	0.0066	1.1897 ***	-0.1062	0.6406 ***	-0.2447	0.1668 *	0.1176	0.6599 ***	-0.4325	-0.1622	0.2654	-0.0969 ***	0.0285	74.49%
x8	0.0015	0.0051 ***	0.9872 ***	0.0401	0.1528 **	-0.0700	-0.1471 ***	0.0320	-0.3881 ***	0.2931 ***	-0.4548 ***	0.2083	-0.0395	-0.0888 **	92.32%
x9	-0.0020 ***	-0.0030 ***	1.0115 ***	0.0846 ***	0.0958 ***	-0.0157	0.0497 **	0.0651 **	-0.0246	-0.4265 ***	-0.1067 **	-0.3088 ***	-0.0103	0.0853 ***	98.59%
x10	-0.0023	0.0171 ***	0.9648 ***	0.0798 *	0.2594 **	0.0877	0.0890	0.2693 **	-0.2488 **	-0.3009 **	-0.2346	-0.4488 **	-0.0222	0.1370 **	83.87%
x13	-0.0141 ***	-0.0149 *	1.0484 ***	0.1986	-0.1328	0.7543	-0.5251 *	-0.4340	-0.3292	-2.0478 ***	0.2035	0.1337	-0.0736	0.0370	35.90%
x17	0.0003	0.0148 ***	0.9040 ***	0.3221 ***	0.3396 ***	-0.5972 ***	-0.2167 **	0.1015	-0.0378	-1.3129 ***	-0.3239 **	-0.1153	0.0598	-0.2134 ***	88.84%
x21	-0.0038 **	0.0062	0.5508 ***	-0.9154 ***	-0.1192	0.1048	0.2078 ***	-2.3368 ***	0.0541	2.3427 ***	-0.4521 **	3.6991 ***	-0.0710	-0.3560 ***	78.68%

Fama and French (2018) six-factor model with a dummy variable – US conventional funds (continuation)

Panel B: US global funds															
	α_p	α_{D*p}	β_{p*rm}	β_{D*rm}	β_{SMB}	β_{D*SMB}	β_{HML}	β_{D*HML}	β_{RMW}	β_{D*RMW}	β_{CMA}	β_{D*CMA}	β_{MOM}	β_{D*MOM}	Adj. R^2
x23	-0.0015	-0.0012	1.1157 ***	-0.0618	0.2359 **	-0.2704 *	-0.4140 ***	0.4955 ***	-0.2529 **	0.5367 ***	0.4200 **	-1.0901 ***	0.0946 *	0.0706	91.81%
x24	0.0024	0.0044	1.0992 ***	-0.1137 *	-0.0046	-0.2871 ***	-0.3356 ***	0.0357	-0.4748 ***	-0.3020 *	-0.2120	-0.1843	-0.1138 ***	0.0072	89.63%
x25	-0.0034 ***	0.0064 *	1.1264 ***	-0.1549 ***	0.4643 ***	0.0908	0.0670	0.3848 **	0.1852 *	-0.1493	-0.1864 *	-0.7025 ***	0.0819 *	0.0665	94.86%
x26	-0.0013	-0.0020	1.0954 ***	-0.0578	0.0535	0.1362	-0.1449 **	-0.2697	-0.3329 ***	0.1433	-0.2255	0.4023	0.0036	-0.1285	94.82%
x27	0.0013	0.0049	0.9530 ***	0.0314	0.3791 ***	-0.2569	-0.1413	-0.1906	0.0764	-1.2605 ***	-0.5711 **	0.0049	-0.0117	0.0247	87.39%
x28	-0.0032 ***	-0.0014	0.8654 ***	-0.0597	-0.0873	0.5013 ***	-0.0254	0.0756	0.7043 ***	-0.7037 **	0.5915 ***	-0.1821	-0.0028	0.0535	92.21%
x29	-0.0015 *	0.0018	1.0302 ***	-0.0390	0.0164	0.1245	0.0006	0.1285	-0.1474 *	-0.1628	-0.1324	-0.2295 **	-0.0108	0.0740	97.55%
x30	-0.0045 ***	0.0217 ***	1.0819 ***	-0.0634	-0.0070	-0.0957	0.0038	0.7671 ***	0.1083	-0.5477	-0.0878	-0.5919 ***	-0.0312	0.3784 ***	91.67%
x31	-0.0021 ***	-0.0026 ***	1.0232 ***	-0.0216	0.2571 ***	0.3200 ***	-0.0547	0.0585	0.0490	-0.8753 ***	0.1018	-0.2948 ***	0.0233	0.2252 ***	96.79%
x36	-0.0038 *	0.0282 ***	1.0713 ***	-0.2340 ***	0.2057	-0.3815	-0.2047	1.7153 ***	-0.0555	1.5937 ***	-0.0782	-0.7161 **	-0.0346	0.5863 **	91.85%
x37	-0.0013	-0.0302 ***	1.0746 ***	0.0765	0.0869	0.8894 ***	-0.5347 ***	-0.0509	-0.4437 **	-2.7519 ***	0.0088	-2.2823 ***	0.1176	0.5894 ***	92.56%
x38	-0.0001	-0.0091 ***	0.9581 ***	-0.0693 **	0.3197 ***	-0.0131	0.1095	0.2094	0.4015 **	-0.9423 ***	-0.1170	-1.1673 ***	0.0145	0.4321 ***	97.42%

This table reports the regression estimates, obtained from the Fama and French (2018) six-factor model with a dummy variable, for the individual US conventional funds. Panel A shows the results for domestic funds and Panel B the results for global funds. The table shows the estimates of performance (α_p), and the risk factors market (β_p), size (SMB), book-to-market (HML), profitability (RMW), investment (CMA) and momentum (MOM), it also reports the adjusted coefficient of determination of the regressions ($Adj.\ R^2$). The considered period is from January 2000 to October 2020. Standard errors are corrected for heteroscedasticity and autocorrelation following Newey and West (1987). The level of statistical significance is represented by asterisks as follow: * statistically significant at the 10% level, ** statistically significant at the 5% level and *** statistically significant at the 1% level.