Universidade do Minho
Escola de Economia e Gestão

Bruna Filipa Matos Azevedo
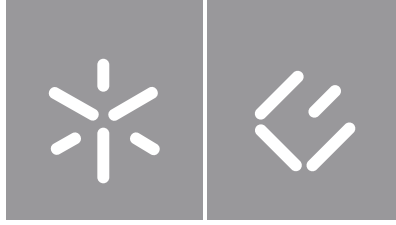
The financial effects of social screening in European stock portfolios

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Resumo

Os efeitos financeiros da aplicação de filtros sociais em carteiras de ações Europeias

Esta dissertação investiga o desempenho de carteiras de ações socialmente responsáveis de 1089 empresas europeias entre 2005 e 2019. Usando critérios ambientais, sociais e de governação, criamos carteiras de ações formadas com base nas caraterísticas sociais do ano anterior. Implementamos três diferentes abordagens para formar carteiras socialmente responsáveis: a abordagem positiva, a abordagem *best-in-class* e a abordagem *high and low CSP industry portfolio*. De seguida, avaliamos o desempenho financeiro das carteiras usando modelos de avaliação de desempenho alternativos. Os resultados mostram que empresas com elevado desempenho ambiental superam o desempenho financeiro das empresas com baixo desempenho ambiental, independentemente do esquema de ponderação aplicado ou da inclusão ou exclusão de empresas do setor financeiro. Adicionalmente, estes resultados persistem quando as carteiras são construídas de acordo com a abordagem *best-in-class* ou a *abordagem high and low CSP industry portfolio*. Sob a abordagem positiva, estratégias *long-short* formadas com base em critérios ambientais produzem rendibilidades positivas desde 2010, independentemente do *cut-off* escolhido, do esquema de ponderação aplicado ou da inclusão ou exclusão de empresas do setor financeiro. No entanto, no primeiro subperíodo (2005-2009), os investidores obtêm rendibilidades negativas e estatisticamente significativas. Os resultados sugerem que este fraco desempenho está associado aos efeitos financeiros da crise financeira de 2008-2009. Adicionalmente, observamos rendibilidades positivas de uma estratégia *long-short* quando as carteiras concentram ações de empresas com alto desempenho em termos de governação se o desempenho da correspondente indústria for abaixo da média.

Palavras Chave: avaliação de desempenho de carteiras; carteiras de ações; critérios ambientais, sociais e de governação; investimentos socialmente responsáveis; *social screening*.

Abstract

The financial effects of social screening in European stock portfolios

This dissertation investigates the performance of socially screened stock portfolios of 1089 European companies from 2005 to 2019. Using a dataset of environmental, social and governance (ESG) company ratings, we form synthetic portfolios based on stocks' social characteristics in the previous year. We employ three different approaches to form socially screened portfolios: the positive approach, the best-in-class approach and the high and low CSP industry portfolios approach. We then evaluate the financial performance of the portfolios by using alternative performance evaluation models. The results show that companies with high Environmental performance outperform those with low Environmental performance, regardless of the weighting scheme applied or the exclusion or inclusion of financial companies. Furthermore, these results persist when constructing portfolios under the best-in-class approach and the high and low CSP industry portfolios approach. Under the positive approach, long-short portfolios formed on Environmental scores yield positive and abnormal returns since 2010, regardless of the cut-off chosen, the weighting scheme applied or the exclusion or inclusion of financial companies. However, in the first subperiod (2005-2009), investors obtain negative and statistically abnormal returns. Our results suggest that this poor performance is associated with the financial effects of the 2008-2009 financial crisis. Additionally, we document positive and abnormal returns from a long-short strategy of portfolios of companies with high governance performance if their corresponding industry performance is below the average.

Keywords: portfolio performance evaluation; stock portfolios; Environmental, Social and Governance (ESG) criteria; socially responsible investments; social screening.

v

INDEX

List of Figures

List of Tables

List of Appendices

1. Introduction

Socially Responsible Investment (SRI) is an investment strategy that considers both financial and social criteria in the investment process. It involves fundamental analysis and the integration of a set of Environmental, Social and Governance (ESG) criteria into the security selection process. Investors may have several motivations to engage in SRI, including personal values and beliefs or the expectation of both financial and non-financial utility from their investment choice (Benson and Humphrey, 2008).

For the last two decades, the number of investors that integrate ESG screens into their investment decisions has increased substantially and firms have been adjusting their social performance in order to respond to investors' preferences. However, according to EUROSIF (2018), the European market has not responded properly to this high demand, leaving some investors with few opportunities to invest according to their sustainability preferences.

Following the growth of SRI worldwide, academic research on the field has debated the relationship between corporate social responsibility (CSR) and financial performance as well the issue of whether investors can achieve higher or lower returns by applying ESG screens in the investment process. At the theoretical level, there are arguments in favor of a positive, negative and even neutral impact of social screens on portfolio performance. At the empirical level, despite decades of considerable research that aims to answer this question, this issue is still debatable. Some studies provide evidence that portfolios formed on sustainability criteria benefit from abnormal returns (Derwall *et al.*, 2005; Kempf and Osthoff, 2007; Statman and Glushkov, 2009; Henke, 2016), while others provide evidence of a negative impact on financial performance (Brammer *et al.*, 2006; de Haan *et al.*, 2012; El Ghoul and Karoui, 2017). However, most studies find no statistically significant differences in performance between socially responsible portfolios and the market or conventional investments (e.g., Bauer *et al.*, 2005; Cortez *et al.*, 2009; Derwall and Koedijk, 2009; Humphrey *et al.,* 2012; Auer, 2016; Pereira *et al.*, 2019).

There are two common approaches to evaluate the financial performance of socially screened investments. One of them involves evaluating the performance of actively managed SRI mutual funds. This approach has several limitations. First, evaluating SRI mutual fund performance does not fully reflect the performance of socially responsible companies since it is difficult to isolate the effect of

management skill from the performance of the funds' holdings (Derwall *et al.*, 2005; Kempf and Osthoff, 2007). Second, mutual fund returns are typically net of management fees (Kempf and Osthoff, 2007). Furthermore, it has been shown that not all funds under the label of "SRI" have higher social standards than conventional funds, suggesting that investing in SRI funds does not ensure investors that they are directing their savings to investments that are truly socially responsible (Utz and Wimmer, 2014).

To overcome these problems, this dissertation follows an alternative approach to evaluating SRI. This approach consists in forming synthetic portfolios based on stocks' social characteristics and evaluating the financial performance of such portfolios, as in Derwall *et al.* (2005), Kempf and Osthoff (2007) and Auer (2016). The main goal of this dissertation is to evaluate the performance of social screened stock portfolios in the European market, which has been less explored in prior research compared to the US. To perform this analysis, we follow Kempf and Osthoff (2007) and employ the positive approach and the best-in-class approach to form portfolios. Additionally, we further construct high and low CSP industry portfolios to overcome any possible industry biases, as in Humphrey *et al.* (2012).

Our dissertation makes several contributions to the existing literature. First, we explore the performance of social screened stock portfolios by applying both unconditional and conditional models to measure the performance of high versus low socially rated portfolios of European stocks. By applying conditional models, we allow portfolio performance and risk to change with economic conditions, thereby evaluating portfolio performance in a more robust way. We consider different screening approaches to form portfolios; the positive approach, the best-in-class approach, and high and low CSP industry approach. For each different approach, we perform three robustness tests, considering alternative cut-offs, the exclusion of companies from the financial industry and a different portfolio weighting scheme. Additionally, we analyze the evolution of social and financial performance over time, this way testing the time-dependency of SRI portfolio performance. Our results provide evidence that investors can obtain abnormal returns by going long in stocks from companies with high Environmental performance and short in stocks from companies with low Environmental performance when a conditional model is applied, suggesting that its application may provide some insights compared to unconditional models.

The remainder of this dissertation is organized as follows. Section 2 reviews the literature on financial performance of SRI. Section 3 details the methodology used. Section 4 describes the data.

Section 5 presents and discusses the empirical results. Finally, section 6 presents the main conclusions of this dissertation.

2. Literature Review

For the last two decades, research on SRI has increased substantially. The debate on the relationship between CSR and financial performance has attracted the attention of academics. In particular, there has been an intense debate on the financial implications of SRI, namely whether investors can achieve higher returns by applying ESG screens in their investment process or, by contrast, whether such screening implies a cost to investors. There is also the possibility that social and environmental screening neither adds nor destroys investment value. Despite decades of considerable research that aims to answer this question, this is still a debatable issue. In this section, we will discuss the main hypotheses regarding the performance of socially responsible portfolios as well as the main empirical evidence in the literature.[1]

2.1. Positive relationship between SRI and financial performance

There are arguments in favor of a positive impact of social screens on portfolio performance. This hypothesis stems directly from stakeholder theory and a contemporary view of CSR. According to this viewpoint, investors that integrate ESG screens in their investment process may report higher returns, as a result of benefits at the firm level, such as reputational benefits (Guenster *et al.*, 2011) and higher firm loyalty, which induces higher retention of good employees and higher productivity (Auer, 2016). The use of CSR practices may also be seen as a signal of good management skills and a consequence of technological innovativeness (Guenster *et al.*, 2011). Firms engaging in such practices can also avoid potential costs associated with social and environmental crisis and lawsuits (Chan and Walter, 2014; Auer, 2016), and reduce their cost of equity capital (El Ghoul *et al.,* 2011). Additionally, firms can benefit from lower capital constraints and better access to finance, as a result of higher level of transparency and reduction of the information asymmetries between managers and investors (Cheng *et al.,* 2014).

There are several empirical studies that find a positive impact of social screens on portfolio financial performance. Derwall *et al.* (2005) rely on the concept of "eco-efficiency" that can be interpreted as "the economic value a company adds relative to the waste it generates". Analyzing data from the

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[1] Considering the objectives of this dissertation, we will restrict the empirical studies discussed in this section to those that evaluate the performance of synthetic socially responsible equity portfolios rather than studies on actively managed socially responsible funds. For an in-depth review of the many studies on the performance of socially responsible mutual funds, see the studies of Capelle-Blancard and Monjon (2012) and Revelli and Viviani (2015). As these papers mention, most studies conclude that socially responsible funds perform similarly to their conventional counterparts.

Innovest Strategic Value Advisors rating to rank US companies on their environmental responsibility and applying the Carhart (1997) four-factor model, they find evidence that a stock portfolio composed by companies with the highest eco-efficiency scores outperforms the less eco-efficient portfolio. Furthermore, the authors show that this outperformance cannot be explained by market sensitivity, investment style or industry bias.

Kempf and Osthoff (2007) also find financial benefits generated by the use of social and environmental screens. Applying the same model as Derwall *et al.* (2005), but using the MSCI ESG KLD STATS rating data on US companies, they claim that investors can achieve higher returns by applying the positive or the best-in-class screening approach, but not the negative screening approach. Additionally, investors should concentrate on the stocks with the highest social ratings. Even when Kempf and Osthoff (2007) take into account transaction costs and change the portfolio weighting scheme, the outperformance does not disappear.

Statman and Glushkov (2009) apply the same performance model and rating data provider as Kempf and Osthoff (2007), but they exclude all companies with no indicators of strengths or concerns from their dataset. They observe an outperformance of US socially responsible companies compared to conventional ones when the best-in-class screening approach is applied. However, this outperformance is offset when stocks of shunned companies are excluded.

Filbeck *et al.* (2009) examine the stock price reaction to the press release of the ranking of the "100 Best Corporate Citizens" published by Business Ethics. They apply several methods to analyze the performance of listed firms, such as the risk-adjusted returns, the buy-and-hold abnormal returns (BHARs), the Fama and French (1993) three-factor model and the Carhart (1997) four-factor model. While newly listed firms show positive and statistically significant abnormal returns around the announcement date, firms that, consecutively remain on the top 100 ("consecutive winners"), appear to experience a type of "winner's curse", suggesting that investors can rebalance their portfolio holdings every year, adding the newly listed firms and dropping the "consecutive winners".

Eccles *et al.* (2014) investigate a matched dataset of 180 US companies, 90 of which they classify as high sustainability companies and another 90 they classify as low sustainability companies. In order to identify companies that adopted a set of corporate policies related to the environment, employees, community, products and customers, they rely on information provided by Thomson Reuters ASSET4 database. The authors find that, during the entire period under evaluation, the high sustainability

companies outperform the low sustainability companies and that the market does not recognize this outperformance.

Auer (2016) constructs SRI portfolios based on both aggregate ESG scores and each of its dimensions (Environmental, Social and Governance) individually. The results show that a strategy using negative screens with low cut-off rates that excludes unrated stocks provides significantly higher performance than a passive benchmark strategy. Additionally, investors can apply negative screens based on the Governance scores to obtain higher portfolio performance and expect to lose nothing under negative screens associated to the Environmental and Social scores. Overall, the results depend on the type of ethical screening strategy applied, although there is evidence supporting that investors in the European stock market can do well while doing good.

In a slightly different approach, Chan and Walter (2014) investigate the performance of IPOs and SEOs of environmentally friendly companies listed on US stock exchanges. Their results show that "environmentally-friendly IPOs attract higher-reputation investment banks for their IPOs, and these banks charge lower underwriting fees" (Chan and Walter, 2014, p. 181) and that "when environmentally-friendly firms go back to the market with a SEO the offer price has doubled compared to the IPO offer price" (Chan and Walter, 2014, p. 182). Their results support the outperformance hypothesis, the presence of a "green premium", and its persistence over time.

2.2. Negative relationship between SRI and financial performance

The underperformance hypothesis of socially responsible portfolios is supported mainly by the argument of the restricted investment opportunity set generated by the imposition of social screens (Chan and Walter, 2014; Auer, 2016). The screening process may ignore and eliminate certain controversial companies or even entire industries from the investor's portfolio, which in turn may result in lack of diversification (Auer, 2016). There are also arguments that these controversial companies and industries, such as alcohol, tobacco, gambling or weapons, provide higher stock returns than stocks of companies in other industries (Hong and Kacperczyk, 2009; Statman and Glushkov, 2009; Derwall *et al.*, 2011). Finally, the additional information costs associated to social screening also support this hypothesis (Cortez *et al.*, 2009).

Brammer *et al.* (2006) show evidence supporting this hypothesis. They rely on EIRIS data to classify stocks from companies in the UK market, and find that the costs incurred in social and environmental activities result in damage to investors' returns over 2002-2005. They argue that a possible explanation for this result is that either investors are willing to forgo returns in order to feel good about the stocks they hold, or they do not immediately recognize this negative relationship.

de Haan *et al.* (2012) also find results in line with Brammer *et al.* (2006). Based on the Newsweek Green Rankings, a rating composite designed to rank the 500 largest publicly traded US corporations on environmental metrics, their results show a negative relationship between corporate environmental performance (CEP) and stock returns from 2004 to 2008. The authors also claim that this relationship is driven by investors´ high demand for high CEP stocks, which induces low CEP stocks to provide extra compensation to persuade investors to hold them.

It is worth mentioning a common characteristic of these two studies is that the period under evaluation is relatively short. This shortcoming suggests that their results should be interpreted with caution.

2.3. Neutral performance

Although some studies find evidence of a positive or negative impact of social screens on portfolio performance, most studies provide evidence that there are no statistically significant differences in returns between socially responsible investments and the market.

Brammer *et al.* (2009) consider the financial information content of the Business Ethics America's "Best 100 Corporate Citizens" survey to rank companies according to their social performance and analyze both their short-term and long-term stock performance. Their results report that firms listed on the "Best 100 Corporate Citizens" generate positive, although statistically insignificant, abnormal returns in a 21-trading day window around the announcement results. By contrast, one year after the announcement, these firms generate negative abnormal returns. However, after controlling for firm characteristics, this poor performance turns out to be statistically insignificant.

Humphrey *et al.* (2012) claim to be the first ones to analyze the impact of general and industry-specific ESG factors on the performance of socially responsible portfolios. Although they argue that CSR

opportunities and risks vary across different industries, their results show that the performance of portfolios composed by firms with high CSR does not differ from that of portfolios composed by US firms with low CSR, and that this result remains the same using general, industry-specific or total CSR ratings.

Lee *et al*. (2013) apply a similar approach to Humphrey *et al*. (2012) and construct high and low CSP industry portfolios of US firms over 1998-2007. Employing an augmented Carhart (1997) four-factor model, they find no evidence of portfolios comprising high-ranked corporate social performance (CSP) companies outperforming portfolios of low-ranked CSP companies.

There are also some studies outside the US. Van de Velde *et al*. (2005) investigate the impact of screening on the financial performance of portfolios of European socially responsible companies. Based on scores provided by Vigeo - an agency that screens European quoted companies on CSR - they form four different portfolios based on the companies' total sustainability rating. Applying the Fama and French (1993) model, they find that portfolios of companies with high CSR rating perform slightly better compared to portfolios of low-rated companies. However, the observed performance differences are not enough to result in a statistically significant outperformance.

Brzeszczyński and McIntosh (2014) also rely on financial data provided by a public list to rank companies according to their social performance. They focus their research in the UK stock market and, using the "Global-100 Most Sustainable Corporations in the World" list, they find that the returns of SRI stock portfolios are slightly higher compared to the market. However, these differences are not statistical significant. When they apply the Fama and French (1993) and the Carhart (1997) models, the results continue to suffer from lack of statistical significance, which supports the hypothesis of neutral performance between SRI and financial performance.

Mollet and Ziegler (2014) evaluate the relationship between SRI and stock performance in both the US and European stock markets. Their methodology is based on the common four-factor model of Carhart (1997) and their results also report no statistically significant abnormal returns in SRI portfolios in both the US and European market, consistent with SRI stocks being correctly priced by market participants.

2.4. Evolution of SRI performance over time

A set of studies have analyzed the evolution of performance of SRI portfolios over time, having documented evidence consistent with two hypotheses regarding the performance of SRI. Derwall *et al.* (2011) suggest a breakdown of the SRI movement into investors with a values-versus-profit orientation to support these two hypotheses. The shunned-stock hypothesis assumes that values-driven investors reject holding controversial stocks, creating a shortage of demand for irresponsible assets and/or excess demand for responsible assets. This exclusion of controversial stocks forces them to trade at relatively lower price, leading to higher risk-adjusted returns. The second hypothesis, the errors-in-expectations hypothesis, argues that SRI can deliver superior performance because the market fails to correctly price socially responsible stocks by misinterpreting the positive impact of CSR practices on companies' cash flows. This is consistent with the existence of profit-seeking investors and extant studies that document that portfolios of companies that perform well on specific positive screens can provide abnormal returns. The authors claim that these two hypotheses are complementary in the short run. However, in the long run, only abnormal returns on socially controversial stocks continue to be stable over time, due to the market progressively being able to recognize the positive impact of CSR practices. So, in the long run, abnormal returns generated by errors-in-expectations are not expected to persist. To test these hypotheses, Derwall *et al.* (2011) form several portfolios: one of shunned stocks and a second one of firms that perform well in terms of labor relations. The analysis of performance shows that the shunned-stock portfolio delivers abnormal returns that are relatively stable over time, while the performance of the portfolio of the best performing companies in terms of labor relations declines over time. These results are thus consistent with both hypotheses.

Edmans (2011) also confirms the mispricing of SRI securities. The author analyzes data for 1984 to 2009 from the "100 Best Companies to Work For in America" list and finds positive abnormal returns of portfolios of firms with high levels of employee satisfaction. His findings also suggest that this outperformance can be explained by the market's inefficiency in correctly estimating the value of intangibles. Similar to other studies, the author finds that the mispricing is temporary - after the fifth year, the outperformance becomes insignificant. Edmans (2011) argues that this mispricing is not permanent for two reasons. First, some firms can fall off the list, since changes in management or changes in human resources policy can affect their ranking. Second, even firms that remain on list for

several years exhibit a significant decline in their outperformance over time, as the market learns about the true value of intangibles and incorporates it into stock' valuation.

Mollet *et al.* (2013) present a hypothesis that rests upon two channels to explain the positive abnormal returns on SRI portfolios. On the one hand, they claim that strategic CSR incorporates value-relevant information that the market has failed to price correctly. This strategic CSR can be distinguished from generic CSR since companies only incorporate specific CSR practices that are in line with the firm business strategy and with the concept of profit maximization as the firm's objective. The authors claim that there are errors-in-expectations in the market, since value-relevant information from strategic CSR is more difficult to identify than generic CSR and the incorporation of such information is likely to take more time. Their results show that small and innovative firms that apply strategic CSR practices exhibit positive abnormal returns that the market has failed to price correctly. On the other hand, they point out the market disequilibrium caused by rising demand for SRI securities as a complementary argument to explain positive abnormal returns. The authors argue that, particularly in the European market, companies following SRI strategies have grown considerably in the last decade, affecting stock prices positively.

Borgers *et al.* (2013) further show evidence supporting the errors-in-expectations hypothesis in the short run. They construct an annual stakeholder-relations index (SI) for US firms and estimate the risk-adjusted returns of stock portfolios that are formed using the SI over the period 1992–2009. Their results reveal that investors can generate superior risk-adjusted returns in the short run, but as investors' public hunt for "mispriced" information that generates superior risk-adjusted returns increases, the market slowly eliminates the mispricing and the abnormal returns generated by errors-in-expectations do not persist. Their research also points out that evidence of errors in investors' expectations has weakened in recent times.

Halbritter and Dorfleitner (2015) argue that investors should no longer expect abnormal returns from SRI portfolios. They examine the link between social and financial performance over three different subperiods and find a significant decline of outperformance over the last years. Their results show that from 1991 to 2001 almost all portfolios exhibit outperformance, which slowly diminishes over the period from 2002 to 2006 and disappears almost completely in the period from 2007 to 2012. This decline of the preceding outperformance over the last years may represent evidence that the market slowly recognizes and incorporates CSR information.

In the bond area, Pereira *et al.* (2019) construct synthetic bond portfolios based on ESG scores and find that there are no significant differences between the performance of high-rated and low rated-portfolios. They also consider the evolution over time of the relationship between socially responsible investment and financial performance. They find that, although currently it is not possible to obtain higher returns investing in socially responsible investments, in previous years it was possible to do well while doing good. This finding goes in line with the errors-in-expectations hypothesis.

3. Methodology

In this section, we detail the methodology used in this dissertation. We explain the process used to construct portfolios based on stocks' social characteristics and we describe the performance evaluation models.

3.1. Portfolio formation

In this study, we employ different approaches to form stock portfolios. Following Kempf and Osthoff (2007), we employ both positive and best-in-class approaches. First, we apply the positive approach, which requires ranking all companies according to their previous year's social scores. Since changes of ESG Scores throughout the year in Thomson Reuters ESG Scores are minimal, companies included in our portfolios are updated yearly. At the end of year $t - 1$, Thomson Reuters ESG Scores reports the ratings of the companies. Based on this rating, we form two value-weighted stock portfolios: a high-rated portfolio, comprising the highest rated stocks, and a low-rated portfolio, comprising the lowest rated stocks. These portfolios are held unchanged until the end of year t. At the end of year t, we consider the new Thomson Reuters ESG Scores ratings and construct the portfolios to be held in year $t + 1$ accordingly. This procedure is repeated every year. Portfolios are constructed with respect to three individual dimensions: Environmental, Social and Governance. For each dimension, the high-rated portfolio is composed by the top 25% best socially rated of all stocks and the low-rated portfolio is composed by the bottom 25% of all stocks. Later in this study, as in prior research (Van de Velde *et al.*, 2005; Kempf and Osthoff, 2007; Derwall *et al.*, 2011; Halbritter and Dorfleitner, 2015; and Auer, 2016) we form portfolios with different cut-offs for purposes of robustness. Additionally, long-short portfolios are also constructed. We calculated the differences in returns between the high- and low-rated portfolio, representing the performance of a strategy of going long in the high-rated portfolio and short in the low-rated portfolio.

Prior research addresses the possible presence of industry biases. Since CSR opportunities and risks may vary across industries (Humphrey *et al.*, 2012), different industries may suffer different types of financial impact from social and environmental activities (Brammer *et al.*, 2006) and so the choice of the industry focus of the investment strategy may affect the outcome (Auer and Schulmacher, 2016). To overcome this possible bias, we employ two different approaches taking into account industry

effects. One is the best-in-class approach that rates all companies according to their ESG scores within each industry. We first divide the companies into eleven different industry classes based on the Industry Classification Benchmark (ICB). In each industry class, we collect the top 25% and bottom 25% of all companies. We form the high-rated portfolio by combining the top 25% companies from each industry class and the low-rated portfolio by combining the bottom 25% companies from each industry class. This method ensures that no industry is excluded from the investment portfolio.

Additionally, we follow Humphrey *et al.* (2012) and construct high and low CSP industry portfolios. This approach requires ranking all industries on their environmental, social and governance performance. Every year we calculate the average CSP score of the companies within each industry and separate industries into the leading and lagging CSP industries. The leading and lagging CSP industries are those industries with average CSP above and below the 50ᵗʰ percentile, respectively. Then, in each leading and lagging CSP industries, all companies are ranked, and the low-rated and high-rated portfolio are composed by the bottom 25% and the top 25% of companies, respectively.

To form portfolios, we collected end-of-month total return index series for the years from 2005 to 2019. Then, we calculated stock returns in a discrete manner, applying the following equation:

$$R_{i,t} = \frac{RI_{i,t}}{RI_{i,t-1}} - 1 \tag{1}$$

where $R_{i,t}$ represents the discrete rate of return of stock *i* in month *t*, $RI_{i,t}$ represents the return index of stock *i* in month *t*, and $RI_{i,t-1}$ represents the return index of stock *i* in month *t – 1*. To form value-weighted portfolios, we apply the following equation:

$$R_{p,t}^{VW} = \sum_{i=1}^{N} \frac{MV_{i,t-1}}{\sum_{i=1}^{N} MV_{i,t-1}} R_{i,t} \tag{2}$$

where $R_{p,t}^{VW}$ represents the rate of return of portfolio *p* in month *t*, $MV_{i,t-1}$ represents the market value of stock *i* in month *t*, and $R_{i,t}$ represents the discrete rate of return of stock *i* in month *t*. The advantage of value-weighted stocks portfolios is that companies are represented according to their

market capitalization. Nonetheless, we follow Auer (2016), Edmans (2011) and Kempf and Osthoff (2007) and evaluate the performance of both value- and equally-weighted portfolios. Equally-weighted portfolios are constructed as a robustness test, as follows:

$$R_{p,t}^{EW} = \frac{1}{N} \sum_{i=1}^{N} R_{i,t} \tag{3}$$

where $R_{p,t}^{EW}$ represents the rate of return of an equally-weighted portfolio p in month t, $R_{i,t}$ represents the discrete rate of return of stock i in month t and N represents the number of stocks in portfolio p.

3.2. Performance measurement

To evaluate the performance of the portfolios, we apply the Carhart (1997) four-factor model, which is well recognized among researchers. The model controls for market risk, size, value versus growth and momentum effects, as follows:

$$r_{p,t} = \alpha_p + \beta_{p,m} \, r_{m,t} + \beta_{p,SMB} \, SMB_t + \beta_{p,HML} \, HML_t + \beta_{p,MOM} \, MOM_t + \varepsilon_{pt} \tag{4}$$

The dependent variable $r_{p,t}$ is the monthly return of portfolio p in month t in excess of the risk-free rate. $r_{m,t}$ denotes the excess return of the market portfolio over the risk-free rate. SMB_t is the return difference between a small and a large capitalization portfolio in month t. HML_t denotes the return difference between a high and a low book-to-market portfolio in month t. A stock with a low book-to-market ratio is often referred to as growth stock, while a high book-to-market ratio indicates a value stock. MOM_t corresponds to the return difference between portfolios of stocks with high and low returns over the past twelve months. $\varepsilon_{p,t}$ denotes the error term and α_p denotes the abnormal return of portfolio p.

Additionally, we employ the Fama and French (2015) five-factor model, which ignores the momentum effect, but includes an investment factor and a profitability factor. This model is specified as follows:

$$r_{p,t} = \alpha_p + \beta_{p,m}\, r_{m,t} + \beta_{p,SMB}\, SMB_t + \beta_{p,HML}\, HML_t + \beta_{p,RMW}\, RMW_t \\ + \beta_{p,CMA}\, CMA_t + \varepsilon_{p,t}$$

(5)

In this model, RMW_t represents the difference between the returns on portfolios of stocks with robust and weak profitability and CMA_t denotes the difference between the returns on portfolios of the stocks of low and high investment firms.

Considering the limitations of unconditional models, we consider the conditional setting of Christopherson *et al.* (1998) model, that allows for both time-varying alphas and betas. The application of conditional models has several advantages over unconditional ones. Unconditional models consider returns and risk as averages over the estimation period, thereby neglecting variations in the state of the economy and not assuming time-varying risk and returns. However, since in the real world both expected returns and risk are time-varying, the model should allow portfolio's performance to change with economic conditions, by considering public information variables.

Equation (4) represents the model developed by Christopherson *et al.* (1998).

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

(6)

The conditional alphas and betas are defined as linear functions of a vector of predetermined information variables, Z_{t-1}, that represents the public information available at time t-1 for predicting returns at time t. z_{t-1} is a vector of deviations of Z_{t-1} from the (unconditional) average values represented by $z_{t-1} = Z_{t-1} - E(Z)$. α_{0p} denotes an average alpha, the vector A'_p measures the response of the conditional alpha to the lagged information variables. β_{0p} denotes the average conditional beta and the vector β'_p measures the response of the conditional beta to the same information variables.

The conditional model of Christopherson et al. (1998) with both time-varying alphas and betas can be extended to a conditional four-factor model specification, by combining the risk factors of equation (4) with equation (6), as follows[2]:

$$
\begin{aligned}
r_{p,t} = \; & \alpha_{0p} + A'_p\, z_{t-1} + \beta_{0p}\, r_{m,t} + \beta'_p\left(z_{t-1}\, r_{m,t}\right) + \beta_{0p,SMB}\, SMB_t \\
& + \beta'_{p,SMB}\left(z_{t-1}\, SMB_t\right) + \beta_{0p,HML}\, HML_t + \beta'_{p,HML}\left(z_{t-1}\, HML_t\right) \\
& + \beta_{0p,MOM}\, MOM_t + \beta'_{p,MOM}\left(z_{t-1}\, MOM_t\right) + \varepsilon_{p,t}
\end{aligned}
\tag{7}
$$

Additionally, we apply a conditional five-factor model with both time-varying alphas and betas as result of the combination of equation (5) with equation (6), as follows:

$$
\begin{aligned}
r_{p,t} = \; & \alpha_{0p} + A'_p\, z_{t-1} + \beta_{0p}\, r_{m,t} + \beta'_p\left(z_{t-1}\, r_{m,t}\right) + \beta_{0p,SMB}\, SMB_t \\
& + \beta'_{p,SMB}\left(z_{t-1}\, SMB_t\right) + \beta_{0p,HML}\, HML_t + \beta'_{p,HML}\left(z_{t-1}\, HML_t\right) \\
& + \beta_{0p,RMW}\, RMW_t + \beta'_{p,RMW}\left(z_{t-1}\, RMW_t\right) + \beta_{0p,CMA}\, CMA_t \\
& + \beta'_{p,CMA}\left(z_{t-1}\, CMA_t\right) + \varepsilon_{p,t}
\end{aligned}
\tag{8}
$$

Finally, we apply both the Carhart (1997) four-factor and the Fama and French (2015) five-factor models in a conditional specification with the incorporation of a dummy variable to distinguish expansion and recession periods, as in Areal *et al.* (2013). We perform this additional analysis taking into consideration the results obtained in the previous models and the concern of whether there are differences in social and financial performance in different states of the market. In this analysis we use the criteria of the Business Cycle Dating Committee for the Euro Area of CEPR to define periods of recession and expansion.

The incorporation of a dummy variable into the Carhart (1997) four-factor model and the Fama and French (2015) five-factor model is represented in equations (9) and (10), as follows:

---

[2] The socially responsible portfolios will be evaluated with a conditional model that considers both time-varying alphas and betas, as it is argued that this model produces more reliable estimates of risk, even when alphas are not time-varying (Ferson *et al.*, 2008).

$$r_{p,t} = \alpha_p + \alpha_{rec} D_t + \beta_{p,m} r_{m,t} + \beta_{rec,m} r_{m,t} D_t + \beta_{p,SMB} SMB_t$$
$$+ \beta_{rec,SMB} SMB_t D_t + \beta_{p,HML} HML_t + \beta_{rec,HML} HML_t D_t \qquad (9)$$
$$+ \beta_{p,MOM} MOM_t + \beta_{rec,MOM} MOM_t D_t + \varepsilon_{pt}$$

$$r_{p,t} = \alpha_p + \alpha_{rec} D_t + \beta_{p,m} r_{m,t} + \beta_{rec,m} r_{m,t} D_t + \beta_{p,SMB} SMB_t$$
$$+ \beta_{rec,SMB} SMB_t D_t + \beta_{p,HML} HML_t + \beta_{rec,HML} HML_t D_t$$
$$+ \beta_{p,RMW} RMW_t + \beta_{rec,RMW} RMW_t D_t + \beta_{p,CMA} CMA_t \qquad (10)$$
$$+ \beta_{rec,CMA} CMA_t D_t + \varepsilon_{p,t}$$

In both models, D_t represents a dummy variable that assumes the value 0 in expansion periods and 1 in recession periods.

4. Data

In this section we describe in detail the data used. We also present descriptive statistics on ESG scores, on ESG portfolios' scores and on the variables used in the performance evaluation models.

4.1. ESG ratings data

Thomson Reuters ESG Scores is a database that provides information about companies' ESG scores as a measure to their social performance[3]. Thomson Reuters ESG Scores provides data since 2002 for over 7,000 companies globally and it is divided into 3 pillars: Environmental, Social and Governance. The Environmental pillar has three categories: resource use, emissions and innovation. The Social pillar has four categories: workforce, human rights, community and product responsibility. The Governance pillar has three categories: management, shareholders and corporate social responsibility (CSR) strategy. In their data process, information on ESG Scores is collected and analyzed over 400 ESG measures and the database is updated on a continuous basis, including the recalculation of the ESG Scores. Overall, ESG reported data is updated yearly and cases that require more frequent updates are uncommon. The ratings are available in both percentages and letter grades from D- to A+ on over 1,200 companies in the European market.

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[3] Thomson Reuters ESG Scores is an improvement and replacement of the former ASSET4 ESG database, which is the main database of several studies, such as Wimmer (2013), Cheng *et al.* (2014), Halbritter and Dorfleitner (2015) and Gonenc and Scholtens (2017). One advantage of this database is the consistency in the reporting (Gonenc and Scholtens, 2017), although the rewriting history issue may be considered a shortcoming (Pereira *et al.*, 2019).

4.2. Dataset

For the purpose of this dissertation, we analyze data and information on the ESG scores to rank companies and industries, according to their ESG performance. We collected ESG scores of all European companies rated by Thomson Reuters ESG between 2002 and 2018. However, we excluded data from the year 2002 and 2003, since Thomson Reuters only provides ESG scores for a very reduced number of companies in these first two years. As a result, we analyze ESG scores of 1089 companies between 2004 to 2018.

We then collected financial data on these companies from Thomson Reuters Datastream. Since we form portfolios based on stocks' social characteristics in the previous year, we collected market-value time series and end-of-month total return index series between 2005 and 2019 and both time series were collected in US dollars. To avoid survivorship bias, we include both active and dead companies in our dataset.

Our final dataset is composed by 1089 companies from 20 different countries and 11 different industries. Tables 1 and 2 present the number of companies in each country and in each industry, respectively. Although our dataset includes companies from 20 different countries, more than half of these companies are concentrated in three countries: United Kingdom of Great Britain and Northern Ireland (representing 34.16% of our dataset), Germany (representing 9.83% of our dataset) and France (representing 9.73% of our dataset). Furthermore, 56.11% of these companies are concentrated in three industries: Financials (representing 20.47% of our dataset), Industrials (representing 19.01% of our dataset) and Consumer Discretionary (representing 16.53% of our dataset). Some authors address the issue of whether the inclusion of financial companies could influence the estimation results. Ziegler (2012) states that financial companies and companies from other sector strongly differ with respect to the valuation by the markets and to accounting rules. Eccles *et al*. (2014) exclude the financial industry from their dataset, considering that environmental and social policies are not likely to be applicable to the financial industry. Ge and Liu (2015) also eliminate financial companies because of different regulations and different debt financing characteristics. Acknowledging the high percentage of financial companies in our dataset, later in this study, we follow Mollet and Ziegler (2014) and eliminate financial companies as a robustness test.

Table 1. Number of companies for each country

This table presents the number of companies in the dataset, by country, from 2004 to 2018.

ISO COUNTRY CODE	Freq.	Percent	Cum.
United Kingdom of Great Britain and Northern Ireland	372	34.16	34.16
Germany	107	9.83	43.99
France	106	9.73	53.72
Sweden	64	5.88	59.60
Switzerland	61	5.60	65.20
Italy	58	5.33	70.52
Spain	50	4.59	75.11
Netherlands	38	3.49	78.60
Poland	34	3.12	81.73
Turkey	30	2.75	84.48
Belgium	29	2.66	87.14
Denmark	27	2.48	89.62
Norway	26	2.39	92.01
Finland	25	2.30	94.31
Greece	19	1.74	96.05
Austria	15	1.38	97.43
Ireland	10	0.92	98.35
Portugal	9	0.83	99.17
Czechia	5	0.46	99.63
Hungary	4	0.37	100.00
Total	1089	100.00	

Table 2. Number of companies for each industry

This table presents the number of companies in the dataset, by industry, from 2004 to 2018.

ICB INDUSTRY NAME	Freq.	Percent	Cum.
Financials	224	20.57	20.57
Industrials	207	19.01	39.58
Consumer Discretionary	180	16.53	56.11
Basic Materials	79	7.25	63.36
Health Care	71	6.52	69.88
Consumer Staples	70	6.43	76.31
Real Estate	62	5.69	82.00
Energy	60	5.51	87.51
Technology	48	4.41	91.92
Telecommunications	46	4.22	96.14
Utilities	42	3.86	100.00
Total	1089	100.00	

Table 3 provides some descriptive statistics of individual ESG scores. On average, companies included in our dataset have mean Environmental and Social scores of 61.36 and 59.10, respectively. Environmental and Social scores are both negatively skewed and excess kurtosis is negative in both cases. Regarding the Governance score, companies have a mean of 50.28. This implies that European companies present, on average, worse scores in the Governance pillar than they do in the Environmental and Social pillars. Excess kurtosis of the Governance pillar is also negative. However, the skewness is very close to zero (0.005), suggesting that most companies are rated close to 50, considering that the scale of scores goes from 0 to 100.

A matrix of the correlations between each pillar is presented in Table 4. The most salient feature of the correlation matrix is the very high degree of association between the Environmental and Social pillar. Regarding the Governance pillar the degree of association with the Social pillar and the Environmental pillar is much lower. The histogram of each ESG score is present in Appendix 1.

Table 3. Descriptive Statistics of ESG scores

This table provides descriptive statistics of individual ESG scores. The dataset includes 1089 companies rated with Thomson Reuters ESG scores from 2004 to 2018.

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median
Environmental	61.36	99.501	2.5	20.724	-.263	2.203	62.783
Social	59.094	99.054	4.225	20.678	-.294	2.31	60.821
Governance	50.275	99.002	.801	21.018	.005	2.137	50.118

Table 4. Matrix of correlations between each pillar

Variables	Environmental	Social	Governance
Environmental	1.000		
Social	0.686	1.000	
Governance	0.338	0.389	1.000

Table 5 reports the descriptive statistics of each individual ESG score for the high- and low-rated portfolios formed using positive screens, considering a 25% cut-off. Both high- and low-rated portfolios present a higher mean in the Environmental pillar (86.6 and 33.85, respectively) and lower mean in the Governance pillar (77.48 and 23.11, respectively). Regardless of the year, high-rated portfolios formed on Environmental, Social and Governance scores have minimum scores of 69.63, 69.98 and 65.00, respectively, and low-rated portfolios formed on Environmental, Social and Governance scores have maximum score of 53.57, 52.09 and 36.31, respectively. This indicates that no company from the low-rated portfolio presents a higher score than any another company from the high-rated portfolio, regardless of the year. In this way, we ensure that high- and low-rated portfolios are a true representation of stock portfolios from companies with the highest and lowest social performance. However, we are not able to make the same statement on portfolios with a 50% cut-off. [4]

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[4] The descriptive statistics of ESG scores for the high- and low-rated portfolios formed with the positive approach with a 50% cut-off are presented in Appendix 2.

Table 5. Descriptive Statistics of ESG scores on portfolios (positive approach)

This table provides descriptive statistics of each individual ESG score for the high- and low-rated portfolios formed with positive screens with a 25% cut-off. The dataset includes 1089 companies rated with Thomson Reuters ESG scores from 2004 to 2018.

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median
Environmental							
High-rated	86.6	99.501	69.627	6.064	-.289	2.654	86.822
Low-rated	33.848	53.571	2.5	9.913	-.401	2.507	34.919
Social							
High-rated	84.301	99.054	69.977	6.112	.237	2.349	83.611
Low-rated	31.191	52.086	4.225	9.846	-.41	2.514	32.468
Governance							
High-rated	77.478	99.002	64.998	7.45	.556	2.511	76.31
Low-rated	23.106	36.308	.801	7.371	-.51	2.445	24.113

Table 6 presents the descriptive statistics of the returns of value-weighted portfolios formed using positive screens, considering a 25% cut-off. For each different pillar, we form high- and low-rated portfolios, as well as a long-short portfolio, representing a trading strategy of going long in the high-rated portfolio and short in the low-rated portfolio. Although high-rated portfolios show lower mean monthly returns than low-rated portfolios in all three ESG dimensions, the differences are not statistically significant. Thereby, it is possible to conclude that the mean return does not differ significantly between the high- and low-rated portfolios.[5] As we mentioned before, we intend to perform three robustness tests: alternative cut-off to form portfolios, the exclusion of companies from the financial industry and a different portfolio weighting scheme. It is worth mentioning that, in these three alternative scenarios, the difference in mean returns between the high- and low-rated portfolios continues to be statistically insignificant.[6]

Additionally, we perform the skewness and kurtosis normality test to verify whether portfolio returns follow a normal distribution. The results show that the null hypothesis of normally distributed returns can be rejected for all high and low-rated portfolios. This evidence reinforces the use of conditional models of performance evaluation, as Adcock *et al.* (2012) argue.

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[5] A simple t-test allows us to determine if there is a significant difference between the means of high- and low-rated portfolios. We perform this inferential statistic using the Stata software.

[6] The descriptive statistics of value-weighted portfolio returns formed with positive screens, considering a 50% cut-off is presented is Appendix 3. The descriptive statistics of value-weighted portfolio returns formed with positive screens, considering a 25% cut-off with the exclusion of financial companies is presented in Appendix 4. Finally, the descriptive statistics of equally-weighted portfolio returns with positive screens, considering a 25% cut-off is presented in Appendix 5.

Table 6. Descriptive Statistics of portfolios (positive approach)

This table provides descriptive statistics of monthly returns of the high- and low-rated portfolios formed with positive screens with a 25% cut-off for each individual pillar. Additionally, it provides descriptive statistics for long-short portfolios, representing a trading strategic of going long in the high-rated portfolios and short in the low-rated portfolios. Portfolios are value-weighted. The dataset includes 1089 companies with an observation period from 2005 to 2019. P-value is the probability of an overall combined test statistic of a test for normality based on skewness and on kurtosis.

	Mean	Maximum	Minimum	Std. Dev.	Median	Skewness	Kurtosis	p-value
Environmental								
High-rated	.004	.147	-.243	.057	.008	-.634	4.69	.0002
Low-rated	.005	.194	-.273	.057	.008	-.678	6.085	.000
Long-short	-.002	.05	-.057	.018	-.002	-.147	3.544	.2186
Social								
High-rated	.004	.134	-.221	.054	.008	-.554	4.452	.0008
Low-rated	.005	.207	-.281	.059	.005	-.796	6.487	.000
Long-short	-.001	.063	-.072	.019	-.001	.053	4.766	.0098
Governance								
High-rated	.004	.162	-.232	.054	.008	-.525	4.863	.0004
Low-rated	.006	.2	-.245	.058	.01	-.572	5.27	.0001
Long-short	-.001	.044	-.058	.017	-.001	-.002	3.728	.1769

4.3. Risk factors and public information variables

To implement the Carhart (1997) four-factor model and the Fama and French (2015) five-factor model, we collect the European factors on market risk, size, value/growth, momentum, investment and profitability, expressed in US dollars, from the website of Professor Kenneth R. French.[7]

Additionally, we employ the Christopherson *et al.* (1998) conditional model extended to a Carhart (1997) four-factor specification and to a Fama and French (2015) five-factor specification model. For these conditional models, we consider two lagged public information variables that have also been used in previous studies on the European market, such as Otten and Bams (2002) and Bessler *et al.* (2009): the short-term rate and the dividend yield of a market index. Since our analysis focuses on the European market, the short-term rate is represented by the 3-month Euribor rate and the dividend yield of a market index is represented by the dividend yield of the STOXX Europe 600 index. We obtain the 3-month Euribor rate from the European Central Bank (ECB) Statistical Data Warehouse and the dividend yield of the STOXX Europe 600 index from the Thomson Reuters Datastream.

Since both short-term rate and dividend yield are highly persistent variables, we detrended these variables by subtracting a 12-month moving average, a procedure suggested by Ferson *et al.* (2003), to avoid possible biases resulting from spurious regressions.[8] We also use the public information variables in their zero-mean form order to avoid possible scale effects.

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[7] The descriptive statistics on the factors used in the Carhart (1997) four-factor model and the Fama and French (2015) five-factor model are presented in Appendixes 6 and 7, respectively.
[8] The descriptive statistics on the information variables are presented in Appendix 8.

5. Empirical Results

In this section, we report the results on the performance of social screened stock portfolios in the European market. We subdivide this section by evaluating the performance of value-weighted stock portfolios for each individual ESG scores, formed with a 25% cut-off under three different approaches: the positive approach, the best-in-class approach and the high and low CSP industry portfolios approach. For each different approach, we perform three robustness tests: alternative cut-off, the exclusion of companies from the financial industry and a different portfolio weighting scheme. Additionally, we analyze social performance over time and evaluate financial performance in different subperiods.

5.1. Performance of portfolios formed with the positive approach

We start by analyzing portfolio performance using unconditional models. Tables 7 and 8 present the results of the Carhart (1997) four-factor model and the Fama and French (2015) five-factor model, respectively, for portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. Performance and risk estimates are presented for the high- and low-rated portfolios, as well as for the long-short portfolios (long in the high-rated portfolios and short in the low-rated portfolios).

The results from the Carhart (1997) four-factor model show that, with exception of the high-rated portfolio formed on Environmental Scores, which shows statistically significant negative alphas, all other portfolios exhibit alphas that are neutral.[9] According to the Fama and French (2015) five-factor model, only the low-rated portfolio formed on the Environmental scores yields a statistically significant negative alpha (at the 5% level). All the other portfolios yield statistically insignificant abnormal returns, including the long-short portfolios, suggesting that investors cannot obtain abnormal returns by going long in high-rated stocks and short in low-rated stocks. These results are consistent with those of Humphrey *et al.* (2012), who also finds no significant difference in the risk-adjusted performance of high- and low-ranked CSP portfolios, when the positive approach is applied. They are also in line with Halbritter and

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[9] The low-rated portfolio formed on the Social score presents negative alpha but only at the 10% significant level. In this research we will emphasize the results that are significant at least at the 5% level.

Dorfleitner (2015), who document that no statistically significant returns of high- and low-rated as well as of long-short portfolios for each individual ESG scores.

The tables show that both market risk and size have a significant impact on the excess returns of the portfolios. Regardless of the ESG dimension used and model applied, the coefficient of market risk is statistically significant (at the 1% level) on both high- and low- rated portfolios, with betas very close to 1, suggesting that variations in the market are followed by similar variations in portfolio returns. The results also show that high-rated portfolios have lower systematic risk than low-rated portfolios. Furthermore, the fact that the coefficient of the long-short portfolios associated to this factor is significant allows us to conclude that the difference in systematic risk between both portfolios is significant.

Regarding size, we observe that all high-rated portfolios are significantly exposed to large firms, while all low-rated portfolios are significantly exposed to small firms. In both models, high-rated portfolios present statistically HML coefficients (at the 1% level) and low-rated portfolios are not significantly exposed to this factor. We thus conclude that high-rated portfolios are more exposed to value firms.

Table 7 shows that only the high-rated portfolios formed on Environmental and Governance scores and the low-rated portfolio formed on the Environmental scores are exposed to momentum effects (they are more exposed to past poor performing firms). The results from Table 8 also show that low-rated portfolios are more exposed to the investment factor than high-rated portfolios. Regarding the profitability factor, in general, portfolios do not seem to be affected by this factor.

Table 7. Estimation results of the Carhart (1997) four-factor model on stock portfolios based on positive screens

This table provides the estimation results of the Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio (long in the high-rated portfolio and short in the low-rated portfolio). Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.015***	1.066***	-0.051**	0.993***	1.100***	-0.107***	0.989***	1.080***	-0.091***
	(0.014)	(0.018)	(0.025)	(0.010)	(0.025)	(0.025)	(0.013)	(0.018)	(0.024)
SMB	-0.184***	0.351***	-0.535***	-0.260***	0.343***	-0.602***	-0.209***	0.262***	-0.471***
	(0.039)	(0.055)	(0.058)	(0.034)	(0.061)	(0.064)	(0.034)	(0.050)	(0.074)
HML	0.228***	-0.003	0.231***	0.116***	-0.037	0.153**	0.097***	0.006	0.092
	(0.037)	(0.049)	(0.065)	(0.027)	(0.063)	(0.064)	(0.030)	(0.050)	(0.062)
MOM	-0.053**	-0.065*	0.012	-0.019	-0.052	0.033	-0.079***	-0.065	-0.014
	(0.025)	(0.039)	(0.059)	(0.014)	(0.046)	(0.054)	(0.015)	(0.040)	(0.042)
α	-0.001**	-0.001	0.000	-0.001	-0.002*	0.001	-0.000	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.9792	0.9583	0.3411	0.9843	0.9465	0.3696	0.9800	0.9607	0.2789
Observations	180	180	180	180	180	180	180	180	180

Table 8. Estimation results of Fama and French (2015) five-factor model on stock portfolios based on positive screens

This table provides the estimation results of the Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio (long in the high-rated portfolio and short in the low-rated portfolio). Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.016***	1.047***	-0.031	0.993***	1.076***	-0.083***	0.993***	1.075***	-0.081**
	(0.015)	(0.019)	(0.026)	(0.011)	(0.024)	(0.026)	(0.013)	(0.025)	(0.032)
SMB	-0.222***	0.336***	-0.558***	-0.272***	0.308***	-0.580***	-0.230***	0.247***	-0.476***
	(0.037)	(0.054)	(0.066)	(0.033)	(0.058)	(0.070)	(0.033)	(0.058)	(0.076)
HML	0.239***	0.173**	0.067	0.167***	0.058	0.110	0.176***	0.082	0.094
	(0.049)	(0.081)	(0.094)	(0.036)	(0.104)	(0.106)	(0.045)	(0.102)	(0.100)
RMW	-0.085	0.180*	-0.265**	0.054	0.016	0.038	0.016	0.029	-0.013
	(0.072)	(0.096)	(0.123)	(0.056)	(0.125)	(0.130)	(0.064)	(0.116)	(0.126)
CMA	-0.059	-0.263***	0.204*	-0.014	-0.281***	0.267***	-0.071	-0.143	0.072
	(0.053)	(0.085)	(0.108)	(0.037)	(0.095)	(0.101)	(0.065)	(0.135)	(0.145)
α	-0.001	-0.002**	0.001	-0.001	-0.001	0.001	-0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.9792	0.9604	0.3942	0.9848	0.9481	0.3960	0.9785	0.9598	0.2817
Observations	180	180	180	180	180	180	180	180	180

In order to control for both time-varying alphas and betas, the previous models will be used in their corresponding conditional specifications. The results of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models are presented in Tables 9 and 10, respectively. Both tables show the results for portfolios formed on individual ESG dimensions and using positive screens with a 25% cut-off. In general, the explanatory power of the models increases compared to the previous unconditional models.

In both conditional specifications models, the results of the Wald test show that, in general, we cannot reject the hypothesis of the conditional alphas being equal to zero. Only on the low-rated portfolio formed on Governance scores, we can reject the hypothesis of the conditional alphas being equal to zero at the 5% level. The results also show, in general, more evidence of time-varying betas than time-varying alphas.

The results from the conditional Carhart (1997) four-factor model show that low-rated portfolios formed on Environmental and Social scores yield negative and statistically significant abnormal returns (at the 5% and 1% level). The results from the conditional Fama and French (2015) five-factor model strengthen the underperformance of the low-rated portfolios formed on Environmental scores. Regarding the long-short strategy, conditional models provide a different result from the unconditional models. The conditional Carhart (1997) four-factor specification model shows that high-rated portfolios formed on the Social scores outperform their low-rated peers at the 5% level, although this effect does not appear when using the conditional Fama and French (2015) five-factor model.

The estimation results show a similar exposure of portfolio returns to risk factors between the unconditional and the conditional models. The market risk and size factors continue to have a significant impact on the excess returns of the portfolios. In both conditional specification models, low-rated portfolios tend to present higher systematic risk than high-rated portfolios. Additionally, high-rated portfolios continue to present positive and significant (at 1% level) coefficients associated to the book-to-market factor, while low-rated portfolios are either not significantly exposed to this factor or they are but in an opposite direction. These results thus confirm that high-rated portfolios are more exposed to value firms than low-rated portfolios. Table 9 shows that the high-rated portfolios formed on Environmental and Governances scores continue to be negatively exposed to momentum effects and Table 10 shows that low-rated portfolios continue to be more exposed to the investment factor than high-rated portfolios.

Table 9. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.015***	1.057***	-0.042	0.999***	1.090***	-0.091***	0.992***	1.070***	-0.078***
	(0.016)	(0.020)	(0.026)	(0.011)	(0.020)	(0.023)	(0.015)	(0.018)	(0.027)
SMB	-0.228***	0.342***	-0.570***	-0.289***	0.326***	-0.615***	-0.238***	0.274***	-0.512***
	(0.033)	(0.057)	(0.061)	(0.027)	(0.060)	(0.066)	(0.031)	(0.054)	(0.071)
HML	0.238***	0.011	0.226***	0.124***	-0.051	0.174***	0.110***	0.015	0.095
	(0.038)	(0.046)	(0.064)	(0.026)	(0.053)	(0.050)	(0.035)	(0.047)	(0.065)
Euribor	-0.255	-0.110	-0.146	-0.177	-0.081	-0.096	-0.171	-0.466**	0.296
	(0.160)	(0.217)	(0.222)	(0.109)	(0.200)	(0.191)	(0.169)	(0.182)	(0.289)
DY	-0.000	0.002	-0.002	-0.001	0.002	-0.002	-0.000	0.006	-0.006
	(0.002)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)	(0.002)	(0.004)	(0.005)
MOM	-0.093***	0.023	-0.116**	-0.035*	0.046	-0.081*	-0.063***	0.030	-0.093
	(0.024)	(0.038)	(0.049)	(0.019)	(0.033)	(0.042)	(0.024)	(0.047)	(0.063)
Mkt-rf x Euribor	5.494**	1.882	3.612	1.521	9.479***	-7.957**	2.728	3.516	-0.788
	(2.483)	(3.440)	(3.810)	(1.737)	(3.298)	(3.314)	(2.856)	(3.596)	(5.467)
SMB x Euribor	-0.896	0.888	-1.784	-1.835	-2.619	0.784	-6.396	-2.731	-3.665
	(4.501)	(9.363)	(10.326)	(3.218)	(8.452)	(9.561)	(4.118)	(8.708)	(9.914)
HML x Euribor	3.604	-7.232	10.836	3.545	-24.619***	28.164***	1.074	-23.622***	24.696**

	(5.960)	(7.649)	(11.125)	(3.789)	(7.586)	(8.623)	(5.081)	(8.051)	(10.918)
MOM x Euribor	-1.357	6.200*	-7.558**	-1.163	8.174***	-9.337***	1.631	1.766	-0.135
	(1.848)	(3.154)	(3.785)	(1.527)	(2.757)	(3.336)	(1.970)	(2.939)	(3.643)
Mkt-rf x DY	-0.023	-0.002	-0.021	-0.033	0.005	-0.038	-0.028	0.039	-0.067
	(0.034)	(0.047)	(0.063)	(0.026)	(0.048)	(0.053)	(0.038)	(0.052)	(0.075)
SMB x DY	-0.050	0.093	-0.142	0.021	0.016	0.005	-0.050	-0.029	-0.020
	(0.050)	(0.128)	(0.139)	(0.055)	(0.129)	(0.139)	(0.064)	(0.131)	(0.181)
HML x DY	-0.093	-0.182	0.089	-0.099	-0.124	0.025	-0.106	0.009	-0.115
	(0.134)	(0.150)	(0.205)	(0.098)	(0.175)	(0.175)	(0.121)	(0.140)	(0.209)
MOM x DY	-0.055	-0.237**	0.182	-0.035	-0.253***	0.218*	-0.112	-0.149	0.037
	(0.072)	(0.103)	(0.130)	(0.060)	(0.096)	(0.113)	(0.075)	(0.118)	(0.168)
α	-0.001	-0.003**	0.002*	-0.000	-0.003***	0.003**	-0.000	-0.002*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.1864	0.6953	0.6045	0.1327	0.7747	0.5965	0.4970	0.0346	0.4785
W_2	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0216	0.0002	0.0076
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0087	0.0004	0.0134
Adj. R^2	0.9807	0.9602	0.3922	0.9854	0.9521	0.4534	0.9801	0.9645	0.3133
Observations	180	180	180	180	180	180	180	180	180

Table 10. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens

This table provides the estimation results of the conditional Fama and French (2015) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.018***	1.041***	-0.022	0.999***	1.070***	-0.071***	0.998***	1.052***	-0.055*
	(0.016)	(0.021)	(0.028)	(0.011)	(0.021)	(0.023)	(0.015)	(0.023)	(0.030)
SMB	-0.264***	0.355***	-0.619***	-0.306***	0.320***	-0.626***	-0.250***	0.275***	-0.525***
	(0.033)	(0.060)	(0.068)	(0.027)	(0.061)	(0.069)	(0.031)	(0.059)	(0.076)
HML	0.260***	0.161**	0.099	0.179***	0.033	0.146*	0.163***	0.096	0.067
	(0.056)	(0.070)	(0.086)	(0.038)	(0.079)	(0.078)	(0.046)	(0.076)	(0.092)
RMW	-0.081	0.216**	-0.297**	0.057	0.070	-0.013	0.027	0.106	-0.079
	(0.077)	(0.093)	(0.126)	(0.058)	(0.122)	(0.134)	(0.063)	(0.106)	(0.125)
CMA	-0.055	-0.237***	0.182*	-0.019	-0.263***	0.244***	-0.006	-0.168*	0.163
	(0.063)	(0.087)	(0.096)	(0.046)	(0.100)	(0.093)	(0.057)	(0.096)	(0.101)
Euribor	-0.312	-0.048	-0.265	-0.285	0.078	-0.362	-0.254	-0.298	0.044
	(0.239)	(0.249)	(0.335)	(0.178)	(0.223)	(0.253)	(0.277)	(0.260)	(0.479)
DY	-0.000	0.003	-0.004	0.000	0.005	-0.005	0.002	0.006	-0.004
	(0.002)	(0.004)	(0.004)	(0.002)	(0.004)	(0.005)	(0.003)	(0.004)	(0.006)
Mkt-rf x Euribor	3.841*	5.323*	-1.482	1.241	12.989***	-11.748***	2.231	6.312	-4.080
	(2.167)	(3.019)	(3.727)	(1.696)	(2.979)	(3.315)	(2.757)	(3.929)	(6.219)
SMB x Euribor	-2.793	-3.100	0.307	-1.646	-7.717	6.071	-8.497	-8.216	-0.281

	(4.175)	(6.899)	(7.388)	(2.712)	(6.190)	(6.364)	(5.200)	(7.442)	(10.268)
HML x Euribor	2.101	-26.851***	28.951**	6.550	-49.126***	55.676***	-4.031	-39.861***	35.830**
	(8.208)	(7.803)	(12.175)	(6.514)	(8.035)	(10.502)	(8.385)	(9.807)	(15.951)
RMW x Euribor	-2.923	-14.957	12.034	6.518	-22.746	29.264	0.504	-25.534	26.039
	(17.447)	(18.215)	(29.255)	(13.780)	(19.424)	(26.074)	(19.116)	(20.740)	(35.931)
CMA x Euribor	0.525	11.848	-11.322	-1.508	13.148	-14.657	11.024	-5.495	16.519
	(6.129)	(9.416)	(10.715)	(5.028)	(11.820)	(13.633)	(7.878)	(10.129)	(16.473)
Mkt-rf x DY	-0.018	0.039	-0.057	-0.031	0.003	-0.034	-0.017	0.093*	-0.110
	(0.040)	(0.050)	(0.059)	(0.032)	(0.055)	(0.056)	(0.043)	(0.054)	(0.082)
SMB x DY	-0.072	0.026	-0.098	0.007	-0.156	0.163	-0.084	-0.063	-0.021
	(0.065)	(0.130)	(0.153)	(0.055)	(0.131)	(0.147)	(0.077)	(0.144)	(0.201)
HML x DY	0.066	-0.269	0.335	-0.039	-0.236	0.196	-0.000	-0.205	0.205
	(0.204)	(0.178)	(0.252)	(0.137)	(0.199)	(0.191)	(0.167)	(0.164)	(0.277)
RMW x DY	0.168	-0.388*	0.556*	0.015	-0.598**	0.613**	-0.043	-0.446**	0.403
	(0.185)	(0.224)	(0.285)	(0.132)	(0.235)	(0.270)	(0.169)	(0.214)	(0.308)
CMA x DY	-0.136	0.164	-0.300	-0.073	-0.008	-0.065	-0.208	0.370*	-0.578**
	(0.115)	(0.178)	(0.201)	(0.088)	(0.192)	(0.209)	(0.126)	(0.202)	(0.267)
α	-0.001	-0.003**	0.002	-0.001	-0.002	0.001	-0.001	-0.002	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.4205	0.6528	0.4853	0.2828	0.4506	0.2044	0.5858	0.1358	0.7983
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9799	0.9617	0.4350	0.9856	0.9528	0.4657	0.9793	0.9663	0.3460
Observations	180	180	180	180	180	180	180	180	180

5.1.1. Robustness test: performance of alternative cut-off portfolios

We follow previous studies (Van de Velde *et al.*, 2005; Kempf and Osthoff, 2007; Derwall *et al.*, 2011; Halbritter and Dorfleitner, 2015; and Auer, 2016) and analyze how the profitability of the long-short strategy depends on the cut-off chosen to form high- and low-rated portfolios. For each ESG dimension, the high- and low-rated portfolio are now formed by the top 50% best socially rated of all stocks and by the bottom 50% of all stocks, respectively.

Regarding the robustness tests, we chose to proceed the analysis with the conditional models since there is evidence of time-varying alphas and betas and the models show a higher explanatory power compared to the unconditional models.

The regression results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model of portfolios formed on positive screens and considering a 50% cut-off are summarized in Table 11.[10] The results show that, regardless of the score used, long-short portfolios yield statistically insignificant abnormal returns. In sum, using a broader cut-off leads to no statistical significance of the alphas of the long-short portfolios. Any effect of screening found previously disappears when the portfolios are formed using a broader definition of what is a socially responsible firm.

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[10]The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off, is presented in Appendixes 9 and 10, respectively.

Table 11. Summary of performance with conditional models using 50% cut-off (positive screening strategy)

This table summarizes the comparison of alphas of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five factor models for portfolios formed on positive screens and considering a 50% cut-off. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Env. Score	-0.001	-0.000	-0.000	-0.001*	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Soc. Score	-0.001	-0.001	0.000	-0.001	-0.001	0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gov. Score	-0.000	-0.002*	0.001	-0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

5.1.2. Robustness test: exclusion of financial companies

Prior research addresses the possible bias arising from the inclusion of financial companies. The estimation results could be influenced by differences with respect to the valuation by the markets and to accounting rules (Ziegler, 2012), differences in the application of environmental and social policies (Eccles *et al.*, 2014) and differences in regulations and debt financing characteristics (Ge and Liu, 2015) between financial companies and companies from other industries. Since financial companies represent 20.47% of our dataset, we follow Mollet and Ziegler (2014) and exclude financial firms as a robustness test.

The regression estimates are summarized in Table 12.[11] The results of the conditional Carhart (1997) four-factor model for portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off, excluding financial firms, show a similar picture to our previous analysis. Market risk and size are significant in all high- and low-rated portfolios, while the momentum factor only

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[11] The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off with the exclusion of financial companies are presented in Appendixes 11 and 12, respectively.

seems to affect high-rated portfolios. Additionally, long-short portfolios continue to yield statistically insignificant abnormal returns.

Regarding the conditional Fama and French (2015) five-factor model, with the exception of the book-to-market, which has no significant impact in all portfolios, all the other risk factors have significant impact in stock returns. Regarding the long-short strategy, all long-short portfolios provide insignificant abnormal returns.

Table 12. Summary of performance with conditional models using 25% cut-off with the exclusion of financial companies (positive screening strategy)

This table summarizes the comparison of alphas of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models for portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off, and excluding financial companies. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Env. Score	0.000	-0.002*	0.002	-0.002***	-0.003***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Soc. Score	0.000	-0.002	0.002	-0.001*	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gov. Score	0.000	-0.001	0.001	-0.002***	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

5.1.3. Robustness test: different portfolio weighting scheme

Following several studies (Kempf and Osthoff, 2007; Halbritter and Dorfleitner, 2015; Auer and Schuhmacher, 2016; Pereira *et al.*, 2019), we also analyze equally-weighted portfolios as a robustness test. The results are summarized in Table 13.[12] The results from the conditional Fama and French (2015) five-factor model for equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off, provide no evidence of outperformance and the conditional

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[12] The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model for equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off are presented in Appendixes 13 and 14, respectively.

Carhart (1997) four-factor model   only exhibits significant abnormal returns for long-short portfolios formed on Governance scores.

Table 13. Summary of performance with conditional models using 25% cut-off on equally-weighted portfolios (positive screening strategy)

This table summarizes the comparison of alphas for the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models for equally-weighted portfolios formed on positive screens and considering a 25% cut-off. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Env. Score	-0.000	-0.002*	0.002*	-0.001	-0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Soc. Score	0.000	-0.002	0.002*	-0.001	-0.001	0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gov. Score	0.000	-0.001	0.002**	-0.000	-0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

5.2. Performance of portfolios formed with the best-in-class approach

In this section, we perform an analysis based on the best-in-class approach. Several studies apply this approach to avoid possible industry biases, since opportunities and risks may vary across industries.

Tables 14 and 15 present the results of the Carhart (1997) four-factor model and the Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions, using the best-in-class approach and considering a 25% cut-off. Performance and risk estimates are presented for the high- and low-rated portfolios, as well as for the long-short portfolios (long in the high-rated portfolios and short in the low-rated portfolios). The results provided show a similar picture to the results obtained in the positive approach, with the same portfolio conditions. Both market risk and size have significant impact on the excess returns of all high- and low-rated portfolios. In general, high-rated portfolios (1) are less exposed to market risk than low-rated portfolios; (2) are exposed mainly to large companies, whereas their low-rated peers are more exposed to small companies, and (3) tend to be more exposed to value companies compared to low-rated portfolios.

Table 14. Estimation results of the Carhart (1997) four-factor model on stock portfolios based on best-in-class screens

This table provides the estimation results of the Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio (long in the high-rated portfolio and short in the low-rated portfolio). Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.000***	1.063***	-0.062***	1.000***	1.084***	-0.084***	0.999***	1.051***	-0.053***
	(0.011)	(0.014)	(0.020)	(0.010)	(0.022)	(0.025)	(0.013)	(0.015)	(0.019)
SMB	-0.197***	0.309***	-0.506***	-0.213***	0.249***	-0.463***	-0.199***	0.141***	-0.340***
	(0.030)	(0.052)	(0.062)	(0.038)	(0.071)	(0.071)	(0.033)	(0.043)	(0.065)
HML	0.189***	-0.016	0.204***	0.139***	-0.070	0.209***	0.108***	0.011	0.097*
	(0.032)	(0.048)	(0.066)	(0.026)	(0.055)	(0.056)	(0.036)	(0.040)	(0.050)
MOM	-0.030	-0.047	0.017	-0.035**	-0.059	0.024	-0.072***	-0.027	-0.045
	(0.029)	(0.036)	(0.060)	(0.013)	(0.040)	(0.047)	(0.017)	(0.023)	(0.029)
α	-0.001	-0.003***	0.001	-0.001	-0.002	0.001	-0.000	-0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.9807	0.9560	0.3155	0.9836	0.9485	0.2833	0.9791	0.9634	0.1973
Observations	180	180	180	180	180	180	180	180	180

Table 15. Estimation results of Fama and French (2015) five-factor model on stock portfolios based on best-in-class screens

This table provides the estimation results of the Fama and French (2015) five-factor model for value-weighted formed on individual ESG dimensions and using best-in-class screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio (long in the high-rated portfolio and short in the low-rated portfolio). Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.005***	1.038***	-0.034	1.000***	1.061***	-0.061**	1.005***	1.055***	-0.050*
	(0.012)	(0.017)	(0.022)	(0.012)	(0.022)	(0.026)	(0.012)	(0.022)	(0.027)
SMB	-0.216***	0.297***	-0.513***	-0.230***	0.206***	-0.437***	-0.220***	0.128***	-0.348***
	(0.033)	(0.060)	(0.075)	(0.036)	(0.072)	(0.082)	(0.033)	(0.045)	(0.061)
HML	0.198***	0.174**	0.024	0.196***	0.010	0.186*	0.165***	0.019	0.146*
	(0.044)	(0.069)	(0.089)	(0.036)	(0.099)	(0.101)	(0.047)	(0.082)	(0.075)
RMW	-0.031	0.219***	-0.250**	0.036	-0.030	0.066	-0.006	-0.009	0.003
	(0.066)	(0.082)	(0.109)	(0.059)	(0.136)	(0.146)	(0.069)	(0.102)	(0.102)
CMA	0.003	-0.278***	0.281***	-0.043	-0.279***	0.236**	-0.045	-0.012	-0.033
	(0.051)	(0.072)	(0.089)	(0.041)	(0.093)	(0.098)	(0.058)	(0.131)	(0.146)
α	-0.001	-0.003***	0.002*	-0.001	-0.001	0.000	-0.001	-0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.9808	0.9598	0.3844	0.9837	0.9497	0.3068	0.9779	0.9626	0.1798
Observations	180	180	180	180	180	180	180	180	180

The results of the previous models employed in their corresponding conditional specifications are presented in Tables 16 and 17. Again, the adjusted R-squared increases when we switch from the unconditional to conditional models. We continue to find more evidence of time-varying betas than time-varying alphas. Regarding the long-strategy, in both conditional models long-short portfolios formed on Environmental scores yield positive and statistically significant abnormal returns. These initial findings provide evidence that the performance of stock portfolios with a 25% cut-off formed on the basis of individual ESG scores change when we apply the best-in-class as an alternative screening approach.

Table 16. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on best-in-class screens

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.012***	1.067***	-0.055**	1.006***	1.069***	-0.063**	1.000***	1.052***	-0.052***
	(0.014)	(0.017)	(0.023)	(0.011)	(0.020)	(0.026)	(0.013)	(0.015)	(0.019)
SMB	-0.219***	0.319***	-0.538***	-0.245***	0.228***	-0.473***	-0.237***	0.163***	-0.399***
	(0.028)	(0.059)	(0.063)	(0.029)	(0.064)	(0.071)	(0.031)	(0.042)	(0.056)
HML	0.185***	-0.029	0.214***	0.150***	-0.068	0.218***	0.132***	0.008	0.124**
	(0.031)	(0.048)	(0.060)	(0.026)	(0.050)	(0.049)	(0.037)	(0.038)	(0.049)
MOM	-0.088***	0.026	-0.114**	-0.045***	0.046	-0.091**	-0.074***	0.025	-0.099**
	(0.023)	(0.041)	(0.048)	(0.017)	(0.035)	(0.040)	(0.020)	(0.039)	(0.046)
Euribor	-0.244*	0.426*	-0.670***	-0.166	0.050	-0.216	-0.305**	-0.123	-0.182
	(0.133)	(0.231)	(0.188)	(0.150)	(0.178)	(0.210)	(0.140)	(0.159)	(0.208)
DY	0.000	-0.002	0.003	-0.001	-0.001	-0.000	0.002	0.005	-0.003
	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.004)	(0.004)
Mkt-rf x Euribor	4.820**	-0.608	5.428	1.581	1.521	0.060	4.275*	-1.735	6.010
	(2.115)	(2.981)	(3.506)	(2.100)	(3.001)	(3.769)	(2.199)	(4.115)	(4.199)
SMB x Euribor	2.150	-10.289	12.439	-4.333	-11.917*	7.583	-3.707	-6.627	2.920
	(4.123)	(8.168)	(9.123)	(3.807)	(6.753)	(8.552)	(3.638)	(6.504)	(7.807)
HML x Euribor	0.631	-11.090	11.721	1.646	-18.977***	20.623***	4.600	-11.743*	16.342*

	(5.106)	(7.286)	(9.797)	(3.982)	(5.959)	(6.826)	(5.209)	(5.975)	(8.643)
MOM x Euribor	-3.674**	5.353**	-9.027***	-1.260	5.095**	-6.355**	0.540	-1.475	2.015
	(1.853)	(2.707)	(3.231)	(1.698)	(2.437)	(2.903)	(1.966)	(3.436)	(3.894)
Mkt-rf x DY	-0.076***	-0.040	-0.036	-0.048*	0.068	-0.116*	-0.029	0.073	-0.102
	(0.028)	(0.044)	(0.056)	(0.028)	(0.052)	(0.061)	(0.035)	(0.047)	(0.065)
SMB x DY	-0.082	0.095	-0.178	0.058	0.212	-0.153	-0.109**	-0.141	0.032
	(0.051)	(0.102)	(0.117)	(0.063)	(0.149)	(0.149)	(0.051)	(0.106)	(0.135)
HML x DY	0.015	-0.013	0.028	-0.061	-0.157	0.096	-0.176	-0.221*	0.044
	(0.107)	(0.149)	(0.181)	(0.118)	(0.154)	(0.163)	(0.123)	(0.126)	(0.153)
MOM x DY	-0.001	-0.166	0.165	-0.068	-0.195*	0.128	-0.170***	-0.099	-0.071
	(0.061)	(0.106)	(0.116)	(0.068)	(0.099)	(0.114)	(0.065)	(0.099)	(0.125)
α	-0.000	-0.004***	0.003***	-0.000	-0.003**	0.002*	-0.000	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.1870	0.1856	0.0022	0.1290	0.9272	0.5382	0.0688	0.3917	0.2154
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0040	0.0014
W_3	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0059	0.0000
Adj. R^2	0.9826	0.9580	0.4138	0.9847	0.9521	0.3493	0.9806	0.9648	0.2415
Observations	180	180	180	180	180	180	180	180	180

Table 17. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on best-in-class screens

This table provides the estimation results of the conditional Fama and French (2015) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.014***	1.049***	-0.035	1.007***	1.048***	-0.041	1.004***	1.036***	-0.032
	(0.014)	(0.020)	(0.024)	(0.012)	(0.023)	(0.028)	(0.013)	(0.018)	(0.022)
SMB	-0.250***	0.326***	-0.576***	-0.261***	0.213***	-0.473***	-0.254***	0.153***	-0.407***
	(0.030)	(0.065)	(0.075)	(0.029)	(0.070)	(0.080)	(0.029)	(0.044)	(0.059)
HML	0.221***	0.127*	0.093	0.198***	-0.023	0.221**	0.191***	0.064	0.127*
	(0.046)	(0.073)	(0.085)	(0.041)	(0.083)	(0.087)	(0.049)	(0.061)	(0.073)
RMW	-0.032	0.224**	-0.256**	0.027	0.007	0.020	0.019	0.070	-0.050
	(0.072)	(0.090)	(0.123)	(0.062)	(0.132)	(0.148)	(0.067)	(0.088)	(0.105)
CMA	-0.028	-0.259***	0.231**	-0.035	-0.221**	0.186*	-0.020	-0.117	0.097
	(0.058)	(0.090)	(0.095)	(0.047)	(0.097)	(0.095)	(0.063)	(0.090)	(0.111)
Euribor	-0.352*	0.510**	-0.862***	-0.151	0.303	-0.454	-0.466**	0.057	-0.524*
	(0.207)	(0.239)	(0.262)	(0.241)	(0.315)	(0.382)	(0.227)	(0.183)	(0.315)
DY	0.002	0.002	-0.000	-0.000	0.002	-0.002	0.003	0.004	-0.001
	(0.002)	(0.004)	(0.004)	(0.002)	(0.004)	(0.005)	(0.003)	(0.003)	(0.004)
Mkt-rf x Euribor	2.237	0.057	2.180	0.655	5.725*	-5.070	5.237***	-0.105	5.342
	(1.861)	(2.698)	(3.441)	(1.881)	(3.178)	(3.891)	(1.820)	(2.903)	(3.538)
SMB x Euribor	1.438	-14.016**	15.454**	-5.389	-16.480**	11.091	-4.572	-12.839**	8.267

	(3.714)	(6.777)	(6.597)	(3.672)	(7.217)	(9.290)	(3.821)	(6.048)	(6.967)
HML x Euribor	8.321	-22.315***	30.636***	-0.963	-42.222***	41.259***	1.029	-21.624***	22.653**
	(6.987)	(7.082)	(10.075)	(8.100)	(8.991)	(11.635)	(7.688)	(7.469)	(11.117)
RMW x Euribor	7.485	-8.662	16.147	-7.788	-31.295	23.507	5.144	-25.766	30.910
	(15.385)	(16.829)	(25.854)	(17.289)	(19.094)	(26.746)	(17.457)	(16.730)	(26.474)
CMA x Euribor	-8.257	0.612	-8.869	-4.915	9.791	-14.706	13.222**	-18.535**	31.757**
	(5.521)	(8.726)	(10.051)	(6.277)	(11.343)	(13.025)	(6.640)	(8.480)	(12.637)
Mkt-rf x DY	-0.080**	-0.055	-0.026	-0.045	0.069	-0.114*	0.006	0.128***	-0.122*
	(0.034)	(0.049)	(0.063)	(0.037)	(0.056)	(0.060)	(0.041)	(0.046)	(0.066)
SMB x DY	-0.088	-0.019	-0.068	0.023	0.035	-0.013	-0.124*	-0.157	0.032
	(0.061)	(0.110)	(0.128)	(0.062)	(0.144)	(0.169)	(0.069)	(0.107)	(0.135)
HML x DY	0.109	-0.019	0.128	0.049	-0.362**	0.411*	-0.111	-0.421***	0.311
	(0.154)	(0.164)	(0.213)	(0.177)	(0.170)	(0.211)	(0.175)	(0.132)	(0.223)
RMW x DY	0.085	-0.319	0.403	0.085	-0.579***	0.664**	-0.148	-0.376**	0.228
	(0.151)	(0.200)	(0.247)	(0.169)	(0.213)	(0.276)	(0.168)	(0.189)	(0.246)
CMA x DY	-0.156	-0.081	-0.075	-0.110	0.040	-0.149	-0.096	0.430***	-0.526***
	(0.107)	(0.172)	(0.202)	(0.103)	(0.201)	(0.233)	(0.110)	(0.163)	(0.184)
α	-0.001	-0.004***	0.003**	-0.001	-0.002	0.001	-0.001	-0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
W_1	0.1577	0.0737	0.0044	0.7969	0.6006	0.4624	0.0816	0.3267	0.2178
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9819	0.9606	0.4428	0.9845	0.9532	0.3698	0.9788	0.9678	0.2615
Observations	180	180	180	180	180	180	180	180	180

5.2.1.   Robustness test: performance of alternative cut-off portfolios

Once more, we analyze how the profitability of long-short portfolios depends on the cut-off chosen. For each individual dimension, the high- and low-rated portfolios are now composed by the top 50% best socially rated of all stocks and by the bottom 50% of all stocks, respectively, considering a best-in-class approach. We also continue to perform the analysis on the robustness tests based on conditional models, since we observe evidence of time-varying alphas and betas and these models show higher explanatory power compared to the unconditional models. The performance results are summarized in Table 18. [13]

Regardless of the dimension used and unconditional model applied, we obtain similar results. All long-short portfolios yield statistically insignificant abnormal returns, suggesting that when portfolios are formed with a 50% cut-off, investors cannot obtain abnormal returns by following a trading strategy of going long in high-rated stocks and short in low-rated stocks. These results are completely in line with those obtained with the positive approach.

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[13] The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 50% cut-off are presented in Appendixes 15 and 16, respectively.

Table 18. Summary of performance with conditional models using 50% cut-off (best-in-class screening strategy)

This table summarizes the comparison of alphas of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models for portfolios formed on the best-in-class screening strategy and considering a 50% cut-off. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Env. Score	-0.001	-0.001	0.000	-0.001	-0.001	0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Soc. Score	-0.000	-0.001	0.001	-0.001	-0.002*	0.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gov. Score	-0.000	-0.002**	0.001	-0.001	-0.002**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

5.2.2. Robustness test: exclusion of financial companies

We continue our analysis by forming best-in-class portfolios excluding all financial companies from our dataset. Table 19 summarizes the results. [14] When applying the conditional Carhart (1997) four-factor model, to value-weighted portfolios based on individual ESG dimensions and considering a 25% cut-off we continue to observe statistically significantly abnormal returns on the long-short strategy for portfolios formed on Environmental scores even when we exclude financial companies from our dataset. Regarding the Fama and French (2015) five-factor model, no long-short portfolio yields statistically significantly abnormal returns.

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[14] The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 25% cut-off with the exclusion of financial companies are presented in Appendixes 17 and 18, respectively.

Table 19. Summary of performance with conditional models using 25% cut-off with the exclusion of financial companies (best-in-class screening strategy)

This table summarizes the comparison of alphas of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models for portfolios formed on individual ESG dimensions and using best-in-class screening strategy, considering a 25% cut-off, and excluding financial companies. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Env. Score	0.000	-0.003***	0.004***	-0.002***	-0.004***	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Soc. Score	0.000	-0.002	0.002*	-0.001*	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Gov. Score	-0.000	-0.001	0.001	-0.002***	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

5.2.3. Robustness test: different portfolio weighting scheme

The final robustness test applied to the analysis based on the best-in-class approach is the construction of equally-weighted rather than value-weighted portfolios.

The results are summarized in Table 20.[15] Observing the results from the conditional Carhart (1997) four-factor and the Fama and French (2015) five-factor models for equally-weighted portfolios formed on individual ESG dimensions, using a best-in-class approach, and considering a 25% cut-off, we can find different results. Even though no long-short portfolio yields statistically significant abnormal returns when the conditional Fama and French (2015) five-factor model is used, when the conditional Carhart (1997) four-factor specification model is applied all long-short portfolios yield now statistically significant abnormal returns.

The results of the conditional Carhart (1997) four-factor model show that, overall, long-short portfolios formed on the Environmental dimension and using a best-in-class approach, considering a 25% cut-off, exhibit positive and abnormal returns, even when we exclude financial companies from our

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[15] The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor for equally-weighted portfolios formed on individual ESG scores and using best-in-class screens, considering a 25% cut-off are presented in Appendixes 19 and 20, respectively.

dataset or when we apply a different portfolio weighting scheme. However, abnormal returns lose their statistically significance when long-short portfolios are formed with a 50% cut-off. Regarding portfolios formed on Social and Governance scores, we do not find strong evidences of outperformance.

Previous studies applying the best-in-class approach to evaluate social and financial performance on stock portfolios find positive abnormal returns. For instance, Kempf and Osthoff (2007) and Statman and Glushkov (2009) argue that investors can earn abnormal returns by following the long-short strategy. However, it is important to note that we only find consistently abnormal returns on long-short portfolios formed on Environmental scores.

Since this outperformance of portfolios formed on Environmental scores is not evident in the positive approach, for a more complete analysis, we further apply a different portfolio construction approach: the high and low CSP industry portfolio approach.

Table 20. Summary of performance with conditional models using 25% cut-off on equally-weighted portfolios (best-in-class screening strategy)

This table summarizes the comparison of alphas of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models for equally-weighted portfolios formed on the best-in-class screening strategy and considering a 25% cut-off. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Env. Score	0.000	-0.002*	0.003**	-0.001	-0.002*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Soc. Score	0.000	-0.001	0.002**	-0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gov. Score	0.001	-0.001	0.002**	-0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

5.3. Performance of portfolios formed with the high and low CSP industry portfolios approach

Our final portfolio construction approach is the high and low CSP industry portfolios approach. This approach requires ranking all industries on their Environmental, Social and Governance scores and separating industries into the leading and lagging CSP industries, where the leading and lagging CSP industries are those industries with average above and below the 50th percentile, respectively. Then, in each leading and lagging CSP industries, all companies are ranked, and the low-rated and high-rated portfolio are composed by the bottom 25% and the top 25% of companies, respectively.

The number of times each industry belongs to the leading CSP industry portfolio is presented in Table 21. For each pillar, there is some consistency in the composition of each leading and lagging CSP industries portfolio. Regarding the Environmental pillar, real estate, consumer discretionary, telecommunications and utilities are industries consistently included in the leading CSP industry portfolio, while industrials, technology and consumer staples are typically included in the lagging CSP industry portfolio. In the Social pillar, energy, utilities, basic materials and consumer discretionary are frequently part of the leading CSP industry portfolio, while real estate, financials and technology are persistently included in the lagging CSP industry portfolio. Regarding the Governance pillar, telecommunications, energy and basic materials are usually in the top industries, while real estate, consumer discretionary and industrials are the worst industries, regarding to their performance in terms of governance. Although we observe some consistency in the composition of each leading and lagging CSP industries portfolio for each individual dimension, it is worth mentioning that the best industries in one pillar may not perform so well in the other pillars. The real estate industry is an example of this. The real estate industry is consistently among the best industries regarding the Environmental pillar. However, its social and governance performance is persistently poor, never reaching the leading CSP industry portfolio. The high and low CSP industry portfolios approach can be a very interesting approach, since it enables the comparison of companies' social performance taking into consideration their industry position in all ESG dimensions.

Table 21. Number of times each industry is classified as leading industry

This table presents the number of times each industry is classified as leading industry in each individual ESG dimension from 2004 to 2018.

	Environmental	Social	Governance
Basic Materials	8	13	11
Consumer Discretionary	12	13	2
Consumer Staples	2	10	10
Energy	11	15	13
Financials	10	0	10
Health Care	6	7	7
Industrials	0	4	5
Real Estate	15	0	0
Technology	2	2	8
Telecommunications	12	11	15
Utilities	12	15	9

Tables 22 and 23 present the results of the Carhart (1997) four-factor and the Fama and French (2015) five-factor models for value-weighted portfolios formed according to the high and low CSP industry portfolios approach, considering a 25% cut-off. Performance results for the high- and low-rated portfolios, as well as the long-short portfolios for each leading and lagging industry portfolios are presented. Regarding the long-short strategy, the results from the Carhart (1997) four-factor model show positive and significant abnormal returns in lagging long-short portfolios formed on the basis of Governance scores. All the other long-short portfolios yield insignificant abnormal returns. These initial findings suggest that portfolios compressing stocks from companies with high governance performance yield positive abnormal returns when their corresponding industry performance is below the average. However, the results from the Fama and French (2015) five-factor model show no statistically significant abnormal returns.

Table 22. Estimation results of the Carhart (1997) four-factor model on stock portfolios based on the high and low CSP industry portfolios approach

This table provides the estimation results of the Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio (long in the high-rated portfolio and short in the low-rated portfolio). Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	1.004***	1.034***	-0.030	1.008***	1.108***	-0.099***	0.978***	1.033***	-0.055**
	(0.033)	(0.023)	(0.035)	(0.029)	(0.045)	(0.035)	(0.020)	(0.023)	(0.027)
SMB	-0.254**	0.223***	-0.477***	-0.255***	0.443***	-0.699***	-0.232***	0.085	-0.317***
	(0.122)	(0.082)	(0.107)	(0.093)	(0.109)	(0.090)	(0.068)	(0.062)	(0.087)
HML	0.126	-0.013	0.139	-0.077	-0.209**	0.132*	0.117*	-0.001	0.118*
	(0.084)	(0.079)	(0.086)	(0.068)	(0.087)	(0.074)	(0.071)	(0.068)	(0.061)
MOM	0.041	-0.011	0.052	0.081*	-0.098***	0.179***	-0.127***	-0.140***	0.013
	(0.078)	(0.034)	(0.082)	(0.042)	(0.031)	(0.056)	(0.039)	(0.041)	(0.043)
α	-0.004***	-0.003**	-0.001	-0.001	-0.003**	0.002	-0.001	0.001	-0.002*
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.9105	0.9227	0.1554	0.9315	0.9200	0.3858	0.9431	0.9328	0.0914
Observations	180	180	180	180	180	180	180	180	180

Table 22. Continued

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.013***	1.116***	-0.103***	0.971***	1.051***	-0.080**	1.037***	1.123***	-0.085***
	(0.030)	(0.025)	(0.034)	(0.033)	(0.036)	(0.035)	(0.025)	(0.026)	(0.031)
SMB	-0.119	0.538***	-0.657***	-0.247***	0.129	-0.376***	-0.149**	0.351***	-0.500***
	(0.082)	(0.075)	(0.081)	(0.066)	(0.086)	(0.084)	(0.059)	(0.066)	(0.079)
HML	0.126	-0.016	0.142	0.363***	0.124	0.239**	-0.006	-0.029	0.023
	(0.091)	(0.073)	(0.092)	(0.060)	(0.097)	(0.093)	(0.068)	(0.069)	(0.074)
MOM	-0.039	-0.064	0.025	-0.121***	-0.084	-0.037	0.046	-0.025	0.071
	(0.072)	(0.076)	(0.037)	(0.031)	(0.081)	(0.070)	(0.044)	(0.049)	(0.071)
α	0.001	-0.001	0.002	-0.000	-0.000	-0.000	0.001	-0.002	0.003**
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.9126	0.9250	0.2813	0.9483	0.9050	0.1352	0.9361	0.9320	0.2497
Observations	180	180	180	180	180	180	180	180	180

Table 23. Estimation results of Fama and French (2015) five-factor model on stock portfolios based on the high and low CSP portfolios approach

This table provides the estimation results of the Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio (long in the high-rated portfolio and short in the low-rated portfolio). Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	1.001***	1.014***	-0.013	1.015***	1.075***	-0.060*	0.993***	1.034***	-0.041
	(0.030)	(0.026)	(0.037)	(0.029)	(0.040)	(0.035)	(0.022)	(0.027)	(0.036)
SMB	-0.255**	0.222***	-0.477***	-0.230**	0.380***	-0.610***	-0.233***	0.073	-0.306***
	(0.126)	(0.076)	(0.126)	(0.099)	(0.085)	(0.093)	(0.062)	(0.072)	(0.088)
HML	0.174	0.169*	0.005	0.009	-0.022	0.031	0.259***	0.158	0.101
	(0.129)	(0.094)	(0.135)	(0.116)	(0.139)	(0.136)	(0.086)	(0.099)	(0.094)
RMW	0.151	0.288**	-0.137	0.347***	0.090	0.257*	0.099	0.071	0.028
	(0.159)	(0.145)	(0.184)	(0.103)	(0.147)	(0.154)	(0.138)	(0.144)	(0.146)
CMA	0.045	-0.186*	0.231	0.179	-0.419***	0.598***	-0.055	-0.198	0.143
	(0.197)	(0.103)	(0.166)	(0.136)	(0.117)	(0.153)	(0.146)	(0.155)	(0.169)
α	-0.005***	-0.005***	-0.000	-0.003*	-0.003*	0.000	-0.003**	-0.000	-0.003*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Adj. R^2	0.9110	0.9261	0.1706	0.9351	0.9217	0.4122	0.9384	0.9285	0.0966
Observations	180	180	180	180	180	180	180	180	180

Table 23. Continued

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.009***	1.100***	-0.091**	0.968***	1.043***	-0.076*	1.031***	1.105***	-0.074**
	(0.035)	(0.026)	(0.042)	(0.035)	(0.037)	(0.040)	(0.029)	(0.034)	(0.034)
SMB	-0.110	0.543***	-0.653***	-0.289***	0.127	-0.415***	-0.165***	0.306***	-0.471***
	(0.087)	(0.086)	(0.084)	(0.077)	(0.094)	(0.095)	(0.057)	(0.074)	(0.085)
HML	0.250**	0.139	0.111	0.378***	0.232	0.146	-0.019	-0.036	0.017
	(0.122)	(0.127)	(0.112)	(0.113)	(0.179)	(0.148)	(0.096)	(0.127)	(0.133)
RMW	0.159	0.167	-0.008	-0.232**	0.035	-0.268	0.025	-0.117	0.142
	(0.162)	(0.116)	(0.177)	(0.102)	(0.161)	(0.181)	(0.130)	(0.141)	(0.155)
CMA	-0.085	-0.239	0.155	-0.189	-0.191	0.002	0.022	-0.190	0.212
	(0.172)	(0.154)	(0.143)	(0.150)	(0.187)	(0.131)	(0.131)	(0.147)	(0.146)
α	-0.000	-0.002	0.002	0.001	-0.001	0.001	0.002	-0.000	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Adj. R^2	0.9126	0.9273	0.2845	0.9455	0.9042	0.1429	0.9356	0.9321	0.2526
Observations	180	180	180	180	180	180	180	180	180

Tables 24 and 25 present the results of the Carhart (1997) four-factor and the Fama and French (2015) five-factor models in their corresponding conditional specifications. The results of the Wald test continue to show more evidence of time-varying betas than time-varying alphas and the adjusted R-squared continues to increase when we change from unconditional to conditional models.

While the results from the conditional Carhart (1997) four-factor model show positive and statistically significant abnormal returns for long-short portfolios from the leading industry formed on Environmental scores and long-short portfolios from the lagging industry formed on the Governance scores, the conditional Fama and French (2015) five-factor model continues to show no statistically significant abnormal returns.

Some of these initial findings are not surprising. In our previous analysis using the best-in-class approach, the conditional Carhart (1997) four-factor model consistently reports positive abnormal returns in long-short portfolios formed on Environmental scores (except for portfolios formed with a 50% cut-off). Regarding the results with respect to the Governance pillar, they imply that investors can obtain abnormal returns when their portfolios include stocks from companies with high governance performance if their corresponding industry performance is below the average. We further consider some robustness test for a more detailed analysis.

Table 24. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on the high and low CSP portfolios approach

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are calculated using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	0.983***	1.042***	-0.057*	1.015***	1.073***	-0.058*	0.975***	1.019***	-0.044
	(0.031)	(0.031)	(0.032)	(0.024)	(0.033)	(0.031)	(0.024)	(0.032)	(0.038)
SMB	-0.417***	0.239**	-0.650***	-0.350***	0.369***	-0.719***	-0.282***	0.063	-0.344***
	(0.091)	(0.100)	(0.083)	(0.059)	(0.082)	(0.089)	(0.073)	(0.071)	(0.100)
HML	0.188**	-0.007	0.187**	-0.070	-0.188**	0.119	0.134	0.053	0.080
	(0.082)	(0.084)	(0.078)	(0.071)	(0.087)	(0.078)	(0.084)	(0.076)	(0.074)
MOM	-0.109*	0.039	-0.146***	0.023	-0.043	0.066	-0.090	-0.023	-0.067
	(0.066)	(0.057)	(0.056)	(0.050)	(0.045)	(0.070)	(0.065)	(0.053)	(0.069)
Euribor	0.046	0.632	-0.751**	0.448**	0.049	0.399	-0.276	-0.504	0.228
	(0.339)	(0.448)	(0.298)	(0.218)	(0.319)	(0.319)	(0.267)	(0.339)	(0.546)
DY	-0.006	-0.001	-0.005	-0.006**	-0.003	-0.003	-0.000	0.004	-0.004
	(0.004)	(0.005)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.006)
Mkt-rf x Euribor	8.082	-7.925	15.726***	0.155	1.513	-1.358	5.518	-4.590	10.108
	(6.031)	(5.520)	(4.610)	(3.298)	(6.262)	(5.325)	(4.060)	(6.629)	(8.722)
SMB x Euribor	-14.147	-23.334	8.273	-22.685***	-2.765	-19.920	-8.176	-20.419	12.243
	(13.169)	(15.680)	(10.727)	(8.647)	(12.428)	(13.921)	(7.840)	(12.739)	(16.201)

HML x Euribor	36.437***	-1.342	34.433***	14.684**	1.356	13.328	5.219	-0.856	6.076
	(10.220)	(12.912)	(13.165)	(7.359)	(11.947)	(12.255)	(9.119)	(9.815)	(14.509)
MOM x Euribor	-1.627	-1.066	-2.131	-0.418	6.267	-6.686	6.268*	2.049	4.219
	(4.155)	(4.284)	(4.953)	(3.163)	(5.545)	(6.217)	(3.482)	(4.573)	(5.893)
Mkt-rf x DY	0.128	0.012	0.113	0.060	0.180**	-0.119	0.024	0.133**	-0.109
	(0.083)	(0.085)	(0.077)	(0.082)	(0.088)	(0.102)	(0.081)	(0.066)	(0.109)
SMB x DY	0.090	-0.016	0.092	0.273**	0.391**	-0.118	-0.154	-0.062	-0.092
	(0.167)	(0.164)	(0.174)	(0.132)	(0.166)	(0.211)	(0.110)	(0.148)	(0.211)
HML x DY	-0.437	-0.308	-0.112	-0.317	-0.417	0.101	-0.217	-0.281	0.064
	(0.267)	(0.240)	(0.224)	(0.244)	(0.256)	(0.247)	(0.232)	(0.208)	(0.279)
MOM x DY	-0.006	-0.317**	0.301*	0.056	-0.100	0.155	-0.090	-0.180	0.090
	(0.158)	(0.140)	(0.170)	(0.137)	(0.129)	(0.184)	(0.144)	(0.154)	(0.226)
α	-0.000	-0.004***	0.003**	-0.000	-0.003**	0.003	-0.002	-0.000	-0.002
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
W_1	0.2711	0.3134	0.0207	0.0092	0.6884	0.3830	0.4665	0.3185	0.7958
W_2	0.0000	0.4415	0.0000	0.0001	0.0237	0.0000	0.1024	0.0581	0.4718
W_3	0.0000	0.4552	0.0000	0.0000	0.0040	0.0000	0.0896	0.0211	0.5447
Adj. R^2	0.9332	0.9232	0.3431	0.9416	0.9223	0.4194	0.9429	0.9351	0.0701
Observations	180	180	180	180	180	180	180	180	180

Table 24. Continued

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.014***	1.081***	-0.066*	0.988***	1.064***	-0.076**	1.032***	1.116***	-0.084***
	(0.039)	(0.026)	(0.039)	(0.026)	(0.030)	(0.037)	(0.031)	(0.026)	(0.032)
SMB	-0.080	0.537***	-0.616***	-0.193***	0.188**	-0.381***	-0.170**	0.374***	-0.544***
	(0.086)	(0.078)	(0.080)	(0.046)	(0.075)	(0.081)	(0.069)	(0.083)	(0.095)
HML	0.102	-0.008	0.110	0.368***	0.067	0.301***	0.002	-0.032	0.034
	(0.106)	(0.071)	(0.105)	(0.070)	(0.079)	(0.081)	(0.074)	(0.070)	(0.083)
MOM	0.072	0.091	-0.019	-0.093**	0.075	-0.168***	0.009	0.071	-0.062
	(0.073)	(0.060)	(0.059)	(0.038)	(0.046)	(0.051)	(0.055)	(0.077)	(0.063)
Euribor	-0.292	-0.278	-0.014	-0.758***	-0.208	-0.550***	-0.140	-0.276	0.136
	(0.296)	(0.287)	(0.325)	(0.174)	(0.213)	(0.202)	(0.252)	(0.276)	(0.393)
DY	0.000	-0.000	0.001	0.007*	0.004	0.003	0.002	0.008*	-0.006
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Mkt-rf x Euribor	2.807	4.199	-1.392	4.991**	12.563***	-7.572	6.120	4.104	2.017
	(4.607)	(4.789)	(5.697)	(2.526)	(4.097)	(5.144)	(4.442)	(4.827)	(4.928)
SMB x Euribor	11.517	9.336	2.180	17.101**	1.268	15.833	16.306*	-1.563	17.869
	(13.443)	(14.460)	(16.697)	(7.161)	(9.748)	(11.959)	(9.683)	(14.640)	(19.805)
HML x Euribor	-11.871	-16.759	4.888	-12.862*	-53.316***	40.454***	5.968	-31.222***	37.190***
	(13.446)	(13.552)	(15.952)	(7.101)	(11.252)	(12.394)	(9.882)	(10.492)	(13.483)
MOM x Euribor	9.791**	12.967**	-3.176	-1.748	8.534**	-10.282**	0.822	1.699	-0.877
	(4.271)	(5.816)	(6.125)	(2.946)	(3.427)	(4.226)	(4.656)	(4.349)	(5.358)
Mkt-rf x DY	-0.071	0.071	-0.142	-0.216***	-0.184***	-0.032	-0.063	0.050	-0.113
	(0.091)	(0.083)	(0.090)	(0.082)	(0.068)	(0.084)	(0.088)	(0.079)	(0.075)
SMB x DY	-0.151	0.180	-0.331**	-0.314***	-0.219	-0.095	-0.024	0.088	-0.112
	(0.145)	(0.168)	(0.160)	(0.117)	(0.160)	(0.185)	(0.114)	(0.161)	(0.162)
HML x DY	0.141	0.023	0.118	0.263	0.216	0.047	-0.175	0.037	-0.212
	(0.263)	(0.208)	(0.301)	(0.192)	(0.242)	(0.249)	(0.219)	(0.225)	(0.210)

MOM x DY	0.000	-0.138	0.138	-0.207*	-0.367***	0.160	-0.199	-0.114	-0.085
	(0.124)	(0.153)	(0.152)	(0.107)	(0.109)	(0.154)	(0.131)	(0.142)	(0.141)
α	-0.001	-0.002	0.001	-0.001	-0.003*	0.002	0.002	-0.002*	0.004***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
W_1	0.5301	0.5955	0.9942	0.0001	0.5055	0.0243	0.8506	0.1479	0.3518
W_2	0.0004	0.0000	0.0057	0.0000	0.0000	0.0000	0.0202	0.0006	0.0000
W_3	0.0000	0.0000	0.0060	0.0000	0.0000	0.0000	0.0023	0.0006	0.0000
Adj. R^2	0.9181	0.9336	0.2749	0.9532	0.9226	0.2345	0.9370	0.9360	0.3209
Observations	180	180	180	180	180	180	180	180	180

Table 25. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on the high and low CSP portfolios approach

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	0.992***	1.019***	-0.027	1.018***	1.046***	-0.027	1.000***	1.008***	-0.009
	(0.027)	(0.032)	(0.037)	(0.022)	(0.033)	(0.033)	(0.021)	(0.032)	(0.039)
SMB	-0.399***	0.251***	-0.645***	-0.329***	0.349***	-0.678***	-0.262***	0.074	-0.336***
	(0.084)	(0.086)	(0.094)	(0.057)	(0.080)	(0.092)	(0.064)	(0.072)	(0.099)
HML	0.343***	0.184*	0.145	0.102	0.025	0.077	0.226**	0.183**	0.042
	(0.087)	(0.106)	(0.119)	(0.087)	(0.110)	(0.116)	(0.092)	(0.080)	(0.088)
RMW	0.191	0.321**	-0.134	0.396***	0.192*	0.204	0.147	0.174	-0.027
	(0.164)	(0.160)	(0.184)	(0.090)	(0.115)	(0.147)	(0.132)	(0.123)	(0.133)
CMA	-0.016	-0.190	0.188	0.103	-0.404***	0.507***	0.118	-0.102	0.220*
	(0.155)	(0.127)	(0.138)	(0.091)	(0.134)	(0.124)	(0.106)	(0.119)	(0.132)
Euribor	0.353	1.037**	-0.824**	0.376	0.052	0.324	-0.670*	-0.493	-0.177
	(0.357)	(0.436)	(0.409)	(0.306)	(0.415)	(0.421)	(0.389)	(0.507)	(0.809)
DY	-0.003	0.009**	-0.011*	0.000	0.006	-0.005	0.003	0.008	-0.004
	(0.005)	(0.004)	(0.006)	(0.004)	(0.004)	(0.006)	(0.003)	(0.005)	(0.006)
Mkt-rf x Euribor	0.300	-8.864**	9.203*	-0.508	0.921	-1.429	4.559	-3.331	7.890
	(5.894)	(4.261)	(4.985)	(3.463)	(4.920)	(4.500)	(3.514)	(6.737)	(8.931)

SMB x Euribor	-25.491**	-24.887*	-0.087	-30.109***	-19.635***	-10.474	-10.101	-26.565**	16.464
	(11.765)	(13.251)	(10.643)	(6.014)	(6.547)	(9.487)	(6.729)	(12.215)	(17.171)
HML x Euribor	23.634	-12.075	34.225**	19.125	-14.462	33.586***	5.988	-9.739	15.727
	(14.994)	(17.662)	(13.214)	(14.769)	(13.831)	(10.858)	(12.798)	(15.631)	(24.974)
RMW x Euribor	-39.601	-38.674	-2.639	5.493	-6.212	11.705	32.277	-5.751	38.028
	(24.763)	(32.228)	(32.437)	(23.146)	(21.310)	(25.659)	(25.938)	(30.448)	(49.107)
CMA x Euribor	-27.138**	-29.505*	-0.482	-11.453	-2.547	-8.906	37.375***	5.804	31.571*
	(11.369)	(16.452)	(16.829)	(8.317)	(14.831)	(15.973)	(11.526)	(12.608)	(17.892)
Mkt-rf x DY	0.119	-0.029	0.146	0.059	0.185**	-0.125	0.030	0.179***	-0.148
	(0.089)	(0.092)	(0.100)	(0.072)	(0.083)	(0.093)	(0.075)	(0.065)	(0.099)
SMB x DY	0.022	-0.268	0.272	0.125	0.164	-0.039	-0.181	-0.101	-0.081
	(0.158)	(0.183)	(0.232)	(0.152)	(0.136)	(0.208)	(0.117)	(0.192)	(0.257)
HML x DY	-0.165	-0.300	0.140	-0.656**	-0.985***	0.330	-0.021	-0.495**	0.474
	(0.336)	(0.305)	(0.349)	(0.287)	(0.293)	(0.273)	(0.282)	(0.219)	(0.355)
RMW x DY	0.378	-0.626*	0.983**	-0.604**	-1.195***	0.591*	0.024	-0.652**	0.676*
	(0.338)	(0.340)	(0.421)	(0.249)	(0.241)	(0.325)	(0.272)	(0.262)	(0.385)
CMA x DY	-0.348	-0.493*	0.126	-0.078	0.129	-0.207	-0.432**	0.033	-0.464
	(0.224)	(0.253)	(0.293)	(0.170)	(0.170)	(0.205)	(0.172)	(0.214)	(0.292)
α	-0.003	-0.006***	0.002	-0.003**	-0.004**	0.001	-0.004***	-0.002	-0.003
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
W_1	0.5776	0.0029	0.0397	0.4698	0.4350	0.5361	0.2008	0.2479	0.6660
W_2	0.0000	0.0474	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0321
W_3	0.0000	0.0164	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0550
Adj. R^2	0.9347	0.9278	0.3475	0.9482	0.9281	0.4526	0.9437	0.9359	0.1169
Observations	180	180	180	180	180	180	180	180	180

Table 25. Continued

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.018***	1.072***	-0.054	0.990***	1.053***	-0.063	1.019***	1.089***	-0.070*
	(0.041)	(0.024)	(0.044)	(0.027)	(0.032)	(0.040)	(0.030)	(0.031)	(0.036)
SMB	-0.070	0.583***	-0.652***	-0.241***	0.207***	-0.448***	-0.194***	0.359***	-0.553***
	(0.081)	(0.088)	(0.083)	(0.052)	(0.079)	(0.087)	(0.067)	(0.089)	(0.106)
HML	0.152	0.077	0.075	0.287***	0.077	0.210*	0.056	-0.017	0.073
	(0.116)	(0.093)	(0.123)	(0.085)	(0.106)	(0.115)	(0.094)	(0.106)	(0.122)
RMW	0.149	0.193*	-0.044	-0.296***	0.008	-0.303*	0.036	-0.039	0.075
	(0.179)	(0.109)	(0.188)	(0.095)	(0.159)	(0.183)	(0.119)	(0.133)	(0.152)
CMA	-0.025	-0.176	0.151	-0.096	-0.123	0.027	-0.107	-0.258**	0.152
	(0.195)	(0.151)	(0.182)	(0.127)	(0.148)	(0.143)	(0.142)	(0.126)	(0.146)
Euribor	-0.702*	-0.256	-0.447	-0.862***	0.208	-1.070***	-0.251	0.267	-0.518
	(0.406)	(0.330)	(0.505)	(0.237)	(0.224)	(0.279)	(0.235)	(0.304)	(0.423)
DY	0.000	-0.004	0.004	0.002	-0.000	0.003	0.003	0.008*	-0.005
	(0.006)	(0.005)	(0.006)	(0.004)	(0.005)	(0.006)	(0.005)	(0.005)	(0.007)
Mkt-rf x Euribor	5.525	9.719**	-4.194	4.748	18.831***	-14.083***	8.706**	5.131	3.575
	(5.378)	(4.334)	(5.654)	(2.899)	(4.375)	(4.347)	(3.821)	(4.502)	(5.372)
SMB x Euribor	12.502	1.929	10.573	28.220***	2.690	25.530***	14.175	-10.282	24.457
	(12.019)	(10.404)	(8.310)	(6.460)	(7.646)	(6.760)	(9.467)	(13.028)	(19.985)
HML x Euribor	-9.307	-46.354***	37.047**	-11.493	-94.899***	83.405***	0.245	-58.919***	59.164***
	(14.821)	(11.411)	(17.601)	(10.216)	(9.950)	(10.361)	(10.011)	(11.686)	(16.520)
RMW x Euribor	42.757	-12.351	55.108	4.894	-57.276***	62.169**	2.670	-61.788***	64.458*
	(30.254)	(22.311)	(40.541)	(15.180)	(21.284)	(24.712)	(19.008)	(22.713)	(33.225)
CMA x Euribor	29.191*	30.746**	-1.555	11.158	24.903*	-13.745	-2.855	-27.410*	24.555
	(15.581)	(14.455)	(16.591)	(8.375)	(13.880)	(15.270)	(15.716)	(14.565)	(19.922)
Mkt-rf x DY	-0.096	0.144**	-0.240**	-0.224***	-0.143*	-0.081	-0.022	0.061	-0.082
	(0.105)	(0.071)	(0.096)	(0.085)	(0.084)	(0.105)	(0.096)	(0.077)	(0.099)

SMB x DY	-0.151	0.199	-0.350**	-0.201*	-0.265	0.064	-0.043	-0.042	-0.000
	(0.145)	(0.177)	(0.172)	(0.118)	(0.165)	(0.148)	(0.120)	(0.160)	(0.207)
HML x DY	0.228	-0.164	0.392	0.918***	0.512*	0.406	-0.379	-0.145	-0.234
	(0.264)	(0.211)	(0.291)	(0.241)	(0.265)	(0.346)	(0.241)	(0.214)	(0.259)
RMW x DY	-0.039	-0.273	0.235	0.814***	0.153	0.661*	-0.636**	-0.350	-0.285
	(0.268)	(0.226)	(0.362)	(0.205)	(0.264)	(0.345)	(0.286)	(0.242)	(0.287)
CMA x DY	0.032	0.586***	-0.554*	-0.286	0.040	-0.326	0.217	0.365	-0.148
	(0.327)	(0.205)	(0.301)	(0.183)	(0.263)	(0.267)	(0.281)	(0.257)	(0.254)
α	-0.001	-0.002	0.001	0.001	-0.001	0.002	0.002	-0.001	0.003
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
W_1	0.2117	0.4223	0.6202	0.0015	0.6501	0.0008	0.4515	0.1743	0.3812
W_2	0.0000	0.0000	0.0042	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
W_3	0.0000	0.0000	0.0018	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Adj. R^2	0.9166	0.9347	0.2917	0.9555	0.9212	0.2476	0.9381	0.9380	0.3222
Observations	180	180	180	180	180	180	180	180	180

5.3.1. Robustness test: performance of alternative cut-off portfolios

We now analyze value-weighted portfolios formed according to the high and low CSP industry portfolio approach based on individual ESG scores with a 50% cut-off. The results are summarized in Table 26.[16] Long-short portfolios formed on Governance scores evaluated with the conditional Carhart (1997) four-factor model continue to exhibit significant abnormal returns when long-short portfolios include stocks from companies with industry performance below the average.

The conditional Fama and French (2015) five-factor model strengthens the outperformance of the long-short portfolios formed on Governance scores that include stocks from companies with industry performance below the average. However, no other long-short portfolio displays significant abnormal alphas. This neutral performance goes in line with some previous research. Humphrey *et al.* (2012) perform a similar analysis with an extended Carhart (1997) four-factor model with industry and idiosyncratic risk controls. They also find no significant abnormal return for long-short portfolios with a 50% cut-off. Although they do not report the results for the original Carhart (1997) four-factor model, the authors find similar results. Lee *et al.* (2013) also apply an augmented Carhart (1997) four-factor model and continue to find no significant result for long-short portfolios with a 50% cut-off.

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[16] The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using high and low CSP industry portfolios screens, considering a 50% cut-off are presented in Appendixes 21 and 22, respectively.

Table 26. Summary of performance with conditional models using 50% cut-off (high and low CSP industry screening strategy)

This table summarizes the comparison of alphas of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models for portfolios formed on the high and low CSP industry screening strategy, considering a 50% cut-off. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Leading						
Env. Score	-0.000	-0.002	0.002	-0.002	-0.002	0.000
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Soc. Score	-0.001	-0.002	0.001	-0.003***	-0.003**	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gov. Score	-0.002	-0.002*	0.001	-0.004***	-0.005***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Lagging						
Env. Score	-0.001	0.001	-0.002	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Soc. Score	-0.000	-0.001	0.001	0.002	-0.001	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gov. Score	0.002*	-0.002	0.004***	0.002	-0.000	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)

5.3.2. Robustness test: exclusion of financial companies

Our second robustness test involves the exclusion of financial companies. The results are summarized in Table 27.[17] We observe that the results for value-weighted portfolios formed according to the high and low CSP industry portfolios approach with a 25% cut-off and excluding financial companies are very similar to those obtain when all companies are included. The conditional Carhart (1997) four-factor model continues to show positive and statistically significant abnormal returns in the lagging CSP long-short portfolio formed on Governance scores and in the leading CSP long-short portfolio formed on

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[17] The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using high and low CSP industry portfolios screens, considering a 25% cut-off with the exclusion of financial companies are presented in Appendixes 23 and 24, respectively.

Environmental scores. Additionally, the conditional Fama and French (2015) five-factor model continues to show no significant abnormal returns.

The results obtained from the conditional Carhart (1997) four-factor model show that long-short portfolios from the lagging industry formed on the Governance scores yield statistically abnormal returns, even when we change the cut-off chosen or when we exclude financial companies. Regarding the Environmental dimension, the conditional Carhart (1997) four-factor model presents similar results with the best-in-class approach: long-short portfolios formed considering a 25% cut-off exhibit positive and abnormal returns when we consider all companies in our dataset or when we exclude financial companies from our dataset. From the high and low CSP industry portfolio approach, we find that this outperformance is driven by long-short portfolios including stocks from companies with industry performance above the average. However, this outperformance disappears when we consider a 50% cut-off.

Table 27. Summary of performance with conditional models using 25% cut-off with the exclusion of financial companies (high and low CSP industry screening strategy)

This table summarizes the comparison of alphas of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models for portfolios formed on the high and low CSP industry screening strategy, considering a 25% cut-off, and excluding financial companies. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Leading						
Env. Score	0.000	-0.003**	0.003**	-0.003*	-0.005***	0.002
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Soc. Score	-0.000	-0.003*	0.002	-0.003**	-0.004*	0.000
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Gov. Score	-0.002	0.000	-0.003	-0.006***	-0.002	-0.004*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Lagging						
Env. Score	0.001	-0.002	0.003	-0.001	-0.002	0.002
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Soc. Score	0.001	-0.001	0.002	0.001	0.001	-0.000
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Gov. Score	0.002*	-0.002*	0.004***	0.002	-0.001	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)

5.3.3. Robustness test: different portfolio weighting scheme

The results obtained when considering a different weighting scheme, i.e., equally-weighted portfolios, are presented in Table 28.[18] The analysis performed with the conditional Carhart (1997) four-factor model shows that equally-weighted long-short portfolios formed on Governance scores and Social scores, considering a 25% cut-off, yield positive and statistically significant abnormal returns when their portfolios include stocks from companies with industry performance below the average.

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[18] The detailed results of the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model for equal-weighted portfolios formed on individual ESG dimensions and using high and low CSP industry portfolios screens, considering a 25% cut-off are presented in Appendixes 25 and 26, respectively.

Regarding the results from the conditional Fama and French (2015) five-factor model, we continue to find no outperformance.

Table 28. Summary of performance with conditional models using 25% cut-off on equally-weighted portfolios (high and low CSP industry screening strategy)

This table summarizes the comparison of alphas for the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models for equally-weighted portfolios formed on the high and low CSP industry screening strategy and considering a 25% cut-off. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. The values of the standard errors are presented in parenthesis.

	Conditional 4-factor model			Conditional 5-factor model		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Leading						
Env. Score	0.000	-0.002*	0.002*	-0.002	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Soc. Score	0.000	-0.002	0.002	-0.003***	-0.003*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Gov. Score	-0.002*	-0.002**	0.001	-0.003***	-0.004***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lagging						
Env. Score	0.000	-0.002	0.003	-0.001	-0.002	0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Soc. Score	0.001	-0.002	0.003**	0.001	-0.000	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gov. Score	0.002	-0.001	0.002**	0.001	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)

5.4. Evolution of social and financial performance over time

Prior research addresses the question of whether financial performance of SRI is stable over time. Empirical evidence has shown significantly differences over time on the relationship between socially responsible investment and financial performance. In light of these findings, we analyze social performance over time and evaluate social and financial performance in subperiods.

5.4.1. Social ratings over time

One of our motivations to evaluate socially responsible investments by forming synthetic portfolios on the basis of stocks' social characteristics is the lack of long-term ESG persistence in actively managed mutual funds. For instance, Wimmer (2013) documents that ESG scores persist only for approximately two years. However, this lack of persistency is driven not by changes in companies' ESG ratings, but by changes in the portfolios' composition as a result of managers' investment strategies. In order to analyze how the social performance of our portfolios perform over time, we present the evolution of ESG ratings in Figure 1. For each individual dimension, Figure 1 shows the evolution of the mean ESG ratings of both high- and low-rated portfolios between 2004 and 2018. High- and low-rated portfolios formed with a positive approach and 25% and 50% cut-offs are represented by solid and dashed lines, respectively.

As we can observe, ESG scores seem to be highly consistent over time, justifying the use of synthetic portfolios formed on the basis of stocks' social characteristics rather than actively managed socially responsible mutual funds to assess the performance of socially responsible investments. In the case of portfolios formed on the Environmental and Social dimensions, it is noteworthy to mention the slight upward trend of the ratings over time. Also, over time there is always a considerable difference between the mean ratings of the high- and low-rated portfolios whatever dimension is considered.

Figure 1. Evolution of portfolio ESG ratings over time

This figure shows the evolution of the mean ESG ratings of both high- and low-rated portfolios between 2004 and 2018. High- and low-rated portfolios formed with a 25% and 50% cut-off formed according to the positive approach are represented by dashed and solid lines, respectively.
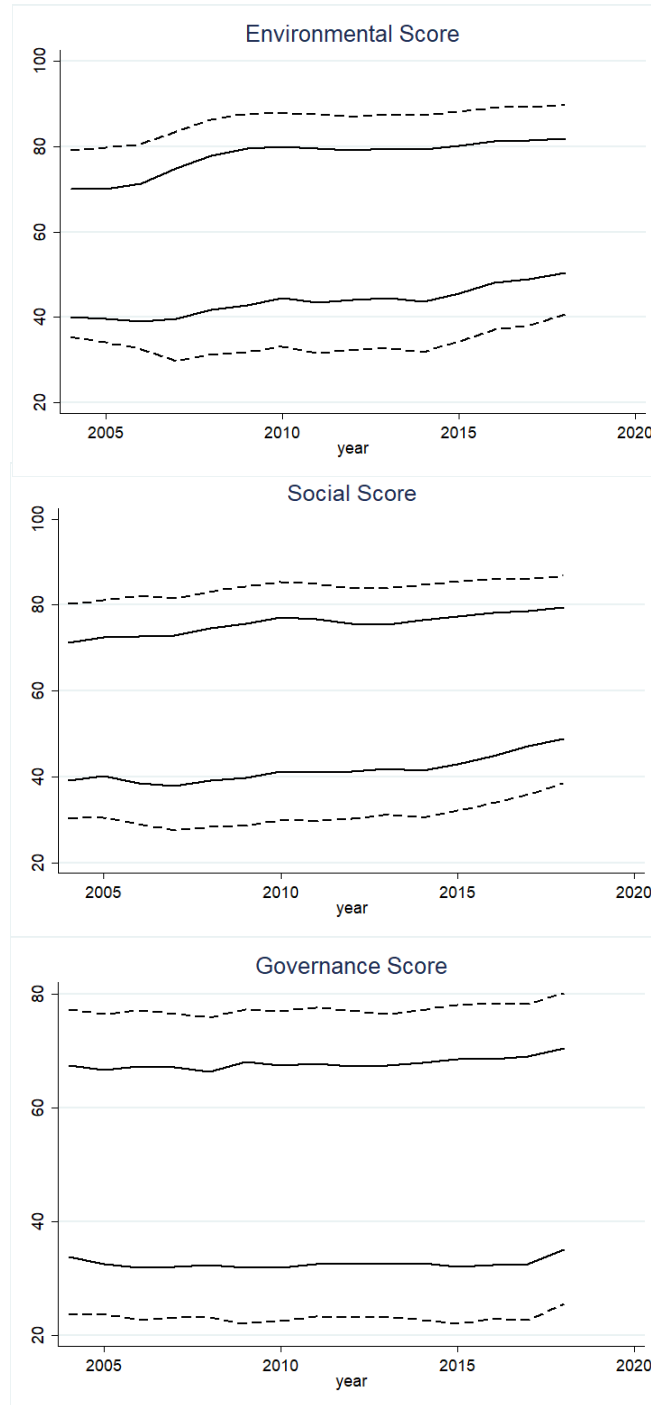
Additionally, since we also apply the high and low CSP industry portfolio approach, Figure 2 shows the evolution of the mean ESG ratings of the leading and lagging industry portfolios. Overall, Environmental and Social ratings tend to increase in both leading and lagging industry portfolios, with the exception of two slowdown periods - the first one around 2007 and the second one from 2010 to 2014. Regarding the Governance score, the mean scores of the leading industry portfolio tend to decrease from 2005 to 2014, while the lagging industry portfolio experiences a growth trend. These two contrasting trends could help explain the differences in abnormal returns of long-short portfolios of stocks from companies with high governance scores when their corresponding industry performance is below or above the average. This issue will be further explored.

Furthermore, Figure 3 presents the evolution of the mean ESG ratings for each high- and low-rated portfolios of the leading and lagging industry. Overall, ESG ratings seem to be quite stable over time and both high- and low-rated portfolios of the leading industry present slightly higher mean scores than those of the lagging industry.

Figure 2. Evolution of leading and lagging industry portfolio ESG ratings over time

This figure shows the evolution of the mean ESG ratings of the leading and lagging industry portfolios, represented by the solid and dashed lines, respectively.

Figure 3. Evolution of ESG ratings of each high- and low-rated portfolios from the leading and lagging industry over time

This figure shows the evolution of the mean ESG ratings for high- and low-rated portfolios of the leading and lagging industry.

Leading and lagging industry portfolios are represented by the solid and dashed lines, respectively.

5.4.2. Financial performance of SRI stocks over time

As we discussed in the literature review, prior research finds evidences that suggests time-dependency of SRI portfolio performance. To further explore the evolution of SRI portfolios over time, we divide the period of analysis into three subperiods (2005-2009; 2010-2014; 2015-2019). In this analysis, we only present the estimation results of the conditional models. We report the results for value-weighted stock portfolios formed on individual dimensions and using positive screens considering a 25% cut-off. Additionally, we also perform our three robustness tests: alternative cut-off, the exclusion of financial companies and a different portfolio weighting scheme. For a more comprehensive comparative analysis, Table 29 displays the alphas of the long-short portfolios for the full period and for the three subperiods considered.[19]

The results of the first period of analysis, between 2005 and 2009, show some negative and statistically abnormal returns from a long-short strategy. Long-short portfolios formed on Social scores yield negative and statistically abnormal returns, regardless of the cut-off chosen or the portfolio weighting scheme applied. Additionally, value-weighted portfolios formed on Environmental scores, considering a 25% cut-off, also yield negative and statistically abnormal returns. These negative returns are particularly highlighted in the conditional Fama and French (2015) five-factor model. It is also worth mentioning that the 2005-2009 period covers the 2008 financial crisis, which could be a possible explanation for these negative effects on portfolio performance.

The results of second period of analysis, between 2010 and 2014, reveals opposite results compared to the first period. The conditional Carhart (1997) four-factor model shows that long-short portfolios, considering a 25% cut-off, yield positive and abnormal returns, for all ESG dimensions. These results persist for both value- and equally-weighted portfolios. Additionally, when we exclude financial companies from our dataset, long-short portfolios formed on Environmental and Governance dimensions continue to show positive alphas and when we consider a 50% cut-off, long-short portfolios on Governance dimensions also yield positive abnormal returns. The results of the conditional Fama and French (2015) five-factor model strengthen the outperformance of the long-short portfolios formed on Environmental scores.

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[19] The detailed results on the subperiod analysis of the conditional Carhart (1997) four-factor specification model and conditional Fama and French (2015) five-factor model for value- and equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% and 50% cut-off with both inclusion and exclusion of financial companies are presented in Appendixes 27 to 50.

The results of the third period of analysis, between 2015 and 2019, continue to show positive and abnormal returns. We highlight the results of long-short portfolios formed on Environmental scores that continue to yield positive and statistically abnormal returns, even when we exclude financial companies from our dataset or when we apply a different portfolio weighting scheme, regardless of the conditional model applied. However, any positive effect of screening disappears when the portfolios are formed with a 50% cut-off. Additionally, the statistical significance of alphas of long-short portfolios formed on Social scores increases and positive and abnormal returns persist, regardless of the cut-off chosen and weighting scheme applied.

These results provide additional insights. Although long-short portfolios formed on Environmental scores using the positive approach did not yield statistically significant abnormal returns in the analysis for the overall period, the subperiods analysis shows us that long-short portfolios formed on Environmental scores yield positive and statistically abnormal returns since 2010, and that this outperformance continues to persist. The positive abnormal returns on portfolios formed on Environmental scores are capture in all three different approaches: the positive approach, the best-in-class approach and the high and low CSP industry portfolios approach.

Additionally, our results suggest the time-dependency of SRI portfolio performance, but not as previous research has argued. Derwall et a. (2011), Borges *et al.* (2013) and Halbritter and Dorfleitner (2015) find that significant abnormal returns obtained in early periods diminish and lose statistical significance over time. However, these studies have several limitations. First, these investigations are limited to the US market. Second, their period of analysis goes at most up to 2012. Finally, we were not able to find previous studies that evaluate social and financial performance over time on stock portfolios with the application of conditional models.

Table 29. The alphas of long-short portfolios for the overall period and three subperiods

This table presents the alphas of the long-short portfolios for the overall period (2005-2019) and three subperiods (2005-2009, 2010-2014 and 2015-2019) using the conditional Carhart (1997) four-factor model and the conditional Fama and French (2015) five-factor model. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively.

	2005-2019			2005-2009			2010-2014			2015-2019		
	Env	Soc	Gov	Env	Soc	Gov	Env	Soc	Gov	Env	Soc	Gov
25% cut-off												
Conditional Carhart (1997) four-factor	0.002*	0.003**	0.001	-0.003*	-0.000	-0.004	0.008***	0.007***	0.007***	0.008***	0.006**	0.002
Conditional Fama and French (2015) five-factor	0.002	0.001	0.000	-0.007**	-0.005**	-0.004	0.006***	0.006*	0.003	0.008***	0.006**	0.000
50% cut-off												
Conditional Carhart (1997) four-factor	-0.000	0.000	0.001	-0.003	-0.003*	-0.002	0.002	0.002	0.004***	0.001	0.004***	0.002
Conditional Fama and French (2015) five-factor	-0.000	0.000	0.001	-0.004*	-0.005**	-0.004	0.001	0.003	0.002	0.001	0.005***	0.002
Exclusion of financial companies												
Conditional Carhart (1997) four-factor	0.002	0.002	0.001	-0.000	0.000	-0.003	0.006***	0.004*	0.006***	0.009***	0.006*	0.003
Conditional Fama and French (2015) five-factor	0.001	-0.000	-0.001	-0.002	-0.005	0.000	0.003	0.001	0.001	0.006***	0.006	-0.000
Equally-weighted												
Conditional Carhart (1997) four-factor	0.002*	0.002*	0.002**	0.000	-0.001	-0.002	0.005***	0.004***	0.005***	0.007**	0.006**	0.002
Conditional Fama and French (2015) five-factor	0.001	0.000	0.001	-0.004**	-0.006***	-0.000	0.004***	0.003**	0.003	0.005**	0.007***	-0.001

5.4.3. Financial performance of SRI stocks in time of crisis

Our previous analysis provides evidence of time-dependency of SRI portfolio performance. The results show that, since 2010, a long-short strategy based on Environmental screens generates positive abnormal returns. However, in the first period of analysis - between 2005 and 2009 - we do not find evidence of any outperformance. A possible explanation for the negative effects on portfolio performance is the financial effects of the 2008-2009 financial crisis. In order to analyze whether there are differences in social and financial performance in different states of the market, we apply an alternative conditional model with a dummy variable to distinguish expansion and recession periods (as in Areal *et al.*, 2013). According to the CEPR, there are two recession periods in Europe: from January 2008 to April 2009 and from July 2011 to January 2013.

The results of the conditional Carhart (1997) four-factor and the conditional Fama and French (2015) five-factor models with a dummy variable are presented in Tables 30 and 31. Both tables provide results of the high- and low-rated portfolios as well as long-short portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off.

The results of the conditional Carhart (1997) four-factor model with a dummy variable show that regardless of the dimension considered, in expansions the alphas of high-rated portfolios are not statistically significant and in recessions the performance of these portfolios does not change significantly relative to expansions. However, low-rated portfolios yield negative and statistically significant abnormal returns in expansion periods and their performance changes in a positive and statistically significant way in recessions. The results of the conditional Fama and French (2015) five-factor model with a dummy variable only highlight the differences in performance between the different states of the market in low-rated portfolios formed on Environmental scores. These initial results show evidence that low-rated portfolios are more sensitive to changes in the state of the market.

In a long-short strategy, the results of the conditional Carhart (1997) four-factor model with a dummy variable show that high-rated portfolios formed on Environmental scores outperform their low-rates peers in expansion periods, but that outperformance decreases in a statistically significant way in recession periods. Regarding portfolios formed on Social and Governance scores, differences in portfolio performance do not change in recession periods relative to expansion periods. Portfolios formed on Social scores outperform in both market states and portfolios formed on Governance scores show a neutral performance. However, the results of the conditional Fama and French (2015) five-factor model

show that long-short portfolios yield statistically insignificant abnormal returns, regardless of the state of the market.

The results of the Carhart (1997) four-factor model with a dummy variable provide evidence that the poor performance of long-short portfolios formed on Environmental scores shown in the previous analysis in the first subperiod between 2005 and 2009 is due to the effects of the 2008-2009 financial crisis.

Table 30. Estimation results of the conditional Carhart (1997) four-factor model with the incorporation of a dummy variable on stock portfolios based on positive screens

This table provides the estimation results of the conditional Carhart (1997) four-factor model with a dummy variable for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering with a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio (long in the high-rated portfolio and short in the low-rated portfolio). Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.005***	1.076***	-0.070**	0.996***	1.068***	-0.072**	0.987***	1.064***	-0.077**
	(0.016)	(0.020)	(0.028)	(0.011)	(0.023)	(0.029)	(0.014)	(0.022)	(0.031)
SMB	-0.217***	0.314***	-0.531***	-0.309***	0.263***	-0.572***	-0.229***	0.235***	-0.464***
	(0.035)	(0.059)	(0.070)	(0.026)	(0.063)	(0.073)	(0.029)	(0.057)	(0.067)
HML	0.224***	0.035	0.189***	0.126***	0.033	0.093	0.107***	0.044	0.063
	(0.034)	(0.057)	(0.071)	(0.023)	(0.073)	(0.075)	(0.029)	(0.059)	(0.070)
MOM	-0.084***	0.043	-0.127**	-0.038*	0.096**	-0.134**	-0.055**	0.046	-0.100
	(0.026)	(0.041)	(0.052)	(0.020)	(0.047)	(0.057)	(0.027)	(0.057)	(0.074)
D	0.000	0.006***	-0.006***	0.001	0.005**	-0.003	0.002	0.005*	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Mkt-rf x D	0.031	-0.016	0.047	0.006	0.069**	-0.063*	0.011	0.036	-0.025
	(0.026)	(0.035)	(0.048)	(0.019)	(0.035)	(0.035)	(0.030)	(0.032)	(0.050)
SMB x D	0.112	0.129	-0.018	0.170***	0.201*	-0.031	0.067	0.068	-0.001

	(0.077)	(0.113)	(0.129)	(0.052)	(0.111)	(0.125)	(0.075)	(0.128)	(0.188)
HML x D	0.018	-0.098	0.116	-0.038	-0.191*	0.154	-0.015	-0.087	0.072
	(0.108)	(0.101)	(0.157)	(0.080)	(0.106)	(0.126)	(0.092)	(0.098)	(0.140)
MOM x D	0.070*	-0.178***	0.248***	0.039	-0.233***	0.272***	-0.031	-0.171**	0.140
	(0.039)	(0.052)	(0.071)	(0.030)	(0.065)	(0.081)	(0.039)	(0.073)	(0.096)
α	-0.001	-0.004***	0.003**	-0.001	-0.003***	0.003**	-0.001	-0.003**	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.9793	0.9611	0.3764	0.9850	0.9515	0.4200	0.9799	0.9630	0.2804
Observations	180	180	180	180	180	180	180	180	180

Table 31. Estimation results of the conditional Fama and French (2015) five-factor model with the incorporation of a dummy variable on stock portfolios based on positive screens

This table provides the estimation results of the conditional Fama and French (2015) five-factor model with a dummy variable for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering with a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio (long in the high-rated portfolio and short in the low-rated portfolio). Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.013***	1.051***	-0.038	0.997***	1.053***	-0.056*	0.995***	1.051***	-0.056
	(0.017)	(0.022)	(0.031)	(0.013)	(0.025)	(0.032)	(0.016)	(0.027)	(0.037)
SMB	-0.237***	0.329***	-0.565***	-0.313***	0.284***	-0.596***	-0.227***	0.251***	-0.478***
	(0.039)	(0.068)	(0.085)	(0.031)	(0.072)	(0.082)	(0.034)	(0.064)	(0.074)
HML	0.232***	0.167**	0.065	0.190***	0.042	0.148	0.134***	0.090	0.044
	(0.062)	(0.077)	(0.100)	(0.042)	(0.097)	(0.095)	(0.046)	(0.089)	(0.103)
RMW	-0.069	0.204**	-0.273**	0.083	0.066	0.017	0.034	0.090	-0.056
	(0.084)	(0.098)	(0.134)	(0.061)	(0.136)	(0.143)	(0.063)	(0.117)	(0.133)
CMA	-0.011	-0.230**	0.220*	-0.004	-0.092	0.088	0.068	-0.108	0.176
	(0.079)	(0.098)	(0.115)	(0.057)	(0.143)	(0.143)	(0.066)	(0.122)	(0.136)
D	0.002	0.007**	-0.005	0.003	0.005*	-0.002	0.005*	0.005	-0.000
	(0.003)	(0.003)	(0.004)	(0.002)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)

Mkt-rf x D	0.005	0.003	0.002	-0.001	0.058	-0.060	-0.022	0.067	-0.089
	(0.027)	(0.041)	(0.052)	(0.024)	(0.041)	(0.048)	(0.026)	(0.051)	(0.065)
SMB x D	0.051	0.063	-0.011	0.135**	0.085	0.050	-0.020	0.019	-0.039
	(0.086)	(0.115)	(0.151)	(0.061)	(0.117)	(0.151)	(0.077)	(0.129)	(0.171)
HML x D	0.009	-0.009	0.018	-0.102	-0.006	-0.096	0.096	-0.035	0.131
	(0.095)	(0.172)	(0.187)	(0.072)	(0.217)	(0.221)	(0.093)	(0.202)	(0.185)
RMW x D	-0.044	-0.097	0.053	-0.121	-0.081	-0.040	-0.096	-0.148	0.052
	(0.159)	(0.261)	(0.325)	(0.146)	(0.291)	(0.359)	(0.185)	(0.287)	(0.289)
CMA x D	-0.077	-0.053	-0.023	-0.013	-0.291	0.279	-0.298***	0.010	-0.308
	(0.105)	(0.168)	(0.212)	(0.086)	(0.210)	(0.244)	(0.090)	(0.272)	(0.310)
α	-0.001	-0.004***	0.002*	-0.001**	-0.003	0.001	-0.002**	-0.002**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.9788	0.9610	0.3839	0.9852	0.9492	0.3979	0.9793	0.9604	0.2707
Observations	180	180	180	180	180	180	180	180	180

5.5. Discussion of results

In this dissertation, we evaluate the financial performance of synthetic portfolios based on European stocks' social characteristics. We employ three different screening approaches to form SRI portfolios (a positive approach, a best-in-class approach and a high and low CSP industry portfolio approach). Portfolio performance is evaluated with robust performance evaluation models, namely conditional models that account for time-varying risk and performance.

Although we construct stocks portfolios with a 50% cut-off as a robustness test, our main analysis is performed with portfolios formed with a 25% cut-off. Additionally, we hold this cut-off when we consider other robustness tests. We strongly believe that high- and low-rated portfolios formed with a 25% cut-off are a better representation of companies with the highest and lowest social performance. It is important to note that there is a very high number of companies with high Environmental and Social scores and the construction of low-rated portfolios with a 50% cut-off could imply the assignment of stocks from companies with a relatively high social performance to low-rated portfolios.

As we highlight in the literature review, most studies provide evidence that there are no statistically significant abnormal returns of long-short stock portfolios formed based on social screens. Some of these studies also consider a different weighting scheme (Brammer *et al.*, 2006; Galema *et al.*, 2008; Halbritter and Dorfleitner, 2015), alternative portfolio cut-offs (Borgers *et al.*, 2013; Halbritter and Dorfleitner, 2015) or the exclusion of financial companies (Mollet and Ziegler, 2014). Anyhow, all these studies are limited to unconditional models and it is also worthwhile emphasizing that when we consider unconditional models, our results resemble theirs. We find no statistically significant abnormal returns in long-short portfolios when unconditional models are applied in both positive approach, best-in-class approach and high and low CSP industry portfolio approach.[20] Although we do not report the results of the unconditional models in our three robustness tests, it is worth mentioning that the results continue to show no statistically abnormal returns, regardless of the cut-off chosen, the weighting scheme applied or the exclusion or inclusion of financial companies.

However, our analysis goes further and the results from conditional models provide some insights. In the positive approach, when we apply the conditional Carhart (1997) four-factor model, long-short

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[20] When we apply unconditional models and consider the high and low CSP industry portfolio approach, we find no statistically significant abnormal returns in long-short portfolios, with the exception of two positive and significant alphas, that lose statistical significance in our robustness tests.

portfolios formed on Social scores with a 25% cut-off yield statistically abnormal returns in a value-weighting scheme. However, they lose their statistical significance when we apply a different weighting scheme or when financial companies are excluded from our dataset. In the best-in-class approach, maintaining the same conditional specification model, long-short portfolios formed on Environmental scores with a 25% cut-off consistently yield positive and statistically abnormal returns, regardless of the weighting scheme applied or the exclusion or inclusion of financial companies. And although long-short portfolios formed with a 50% cut-off yield statistically insignificant results, we consider that the 50% cut-offs could be misleading, as discussed previously.

We also apply a third portfolio construction approach: the high and low CSP industry portfolio approach. We find two previous studies evaluating stock portfolios with this approach. Humphrey *et al.* (2012) perform this analysis with an extended Carhart (1997) four-factor model with industry and idiosyncratic risk controls. Lee *et al.* (2013) also apply an augmented Carhart (1997) four-factor model and find similar results to Humphrey *et al.* (2012), as no significant abnormal returns on long-short portfolios are displayed. However, their analysis is limited not only to an unconditional model, but also to portfolios formed with a 50% cut-off. Once again, when we consider the same portfolio construction conditions and the Carhart (1997) four-factor model, our results do not differ from previous research. However, when we further explore this approach and apply different cut-offs, different weighting schemes and exclude or include financial companies, some interesting results come up. Some consistently significant alphas suggest that investors can obtain abnormal returns when their portfolios include stocks from companies with high governance scores if their corresponding industry performance is below the average. These differences in abnormal returns from leading and lagging industries could be explained by their evolution over time. As we mentioned before, mean Governance scores of the leading industry portfolio tend to decrease from 2005 to 2014, while the lagging industry portfolio presents a growth trend. It is possible that the market is unaware of these two opposite trends, failing to price them correctly.

Additionally, we continue to capture the positive effect of high Environmental performance on stocks returns. When we apply the conditional Carhart (1997) four-factor model, long-short portfolios formed on Environmental scores with a 25% cut-off consistently exhibit statistically abnormal returns, regardless of the exclusion or inclusion of financial companies.

Since previous studies find evidence that suggest time-dependency of SRI portfolio performance, we analyze social performance over time and evaluate social and financial performance in different

subperiods. Borgers *et al.* (2013) and Halbritter and Dorfleitner (2015) argue that in an earlier stage it was possible for investors to obtain abnormal returns. However, over time, the positive alphas of the long-short portfolio diminish and lose statistical significance. Derwall *et al.* (2011) suggest that in the long run, the market slowly recognizes the positive impact of CSR practices and abnormal returns do not persist. However, our results show that, under a positive approach, investors obtain negative and statistically abnormal returns in the first subperiod (2005-2009) and positive abnormal returns in the following two subperiods (2010-2014 and 2015-2019). It is interesting to note that in the positive approach, the full period analysis does not uncover evidence of outperformance of long-short portfolios formed on Environmental scores, as the other two approaches did. However, the three subperiods analysis show that if investors follow a long-short strategy with portfolios formed on Environmental scores, they can achieve positive abnormal returns since 2010, regardless of the weighting scheme applied or the exclusion or inclusion of financial companies.

We also perform an additional analysis with the Carhart (1997) four-factor and the Fama and French (2015) five-factor models including a dummy variable to distinguish expansion and recession periods, to analyze financial performance of SRI stocks in time of crisis. The results show that the poor performance of long-short portfolios formed on Environmental scores in the first subperiod (2005-2009) was influenced by the effects of the 2008-2009 financial crisis, since portfolios outperform in expansion periods and its performance decreases in a statistically significant way in recession periods.

6. Conclusion

This dissertation investigates the performance of social screened stock portfolios of 1089 European companies from 2005 to 2019. To perform this investigation, we analyze data and information on the Thomson Reuters ESG Scores to rank European companies and industries according to their ESG performance. We form synthetic portfolios based on stocks' social characteristics in the previous year. Portfolios are formed with respect to each individual ESG dimension (Environmental, Social and Governance). We employ three different approaches to form socially screened portfolios: the positive approach, the best-in-class approach and the high and low CSP industry portfolios approach. For each different approach, we consider three robustness tests: alternative cut-off, the exclusion of financial companies and a different portfolio weighting scheme. We construct both high- and low-rated portfolios, representing stocks portfolios from companies with the highest and lowest social performance. Additionally, long-short portfolios are also constructed, representing the performance of a strategy of going long in high-rated stocks and short in low-rated stocks. We then evaluate the financial performance of such portfolios by using alternative performance evaluation models, including both unconditional and conditional models.

The results obtained by using unconditional models are similar to those documented in previous research. We find no statistically significant abnormal returns in long-short portfolios when unconditional models are applied. These results hold under all robustness tests applied in both positive and best-in-class approach. However, when the conditional Carhart (1997) four-factor model is applied, long-short portfolios formed on Environmental scores with a 25% cut-off consistently yield statistically abnormal returns, regardless of the weighting scheme applied or the exclusion or inclusion of financial companies. These positive effects of high environmental performance on stock returns persist in both best-in-class and high and low CSP industry portfolios approach, providing evidence that investors can obtain abnormal returns by going long in stocks from companies with high Environmental performance and short in stocks from companies with low Environmental performance.

The high and low CSP industry portfolio approach provides additional insights. With some consistency, when the conditional Carhart (1997) four-factor model is applied, portfolios of stocks from companies with high governance scores yield positive abnormal returns when their corresponding industry performance is below the average. We attribute these abnormal returns to the market's inability

90

to recognize the downward and growth trend of governance performance in the leading and lagging industry, respectively.

We also analyze social and financial performance in three different subperiods using the positive approach and find that long-short strategy of portfolios formed on Environmental scores generates positive abnormal returns since 2010, regardless of the weighting scheme applied or the exclusion or inclusion of financial companies. However, investors obtain negative and statistically abnormal returns in the first subperiod (2005-2009). The additional analysis with conditional models with a dummy variable to distinguish expansion and recession periods provides evidence that this poor performance in the first subperiod is associated with the financial effects of the 2008-2009 financial crisis, since long-short portfolios formed on Environmental scores outperform in expansion periods and its performance decreases in a statistically significant way in recession periods.

In conclusion, our results show abnormal returns resulting from a strategy of going long in stocks from companies with high Environmental performance and short in stocks from companies with low Environmental performance. Additionally, our results show abnormal returns in a long-short strategy of portfolios of stocks from companies with high governance performance if their corresponding industry performance is below the average.

This study makes several contributions to the existing literature, but it also presents some limitations. The main limitation of this study is related to the choice of the database. Thomson Reuters ESG database has been used in several studies (e.g., Halbritter and Dorfleitner, 2015; Stellner *et al.*, 2015; Gonenc and Scholtens, 2017, Eding and Scholtens, 2017, Pereira *et al.*, 2019) due to its consistency in the reporting. However, Pereira *et al.* (2019) mention the 'rewriting history' issue as a limitation of Thomson Reuters ESG. This may represent a challenge: due to the normalization of the scores getting refitted in time the scores collected can vary depending on the date on which they are downloaded. In this way, an interesting avenue for future research would be to assess the impact of the "rewriting history" on the composition of the portfolios. Also, it would be of interest to form portfolios with social scores from alternative social databases to assess the consistency of the high- and low-rated portfolios.

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Appendices

Appendix 1. Histogram of ESG Scores
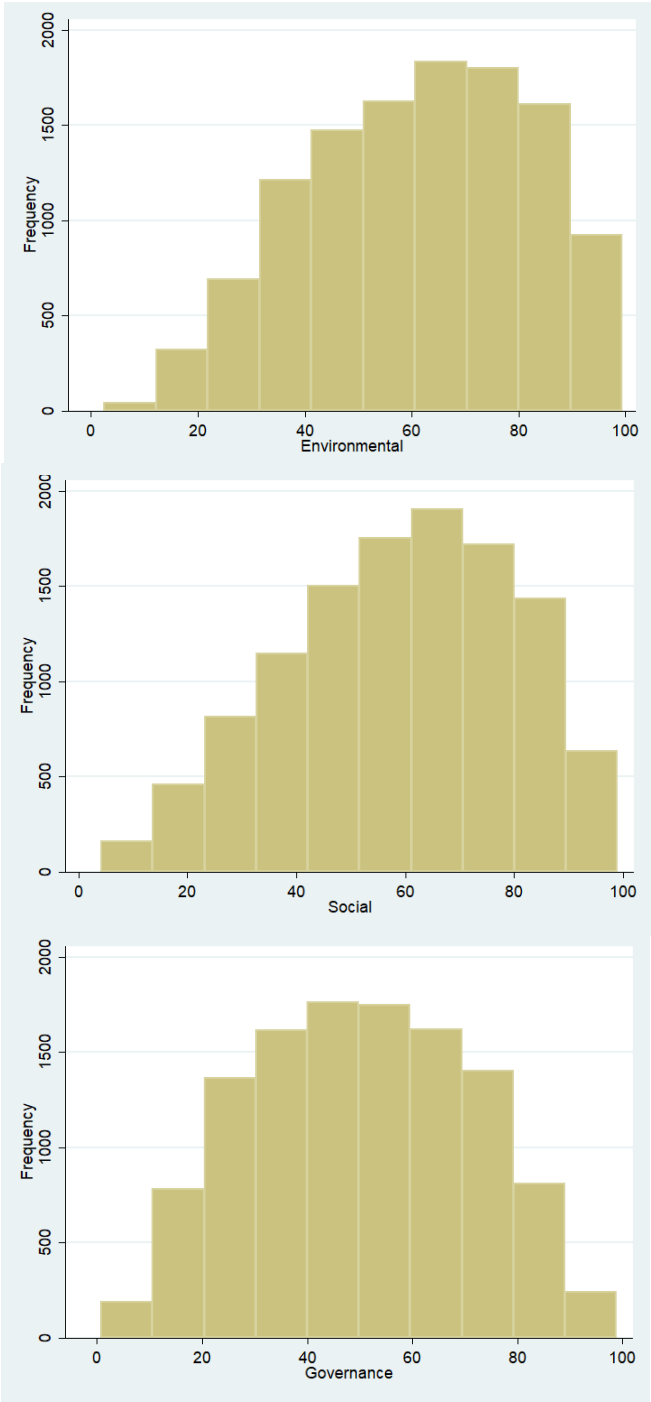
Appendix 2. Descriptive Statistics of ESG scores on portfolios (positive approach) – 50% cut-off

This table provides descriptive statistics of each individual ESG score for the high- and low-rated portfolios formed with positive screens with a 50% cut-off. The dataset includes 1089 companies from Thomson Reuters ESG scores from 2004 to 2018.

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median
Environmental							
High-rated	78.492	99.501	50.735	10.155	-.099	2.256	78.255
Low-rated	44.657	67.121	2.5	13.528	-.496	2.416	46.592
Social							
High-rated	76.103	99.054	55.008	9.943	.17	2.123	75.608
Low-rated	42.124	65.517	4.225	13.512	-.506	2.439	44.163
Governance							
High-rated	67.986	99.002	49.212	11.429	.374	2.261	66.994
Low-rated	32.563	51.831	.801	11.356	-.369	2.222	33.697

Appendix 3. Descriptive Statistics of portfolios (positive approach) – 50% cut off

This table provides descriptive statistics of monthly returns of the high- and low-rated portfolios formed with positive screens with a 50% cut-off for each individual pillar. Additionally, it provides descriptive statistics for long-short portfolios, representing a trading strategic of going long in the high-rated portfolios and short in the low-rated portfolios. Portfolios are value-weighted. The dataset includes 1089 companies with an observation period from 2005 to 2019. P-value is the probability of an overall combined test statistic of a test for normality based on skewness and on kurtosis.

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median	p-value
Environmental								
High-rated	.004	.142	-.214	.054	-.551	4.322	.006	0.0012
Low-rated	.007	.195	-.241	.055	-.558	5.617	.009	0.0001
Long-short	-.002	.033	-.053	.013	-.244	3.913	-.002	0.0442
Social								
High-rated	.004	.141	-.212	.053	-.548	4.295	.007	0.0013
Low-rated	.006	.205	-.259	.056	-.596	6.025	.008	0.0000
Long-short	-.001	.047	-.064	.014	-.154	5.388	-.002	0.0017
Governance								
High-rated	.004	.139	-.232	.053	-.64	4.872	.006	0.0001
Low-rated	.006	.181	-.196	.055	-.422	4.201	.01	0.0055
Long-short	-.001	.037	-.042	.012	-.062	3.694	-.001	0.1849

Appendix 4. Descriptive Statistics of portfolios (positive approach) – Exclusion of financial companies

This table provides descriptive statistics of monthly returns of the high- and low-rated portfolios formed with positive screens with a 25% cut-off with the exclusion of financial companies for each individual pillar. Additionally, it provides descriptive statistics for long-short portfolios, representing a trading strategic of going long in the high-rated portfolios and short in the low-rated portfolios. Portfolios are value-weighted. The dataset includes 1089 companies with an observation period from 2005 to 2019. P-value is the probability of an overall combined test statistic of a test for normality based on skewness and on kurtosis.

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median	p-value
Environmental								
High-rated	.005	.125	-.19	.05	-.591	4.232	.009	0.0009
Low-rated	.006	.164	-.275	.056	-.829	6.431	.009	0.0000
Long-short	-.001	.085	-.077	.02	.134	5.474	-.002	0.0015
Social								
High-rated	.006	.127	-.18	.049	.009	-.537	4.143	0.0021
Low-rated	.006	.186	-.289	.057	.007	-.984	7.515	0.0000
Long-short	0	.109	-.102	.021	-.001	.257	9.08	0.0000
Governance								
High-rated	.006	.132	-.176	.049	.008	-.464	4.166	0.0041
Low-rated	.006	.185	-.241	.056	.011	-.6	5.469	0.0000
Long-short	-.001	.065	-.09	.02	0	-.176	5.902	0.0005

Appendix 5. Descriptive Statistics of portfolios (positive approach) – Equally-weighted

This table provides descriptive statistics of monthly returns of the high- and low-rated portfolios formed with positive screens with a 25% cut-off for each individual pillar. Additionally, it provides descriptive statistics for long-short portfolios, representing a trading strategic of going long in the high-rated portfolios and short in the low-rated portfolios. Portfolios are equally-weighted. The dataset includes 1089 companies with an observation period from 2005 to 2019. P-value is the probability of an overall combined test statistic of a test for normality based on skewness and on kurtosis

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median	p-value
Environmental								
High-rated	.005	.234	-.269	.063	-.415	5.22	.009	0.0005
Low-rated	.007	.271	-.281	.063	-.327	6.25	.012	0.0001
Long-short	-.002	.037	-.046	.015	-.305	3.142	-.001	0.1892
Social								
High-rated	.006	.201	-.253	.059	-.505	5.099	.01	0.0003
Low-rated	.008	.291	-.281	.062	-.26	7.016	.012	0.0000
Long-short	-.002	.034	-.09	.016	-1.002	7.194	-.001	0.0000
Governance								
High-rated	.007	.22	-.27	.059	-.487	5.826	.011	0.0001
Low-rated	.007	.285	-.272	.062	-.257	6.795	.01	0.0001
Long-short	-.001	.037	-.065	.013	-.45	6.329	-.001	0.0000

Appendix 6. Descriptive Statistics on the factors used in the Carhart (1997) four-factor model

This table provides descriptive statistics on the monthly returns of the factors used in the Carhart (1997) four-factor model from 2005 to 2019. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median
Mkt-rf	.006	.137	-.22	.052	-.7	4.949	.008
SMB	.003	.049	-.049	.018	-.475	3.549	.006
HML	.001	.075	-.05	.022	.191	3.677	.004
MOM	.009	.101	-.261	.036	-2.599	20.926	.011

Appendix 7. Descriptive Statistics on the factors used in the Fama and French (2015) five-factor model

This table provides descriptive statistics on the monthly returns of the factors used in the Fama and French (2015) five-factor model from 2005 to 2019. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms.

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median
Mkt-rf	.006	.137	-.22	.052	-.7	4.949	.008
SMB	.004	.047	-.046	.017	-.444	3.444	.006
HML	.001	.075	-.05	.022	.191	3.677	.004
RMW	.006	.041	-.047	.014	-.648	4.304	.006
CMA	.004	.054	-.035	.012	-.067	5.507	.004

Appendix 8. Descriptive Statistics on the information variables used in the conditional models

This table provides descriptive statistics on the short-term rate represented by the 3-month Euribor and the dividend yield of the STOXX Europe 600 index. The observation period is from 2005 to 2019.

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Median
Euribor	0	.011	-.026	.006	-2.006	9.382	.001
DY	0	1.453	-1.169	.381	.457	5.745	-.032

Appendix 9. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens – 50% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.998***	1.051***	-0.053***	1.000***	1.048***	-0.048**	1.000***	1.041***	-0.041*
	(0.008)	(0.014)	(0.017)	(0.010)	(0.016)	(0.021)	(0.010)	(0.016)	(0.021)
SMB	-0.219***	0.159***	-0.378***	-0.219***	0.194***	-0.413***	-0.207***	0.047	-0.254***
	(0.016)	(0.045)	(0.045)	(0.018)	(0.050)	(0.055)	(0.024)	(0.044)	(0.058)
HML	-0.122	-0.144	0.022	-0.100	-0.273	0.172	-0.162	0.018	-0.181
	(0.089)	(0.154)	(0.177)	(0.079)	(0.166)	(0.169)	(0.133)	(0.132)	(0.237)
Euribor	0.001	0.003	-0.002	0.001	0.004**	-0.004	-0.001	0.007***	-0.007**
	(0.001)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)
DY	0.126***	-0.132***	0.259***	0.112***	-0.083*	0.195***	0.066***	0.079**	-0.013
	(0.021)	(0.039)	(0.040)	(0.020)	(0.042)	(0.042)	(0.023)	(0.039)	(0.046)
MOM	-0.050***	0.038	-0.088**	-0.037**	-0.004	-0.033	-0.064***	0.054	-0.118**
	(0.013)	(0.035)	(0.037)	(0.014)	(0.032)	(0.036)	(0.017)	(0.037)	(0.046)
Mkt-rf x Euribor	2.642**	4.825*	-2.183	2.720**	3.990	-1.270	2.929	2.024	0.905
	(1.197)	(2.684)	(2.875)	(1.256)	(2.421)	(2.758)	(2.182)	(4.068)	(5.770)
SMB x Euribor	-2.671	-4.159	1.488	-3.789	0.663	-4.451	-2.388	-4.406	2.017
	(2.311)	(8.941)	(9.441)	(2.608)	(6.411)	(7.055)	(3.386)	(5.993)	(7.971)
HML x Euribor	0.920	-25.423***	26.343***	0.336	-24.369***	24.705***	-0.677	-13.137**	12.459*

	(2.954)	(7.650)	(8.540)	(2.947)	(5.504)	(6.139)	(3.506)	(5.423)	(7.327)
MOM x Euribor	-0.909	5.273*	-6.182*	-0.548	4.475**	-5.023**	-1.786	4.630*	-6.416**
	(1.358)	(3.034)	(3.535)	(1.296)	(2.034)	(2.377)	(1.479)	(2.496)	(3.184)
Mkt-rf x DY	-0.064***	-0.003	-0.060	-0.062***	0.021	-0.083	-0.052*	-0.047	-0.005
	(0.022)	(0.039)	(0.053)	(0.021)	(0.043)	(0.056)	(0.029)	(0.061)	(0.082)
SMB x DY	-0.083***	0.158*	-0.242**	-0.057*	0.075	-0.132	-0.024	-0.067	0.043
	(0.029)	(0.092)	(0.101)	(0.030)	(0.117)	(0.128)	(0.055)	(0.123)	(0.169)
HML x DY	-0.038	0.199	-0.236*	-0.006	0.035	-0.040	-0.062	0.116	-0.177
	(0.061)	(0.138)	(0.141)	(0.064)	(0.130)	(0.140)	(0.090)	(0.163)	(0.221)
MOM x DY	-0.097**	-0.001	-0.097	-0.072*	-0.111	0.040	-0.079	-0.137	0.058
	(0.038)	(0.092)	(0.104)	(0.038)	(0.078)	(0.088)	(0.058)	(0.124)	(0.166)
α	-0.001	-0.000	-0.000	-0.001	-0.001	0.000	-0.000	-0.002**	0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.3826	0.4578	0.8546	0.4436	0.0788	0.2794	0.1185	0.0047	0.0060
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9897	0.9712	0.4717	0.9896	0.9708	0.4623	0.9874	0.0000	0.2125
Observations	180	180	180	180	180	180	180	180	180

Appendix 10. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens – 50% cut-off

This table provides the estimation results of the conditional Fama and French (2015) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.000***	1.039***	-0.039**	0.998***	1.045***	-0.047**	1.000***	1.031***	-0.031
	(0.010)	(0.017)	(0.018)	(0.011)	(0.018)	(0.021)	(0.011)	(0.017)	(0.020)
SMB	-0.234***	0.178***	-0.412***	-0.234***	0.213***	-0.446***	-0.225***	0.058	-0.282***
	(0.021)	(0.049)	(0.052)	(0.021)	(0.053)	(0.057)	(0.026)	(0.040)	(0.051)
HML	0.175***	-0.009	0.184***	0.176***	-0.020	0.196***	0.122***	0.166**	-0.044
	(0.034)	(0.058)	(0.060)	(0.034)	(0.057)	(0.058)	(0.035)	(0.067)	(0.074)
RMW	0.033	0.213***	-0.181**	0.066	0.089	-0.023	0.029	0.167*	-0.138
	(0.055)	(0.071)	(0.081)	(0.053)	(0.080)	(0.087)	(0.052)	(0.097)	(0.104)
CMA	-0.023	-0.155*	0.133**	-0.045	-0.082	0.036	-0.037	-0.112	0.075
	(0.043)	(0.082)	(0.062)	(0.047)	(0.083)	(0.075)	(0.050)	(0.075)	(0.075)
Euribor	-0.195	-0.208	0.013	-0.201	-0.215	0.014	-0.263	0.064	-0.327
	(0.140)	(0.190)	(0.266)	(0.122)	(0.192)	(0.220)	(0.191)	(0.249)	(0.386)
DY	0.001	0.006**	-0.005*	0.001	0.004	-0.003	-0.000	0.007***	-0.007**
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
Mkt-rf x Euribor	2.170	4.550*	-2.380	2.034	5.330**	-3.296	2.183	3.487	-1.304

	(1.661)	(2.517)	(3.145)	(1.517)	(2.633)	(2.950)	(1.992)	(4.252)	(5.401)
SMB x Euribor	-0.963	-11.805**	10.842**	-2.601	-5.050	2.449	-1.836	-4.621	2.785
	(2.456)	(5.271)	(5.267)	(2.749)	(4.595)	(5.346)	(3.348)	(4.294)	(6.285)
HML x Euribor	1.341	-30.137***	31.477***	3.023	-40.162***	43.185***	1.836	-22.705***	24.540*
	(4.599)	(7.558)	(10.573)	(4.128)	(5.654)	(7.778)	(6.026)	(8.659)	(13.080)
RMW x Euribor	2.022	7.598	-5.577	6.927	-13.608	20.535	4.666	-6.153	10.819
	(9.339)	(16.296)	(22.512)	(8.244)	(14.027)	(17.956)	(12.330)	(17.665)	(26.744)
CMA x Euribor	1.844	-2.990	4.835	-1.042	10.379	-11.421	-0.481	2.530	-3.012
	(4.878)	(7.526)	(9.409)	(4.356)	(9.629)	(10.568)	(6.052)	(7.402)	(11.141)
Mkt-rf x DY	-0.054**	-0.002	-0.052	-0.061**	0.064	-0.125***	-0.040	-0.046	0.007
	(0.024)	(0.039)	(0.043)	(0.024)	(0.043)	(0.047)	(0.038)	(0.070)	(0.098)
SMB x DY	-0.062	0.109	-0.171	-0.044	0.054	-0.097	-0.017	-0.078	0.061
	(0.046)	(0.095)	(0.115)	(0.040)	(0.119)	(0.129)	(0.052)	(0.089)	(0.114)
HML x DY	0.158*	-0.063	0.221	0.147*	-0.079	0.226	0.051	0.224	-0.173
	(0.084)	(0.131)	(0.148)	(0.079)	(0.137)	(0.138)	(0.155)	(0.234)	(0.361)
RMW x DY	0.172*	-0.522***	0.694***	0.099	-0.255	0.354**	0.064	-0.054	0.118
	(0.097)	(0.172)	(0.192)	(0.089)	(0.169)	(0.168)	(0.143)	(0.242)	(0.337)
CMA x DY	-0.138*	0.196	-0.334***	-0.115	0.167	-0.283**	-0.105	0.017	-0.122
	(0.080)	(0.130)	(0.120)	(0.081)	(0.144)	(0.143)	(0.092)	(0.132)	(0.148)
α	-0.001*	-0.001	-0.000	-0.001	-0.001	0.000	-0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.3010	0.0893	0.1964	0.1352	0.2530	0.6489	0.3804	0.0290	0.0426
W_2	0.0018	0.0000	0.0000	0.0019	0.0000	0.0000	0.0223	0.0000	0.0000
W_3	0.0010	0.0000	0.0000	0.0023	0.0000	0.0000	0.0012	0.0000	0.0000
Adj. R^2	0.9894	0.9737	0.5154	0.9898	0.9707	0.4845	0.9865	0.9722	0.1696
Observations	180	180	180	180	180	180	180	180	180

Appendix 11. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens – Exclusion of financial companies

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions, using positive screens, considering a 25% cut-off and with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.993***	1.065***	-0.072***	0.980***	1.071***	-0.091***	0.977***	1.062***	-0.085***
	(0.014)	(0.020)	(0.025)	(0.013)	(0.023)	(0.025)	(0.015)	(0.020)	(0.024)
SMB	-0.290***	0.397***	-0.687***	-0.335***	0.341***	-0.676***	-0.285***	0.299***	-0.585***
	(0.043)	(0.059)	(0.064)	(0.037)	(0.070)	(0.077)	(0.044)	(0.071)	(0.090)
HML	-0.093**	-0.126**	0.033	-0.115***	-0.182***	0.067	-0.174***	-0.087	-0.087
	(0.037)	(0.053)	(0.063)	(0.036)	(0.052)	(0.052)	(0.041)	(0.053)	(0.063)
Euribor	0.022	0.028	-0.006	0.060**	0.050	0.010	0.054	0.082	-0.028
	(0.031)	(0.047)	(0.057)	(0.030)	(0.044)	(0.056)	(0.033)	(0.053)	(0.059)
DY	0.221*	-0.090	0.311	0.122	-0.238	0.360	0.115	-0.431	0.546*
	(0.127)	(0.214)	(0.225)	(0.138)	(0.233)	(0.285)	(0.152)	(0.262)	(0.318)
MOM	-0.006**	-0.000	-0.006*	-0.005***	-0.002	-0.003	-0.004	0.006	-0.009*
	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.006)	(0.005)
Mkt-rf x Euribor	6.463***	2.431	4.033	3.026*	6.642	-3.617	4.970**	4.247	0.723
	(2.437)	(3.766)	(4.376)	(1.677)	(5.000)	(4.921)	(2.252)	(4.576)	(5.067)
SMB x Euribor	-1.077	0.585	-1.662	-1.669	-5.345	3.676	-2.543	-12.283	9.740

	(5.801)	(9.547)	(12.050)	(4.790)	(12.840)	(15.403)	(5.699)	(15.703)	(19.482)
HML x Euribor	10.475***	3.516	6.959	10.725**	-9.062	19.787*	8.123*	-21.949*	30.072**
	(3.992)	(8.241)	(9.694)	(4.333)	(9.453)	(10.909)	(4.506)	(11.383)	(12.519)
MOM x Euribor	2.631	6.257*	-3.626	2.023	8.349*	-6.326	4.393**	2.160	2.233
	(1.817)	(3.709)	(3.919)	(1.748)	(4.566)	(5.146)	(2.180)	(4.638)	(5.087)
Mkt-rf x DY	-0.019	0.082	-0.100	-0.021	0.133**	-0.154*	-0.049	0.114	-0.162**
	(0.035)	(0.056)	(0.068)	(0.038)	(0.066)	(0.080)	(0.041)	(0.071)	(0.077)
SMB x DY	-0.014	0.115	-0.129	0.052	0.123	-0.070	-0.064	0.038	-0.102
	(0.081)	(0.140)	(0.164)	(0.076)	(0.150)	(0.178)	(0.082)	(0.163)	(0.191)
HML x DY	-0.194*	-0.184	-0.009	-0.228*	-0.325*	0.098	-0.227*	-0.032	-0.195
	(0.116)	(0.168)	(0.198)	(0.122)	(0.187)	(0.207)	(0.130)	(0.184)	(0.223)
MOM x DY	0.065	0.013	0.053	0.014	-0.122	0.136	-0.052	-0.074	0.022
	(0.071)	(0.112)	(0.115)	(0.072)	(0.117)	(0.145)	(0.070)	(0.151)	(0.164)
α	0.000	-0.002*	0.002	0.000	-0.002	0.002	0.000	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.0296	0.9140	0.1008	0.0157	0.3922	0.3602	0.2677	0.2536	0.1234
W_2	0.0033	0.3149	0.0263	0.0022	0.0000	0.0000	0.0501	0.0004	0.0002
W_3	0.0016	0.4581	0.0214	0.0059	0.0000	0.0000	0.0515	0.0004	0.0004
Adj. R^2	0.9679	0.9521	0.4615	0.9723	0.9452	0.5204	0.9641	0.9461	0.4333
Observations	180	180	180	180	180	180	180	180	180

Appendix 12. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens – Exclusion of financial companies

This table provides the estimation results of the conditional Fama and French (2015) four-factor model for value-weighted portfolios formed on individual ESG dimensions, using positive screens, considering a 25% cut-off and with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.001***	1.052***	-0.051**	0.982***	1.050***	-0.068***	0.986***	1.041***	-0.055**
	(0.014)	(0.023)	(0.026)	(0.013)	(0.022)	(0.023)	(0.015)	(0.023)	(0.027)
SMB	-0.250***	0.429***	-0.678***	-0.307***	0.345***	-0.652***	-0.241***	0.324***	-0.565***
	(0.046)	(0.068)	(0.071)	(0.039)	(0.072)	(0.079)	(0.043)	(0.072)	(0.095)
HML	0.051	0.044	0.007	0.014	-0.079	0.094	-0.044	0.040	-0.085
	(0.053)	(0.078)	(0.086)	(0.048)	(0.083)	(0.084)	(0.049)	(0.086)	(0.093)
RMW	0.347***	0.293***	0.054	0.336***	0.113	0.223	0.357***	0.257**	0.099
	(0.083)	(0.088)	(0.120)	(0.065)	(0.126)	(0.136)	(0.070)	(0.114)	(0.131)
CMA	0.102*	-0.193**	0.295***	0.081	-0.264***	0.345***	0.151**	-0.147	0.299***
	(0.062)	(0.084)	(0.101)	(0.058)	(0.095)	(0.095)	(0.072)	(0.110)	(0.115)
Euribor	0.039	-0.089	0.128	-0.007	-0.144	0.137	-0.073	-0.232	0.158
	(0.204)	(0.202)	(0.297)	(0.182)	(0.240)	(0.315)	(0.206)	(0.332)	(0.451)
DY	-0.003	0.003	-0.006*	-0.002	0.004	-0.005	0.001	0.006*	-0.005
	(0.002)	(0.003)	(0.003)	(0.002)	(0.004)	(0.004)	(0.003)	(0.004)	(0.005)

Mkt-rf x Euribor	5.248**	2.069	3.179	3.508*	8.465**	-4.957	7.218***	6.557*	0.661
	(2.442)	(3.588)	(3.940)	(2.016)	(4.079)	(3.984)	(2.721)	(3.619)	(5.386)
SMB x Euribor	-6.448	-9.395	2.947	-3.038	-14.859*	11.821	-4.675	-21.951**	17.276
	(6.092)	(6.669)	(9.133)	(5.082)	(7.850)	(11.196)	(6.278)	(10.157)	(15.201)
HML x Euribor	13.745**	-5.789	19.534*	14.095*	-27.355***	41.451***	7.077	-36.666***	43.744***
	(6.737)	(9.113)	(9.904)	(7.373)	(10.118)	(10.933)	(6.332)	(12.526)	(16.424)
RMW x Euribor	16.809	0.440	16.369	13.311	-10.408	23.719	16.935	-25.290	42.225
	(13.497)	(16.541)	(23.600)	(12.027)	(18.619)	(24.915)	(12.267)	(25.053)	(33.013)
CMA x Euribor	-1.945	0.344	-2.289	-3.507	7.278	-10.785	15.427**	-18.063	33.490**
	(6.070)	(9.057)	(10.356)	(5.062)	(11.708)	(13.911)	(7.635)	(11.187)	(15.657)
Mkt-rf x DY	-0.009	0.092*	-0.101	-0.031	0.119*	-0.150**	-0.041	0.177***	-0.219***
	(0.043)	(0.055)	(0.067)	(0.036)	(0.062)	(0.071)	(0.041)	(0.064)	(0.076)
SMB x DY	-0.025	0.053	-0.077	0.001	-0.053	0.054	-0.146*	0.013	-0.158
	(0.075)	(0.143)	(0.160)	(0.085)	(0.125)	(0.169)	(0.084)	(0.131)	(0.185)
HML x DY	-0.308**	-0.449***	0.141	-0.311**	-0.662***	0.351*	-0.401***	-0.462**	0.061
	(0.132)	(0.165)	(0.220)	(0.121)	(0.176)	(0.201)	(0.111)	(0.200)	(0.243)
RMW x DY	-0.219	-0.461***	0.242	-0.244*	-0.866***	0.622**	-0.515***	-0.719***	0.205
	(0.147)	(0.170)	(0.228)	(0.127)	(0.241)	(0.299)	(0.124)	(0.241)	(0.274)
CMA x DY	0.023	0.204*	-0.182	-0.054	0.070	-0.123	-0.148	0.590***	-0.738***
	(0.132)	(0.117)	(0.164)	(0.099)	(0.153)	(0.184)	(0.126)	(0.201)	(0.233)
α	-0.002***	-0.003***	0.001	-0.001*	-0.001	-0.000	-0.002***	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.3420	0.5198	0.1742	0.6921	0.5223	0.4697	0.8452	0.1934	0.5864
W_2	0.0000	0.0695	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9718	0.9555	0.4840	0.9756	0.9486	0.5581	0.9694	0.9529	0.4793
Observations	180	180	180	180	180	180	180	180	180

Appendix 13. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens – Equally-weighted

This table provides the estimation results of the conditional Carhart (1997) four-factor model for equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.068***	1.075***	-0.007	1.044***	1.073***	-0.028*	1.051***	1.038***	0.013
	(0.016)	(0.020)	(0.021)	(0.010)	(0.020)	(0.017)	(0.017)	(0.018)	(0.017)
SMB	0.070	0.618***	-0.548***	-0.007	0.601***	-0.608***	0.157***	0.597***	-0.440***
	(0.044)	(0.043)	(0.046)	(0.032)	(0.043)	(0.045)	(0.039)	(0.046)	(0.051)
HML	0.271***	0.175***	0.096*	0.187***	0.134**	0.053	0.118***	0.149***	-0.030
	(0.041)	(0.049)	(0.050)	(0.023)	(0.059)	(0.057)	(0.032)	(0.053)	(0.045)
Euribor	-0.308***	-0.520***	0.212	-0.195**	-0.357*	0.163	-0.182	-0.524***	0.341**
	(0.118)	(0.168)	(0.136)	(0.082)	(0.193)	(0.173)	(0.123)	(0.188)	(0.170)
DY	0.004*	0.004	0.000	0.001	0.003	-0.002	0.004**	0.005	-0.001
	(0.003)	(0.003)	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)
MOM	-0.167***	-0.043	-0.123***	-0.118***	-0.013	-0.105***	-0.129***	-0.063	-0.065*
	(0.035)	(0.039)	(0.040)	(0.031)	(0.040)	(0.036)	(0.033)	(0.044)	(0.034)
Mkt-rf x Euribor	6.379**	6.189*	0.190	6.173***	8.871**	-2.698	3.126	10.594***	-7.468**
	(2.876)	(3.426)	(3.609)	(2.050)	(3.661)	(3.187)	(2.684)	(3.864)	(3.445)
SMB x Euribor	-1.599	1.112	-2.711	0.678	-11.538	12.216	0.290	6.054	-5.765
	(4.765)	(6.568)	(6.565)	(3.522)	(8.269)	(7.387)	(5.062)	(6.623)	(7.219)
HML x Euribor	-13.898***	1.240	-15.138**	-0.387	-25.549***	25.162***	-5.146	-13.180*	8.034

	(4.690)	(7.369)	(6.787)	(4.129)	(8.742)	(7.510)	(4.288)	(7.101)	(6.039)
MOM x Euribor	1.810	15.777***	-13.967***	3.782**	14.168***	-10.386***	4.176**	17.202***	-13.026***
	(2.710)	(2.573)	(3.118)	(1.604)	(3.177)	(2.815)	(2.046)	(3.030)	(2.678)
Mkt-rf x DY	-0.089*	-0.024	-0.066	-0.093***	-0.040	-0.053	-0.088*	-0.036	-0.052
	(0.046)	(0.056)	(0.059)	(0.030)	(0.062)	(0.052)	(0.045)	(0.049)	(0.045)
SMB x DY	-0.092	-0.069	-0.023	0.025	0.072	-0.048	-0.005	-0.112	0.107
	(0.083)	(0.110)	(0.102)	(0.060)	(0.127)	(0.101)	(0.099)	(0.091)	(0.108)
HML x DY	-0.151	-0.227	0.077	-0.184**	-0.030	-0.154	-0.120	-0.183	0.063
	(0.118)	(0.169)	(0.153)	(0.083)	(0.192)	(0.198)	(0.099)	(0.151)	(0.138)
MOM x DY	-0.307***	-0.270***	-0.037	-0.255***	-0.234**	-0.021	-0.291***	-0.291***	0.000
	(0.085)	(0.091)	(0.090)	(0.057)	(0.090)	(0.090)	(0.065)	(0.102)	(0.084)
α	-0.000	-0.002*	0.002*	0.000	-0.002	0.002*	0.000	-0.002	0.002**
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.0247	0.0060	0.2605	0.0621	0.1529	0.5695	0.0397	0.0122	0.1187
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9791	0.9668	0.5288	0.9861	0.9643	0.6039	0.9802	0.9719	0.5357
Observations	180	180	180	180	180	180	180	180	180

Appendix 14. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens – Equally-weighted

This table provides the estimation results of the conditional Fama and French (2015) four-factor model for equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.069***	1.070***	-0.001	1.038***	1.063***	-0.025	1.044***	1.036***	0.008
	(0.022)	(0.021)	(0.021)	(0.015)	(0.021)	(0.017)	(0.019)	(0.021)	(0.019)
SMB	0.048	0.649***	-0.601***	-0.017	0.634***	-0.650***	0.143***	0.628***	-0.485***
	(0.046)	(0.041)	(0.052)	(0.034)	(0.044)	(0.049)	(0.037)	(0.054)	(0.056)
HML	0.354***	0.308***	0.047	0.324***	0.235***	0.090	0.239***	0.266***	-0.027
	(0.063)	(0.070)	(0.063)	(0.040)	(0.077)	(0.066)	(0.046)	(0.072)	(0.056)
RMW	-0.064	0.097	-0.161*	0.062	0.063	-0.001	0.014	0.048	-0.035
	(0.100)	(0.081)	(0.095)	(0.062)	(0.083)	(0.083)	(0.072)	(0.089)	(0.070)
CMA	-0.138	-0.289***	0.152	-0.179**	-0.279***	0.100	-0.204**	-0.269***	0.065
	(0.107)	(0.110)	(0.096)	(0.069)	(0.104)	(0.080)	(0.082)	(0.089)	(0.070)
Euribor	-0.362**	-0.261	-0.101	-0.124	-0.001	-0.122	-0.185	-0.289	0.105
	(0.168)	(0.243)	(0.154)	(0.104)	(0.227)	(0.215)	(0.167)	(0.210)	(0.203)
DY	0.005	0.004	0.000	0.001	0.003	-0.002	0.005	0.005	0.000
	(0.004)	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Mkt-rf x Euribor	7.616**	7.716**	-0.100	8.162***	11.014***	-2.852	6.039*	12.376***	-6.337*

	(3.715)	(3.901)	(2.603)	(3.056)	(3.485)	(2.897)	(3.308)	(4.336)	(3.538)
SMB x Euribor	-8.177*	-11.979***	3.802	-7.542**	-23.561***	16.018**	-6.093	-9.076	2.983
	(4.530)	(3.732)	(4.699)	(3.525)	(5.397)	(6.550)	(3.987)	(8.237)	(9.884)
HML x Euribor	-34.102***	-48.081***	13.979**	-28.353***	-73.073***	44.720***	-29.743***	-67.386***	37.642***
	(6.146)	(6.827)	(5.961)	(5.092)	(8.286)	(7.809)	(4.633)	(10.296)	(9.198)
RMW x Euribor	-16.213	-45.151***	28.937**	-29.063***	-50.901***	21.838	-19.007*	-46.498**	27.492
	(14.784)	(13.819)	(13.321)	(9.547)	(15.753)	(17.062)	(10.951)	(19.099)	(17.213)
CMA x Euribor	26.283***	41.648***	-15.365**	23.390***	35.742***	-12.352	32.982***	49.663***	-16.681
	(8.487)	(9.697)	(6.754)	(6.369)	(9.164)	(8.434)	(8.447)	(11.745)	(12.573)
Mkt-rf x DY	0.012	0.033	-0.021	-0.006	0.001	-0.007	-0.009	0.035	-0.044
	(0.056)	(0.048)	(0.064)	(0.032)	(0.057)	(0.059)	(0.049)	(0.047)	(0.060)
SMB x DY	-0.083	-0.138*	0.055	-0.000	-0.029	0.029	-0.061	-0.186*	0.125
	(0.107)	(0.077)	(0.118)	(0.068)	(0.092)	(0.100)	(0.079)	(0.105)	(0.124)
HML x DY	-0.179	-0.110	-0.069	-0.232**	-0.000	-0.232	-0.190	-0.128	-0.062
	(0.171)	(0.181)	(0.173)	(0.115)	(0.185)	(0.173)	(0.141)	(0.167)	(0.158)
RMW x DY	-0.324	-0.060	-0.264	-0.263*	-0.143	-0.120	-0.385**	-0.195	-0.190
	(0.275)	(0.208)	(0.201)	(0.148)	(0.189)	(0.179)	(0.173)	(0.234)	(0.231)
CMA x DY	0.015	0.039	-0.025	0.071	0.056	0.016	-0.032	0.048	-0.080
	(0.216)	(0.156)	(0.174)	(0.114)	(0.153)	(0.132)	(0.139)	(0.163)	(0.184)
α	-0.001	-0.002	0.001	-0.001	-0.001	0.000	-0.000	-0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.0217	0.2718	0.7852	0.4400	0.6974	0.6559	0.0929	0.1671	0.8680
W_2	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9718	0.9667	0.5137	0.9828	0.9661	0.5950	0.9765	0.9705	0.4934
Observations	180	180	180	180	180	180	180	180	180

Appendix 15. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on best-in-class screens – 50% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.999***	1.046***	-0.047***	1.000***	1.046***	-0.046**	1.005***	1.025***	-0.020
	(0.009)	(0.014)	(0.017)	(0.010)	(0.014)	(0.019)	(0.011)	(0.017)	(0.023)
SMB	-0.209***	0.119***	-0.328***	-0.216***	0.162***	-0.378***	-0.183***	-0.025	-0.158**
	(0.016)	(0.044)	(0.043)	(0.018)	(0.045)	(0.048)	(0.026)	(0.044)	(0.061)
HML	0.122***	-0.115***	0.237***	0.124***	-0.135***	0.259***	0.065***	0.080**	-0.014
	(0.020)	(0.044)	(0.045)	(0.020)	(0.041)	(0.041)	(0.024)	(0.037)	(0.045)
Euribor	-0.045***	0.019	-0.064*	-0.035**	-0.015	-0.020	-0.066***	0.056*	-0.121***
	(0.014)	(0.035)	(0.038)	(0.015)	(0.030)	(0.035)	(0.016)	(0.029)	(0.036)
DY	-0.172*	0.038	-0.210	-0.172**	0.039	-0.211	-0.179	0.027	-0.205
	(0.090)	(0.157)	(0.187)	(0.084)	(0.136)	(0.149)	(0.142)	(0.132)	(0.249)
MOM	0.001	0.002	-0.000	0.001	0.001	-0.000	-0.000	0.005**	-0.005*
	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Mkt-rf x Euribor	2.899**	3.510	-0.611	2.670*	3.859*	-1.189	3.729	-0.076	3.806
	(1.175)	(2.794)	(2.981)	(1.358)	(2.203)	(2.752)	(2.287)	(3.916)	(5.740)
SMB x Euribor	-1.130	-8.180	7.050	-3.361	-0.051	-3.310	-0.253	-8.796*	8.544
	(2.240)	(7.143)	(7.340)	(2.758)	(5.346)	(6.249)	(3.587)	(5.254)	(7.506)
HML x Euribor	-0.086	-19.936***	19.849***	-0.854	-18.349***	17.496***	-6.739*	0.670	-7.409

	(2.924)	(5.579)	(6.241)	(2.993)	(4.729)	(5.497)	(3.627)	(4.703)	(6.766)
MOM x Euribor	-0.612	3.507	-4.119	-1.271	6.016***	-7.287***	-1.148	2.710	-3.858
	(1.341)	(2.690)	(3.150)	(1.364)	(1.678)	(2.188)	(1.554)	(2.296)	(3.123)
Mkt-rf x DY	-0.067***	0.016	-0.083	-0.068***	0.037	-0.105**	-0.045	-0.053	0.008
	(0.023)	(0.045)	(0.059)	(0.022)	(0.039)	(0.053)	(0.031)	(0.059)	(0.083)
SMB x DY	-0.070***	0.080	-0.150	-0.041	-0.013	-0.027	0.018	-0.145	0.163
	(0.027)	(0.090)	(0.095)	(0.030)	(0.100)	(0.109)	(0.061)	(0.122)	(0.174)
HML x DY	-0.033	0.160	-0.193	0.010	-0.015	0.025	-0.018	0.004	-0.022
	(0.061)	(0.133)	(0.138)	(0.067)	(0.115)	(0.131)	(0.097)	(0.167)	(0.233)
MOM x DY	-0.098**	0.005	-0.103	-0.079*	-0.075	-0.004	-0.075	-0.127	0.052
	(0.039)	(0.094)	(0.108)	(0.042)	(0.077)	(0.095)	(0.062)	(0.115)	(0.161)
α	-0.001	-0.001	0.000	-0.000	-0.001	0.001	-0.000	-0.002**	0.001
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.1575	0.6342	0.2508	0.1272	0.5209	0.1899	0.2147	0.0470	0.0518
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0196	0.0153	0.0567
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0126	0.0017	0.0109
Adj. R^2	0.9899	0.9705	0.3932	0.9896	0.9739	0.4898	0.9873	0.9729	0.1083
Observations	180	180	180	180	180	180	180	180	180

Appendix 16. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on best-in-class screens – 50% cut-off

This table provides the estimation results of the conditional Fama and French (2015) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.000***	1.038***	-0.038*	0.998***	1.044***	-0.045**	1.004***	1.021***	-0.017
	(0.010)	(0.017)	(0.020)	(0.011)	(0.016)	(0.019)	(0.011)	(0.017)	(0.020)
SMB	-0.224***	0.134***	-0.358***	-0.231***	0.182***	-0.413***	-0.204***	-0.008	-0.196***
	(0.020)	(0.048)	(0.049)	(0.021)	(0.048)	(0.050)	(0.026)	(0.039)	(0.052)
HML	0.177***	-0.015	0.192***	0.185***	-0.055	0.240***	0.127***	0.153**	-0.026
	(0.034)	(0.063)	(0.065)	(0.034)	(0.055)	(0.056)	(0.037)	(0.062)	(0.071)
RMW	0.045	0.166**	-0.121	0.063	0.097	-0.034	0.023	0.178*	-0.155
	(0.052)	(0.083)	(0.089)	(0.054)	(0.075)	(0.082)	(0.053)	(0.091)	(0.098)
CMA	-0.031	-0.127	0.096	-0.044	-0.096	0.052	-0.069	-0.031	-0.038
	(0.044)	(0.083)	(0.067)	(0.050)	(0.073)	(0.070)	(0.055)	(0.072)	(0.082)
Euribor	-0.245	-0.026	-0.219	-0.270**	0.087	-0.357	-0.293	0.092	-0.385
	(0.149)	(0.239)	(0.327)	(0.127)	(0.182)	(0.223)	(0.196)	(0.231)	(0.375)
DY	0.002	0.003	-0.002	0.002	0.003	-0.001	0.001	0.005**	-0.005
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
Mkt-rf x Euribor	2.548	2.952	-0.404	2.151	4.082	-1.931	3.255*	0.652	2.603

	(1.696)	(2.477)	(3.197)	(1.620)	(2.541)	(3.071)	(1.942)	(3.844)	(4.928)
SMB x Euribor	0.414	-14.462***	14.876***	-1.255	-8.681*	7.426	-0.273	-7.554*	7.281
	(2.470)	(5.000)	(5.115)	(2.762)	(4.862)	(5.714)	(3.321)	(4.083)	(5.934)
HML x Euribor	0.013	-22.298**	22.312*	2.936	-35.637***	38.573***	-5.281	-4.894	-0.386
	(5.088)	(9.437)	(13.126)	(4.049)	(4.948)	(6.758)	(6.017)	(7.788)	(12.213)
RMW x Euribor	2.424	6.523	-4.099	6.773	-12.168	18.941	5.596	-6.533	12.129
	(10.134)	(20.728)	(27.785)	(7.977)	(11.768)	(14.742)	(11.924)	(14.430)	(22.946)
CMA x Euribor	1.911	-4.585	6.496	-2.764	11.991	-14.754	1.375	-2.638	4.013
	(4.840)	(8.414)	(10.278)	(4.713)	(8.097)	(9.625)	(6.025)	(6.306)	(9.960)
Mkt-rf x DY	-0.060**	0.029	-0.089**	-0.066***	0.069*	-0.135***	-0.035	-0.049	0.015
	(0.023)	(0.041)	(0.045)	(0.025)	(0.039)	(0.046)	(0.040)	(0.070)	(0.100)
SMB x DY	-0.059	0.077	-0.136	-0.022	-0.049	0.026	0.010	-0.125	0.136
	(0.045)	(0.104)	(0.122)	(0.040)	(0.112)	(0.121)	(0.054)	(0.086)	(0.115)
HML x DY	0.140*	0.002	0.138	0.171**	-0.137	0.308**	0.058	0.183	-0.125
	(0.082)	(0.148)	(0.163)	(0.083)	(0.110)	(0.119)	(0.169)	(0.236)	(0.381)
RMW x DY	0.123	-0.297	0.420*	0.121	-0.299**	0.421***	0.010	0.073	-0.063
	(0.097)	(0.203)	(0.230)	(0.096)	(0.133)	(0.145)	(0.154)	(0.233)	(0.343)
CMA x DY	-0.143*	0.236*	-0.378***	-0.104	0.112	-0.215	-0.086	-0.032	-0.054
	(0.082)	(0.135)	(0.133)	(0.086)	(0.138)	(0.149)	(0.097)	(0.125)	(0.151)
α	-0.001	-0.001	0.000	-0.001	-0.002*	0.001	-0.001	-0.002**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.1516	0.5587	0.5178	0.0351	0.5115	0.2578	0.3279	0.1113	0.1385
W_2	0.0061	0.0000	0.0000	0.0006	0.0000	0.0000	0.0060	0.3207	0.7063
W_3	0.0024	0.0000	0.0000	0.0005	0.0000	0.0000	0.0001	0.0435	0.0656
Adj. R^2	0.9897	0.9718	0.4224	0.9897	0.9740	0.5150	0.9864	0.9726	0.0446
Observations	180	180	180	180	180	180	180	180	180

Appendix 17. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on best-in-class screens – Exclusion of financial companies

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.998***	1.069***	-0.072***	0.991***	1.061***	-0.070***	0.987***	1.041***	-0.054**
	(0.014)	(0.019)	(0.024)	(0.013)	(0.021)	(0.025)	(0.016)	(0.018)	(0.022)
SMB	-0.273***	0.362***	-0.635***	-0.286***	0.241***	-0.527***	-0.279***	0.164***	-0.443***
	(0.041)	(0.064)	(0.069)	(0.040)	(0.073)	(0.075)	(0.042)	(0.052)	(0.062)
HML	-0.105***	-0.154***	0.049	-0.131***	-0.158***	0.027	-0.166***	-0.080**	-0.085*
	(0.038)	(0.053)	(0.062)	(0.035)	(0.053)	(0.052)	(0.043)	(0.040)	(0.046)
Euribor	0.034	0.027	0.007	0.063**	0.061	0.002	0.050	0.055	-0.005
	(0.030)	(0.046)	(0.052)	(0.029)	(0.043)	(0.049)	(0.033)	(0.042)	(0.047)
DY	0.084	0.577**	-0.494*	0.160	0.072	0.087	0.101	-0.034	0.135
	(0.126)	(0.243)	(0.259)	(0.148)	(0.204)	(0.222)	(0.160)	(0.193)	(0.232)
MOM	-0.005**	-0.005	-0.001	-0.006***	-0.003	-0.003	-0.003	0.004	-0.007*
	(0.002)	(0.003)	(0.004)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)
Mkt-rf x Euribor	6.544***	-0.225	6.769	2.338	-2.139	4.477	4.273*	-1.590	5.863
	(2.409)	(3.149)	(4.136)	(1.968)	(3.518)	(3.482)	(2.507)	(5.270)	(5.465)
SMB x Euribor	2.326	-10.473	12.799	-4.664	-15.828**	11.165	-5.497	-15.099	9.602

	(5.991)	(8.831)	(10.979)	(4.901)	(7.729)	(8.956)	(5.543)	(11.279)	(14.151)
HML x Euribor	10.950**	-2.895	13.845	8.524**	-7.091	15.616**	9.402*	-8.857	18.259**
	(4.495)	(7.737)	(9.344)	(4.278)	(7.231)	(7.457)	(5.152)	(7.570)	(8.337)
MOM x Euribor	3.162	6.205*	-3.043	2.012	5.419	-3.406	4.597*	-2.049	6.647
	(1.998)	(3.224)	(3.759)	(1.895)	(3.494)	(3.487)	(2.383)	(4.671)	(5.277)
Mkt-rf x DY	-0.034	0.017	-0.051	-0.009	0.178***	-0.186***	-0.047	0.142**	-0.189***
	(0.034)	(0.047)	(0.064)	(0.039)	(0.062)	(0.069)	(0.047)	(0.058)	(0.071)
SMB x DY	-0.036	0.078	-0.114	0.117	0.276*	-0.158	-0.078	-0.074	-0.003
	(0.089)	(0.116)	(0.140)	(0.085)	(0.157)	(0.159)	(0.078)	(0.132)	(0.144)
HML x DY	-0.192	-0.001	-0.191	-0.235*	-0.355**	0.119	-0.294**	-0.274*	-0.019
	(0.118)	(0.163)	(0.183)	(0.140)	(0.158)	(0.180)	(0.133)	(0.149)	(0.153)
MOM x DY	0.033	0.033	0.000	-0.003	-0.131	0.128	-0.099	-0.030	-0.068
	(0.069)	(0.113)	(0.112)	(0.077)	(0.115)	(0.131)	(0.071)	(0.116)	(0.123)
α	0.000	-0.003***	0.004***	0.000	-0.002	0.002*	-0.000	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.0815	0.0475	0.0934	0.0046	0.4633	0.5702	0.3421	0.7435	0.1438
W_2	0.0314	0.0456	0.0010	0.0006	0.0000	0.0000	0.0082	0.0004	0.0004
W_3	0.0653	0.0273	0.0020	0.0008	0.0000	0.0000	0.0084	0.0011	0.0000
Adj. R^2	0.9681	0.9477	0.4075	0.9730	0.9440	0.4309	0.9658	0.9511	0.3098
Observations	180	180	180	180	180	180	180	180	180

Appendix 18. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on best-in-class screens – Exclusion of financial companies

This table provides the estimation results of the conditional Fama and French (2015) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.005***	1.055***	-0.050*	0.993***	1.034***	-0.041*	0.992***	1.025***	-0.033
	(0.014)	(0.024)	(0.027)	(0.013)	(0.023)	(0.024)	(0.015)	(0.019)	(0.025)
SMB	-0.232***	0.386***	-0.618***	-0.250***	0.231***	-0.481***	-0.235***	0.175***	-0.411***
	(0.043)	(0.073)	(0.076)	(0.040)	(0.081)	(0.081)	(0.042)	(0.051)	(0.067)
HML	0.040	0.027	0.013	-0.006	-0.099	0.093	-0.022	0.016	-0.037
	(0.052)	(0.081)	(0.086)	(0.046)	(0.092)	(0.090)	(0.054)	(0.067)	(0.079)
RMW	0.355***	0.293***	0.062	0.335***	0.030	0.305**	0.355***	0.198**	0.157
	(0.077)	(0.090)	(0.119)	(0.063)	(0.140)	(0.145)	(0.073)	(0.096)	(0.123)
CMA	0.095	-0.228**	0.323***	0.089	-0.253**	0.341***	0.104	-0.081	0.185
	(0.063)	(0.098)	(0.118)	(0.057)	(0.099)	(0.101)	(0.079)	(0.111)	(0.141)
Euribor	-0.076	0.665***	-0.741**	0.159	0.374	-0.215	-0.009	0.171	-0.180
	(0.207)	(0.233)	(0.330)	(0.183)	(0.354)	(0.340)	(0.216)	(0.214)	(0.320)
DY	-0.002	0.003	-0.005	-0.002	0.001	-0.004	0.000	0.004	-0.004
	(0.002)	(0.003)	(0.003)	(0.002)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)

Mkt-rf x Euribor	6.105***	-3.593	9.698**	2.301	0.798	1.503	6.988***	-0.996	7.984*
	(2.307)	(3.565)	(3.907)	(2.181)	(3.360)	(3.270)	(2.433)	(2.826)	(4.087)
SMB x Euribor	-2.353	-20.545***	18.192*	-8.386*	-24.476***	16.090**	-9.351	-24.514***	15.163
	(5.865)	(7.661)	(9.302)	(4.759)	(6.592)	(7.710)	(6.269)	(6.224)	(10.208)
HML x Euribor	11.659	-8.463	20.122**	6.096	-29.812**	35.908***	1.737	-15.730*	17.468
	(7.334)	(8.262)	(9.877)	(7.440)	(11.653)	(10.718)	(6.157)	(8.997)	(11.259)
RMW x Euribor	13.762	-1.273	15.035	-1.160	-31.840	30.681	4.406	-25.333	29.739
	(15.438)	(15.386)	(24.160)	(12.378)	(19.649)	(24.021)	(13.244)	(20.307)	(27.603)
CMA x Euribor	-0.024	-10.174	10.149	-8.378	1.164	-9.542	12.950*	-30.488***	43.438***
	(6.828)	(9.101)	(10.911)	(5.779)	(11.143)	(11.972)	(7.412)	(8.838)	(13.217)
Mkt-rf x DY	-0.023	-0.035	0.012	-0.011	0.165***	-0.176***	-0.019	0.204***	-0.223***
	(0.042)	(0.048)	(0.070)	(0.037)	(0.056)	(0.061)	(0.043)	(0.053)	(0.070)
SMB x DY	-0.057	-0.066	0.009	0.044	0.076	-0.031	-0.152*	-0.080	-0.072
	(0.075)	(0.108)	(0.122)	(0.094)	(0.134)	(0.175)	(0.088)	(0.102)	(0.140)
HML x DY	-0.297**	-0.127	-0.171	-0.355**	-0.730***	0.375*	-0.449***	-0.619***	0.170
	(0.116)	(0.155)	(0.187)	(0.147)	(0.158)	(0.211)	(0.120)	(0.141)	(0.186)
RMW x DY	-0.241	-0.397**	0.156	-0.290**	-0.846***	0.557**	-0.486***	-0.530**	0.045
	(0.147)	(0.177)	(0.227)	(0.139)	(0.215)	(0.280)	(0.138)	(0.204)	(0.240)
CMA x DY	0.017	-0.157	0.174	-0.032	0.082	-0.113	-0.021	0.561***	-0.583***
	(0.141)	(0.136)	(0.202)	(0.119)	(0.158)	(0.218)	(0.121)	(0.178)	(0.198)
α	-0.002***	-0.004***	0.002	-0.001*	-0.001	-0.001	-0.002***	-0.002	-0.001
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
W_1	0.4864	0.0123	0.0163	0.3760	0.5647	0.6049	0.9898	0.2579	0.4401
W_2	0.0000	0.0028	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Adj. R^2	0.9720	0.9517	0.4422	0.9763	0.9476	0.4890	0.9709	0.9581	0.3538
Observations	180	180	180	180	180	180	180	180	180

Appendix 19. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on best-in-class screens – Equally-weighted

This table provides the estimation results of the conditional Carhart (1997) four-factor model for equally-weighted portfolios formed on individual ESG dimensions and using best-in-class screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.069***	1.084***	-0.015	1.052***	1.087***	-0.035**	1.057***	1.041***	0.016
	(0.015)	(0.020)	(0.019)	(0.011)	(0.019)	(0.015)	(0.019)	(0.016)	(0.018)
SMB	0.090**	0.611***	-0.520***	0.045	0.583***	-0.539***	0.193***	0.574***	-0.382***
	(0.042)	(0.045)	(0.044)	(0.036)	(0.040)	(0.043)	(0.043)	(0.035)	(0.042)
HML	0.204***	0.166***	0.038	0.192***	0.104*	0.088*	0.103***	0.154***	-0.051
	(0.037)	(0.051)	(0.047)	(0.026)	(0.056)	(0.051)	(0.037)	(0.044)	(0.038)
Euribor	-0.145***	-0.037	-0.108***	-0.125***	-0.037	-0.088***	-0.147***	-0.048	-0.099***
	(0.035)	(0.039)	(0.036)	(0.032)	(0.038)	(0.031)	(0.038)	(0.040)	(0.031)
DY	-0.356***	-0.288	-0.069	-0.290***	-0.316*	0.026	-0.269**	-0.463***	0.194
	(0.122)	(0.175)	(0.157)	(0.103)	(0.174)	(0.144)	(0.132)	(0.177)	(0.142)
MOM	0.005*	0.003	0.002	0.001	0.003	-0.002	0.005**	0.004	0.001
	(0.003)	(0.003)	(0.004)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)
Mkt-rf x Euribor	8.680***	2.324	6.357*	7.599***	6.675*	0.924	5.325*	8.088**	-2.763
	(2.859)	(3.670)	(3.541)	(2.099)	(3.738)	(3.276)	(2.878)	(3.420)	(2.822)
SMB x Euribor	2.916	-9.415	12.331*	4.885	-13.176*	18.060***	1.427	2.975	-1.548
	(4.893)	(6.883)	(6.296)	(3.945)	(7.311)	(6.211)	(5.268)	(6.177)	(6.185)
HML x Euribor	-20.359***	-2.841	-17.518**	-6.115	-23.394***	17.279***	-13.298**	-9.547	-3.751

	(5.060)	(7.711)	(6.880)	(4.685)	(7.634)	(5.870)	(5.791)	(6.335)	(6.629)
MOM x Euribor	1.644	13.461***	-11.817***	5.635***	11.954***	-6.319**	2.017	16.938***	-14.921***
	(2.691)	(2.505)	(3.102)	(1.856)	(3.074)	(2.584)	(2.562)	(2.769)	(2.721)
Mkt-rf x DY	-0.133***	-0.015	-0.118**	-0.085**	-0.046	-0.038	-0.103*	-0.021	-0.083
	(0.044)	(0.058)	(0.050)	(0.037)	(0.058)	(0.046)	(0.053)	(0.045)	(0.051)
SMB x DY	-0.118	0.059	-0.177**	0.013	0.104	-0.092	0.028	-0.083	0.111
	(0.080)	(0.109)	(0.086)	(0.062)	(0.122)	(0.093)	(0.096)	(0.078)	(0.090)
HML x DY	-0.113	-0.178	0.065	-0.155	-0.069	-0.086	-0.062	-0.281**	0.219*
	(0.116)	(0.169)	(0.139)	(0.095)	(0.173)	(0.178)	(0.116)	(0.124)	(0.129)
MOM x DY	-0.310***	-0.303***	-0.007	-0.249***	-0.277***	0.028	-0.257***	-0.299***	0.042
	(0.086)	(0.094)	(0.075)	(0.062)	(0.096)	(0.091)	(0.072)	(0.095)	(0.070)
α	0.000	-0.002*	0.003**	0.000	-0.001	0.002**	0.000	-0.001	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.0093	0.2181	0.8571	0.0111	0.1438	0.8092	0.0130	0.0175	0.2334
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9784	0.9676	0.5243	0.9853	0.9648	0.5443	0.9774	0.9747	0.5169
Observations	180	180	180	180	180	180	180	180	180

Appendix 20. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on best-in-class screens – Equally-weighted

This table provides the estimation results of the conditional Fama and French (2015) four-factor model for equally-weighted portfolios formed on individual ESG dimensions ans using best-in-class screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.064***	1.075***	-0.011	1.048***	1.074***	-0.025*	1.047***	1.041***	0.006
	(0.020)	(0.021)	(0.019)	(0.015)	(0.022)	(0.015)	(0.022)	(0.019)	(0.020)
SMB	0.073	0.636***	-0.563***	0.039	0.608***	-0.569***	0.177***	0.605***	-0.428***
	(0.044)	(0.044)	(0.051)	(0.038)	(0.040)	(0.045)	(0.039)	(0.043)	(0.044)
HML	0.330***	0.305***	0.025	0.315***	0.215***	0.099	0.239***	0.250***	-0.011
	(0.061)	(0.072)	(0.060)	(0.045)	(0.076)	(0.062)	(0.051)	(0.067)	(0.051)
RMW	0.020	0.108	-0.088	0.023	0.047	-0.023	0.017	0.036	-0.019
	(0.102)	(0.079)	(0.093)	(0.063)	(0.087)	(0.083)	(0.081)	(0.083)	(0.078)
CMA	-0.168	-0.310***	0.142	-0.184**	-0.313***	0.129*	-0.236**	-0.239***	0.002
	(0.103)	(0.104)	(0.097)	(0.078)	(0.099)	(0.074)	(0.096)	(0.088)	(0.088)
Euribor	-0.385**	-0.010	-0.375**	-0.166	0.035	-0.201	-0.209	-0.237	0.027
	(0.171)	(0.233)	(0.157)	(0.114)	(0.235)	(0.220)	(0.180)	(0.192)	(0.172)
DY	0.006	0.004	0.002	0.001	0.003	-0.002	0.006*	0.003	0.003
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Mkt-rf x Euribor	10.724***	3.670	7.054**	9.135***	8.764**	0.371	6.859*	10.371***	-3.512

	(3.819)	(4.189)	(2.927)	(2.911)	(3.635)	(2.474)	(3.756)	(3.574)	(2.876)
SMB x Euribor	-3.844	-20.534***	16.690***	-5.866	-24.030***	18.165***	-7.248**	-10.623	3.374
	(3.935)	(4.244)	(4.611)	(4.230)	(3.438)	(4.922)	(3.579)	(6.682)	(7.025)
HML x Euribor	-41.120***	-46.466***	5.346	-40.436***	-68.377***	27.942***	-37.085***	-62.166***	25.082***
	(6.532)	(7.283)	(6.191)	(5.705)	(7.170)	(7.406)	(5.704)	(9.128)	(7.849)
RMW x Euribor	-17.896	-43.194***	25.298*	-36.532***	-50.414***	13.882	-25.494*	-44.873**	19.380
	(14.400)	(12.819)	(13.047)	(9.734)	(15.246)	(15.789)	(13.294)	(18.455)	(18.773)
CMA x Euribor	23.258***	33.103***	-9.845	27.041***	31.813***	-4.772	20.788**	49.804***	-29.017***
	(8.134)	(8.875)	(8.101)	(6.404)	(8.824)	(6.958)	(8.847)	(10.504)	(10.711)
Mkt-rf x DY	-0.036	0.032	-0.068	0.002	0.005	-0.003	-0.017	0.051	-0.067
	(0.051)	(0.052)	(0.057)	(0.033)	(0.055)	(0.053)	(0.055)	(0.043)	(0.063)
SMB x DY	-0.140*	-0.026	-0.114	-0.031	0.022	-0.053	-0.017	-0.145	0.129
	(0.079)	(0.081)	(0.084)	(0.067)	(0.094)	(0.095)	(0.077)	(0.095)	(0.107)
HML x DY	-0.212	-0.086	-0.126	-0.200*	-0.060	-0.140	-0.189	-0.209	0.020
	(0.156)	(0.188)	(0.148)	(0.121)	(0.194)	(0.186)	(0.160)	(0.146)	(0.157)
RMW x DY	-0.467*	-0.158	-0.309*	-0.247	-0.216	-0.031	-0.399*	-0.160	-0.239
	(0.275)	(0.206)	(0.185)	(0.153)	(0.190)	(0.169)	(0.205)	(0.223)	(0.255)
CMA x DY	0.023	-0.018	0.041	0.064	0.052	0.012	0.060	0.066	-0.006
	(0.213)	(0.152)	(0.154)	(0.130)	(0.152)	(0.124)	(0.146)	(0.157)	(0.167)
α	-0.001	-0.002*	0.001	-0.001	-0.001	0.001	-0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.0064	0.5445	0.0581	0.2679	0.6299	0.4261	0.1012	0.2508	0.5964
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9729	0.9679	0.5200	0.9819	0.9667	0.5594	0.9729	0.9730	0.4474
Observations	180	180	180	180	180	180	180	180	180

Appendix 21. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on the high and low CSP portfolios approach – 50% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	0.977***	1.041***	-0.064**	1.006***	1.058***	-0.053**	0.971***	1.017***	-0.046
	(0.027)	(0.028)	(0.027)	(0.017)	(0.021)	(0.025)	(0.026)	(0.028)	(0.030)
SMB	-0.354***	-0.084	-0.270***	-0.312***	0.181***	-0.493***	-0.303***	-0.075	-0.227***
	(0.075)	(0.082)	(0.075)	(0.045)	(0.060)	(0.068)	(0.074)	(0.064)	(0.073)
HML	0.158**	-0.121*	0.279***	-0.038	-0.189***	0.151**	0.090	0.108*	-0.019
	(0.068)	(0.071)	(0.066)	(0.050)	(0.060)	(0.059)	(0.066)	(0.061)	(0.048)
MOM	-0.106*	0.072	-0.178***	0.030	-0.006	0.036	-0.069	0.022	-0.091
	(0.058)	(0.052)	(0.058)	(0.040)	(0.040)	(0.049)	(0.060)	(0.052)	(0.057)
Euribor	0.059	0.460**	-0.402	0.314**	0.288	0.026	-0.269	-0.263	-0.006
	(0.247)	(0.178)	(0.270)	(0.159)	(0.193)	(0.203)	(0.294)	(0.230)	(0.457)
DY	-0.003	-0.001	-0.002	-0.004	-0.000	-0.004	-0.001	0.005*	-0.006
	(0.004)	(0.004)	(0.006)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.005)
Mkt-rf x Euribor	2.829	-4.812	7.642	1.013	-2.392	3.405	0.903	-8.182*	9.085
	(5.065)	(3.488)	(5.636)	(2.271)	(3.443)	(3.471)	(4.673)	(4.447)	(7.650)

SMB x Euribor	-13.555	-19.818***	6.263	-14.596**	-8.854	-5.741	-14.418*	-22.399**	7.981
	(8.602)	(7.590)	(10.957)	(6.580)	(6.646)	(8.237)	(8.088)	(10.423)	(14.347)
HML x Euribor	-0.460	-21.417**	20.956*	23.686***	-4.469	28.155***	-4.050	7.501	-11.551
	(11.472)	(9.333)	(11.829)	(5.854)	(8.845)	(9.184)	(8.052)	(8.939)	(10.953)
MOM x Euribor	1.643	4.759	-3.115	3.103	4.425	-1.322	1.763	-5.317	7.080
	(3.539)	(3.931)	(3.875)	(2.745)	(4.028)	(4.545)	(3.428)	(4.211)	(5.291)
Mkt-rf x DY	0.067	0.143*	-0.076	0.051	0.135**	-0.084	0.018	0.136**	-0.119
	(0.081)	(0.086)	(0.082)	(0.059)	(0.059)	(0.072)	(0.081)	(0.055)	(0.080)
SMB x DY	0.017	0.161	-0.144	0.103	0.194*	-0.091	-0.026	0.027	-0.053
	(0.114)	(0.130)	(0.175)	(0.109)	(0.115)	(0.146)	(0.108)	(0.134)	(0.165)
HML x DY	-0.225	-0.315	0.090	-0.267*	-0.114	-0.153	-0.106	-0.463**	0.356*
	(0.231)	(0.242)	(0.232)	(0.158)	(0.179)	(0.173)	(0.213)	(0.183)	(0.194)
MOM x DY	-0.139	-0.233*	0.094	0.007	-0.003	0.010	-0.063	-0.147	0.084
	(0.106)	(0.134)	(0.159)	(0.116)	(0.118)	(0.128)	(0.132)	(0.127)	(0.173)
α	0.000	-0.002	0.002	-0.001	-0.002	0.001	-0.002	-0.002*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.7709	0.0321	0.1765	0.0548	0.2965	0.4805	0.4982	0.1384	0.3642
W_2	0.0167	0.0000	0.0000	0.0000	0.0227	0.0000	0.1531	0.0119	0.2200
W_3	0.0376	0.0000	0.0000	0.0000	0.0333	0.0000	0.0732	0.0020	0.3225
Adj. R^2	0.9464	0.9364	0.2193	0.9585	0.9513	0.4144	0.9464	0.9477	0.1255
Observations	180	180	180	180	180	180	180	180	180

Appendix 21. Continued

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.012***	1.087***	-0.075***	0.988***	1.041***	-0.053*	1.011***	1.049***	-0.039
	(0.024)	(0.025)	(0.025)	(0.020)	(0.026)	(0.031)	(0.026)	(0.022)	(0.032)
SMB	-0.102*	0.291***	-0.393***	-0.139***	0.176***	-0.315***	-0.085	0.113	-0.198**
	(0.056)	(0.078)	(0.090)	(0.043)	(0.063)	(0.058)	(0.058)	(0.085)	(0.084)
HML	0.046	-0.183***	0.229***	0.285***	-0.013	0.297***	-0.022	0.063	-0.085
	(0.066)	(0.051)	(0.065)	(0.055)	(0.068)	(0.071)	(0.064)	(0.061)	(0.065)
MOM	0.043	0.065	-0.023	-0.117***	-0.006	-0.110**	-0.023	0.083	-0.105**
	(0.053)	(0.042)	(0.051)	(0.039)	(0.049)	(0.047)	(0.052)	(0.060)	(0.053)
Euribor	-0.417*	-0.645**	0.228	-0.685***	-0.408	-0.278	-0.040	0.135	-0.176
	(0.225)	(0.276)	(0.328)	(0.200)	(0.297)	(0.195)	(0.186)	(0.218)	(0.281)
DY	0.003	0.003	-0.000	0.006*	0.004	0.002	-0.002	0.007**	-0.009**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Mkt-rf x Euribor	4.538	8.728*	-4.190	6.383***	8.288**	-1.905	4.335	8.911*	-4.575
	(4.511)	(4.630)	(6.194)	(2.313)	(4.032)	(4.782)	(3.251)	(5.241)	(5.466)
SMB x Euribor	13.116*	0.576	12.541	12.018*	-0.128	12.146	17.701***	0.629	17.071
	(7.457)	(14.077)	(17.583)	(7.166)	(11.476)	(11.007)	(6.531)	(10.408)	(11.056)
HML x Euribor	5.669	-18.440	24.109**	-26.438***	-43.142***	16.704	-5.014	-17.493**	12.480
	(10.795)	(11.197)	(10.839)	(5.920)	(9.701)	(10.100)	(6.193)	(8.586)	(8.959)
MOM x Euribor	-2.251	6.669	-8.920*	-3.349	5.915	-9.264**	-0.836	6.113	-6.949
	(2.730)	(5.457)	(5.281)	(3.046)	(3.612)	(3.929)	(3.097)	(4.026)	(4.709)
Mkt-rf x DY	-0.220***	0.005	-0.225*	-0.190***	-0.092	-0.099	-0.053	-0.184	0.132
	(0.057)	(0.111)	(0.116)	(0.069)	(0.074)	(0.072)	(0.072)	(0.119)	(0.158)
SMB x DY	-0.085	0.275	-0.360	-0.255**	-0.066	-0.189	0.159*	-0.288	0.447*
	(0.091)	(0.182)	(0.219)	(0.106)	(0.155)	(0.142)	(0.094)	(0.223)	(0.235)
HML x DY	0.169	0.347*	-0.178	0.289*	0.231	0.058	0.073	0.412	-0.339
	(0.188)	(0.202)	(0.246)	(0.148)	(0.213)	(0.202)	(0.172)	(0.300)	(0.289)

MOM x DY	-0.084	0.180	-0.263*	-0.190*	-0.213*	0.023	-0.003	-0.205	0.203
	(0.092)	(0.126)	(0.150)	(0.105)	(0.118)	(0.125)	(0.118)	(0.182)	(0.168)
α	-0.001	0.001	-0.002	-0.000	-0.001	0.001	0.002*	-0.002	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.1823	0.0663	0.7533	0.0031	0.3240	0.3529	0.7625	0.0563	0.0497
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0011	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0000
Adj. R^2	0.9512	0.9419	0.3680	0.9638	0.9475	0.2995	0.9547	0.9380	0.1493
Observations	180	180	180	180	180	180	180	180	180

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	0.985***	1.035***	-0.050*	1.007***	1.051***	-0.044*	0.992***	1.020***	-0.029
	(0.024)	(0.027)	(0.028)	(0.017)	(0.023)	(0.025)	(0.022)	(0.024)	(0.027)
SMB	-0.346***	-0.060	-0.286***	-0.287***	0.192***	-0.479***	-0.287***	-0.045	-0.242***
	(0.062)	(0.072)	(0.080)	(0.045)	(0.065)	(0.071)	(0.060)	(0.063)	(0.073)
HML	0.325***	-0.071	0.395***	0.137**	-0.074	0.211**	0.172**	0.207***	-0.034
	(0.084)	(0.099)	(0.097)	(0.065)	(0.078)	(0.085)	(0.076)	(0.077)	(0.074)
RMW	0.211	0.134	0.077	0.384***	0.164*	0.219*	0.167	0.282**	-0.115
	(0.164)	(0.176)	(0.153)	(0.083)	(0.088)	(0.111)	(0.132)	(0.115)	(0.114)
CMA	-0.061	-0.042	-0.019	0.057	-0.108	0.166	0.153	0.149	0.004
	(0.142)	(0.144)	(0.135)	(0.081)	(0.104)	(0.107)	(0.107)	(0.127)	(0.114)
Euribor	0.046	0.762**	-0.715	0.202	0.370*	-0.168	-0.552	-0.102	-0.450
	(0.284)	(0.319)	(0.433)	(0.209)	(0.213)	(0.267)	(0.432)	(0.297)	(0.564)
DY	-0.003	-0.002	-0.001	0.001	0.006	-0.005	0.003	0.011***	-0.008*

	(0.004)	(0.005)	(0.005)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.005)
Mkt-rf x Euribor	-1.144	-2.712	1.568	1.557	-3.888	5.446	0.519	-8.685**	9.204
	(4.562)	(3.865)	(5.464)	(2.464)	(3.234)	(3.663)	(4.727)	(4.083)	(7.596)
SMB x Euribor	-15.429**	-21.932***	6.502	-20.973***	-23.571***	2.598	-13.783	-22.162**	8.379
	(7.418)	(8.156)	(11.121)	(5.608)	(6.041)	(6.702)	(8.413)	(10.060)	(17.012)
HML x Euribor	-9.160	-45.840***	36.680***	21.764**	-16.954*	38.718***	1.298	12.891	-11.594
	(12.951)	(12.188)	(11.172)	(9.218)	(9.859)	(10.593)	(13.064)	(9.373)	(12.992)
RMW x Euribor	-10.462	-39.398	28.936	7.805	-11.585	19.390	23.625	-12.584	36.209
	(19.090)	(26.614)	(26.077)	(14.840)	(13.325)	(21.583)	(24.562)	(19.722)	(25.048)
CMA x Euribor	0.448	-1.668	2.116	2.213	-4.787	7.000	23.959*	-19.350*	43.309**
	(10.837)	(13.961)	(12.431)	(6.955)	(10.266)	(11.669)	(13.796)	(10.329)	(17.103)
Mkt-rf x DY	0.091	0.177*	-0.086	0.061	0.150**	-0.090	0.025	0.146***	-0.121
	(0.074)	(0.100)	(0.098)	(0.050)	(0.062)	(0.070)	(0.081)	(0.056)	(0.078)
SMB x DY	0.090	0.140	-0.050	0.017	0.058	-0.041	-0.060	-0.071	0.011
	(0.105)	(0.140)	(0.157)	(0.102)	(0.105)	(0.153)	(0.108)	(0.178)	(0.208)
HML x DY	0.267	-0.193	0.460*	-0.493***	-0.563***	0.070	0.006	-0.561***	0.567**
	(0.244)	(0.265)	(0.273)	(0.159)	(0.176)	(0.190)	(0.266)	(0.175)	(0.228)
RMW x DY	0.648**	-0.007	0.655**	-0.482**	-0.836***	0.354*	-0.004	-0.431*	0.427
	(0.264)	(0.306)	(0.299)	(0.195)	(0.149)	(0.190)	(0.276)	(0.232)	(0.295)
CMA x DY	-0.257	0.114	-0.371*	-0.035	0.112	-0.147	-0.390**	-0.312	-0.078
	(0.197)	(0.222)	(0.219)	(0.129)	(0.132)	(0.175)	(0.193)	(0.211)	(0.263)
α	-0.002	-0.002	0.000	-0.003***	-0.003**	-0.000	-0.004***	-0.005***	0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
W_1	0.7022	0.0596	0.1852	0.6176	0.0393	0.3685	0.4213	0.0114	0.1079
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0019	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9478	0.9347	0.2089	0.9640	0.9539	0.4314	0.9477	0.0000	0.1392
Observations	180	180	180	180	180	180	180	180	180

Appendix 22. Continued

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.004***	1.075***	-0.071**	0.984***	1.044***	-0.060*	0.997***	1.035***	-0.038
	(0.025)	(0.023)	(0.030)	(0.021)	(0.025)	(0.031)	(0.025)	(0.024)	(0.028)
SMB	-0.117**	0.328***	-0.445***	-0.194***	0.213***	-0.407***	-0.108*	0.121	-0.229***
	(0.052)	(0.076)	(0.098)	(0.048)	(0.064)	(0.060)	(0.055)	(0.077)	(0.075)
HML	0.067	-0.019	0.085	0.260***	0.042	0.218**	0.047	0.136	-0.089
	(0.080)	(0.073)	(0.086)	(0.069)	(0.079)	(0.089)	(0.071)	(0.100)	(0.093)
RMW	0.074	0.338***	-0.263**	-0.237***	0.088	-0.324**	0.036	0.147	-0.111
	(0.125)	(0.093)	(0.131)	(0.079)	(0.113)	(0.129)	(0.112)	(0.139)	(0.137)
CMA	0.022	-0.165	0.187*	-0.180	-0.051	-0.129	-0.178	-0.161	-0.018
	(0.131)	(0.125)	(0.113)	(0.116)	(0.129)	(0.103)	(0.128)	(0.115)	(0.105)
Euribor	-0.676**	-0.969***	0.293	-0.801***	-0.272	-0.530*	-0.143	0.187	-0.330
	(0.284)	(0.320)	(0.447)	(0.241)	(0.252)	(0.282)	(0.222)	(0.333)	(0.312)
DY	0.006	0.008*	-0.002	0.003	0.000	0.003	-0.001	0.004	-0.005
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)
Mkt-rf x Euribor	8.518*	7.171	1.347	4.491	11.516***	-7.025*	1.931	11.981**	-10.051**
	(4.815)	(4.791)	(6.772)	(2.765)	(3.859)	(3.812)	(3.588)	(4.710)	(4.772)
SMB x Euribor	18.964**	-10.056	29.020**	20.972***	-0.124	21.096***	15.110***	6.184	8.926
	(7.288)	(10.024)	(13.801)	(6.980)	(8.315)	(6.402)	(5.339)	(8.021)	(10.835)
HML x Euribor	19.449*	-8.396	27.845*	-21.145**	-67.716***	46.571***	-0.718	-30.121**	29.403**
	(11.672)	(11.705)	(15.126)	(9.645)	(9.139)	(11.496)	(8.630)	(11.751)	(11.555)
RMW x Euribor	29.514*	42.750*	-13.236	6.908	-25.898	32.806	10.708	-7.537	18.244
	(17.649)	(22.884)	(29.761)	(12.561)	(22.619)	(25.396)	(15.179)	(27.179)	(29.307)
CMA x Euribor	3.500	-6.528	10.029	-1.039	26.909**	-27.947**	-19.722*	8.178	-27.900*
	(8.986)	(13.132)	(15.523)	(7.492)	(12.382)	(10.858)	(11.539)	(12.718)	(16.052)
Mkt-rf x DY	-0.224***	-0.006	-0.218**	-0.195***	-0.033	-0.162**	-0.051	-0.177	0.126
	(0.064)	(0.092)	(0.105)	(0.067)	(0.072)	(0.066)	(0.071)	(0.123)	(0.148)

SMB x DY	-0.140	0.250	-0.390	-0.135	-0.024	-0.110	0.211**	-0.208	0.419**
	(0.097)	(0.196)	(0.241)	(0.099)	(0.155)	(0.131)	(0.101)	(0.163)	(0.193)
HML x DY	-0.054	-0.171	0.118	0.886***	0.468**	0.418**	-0.015	0.779*	-0.793*
	(0.191)	(0.210)	(0.259)	(0.191)	(0.186)	(0.202)	(0.153)	(0.456)	(0.471)
RMW x DY	-0.592***	-0.787***	0.195	0.730***	0.303	0.427*	-0.185	0.324	-0.510
	(0.185)	(0.277)	(0.315)	(0.203)	(0.265)	(0.225)	(0.209)	(0.449)	(0.433)
CMA x DY	-0.025	0.393**	-0.418**	-0.225	0.067	-0.292	0.177	0.081	0.096
	(0.196)	(0.195)	(0.188)	(0.164)	(0.235)	(0.195)	(0.217)	(0.223)	(0.197)
α	-0.001	-0.001	-0.001	0.002	-0.001	0.002*	0.002	-0.000	0.003**
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
W_1	0.0457	0.0038	0.7862	0.0036	0.5569	0.1462	0.7828	0.6357	0.3770
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0981	0.0001
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0014	0.0000
Adj. R^2	0.9522	0.9472	0.3740	0.9647	0.9478	0.3504	0.9560	0.9367	0.0000
Observations	180	180	180	180	180	180	180	180	180

Appendix 23. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on the high and low CSP portfolios approach – Exclusion of financial companies

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	0.967***	1.036***	-0.069**	1.006***	1.076***	-0.070**	0.970***	0.991***	-0.022
	(0.029)	(0.033)	(0.029)	(0.023)	(0.031)	(0.035)	(0.031)	(0.032)	(0.035)
SMB	-0.503***	0.298***	-0.802***	-0.422***	0.319***	-0.741***	-0.339***	-0.006	-0.333***
	(0.071)	(0.103)	(0.085)	(0.065)	(0.083)	(0.101)	(0.089)	(0.082)	(0.098)
HML	-0.057	-0.165*	0.107	-0.007	-0.206**	0.199**	-0.177**	-0.076	-0.101
	(0.073)	(0.084)	(0.088)	(0.075)	(0.085)	(0.089)	(0.085)	(0.077)	(0.103)
MOM	-0.028	-0.013	-0.015	0.018	-0.040	0.059	0.098	0.020	0.078
	(0.062)	(0.075)	(0.082)	(0.052)	(0.050)	(0.076)	(0.064)	(0.066)	(0.071)
Euribor	0.508**	0.734*	-0.227	0.471*	0.327	0.144	0.614*	0.744**	-0.131
	(0.247)	(0.423)	(0.384)	(0.243)	(0.329)	(0.377)	(0.325)	(0.375)	(0.405)
DY	-0.010***	-0.003	-0.007	-0.006	-0.003	-0.003	-0.006	-0.002	-0.004
	(0.003)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.008)	(0.008)
Mkt-rf x Euribor	6.726	-0.021	6.748	0.333	-0.369	0.702	3.011	-13.318*	16.329*

	(4.829)	(5.531)	(6.357)	(3.860)	(5.280)	(5.588)	(4.118)	(7.342)	(8.741)
SMB x Euribor	-8.701	2.600	-11.301	-24.796***	-14.258	-10.539	-30.342***	-46.588***	16.246
	(11.991)	(18.682)	(18.348)	(8.847)	(11.482)	(14.331)	(10.208)	(12.856)	(16.185)
HML x Euribor	33.680***	-1.909	35.589**	20.083**	-8.114	28.198**	17.349*	9.143	8.206
	(7.838)	(12.838)	(14.036)	(8.480)	(12.348)	(13.704)	(10.409)	(14.302)	(14.254)
MOM x Euribor	6.790*	4.783	2.006	1.209	5.255	-4.046	6.561	-4.607	11.168
	(3.848)	(4.510)	(5.014)	(3.244)	(5.857)	(6.827)	(4.466)	(7.803)	(8.277)
Mkt-rf x DY	0.095	-0.072	0.167*	0.011	0.119	-0.107	-0.031	0.281***	-0.312**
	(0.088)	(0.103)	(0.091)	(0.084)	(0.081)	(0.110)	(0.112)	(0.076)	(0.132)
SMB x DY	0.046	-0.049	0.095	0.124	0.332**	-0.208	-0.089	-0.119	0.030
	(0.179)	(0.169)	(0.202)	(0.144)	(0.145)	(0.237)	(0.132)	(0.157)	(0.199)
HML x DY	-0.547**	0.004	-0.552**	-0.466*	-0.426*	-0.040	-0.372	-0.462*	0.090
	(0.215)	(0.242)	(0.233)	(0.267)	(0.233)	(0.272)	(0.260)	(0.246)	(0.286)
MOM x DY	0.177	0.009	0.169	-0.037	-0.252*	0.216	0.024	0.020	0.004
	(0.136)	(0.131)	(0.134)	(0.134)	(0.141)	(0.206)	(0.139)	(0.174)	(0.217)
α	0.000	-0.003**	0.003**	-0.000	-0.003*	0.002	-0.002	0.000	-0.003
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
W_1	0.0001	0.1949	0.2361	0.0245	0.5410	0.7891	0.1120	0.1361	0.6781
W_2	0.0001	0.4692	0.0004	0.0002	0.0004	0.0000	0.0000	0.0000	0.1486
W_3	0.0000	0.2345	0.0010	0.0002	0.0005	0.0000	0.0001	0.0000	0.0216
Adj. R^2	0.9211	0.9101	0.3453	0.9351	0.9166	0.3955	0.8838	0.8622	0.1492
Observations	180	180	180	180	180	180	180	180	180

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.002***	1.101***	-0.100***	0.958***	1.079***	-0.121***	1.020***	1.100***	-0.080**
	(0.029)	(0.025)	(0.031)	(0.019)	(0.027)	(0.031)	(0.029)	(0.025)	(0.035)
SMB	-0.138**	0.525***	-0.663***	-0.167***	0.349***	-0.516***	-0.202***	0.342***	-0.544***
	(0.066)	(0.080)	(0.079)	(0.054)	(0.101)	(0.087)	(0.067)	(0.078)	(0.088)
HML	-0.119*	-0.069	-0.050	-0.216***	-0.140*	-0.076	-0.183**	-0.130**	-0.053
	(0.067)	(0.075)	(0.081)	(0.066)	(0.073)	(0.079)	(0.070)	(0.063)	(0.091)
MOM	0.109**	0.111**	-0.002	0.118***	0.164***	-0.046	0.035	0.126**	-0.091
	(0.053)	(0.051)	(0.053)	(0.040)	(0.061)	(0.050)	(0.048)	(0.054)	(0.068)
Euribor	-0.338	-0.315	-0.023	-0.233	-0.624**	0.391	-0.568**	-0.776***	0.207
	(0.289)	(0.266)	(0.353)	(0.182)	(0.292)	(0.329)	(0.260)	(0.254)	(0.303)
DY	-0.003	-0.003	-0.000	-0.002	-0.004	0.001	0.000	0.007*	-0.007
	(0.004)	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Mkt-rf x Euribor	4.623	-0.378	5.001	7.960**	8.716*	-0.756	10.283**	6.024	4.259
	(3.608)	(4.807)	(5.626)	(3.119)	(4.927)	(5.072)	(4.135)	(4.219)	(5.011)
SMB x Euribor	10.902	-12.622	23.524	25.160***	-1.446	26.605	37.060***	3.027	34.033*
	(11.302)	(15.865)	(19.876)	(6.751)	(17.743)	(18.586)	(8.381)	(14.579)	(17.329)
HML x Euribor	-1.990	-0.168	-1.822	-7.970	-14.207	6.237	4.802	-25.459***	30.262**
	(7.863)	(12.893)	(14.324)	(7.618)	(11.416)	(12.871)	(11.512)	(9.635)	(12.968)
MOM x Euribor	0.824	8.598	-7.773	1.304	10.839**	-9.534*	5.645	7.372*	-1.727
	(3.432)	(6.542)	(6.901)	(2.977)	(4.894)	(5.212)	(4.821)	(4.096)	(4.846)
Mkt-rf x DY	-0.104	0.145*	-0.249***	-0.090	0.250**	-0.340***	-0.051	0.097	-0.148*
	(0.071)	(0.077)	(0.071)	(0.063)	(0.107)	(0.080)	(0.087)	(0.071)	(0.080)
SMB x DY	-0.034	0.096	-0.130	-0.077	0.118	-0.195	-0.084	0.172	-0.256*
	(0.116)	(0.182)	(0.161)	(0.127)	(0.225)	(0.163)	(0.113)	(0.150)	(0.153)
HML x DY	0.033	-0.183	0.216	0.159	-0.242	0.401	-0.236	-0.231	-0.005
	(0.187)	(0.224)	(0.240)	(0.211)	(0.264)	(0.247)	(0.184)	(0.198)	(0.217)

MOM x DY	-0.131	0.008	-0.139	0.081	0.096	-0.016	-0.240*	-0.192	-0.049
	(0.106)	(0.165)	(0.161)	(0.112)	(0.169)	(0.138)	(0.140)	(0.143)	(0.135)
α	0.001	-0.002	0.003	0.001	-0.001	0.002	0.002*	-0.002*	0.004***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
W_1	0.0821	0.4127	0.9949	0.3499	0.0278	0.3755	0.0622	0.0094	0.2693
W_2	0.1946	0.0018	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0001
W_3	0.0516	0.0014	0.0000	0.0013	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9225	0.9268	0.3947	0.9394	0.9178	0.4776	0.9383	0.9370	0.3609
Observations	180	180	180	180	180	180	180	180	180

Appendix 24. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on the high and low CSP portfolios approach – Exclusion of financial companies

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	0.987***	1.019***	-0.032	1.011***	1.054***	-0.042	0.993***	0.987***	0.006
	(0.025)	(0.033)	(0.034)	(0.021)	(0.033)	(0.036)	(0.032)	(0.033)	(0.036)
SMB	-0.454***	0.312***	-0.766***	-0.399***	0.306***	-0.704***	-0.267***	0.007	-0.274***
	(0.069)	(0.095)	(0.089)	(0.063)	(0.086)	(0.103)	(0.076)	(0.072)	(0.092)
HML	0.080	0.076	0.004	0.155*	-0.036	0.190	-0.022	0.007	-0.030
	(0.093)	(0.114)	(0.115)	(0.090)	(0.107)	(0.121)	(0.116)	(0.105)	(0.115)
RMW	0.284**	0.343**	-0.059	0.370***	0.153	0.217	0.539***	0.228	0.311*
	(0.126)	(0.147)	(0.147)	(0.108)	(0.123)	(0.163)	(0.134)	(0.139)	(0.162)
CMA	0.145	-0.287**	0.432***	0.146	-0.285**	0.431***	0.328***	0.147	0.182
	(0.151)	(0.142)	(0.143)	(0.093)	(0.139)	(0.137)	(0.123)	(0.163)	(0.211)
Euribor	0.601**	0.885**	-0.284	0.485	0.382	0.104	0.184	0.557*	-0.373
	(0.294)	(0.437)	(0.450)	(0.354)	(0.458)	(0.498)	(0.394)	(0.331)	(0.454)
DY	-0.009**	0.005	-0.013***	-0.002	0.004	-0.006	0.002	0.004	-0.002

	(0.003)	(0.004)	(0.005)	(0.004)	(0.004)	(0.006)	(0.004)	(0.004)	(0.004)
Mkt-rf x Euribor	2.923	-4.497	7.420	2.658	2.135	0.523	6.126	-11.594**	17.720**
	(4.648)	(4.644)	(4.641)	(3.298)	(4.228)	(5.073)	(5.547)	(4.638)	(7.504)
SMB x Euribor	-28.285***	-8.903	-19.382	-34.712***	-27.202***	-7.510	-27.296***	-56.277***	28.982***
	(9.531)	(16.788)	(14.900)	(8.165)	(8.217)	(10.934)	(8.697)	(7.305)	(11.007)
HML x Euribor	11.649	-12.047	23.696	9.146	-29.092**	38.238***	31.990**	25.765*	6.224
	(15.614)	(15.487)	(14.655)	(15.997)	(12.819)	(13.454)	(15.691)	(14.068)	(19.330)
RMW x Euribor	-24.444	-14.197	-10.247	-14.703	-15.511	0.808	50.416**	23.048	27.367
	(26.017)	(24.630)	(30.618)	(28.342)	(23.215)	(31.630)	(23.421)	(25.705)	(31.599)
CMA x Euribor	2.031	-18.810	20.840	2.506	11.326	-8.820	33.830**	-10.680	44.510**
	(10.672)	(13.420)	(13.312)	(9.888)	(15.672)	(17.451)	(15.922)	(15.703)	(17.921)
Mkt-rf x DY	0.128*	-0.120	0.248***	0.070	0.170**	-0.100	-0.069	0.354***	-0.423***
	(0.072)	(0.106)	(0.090)	(0.070)	(0.073)	(0.096)	(0.104)	(0.065)	(0.112)
SMB x DY	-0.008	-0.216	0.207	0.009	0.150	-0.140	-0.227	-0.149	-0.078
	(0.183)	(0.167)	(0.180)	(0.174)	(0.125)	(0.237)	(0.166)	(0.126)	(0.233)
HML x DY	-0.678***	-0.017	-0.661**	-0.841***	-0.989***	0.148	-0.456	-1.253***	0.798**
	(0.244)	(0.277)	(0.267)	(0.262)	(0.238)	(0.288)	(0.293)	(0.231)	(0.321)
RMW x DY	-0.005	-0.248	0.243	-0.653**	-1.288***	0.635*	-0.426	-1.407***	0.981***
	(0.247)	(0.269)	(0.310)	(0.316)	(0.223)	(0.384)	(0.261)	(0.243)	(0.353)
CMA x DY	0.147	-0.197	0.345	0.127	0.105	0.023	-0.493**	0.351*	-0.843***
	(0.210)	(0.228)	(0.271)	(0.199)	(0.173)	(0.232)	(0.238)	(0.199)	(0.322)
α	-0.003*	-0.005***	0.002	-0.003**	-0.004*	0.000	-0.006***	-0.002	-0.004*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
W_1	0.0107	0.0273	0.0154	0.3623	0.5031	0.6266	0.8106	0.1379	0.6276
W_2	0.0000	0.1361	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0267	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9247	0.9156	0.3931	0.9448	0.9206	0.4260	0.8957	0.8774	0.2288
Observations	180	180	180	180	180	180	180	180	180

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	0.997***	1.095***	-0.098***	0.960***	1.056***	-0.096***	1.007***	1.074***	-0.067*
	(0.029)	(0.024)	(0.035)	(0.022)	(0.028)	(0.029)	(0.028)	(0.032)	(0.039)
SMB	-0.104	0.601***	-0.705***	-0.122**	0.384***	-0.506***	-0.194***	0.372***	-0.566***
	(0.074)	(0.091)	(0.085)	(0.060)	(0.112)	(0.096)	(0.062)	(0.085)	(0.098)
HML	0.044	0.007	0.037	-0.144**	-0.104	-0.040	-0.039	-0.036	-0.003
	(0.086)	(0.090)	(0.112)	(0.067)	(0.122)	(0.123)	(0.082)	(0.104)	(0.127)
RMW	0.459***	0.241**	0.218	0.303***	0.093	0.210	0.222**	0.176	0.046
	(0.128)	(0.111)	(0.171)	(0.096)	(0.203)	(0.188)	(0.107)	(0.134)	(0.148)
CMA	0.051	-0.069	0.121	0.049	-0.254*	0.303**	-0.138	-0.258*	0.120
	(0.116)	(0.148)	(0.149)	(0.111)	(0.143)	(0.123)	(0.093)	(0.134)	(0.136)
Euribor	-0.807**	0.023	-0.829	-0.540*	-0.128	-0.412	-0.645**	-0.147	-0.499
	(0.396)	(0.339)	(0.506)	(0.278)	(0.316)	(0.326)	(0.272)	(0.318)	(0.389)
DY	0.003	-0.000	0.004	0.001	0.001	0.000	0.003	0.005	-0.002
	(0.004)	(0.006)	(0.006)	(0.004)	(0.006)	(0.005)	(0.005)	(0.004)	(0.007)
Mkt-rf x Euribor	7.334*	-1.753	9.087	5.331	6.261	-0.931	12.402***	8.249**	4.153
	(4.111)	(4.785)	(5.528)	(3.461)	(5.264)	(4.557)	(4.335)	(4.169)	(5.525)
SMB x Euribor	21.759	-25.086**	46.845***	37.192***	-14.221	51.412***	31.302***	-7.547	38.849**
	(13.287)	(10.554)	(13.143)	(5.177)	(13.516)	(15.268)	(8.592)	(10.791)	(16.464)
HML x Euribor	23.179**	-21.455*	44.634***	19.489*	-39.828***	59.316***	-12.644	-69.105***	56.461***
	(10.056)	(11.194)	(15.323)	(10.289)	(13.114)	(12.676)	(9.603)	(12.556)	(16.056)
RMW x Euribor	59.177***	-29.082	88.259***	52.450**	-39.692	92.142***	-4.297	-75.863***	71.566**
	(22.266)	(22.045)	(33.632)	(20.533)	(26.230)	(22.758)	(16.665)	(27.056)	(29.985)
CMA x Euribor	-0.639	-8.199	7.559	-16.131	-22.261	6.130	-0.777	-20.148	19.371
	(12.489)	(15.596)	(16.986)	(10.487)	(17.135)	(14.746)	(15.349)	(14.727)	(17.815)
Mkt-rf x DY	-0.133	0.154**	-0.287***	-0.194***	0.153	-0.348***	-0.009	0.138*	-0.147
	(0.090)	(0.068)	(0.079)	(0.067)	(0.095)	(0.075)	(0.095)	(0.077)	(0.101)

SMB x DY	-0.046	0.050	-0.096	-0.032	-0.082	0.051	-0.124	0.087	-0.211
	(0.135)	(0.217)	(0.179)	(0.135)	(0.199)	(0.156)	(0.111)	(0.137)	(0.184)
HML x DY	-0.021	-0.415*	0.394	0.494**	-0.385	0.878***	-0.404*	-0.315	-0.090
	(0.178)	(0.224)	(0.256)	(0.194)	(0.255)	(0.243)	(0.211)	(0.191)	(0.252)
RMW x DY	-0.523***	-0.391*	-0.132	0.341	-0.350	0.691***	-0.683***	-0.197	-0.486*
	(0.192)	(0.234)	(0.293)	(0.253)	(0.325)	(0.245)	(0.257)	(0.262)	(0.247)
CMA x DY	-0.214	0.254	-0.468*	-0.367**	0.063	-0.430**	0.195	0.507*	-0.313
	(0.237)	(0.226)	(0.249)	(0.173)	(0.227)	(0.177)	(0.250)	(0.279)	(0.244)
α	-0.001	-0.002	0.001	0.001	0.001	-0.000	0.002	-0.001	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
W_1	0.1293	0.9949	0.2607	0.1554	0.9161	0.4019	0.0455	0.4886	0.4205
W_2	0.0009	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
W_3	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9278	0.9278	0.4177	0.9415	0.9145	0.5186	0.9399	0.9394	0.3649
Observations	180	180	180	180	180	180	180	180	180

Appendix 25. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on the high and low CSP portfolios approach – Equally-weighted

This table provides the estimation results of the conditional Carhart (1997) four-factor model for equally-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	1.018***	1.036***	-0.018	1.079***	1.121***	-0.042	1.015***	1.045***	-0.030
	(0.029)	(0.031)	(0.033)	(0.016)	(0.028)	(0.027)	(0.021)	(0.024)	(0.022)
SMB	-0.072	0.422***	-0.494***	-0.072	0.628***	-0.700***	-0.050	0.435***	-0.485***
	(0.074)	(0.085)	(0.066)	(0.059)	(0.072)	(0.059)	(0.060)	(0.068)	(0.062)
HML	0.172**	0.135	0.037	0.067	0.012	0.055	0.166***	0.270***	-0.104**
	(0.086)	(0.085)	(0.062)	(0.054)	(0.085)	(0.094)	(0.051)	(0.052)	(0.046)
MOM	-0.148**	-0.034	-0.114**	-0.032	-0.056	0.024	-0.112**	-0.034	-0.078**
	(0.062)	(0.061)	(0.045)	(0.039)	(0.057)	(0.049)	(0.043)	(0.047)	(0.037)
Euribor	-0.326	-0.461	0.135	0.390*	-0.038	0.428	-0.197	-0.116	-0.082
	(0.236)	(0.304)	(0.207)	(0.204)	(0.287)	(0.268)	(0.211)	(0.248)	(0.224)
DY	-0.005	-0.000	-0.004	-0.007*	-0.003	-0.005	0.002	0.002	-0.000
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
Mkt-rf x Euribor	5.578	0.828	4.750	0.253	6.623	-6.370	1.412	0.690	0.722

	(3.777)	(4.359)	(5.262)	(3.837)	(4.792)	(4.096)	(3.800)	(6.307)	(5.029)
SMB x Euribor	1.605	4.216	-2.611	-32.244***	-21.443*	-10.802	9.259	1.330	7.929
	(9.247)	(7.561)	(8.548)	(10.307)	(12.130)	(8.002)	(12.832)	(14.918)	(9.710)
HML x Euribor	-1.094	4.563	-5.657	8.633	2.276	6.357	28.360***	13.491*	14.869*
	(11.034)	(11.776)	(9.330)	(9.238)	(11.782)	(12.380)	(9.141)	(8.127)	(7.810)
MOM x Euribor	10.717**	18.520***	-7.803	3.864	19.662***	-15.798***	15.097***	14.268***	0.829
	(4.835)	(4.364)	(5.117)	(3.249)	(4.161)	(4.551)	(4.301)	(3.831)	(4.059)
Mkt-rf x DY	0.114	-0.006	0.120	0.018	-0.039	0.057	-0.015	0.043	-0.058
	(0.084)	(0.095)	(0.099)	(0.063)	(0.077)	(0.068)	(0.064)	(0.077)	(0.064)
SMB x DY	-0.077	0.212	-0.289**	0.364***	0.389*	-0.025	-0.208	-0.201	-0.007
	(0.124)	(0.134)	(0.135)	(0.119)	(0.200)	(0.165)	(0.136)	(0.159)	(0.138)
HML x DY	-0.577**	-0.540**	-0.036	-0.354*	-0.322	-0.031	-0.443***	-0.541***	0.098
	(0.242)	(0.252)	(0.183)	(0.182)	(0.239)	(0.257)	(0.163)	(0.173)	(0.158)
MOM x DY	-0.300**	-0.483***	0.182	-0.243***	-0.325**	0.082	-0.208*	-0.273***	0.065
	(0.146)	(0.102)	(0.132)	(0.083)	(0.125)	(0.113)	(0.125)	(0.100)	(0.121)
α	0.000	-0.002*	0.002*	0.000	-0.002	0.002	-0.002*	-0.002**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.0484	0.1868	0.4984	0.0553	0.7381	0.1634	0.6296	0.8230	0.9333
W_2	0.0000	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0273
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0128
Adj. R^2	0.9483	0.9353	0.3068	0.9604	0.9373	0.4887	0.9617	0.9500	0.3347
Observations	180	180	180	180	180	180	180	180	180

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.103***	1.110***	-0.007	1.003***	1.048***	-0.045**	1.083***	1.040***	0.042
	(0.027)	(0.025)	(0.024)	(0.022)	(0.029)	(0.021)	(0.029)	(0.025)	(0.029)
SMB	0.158**	0.800***	-0.643***	0.030	0.491***	-0.461***	0.309***	0.671***	-0.361***
	(0.076)	(0.064)	(0.063)	(0.048)	(0.064)	(0.060)	(0.077)	(0.076)	(0.064)
HML	0.273***	0.189***	0.084	0.347***	0.239***	0.108*	0.031	0.051	-0.020
	(0.070)	(0.061)	(0.074)	(0.058)	(0.087)	(0.062)	(0.071)	(0.077)	(0.081)
MOM	-0.137**	-0.034	-0.104*	-0.164***	0.025	-0.189***	-0.131**	-0.060	-0.071
	(0.066)	(0.048)	(0.054)	(0.040)	(0.045)	(0.041)	(0.055)	(0.065)	(0.048)
Euribor	-0.313	-0.509**	0.196	-0.548***	-0.522**	-0.026	-0.391*	-0.714**	0.323
	(0.285)	(0.230)	(0.288)	(0.133)	(0.225)	(0.179)	(0.229)	(0.280)	(0.241)
DY	0.010	0.004	0.006	0.007**	0.007*	-0.000	0.005	0.005	0.000
	(0.006)	(0.004)	(0.006)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)
Mkt-rf x Euribor	9.441	5.145	4.296	10.180***	9.377*	0.802	9.797**	14.089***	-4.292
	(6.109)	(3.759)	(4.399)	(3.446)	(5.209)	(3.823)	(4.001)	(4.227)	(3.913)
SMB x Euribor	11.237	-11.394	22.632*	14.638**	-10.672	25.310***	3.361	0.162	3.199
	(12.518)	(10.170)	(12.375)	(7.310)	(9.084)	(8.483)	(12.080)	(11.751)	(9.861)
HML x Euribor	-16.508	-11.805	-4.702	-19.530***	-40.090***	20.560**	-35.789***	-32.768***	-3.021
	(10.240)	(10.918)	(10.977)	(6.318)	(11.036)	(8.599)	(12.993)	(10.055)	(13.324)
MOM x Euribor	-3.085	9.868***	-12.953***	5.160*	11.249***	-6.089*	0.623	18.780***	-18.157***
	(4.889)	(3.693)	(4.287)	(3.054)	(3.947)	(3.449)	(4.277)	(3.820)	(4.394)
Mkt-rf x DY	-0.306***	-0.027	-0.279***	-0.208***	-0.075	-0.133**	-0.179**	-0.060	-0.119
	(0.087)	(0.061)	(0.078)	(0.069)	(0.089)	(0.065)	(0.080)	(0.062)	(0.074)
SMB x DY	-0.015	-0.099	0.084	-0.285***	-0.264*	-0.021	0.124	0.035	0.089
	(0.197)	(0.128)	(0.170)	(0.098)	(0.145)	(0.144)	(0.159)	(0.126)	(0.129)
HML x DY	0.263	0.057	0.205	0.048	0.067	-0.019	0.115	0.014	0.101
	(0.189)	(0.195)	(0.217)	(0.165)	(0.290)	(0.215)	(0.212)	(0.216)	(0.228)

146

MOM x DY	-0.268	-0.212*	-0.057	-0.362***	-0.289**	-0.074	-0.374***	-0.283**	-0.091
	(0.184)	(0.122)	(0.149)	(0.090)	(0.131)	(0.117)	(0.100)	(0.137)	(0.093)
α	0.000	-0.002	0.003	0.001	-0.002	0.003**	0.002	-0.001	0.002**
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.2185	0.0583	0.2802	0.0002	0.0388	0.9828	0.0459	0.0318	0.3394
W_2	0.0074	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9458	0.9513	0.4670	0.9703	0.9512	0.4145	0.9522	0.9483	0.3397
Observations	180	180	180	180	180	180	180	180	180

147

Appendix 26. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on the high and low CSP portfolios approach – Equally-weighted

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for equally-weighted portfolios formed on individual ESG dimensions and using the high and low CSP industry portfolio approach, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. RMW denotes the difference between the returns on portfolios of stocks with robust and weak profitability. CMA denotes the difference between returns on portfolios of the stocks of low and high investment firms. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading	High-rated Leading	Low-rated Leading	Long-short Leading
Mkt-rf	1.033***	1.024***	0.009	1.075***	1.112***	-0.037	1.028***	1.052***	-0.024
	(0.031)	(0.031)	(0.033)	(0.017)	(0.033)	(0.029)	(0.019)	(0.025)	(0.023)
SMB	-0.038	0.434***	-0.471***	-0.040	0.684***	-0.724***	-0.033	0.484***	-0.517***
	(0.075)	(0.077)	(0.069)	(0.053)	(0.069)	(0.062)	(0.052)	(0.072)	(0.062)
HML	0.322***	0.261**	0.061	0.245***	0.259**	-0.014	0.303***	0.404***	-0.101*
	(0.098)	(0.105)	(0.095)	(0.071)	(0.109)	(0.108)	(0.062)	(0.077)	(0.054)
RMW	0.106	0.032	0.074	0.295***	0.285***	0.010	0.099	0.186*	-0.088
	(0.153)	(0.146)	(0.147)	(0.076)	(0.105)	(0.111)	(0.089)	(0.100)	(0.085)
CMA	-0.092	-0.381**	0.289**	0.007	-0.329**	0.336***	-0.094	-0.092	-0.002
	(0.153)	(0.177)	(0.135)	(0.095)	(0.150)	(0.121)	(0.097)	(0.097)	(0.084)
Euribor	-0.151	0.005	-0.156	0.605***	0.303	0.302	-0.428	-0.034	-0.394
	(0.300)	(0.265)	(0.292)	(0.222)	(0.380)	(0.337)	(0.269)	(0.426)	(0.310)
DY	-0.005	-0.001	-0.003	-0.003	0.003	-0.006	-0.000	0.002	-0.002

	(0.004)	(0.004)	(0.004)	(0.003)	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)
Mkt-rf x Euribor	3.715	5.014	-1.299	5.138**	8.612*	-3.474	6.875**	5.715	1.160
	(3.788)	(4.430)	(5.041)	(2.419)	(4.662)	(3.944)	(3.275)	(5.856)	(4.685)
SMB x Euribor	-11.878	-4.867	-7.011	-45.243***	-44.825***	-0.417	0.257	-9.620	9.878
	(10.474)	(9.091)	(7.442)	(7.757)	(8.599)	(7.503)	(8.982)	(13.600)	(7.071)
HML x Euribor	-45.466***	-64.748***	19.282**	-24.006***	-60.941***	36.935***	-9.821	-30.716***	20.895**
	(10.996)	(12.346)	(9.432)	(7.582)	(11.103)	(11.903)	(8.801)	(9.913)	(8.311)
RMW x Euribor	-44.160*	-75.100***	30.941	-42.928***	-57.946***	15.018	-4.587	-32.315	27.728
	(25.079)	(20.681)	(21.799)	(14.891)	(21.379)	(24.833)	(18.867)	(25.585)	(18.511)
CMA x Euribor	35.718***	52.266***	-16.548	22.466**	50.257***	-27.791**	79.572***	56.156***	23.415**
	(12.758)	(15.509)	(15.836)	(9.120)	(15.816)	(12.455)	(10.942)	(14.546)	(9.603)
Mkt-rf x DY	0.199**	0.042	0.157	0.128**	0.044	0.085	0.066	0.134*	-0.067
	(0.099)	(0.091)	(0.120)	(0.052)	(0.080)	(0.081)	(0.059)	(0.068)	(0.068)
SMB x DY	-0.076	0.068	-0.144	0.210**	0.192	0.018	-0.252**	-0.293*	0.042
	(0.151)	(0.103)	(0.146)	(0.098)	(0.150)	(0.166)	(0.119)	(0.173)	(0.135)
HML x DY	-0.277	-0.218	-0.058	-0.911***	-0.637**	-0.274	-0.340*	-0.570***	0.230
	(0.270)	(0.274)	(0.263)	(0.192)	(0.265)	(0.244)	(0.185)	(0.219)	(0.153)
RMW x DY	0.198	0.088	0.111	-1.058***	-0.839***	-0.218	-0.017	-0.274	0.257
	(0.305)	(0.275)	(0.306)	(0.173)	(0.248)	(0.251)	(0.212)	(0.227)	(0.220)
CMA x DY	-0.193	-0.163	-0.030	0.151	0.035	0.116	-0.046	0.090	-0.135
	(0.211)	(0.209)	(0.249)	(0.143)	(0.214)	(0.194)	(0.165)	(0.199)	(0.175)
α	-0.002	-0.001	-0.000	-0.003***	-0.003*	0.001	-0.003***	-0.004***	0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
W_1	0.4130	0.9568	0.6254	0.0263	0.6211	0.1670	0.2800	0.9355	0.4018
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9424	0.9359	0.3091	0.9664	0.9398	0.5117	0.9630	0.9504	0.3372
Observations	180	180	180	180	180	180	180	180	180

	Environmental			Social			Governance		
	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging	High-rated Lagging	Low-rated Lagging	Long-short Lagging
Mkt-rf	1.096***	1.100***	-0.003	1.001***	1.039***	-0.038*	1.065***	1.036***	0.029
	(0.030)	(0.025)	(0.028)	(0.025)	(0.030)	(0.022)	(0.031)	(0.028)	(0.033)
SMB	0.117*	0.834***	-0.717***	-0.001	0.516***	-0.517***	0.283***	0.696***	-0.413***
	(0.065)	(0.065)	(0.067)	(0.058)	(0.061)	(0.063)	(0.069)	(0.084)	(0.073)
HML	0.332***	0.304***	0.029	0.428***	0.257**	0.171*	0.156	0.126	0.030
	(0.087)	(0.080)	(0.084)	(0.074)	(0.108)	(0.093)	(0.095)	(0.112)	(0.103)
RMW	-0.067	0.086	-0.153	-0.111	-0.031	-0.080	-0.018	-0.057	0.039
	(0.162)	(0.101)	(0.131)	(0.081)	(0.113)	(0.120)	(0.136)	(0.133)	(0.103)
CMA	-0.098	-0.295**	0.197	-0.248**	-0.203*	-0.044	-0.291**	-0.339***	0.048
	(0.173)	(0.144)	(0.138)	(0.106)	(0.119)	(0.098)	(0.141)	(0.127)	(0.118)
Euribor	-0.586*	-0.217	-0.369	-0.604***	-0.255	-0.350	-0.152	-0.361	0.208
	(0.353)	(0.345)	(0.392)	(0.183)	(0.288)	(0.289)	(0.257)	(0.346)	(0.271)
DY	0.011	0.004	0.007	0.004	0.003	0.001	0.009*	0.004	0.004
	(0.007)	(0.004)	(0.006)	(0.004)	(0.004)	(0.003)	(0.005)	(0.004)	(0.005)
Mkt-rf x Euribor	14.429**	4.412	10.017**	10.722**	13.221***	-2.500	11.299**	14.068***	-2.769
	(7.072)	(5.351)	(4.363)	(4.968)	(4.960)	(3.267)	(5.267)	(4.502)	(4.794)
SMB x Euribor	8.196	-25.250***	33.446***	15.177**	-11.155*	26.332***	-4.342	-16.886	12.544
	(9.361)	(4.648)	(9.330)	(6.864)	(6.066)	(5.614)	(8.623)	(13.091)	(12.904)
HML x Euribor	-20.892**	-46.103***	25.211**	-42.754***	-76.023***	33.269***	-63.982***	-92.317***	28.335***
	(10.530)	(10.213)	(10.115)	(12.042)	(14.203)	(10.905)	(12.075)	(14.427)	(10.101)
RMW x Euribor	8.681	-40.088**	48.769**	-13.557	-36.795	23.238	-42.273**	-56.799**	14.526
	(19.703)	(18.507)	(23.279)	(15.031)	(23.638)	(26.105)	(18.403)	(26.068)	(22.414)
CMA x Euribor	23.288*	12.271	11.016	35.154***	35.886***	-0.731	9.433	43.625***	-34.193*
	(12.435)	(12.583)	(11.466)	(8.437)	(10.623)	(9.199)	(12.581)	(13.889)	(17.591)
Mkt-rf x DY	-0.181*	0.039	-0.219**	-0.152**	-0.035	-0.117	-0.103	0.003	-0.105
	(0.092)	(0.060)	(0.087)	(0.072)	(0.091)	(0.083)	(0.080)	(0.068)	(0.097)

SMB x DY	-0.018	-0.111	0.093	-0.210*	-0.221*	0.011	0.017	-0.002	0.020
	(0.149)	(0.098)	(0.142)	(0.116)	(0.123)	(0.121)	(0.129)	(0.132)	(0.175)
HML x DY	-0.209	0.060	-0.268	0.574***	0.413	0.162	-0.049	0.130	-0.179
	(0.236)	(0.199)	(0.209)	(0.194)	(0.337)	(0.312)	(0.236)	(0.235)	(0.265)
RMW x DY	-0.955**	-0.167	-0.789***	0.464***	0.304	0.160	-0.627**	-0.053	-0.574*
	(0.440)	(0.269)	(0.301)	(0.175)	(0.274)	(0.294)	(0.299)	(0.297)	(0.320)
CMA x DY	0.285	0.262	0.023	-0.248	0.050	-0.298**	-0.057	0.112	-0.169
	(0.335)	(0.217)	(0.244)	(0.175)	(0.175)	(0.143)	(0.221)	(0.205)	(0.249)
α	-0.001	-0.002	0.001	0.001	-0.000	0.002	0.001	0.000	0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
W_1	0.0487	0.4988	0.3615	0.0037	0.6343	0.4824	0.1783	0.4574	0.4691
W_2	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9434	0.9515	0.4956	0.9657	0.9524	0.3468	0.9471	0.9465	0.2975
Observations	180	180	180	180	180	180	180	180	180

Appendix 27. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 1– 25% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2009. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computes using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.042***	1.092***	-0.050*	1.006***	1.142***	-0.136***	1.025***	1.068***	-0.043
	(0.028)	(0.025)	(0.026)	(0.025)	(0.032)	(0.029)	(0.028)	(0.046)	(0.063)
SMB	-0.148***	0.304***	-0.452***	-0.201***	0.500***	-0.702***	-0.138***	0.310***	-0.448***
	(0.047)	(0.067)	(0.076)	(0.040)	(0.066)	(0.067)	(0.048)	(0.064)	(0.089)
HML	0.192**	0.035	0.157	0.053	-0.079	0.132	0.148	-0.084	0.232
	(0.093)	(0.077)	(0.118)	(0.059)	(0.128)	(0.122)	(0.099)	(0.193)	(0.252)
Euribor	-0.006	0.071	-0.077	-0.114	0.131	-0.245	0.071	-0.484***	0.555**
	(0.143)	(0.156)	(0.182)	(0.126)	(0.145)	(0.153)	(0.134)	(0.132)	(0.226)
DY	-0.000	0.001	-0.001	-0.001	0.004*	-0.005*	0.001	0.008*	-0.007
	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.006)
MOM	-0.011	-0.025	0.013	0.032	0.033	-0.001	0.015	-0.116	0.131
	(0.038)	(0.059)	(0.074)	(0.032)	(0.063)	(0.072)	(0.033)	(0.076)	(0.090)
Mkt-rf x Euribor	-0.738	5.421*	-6.159*	-2.158	5.893*	-8.051**	-3.545	10.592**	-14.137**
	(3.204)	(2.900)	(3.460)	(3.014)	(3.164)	(3.592)	(3.341)	(5.062)	(6.864)
SMB x Euribor	-10.069**	1.829	-11.898	-6.061*	-10.480	4.419	-17.311***	13.306*	-30.617***

	(4.998)	(7.089)	(8.249)	(3.297)	(7.451)	(7.786)	(4.622)	(7.203)	(8.834)
HML x Euribor	-0.145	-15.858*	15.714	-0.723	-41.243***	40.520***	-5.662	-28.702*	23.041
	(7.584)	(8.756)	(10.989)	(4.807)	(8.805)	(10.369)	(5.450)	(15.052)	(19.034)
MOM x Euribor	-2.102	4.716**	-6.818**	-1.038	2.008	-3.046	-0.776	0.468	-1.244
	(2.265)	(2.334)	(3.286)	(1.632)	(1.567)	(2.269)	(2.212)	(3.309)	(4.407)
Mkt-rf x DY	-0.017	-0.038	0.022	-0.006	-0.040	0.033	-0.102*	0.020	-0.121
	(0.053)	(0.050)	(0.060)	(0.041)	(0.053)	(0.055)	(0.059)	(0.086)	(0.137)
SMB x DY	-0.055	0.425***	-0.479***	0.011	0.265**	-0.254**	-0.049	-0.032	-0.017
	(0.070)	(0.078)	(0.083)	(0.058)	(0.103)	(0.112)	(0.064)	(0.112)	(0.149)
HML x DY	-0.284	0.236	-0.520**	-0.237	0.126	-0.362**	-0.240	0.480	-0.720*
	(0.216)	(0.159)	(0.216)	(0.158)	(0.153)	(0.166)	(0.173)	(0.298)	(0.409)
MOM x DY	-0.219	0.002	-0.221	-0.159	-0.213	0.054	-0.369***	0.273	-0.642**
	(0.138)	(0.159)	(0.185)	(0.106)	(0.170)	(0.184)	(0.120)	(0.170)	(0.239)
α	-0.002**	0.001	-0.003*	-0.001	-0.001	-0.000	-0.002**	0.002	-0.004
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)
W_1	0.9940	0.8502	0.8572	0.4848	0.1277	0.0473	0.7735	0.0027	0.0468
W_2	0.0280	0.0000	0.0000	0.5463	0.0000	0.0000	0.0024	0.1226	0.0276
W_3	0.0149	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0040	0.0045
Adj. R^2	0.9879	0.9805	0.3991	0.9899	0.9804	0.6846	0.9858	0.9720	0.3132
Observations	60	60	60	60	60	60	60	60	60

Appendix 28. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 1– 50% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2009. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.988***	1.073***	-0.084*	0.997***	1.042***	-0.044	1.020***	0.980***	0.040
	(0.022)	(0.030)	(0.044)	(0.019)	(0.024)	(0.031)	(0.024)	(0.026)	(0.040)
SMB	-0.197***	0.269***	-0.466***	-0.166***	0.178**	-0.344***	-0.143***	-0.003	-0.140*
	(0.027)	(0.075)	(0.070)	(0.030)	(0.076)	(0.075)	(0.045)	(0.059)	(0.083)
HML	0.127***	-0.161	0.289**	0.090**	-0.027	0.118	0.062	0.087	-0.025
	(0.045)	(0.105)	(0.118)	(0.044)	(0.070)	(0.075)	(0.072)	(0.119)	(0.172)
Euribor	-0.075	-0.076	0.001	-0.068	-0.144	0.077	0.006	-0.213	0.219
	(0.089)	(0.113)	(0.161)	(0.070)	(0.128)	(0.124)	(0.131)	(0.138)	(0.238)
DY	-0.001	0.005	-0.006	-0.000	0.004**	-0.004	-0.002	0.005***	-0.007**
	(0.002)	(0.003)	(0.005)	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
MOM	-0.010	-0.027	0.018	0.004	-0.062	0.066	-0.015	-0.009	-0.006
	(0.023)	(0.066)	(0.073)	(0.027)	(0.043)	(0.053)	(0.026)	(0.063)	(0.075)
Mkt-rf x Euribor	1.176	7.733**	-6.557	1.628	4.582**	-2.954	-1.485	11.403***	-12.888**
	(1.815)	(3.481)	(4.425)	(1.743)	(2.183)	(2.998)	(2.778)	(3.295)	(5.513)
SMB x Euribor	-3.885	0.471	-4.355	-4.984	3.286	-8.270	-9.145**	13.265**	-22.409***

	(3.089)	(6.882)	(7.590)	(3.092)	(5.148)	(5.735)	(3.807)	(5.691)	(7.293)
HML x Euribor	1.741	-39.196***	40.937***	-2.987	-23.221***	20.233**	-1.464	-15.283*	13.819
	(4.181)	(9.487)	(11.918)	(3.405)	(7.879)	(8.514)	(4.177)	(8.284)	(10.668)
MOM x Euribor	0.413	2.389	-1.976	0.141	3.888*	-3.748	-2.847*	9.439***	-12.286***
	(1.237)	(2.808)	(3.558)	(1.184)	(1.932)	(2.642)	(1.639)	(2.175)	(3.404)
Mkt-rf x DY	-0.049	-0.050	0.001	-0.066*	0.061	-0.127**	-0.046	-0.061	0.015
	(0.040)	(0.048)	(0.076)	(0.035)	(0.041)	(0.058)	(0.050)	(0.044)	(0.083)
SMB x DY	-0.085**	0.352***	-0.437***	-0.063*	0.323***	-0.386***	-0.002	-0.013	0.011
	(0.033)	(0.081)	(0.087)	(0.036)	(0.096)	(0.106)	(0.048)	(0.085)	(0.113)
HML x DY	-0.097	0.696***	-0.793***	0.011	0.213**	-0.203	-0.208	0.601***	-0.809***
	(0.112)	(0.177)	(0.253)	(0.095)	(0.090)	(0.122)	(0.154)	(0.155)	(0.278)
MOM x DY	-0.146*	0.275*	-0.421**	-0.104	0.081	-0.185	-0.221*	0.255*	-0.476**
	(0.075)	(0.151)	(0.189)	(0.069)	(0.091)	(0.112)	(0.110)	(0.141)	(0.222)
α	-0.001	0.002	-0.003	-0.001	0.002	-0.003*	-0.001	0.001	-0.002
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
W_1	0.3028	0.3096	0.2024	0.4975	0.0181	0.2456	0.6585	0.0086	0.0865
W_2	0.0097	0.0000	0.0000	0.1500	0.0000	0.0012	0.0332	0.0007	0.0017
W_3	0.0032	0.0000	0.0000	0.0003	0.0000	0.0000	0.0004	0.0000	0.0000
Adj. R^2	0.9935	0.9808	0.5472	0.9943	0.9855	0.6845	0.9901	0.9825	0.3184
Observations	60	60	60	60	60	60	60	60	60

Appendix 29. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 1 – Exclusion of financial companies

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2009. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.026***	1.124***	-0.097***	1.004***	1.157***	-0.154***	1.014***	1.073***	-0.059
	(0.029)	(0.034)	(0.034)	(0.026)	(0.047)	(0.047)	(0.028)	(0.055)	(0.059)
SMB	-0.181***	0.386***	-0.567***	-0.227***	0.497***	-0.724***	-0.197***	0.399***	-0.596***
	(0.064)	(0.092)	(0.079)	(0.049)	(0.118)	(0.112)	(0.054)	(0.096)	(0.106)
HML	-0.323***	-0.030	-0.293**	-0.394***	-0.253	-0.140	-0.431***	-0.209	-0.222
	(0.114)	(0.090)	(0.127)	(0.097)	(0.164)	(0.162)	(0.110)	(0.266)	(0.229)
Euribor	0.082	0.012	0.070	-0.012	-0.056	0.044	0.072	-0.536***	0.608**
	(0.120)	(0.165)	(0.198)	(0.139)	(0.211)	(0.273)	(0.141)	(0.199)	(0.229)
DY	-0.003	0.001	-0.004	-0.004*	0.000	-0.004	-0.001	0.011	-0.012*
	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.004)	(0.003)	(0.008)	(0.007)
MOM	0.173***	-0.022	0.195**	0.168***	-0.039	0.208**	0.192***	-0.099	0.291***
	(0.050)	(0.073)	(0.086)	(0.048)	(0.080)	(0.100)	(0.056)	(0.088)	(0.086)
Mkt-rf x Euribor	0.690	5.895	-5.205	-0.533	7.807*	-8.340*	-0.630	13.215**	-13.845**
	(2.519)	(3.546)	(3.529)	(2.307)	(4.267)	(4.565)	(2.671)	(6.039)	(5.661)

SMB x Euribor	-10.702**	1.437	-12.138	-8.146	-3.488	-4.657	-12.856**	9.218	-22.074
	(5.203)	(8.029)	(9.733)	(5.289)	(9.423)	(12.496)	(6.194)	(12.672)	(14.042)
HML x Euribor	-9.610	-7.722	-1.888	-10.656	-27.512*	16.856	-15.631**	-35.770	20.139
	(7.742)	(9.563)	(9.963)	(7.749)	(14.943)	(17.973)	(7.628)	(22.347)	(22.003)
MOM x Euribor	1.062	1.777	-0.716	0.438	0.636	-0.198	2.747	-2.030	4.777
	(3.001)	(3.824)	(3.649)	(2.465)	(4.347)	(5.180)	(3.092)	(5.866)	(6.026)
Mkt-rf x DY	0.073	-0.002	0.075	0.033	0.042	-0.009	-0.023	0.065	-0.088
	(0.050)	(0.061)	(0.069)	(0.044)	(0.069)	(0.083)	(0.046)	(0.104)	(0.115)
SMB x DY	0.008	0.458***	-0.450***	0.040	0.394***	-0.354***	-0.044	0.107	-0.151
	(0.082)	(0.126)	(0.101)	(0.065)	(0.114)	(0.112)	(0.065)	(0.166)	(0.167)
HML x DY	-0.287**	0.372*	-0.660***	-0.289**	0.194	-0.482***	-0.351***	0.782*	-1.132**
	(0.117)	(0.212)	(0.211)	(0.118)	(0.169)	(0.175)	(0.125)	(0.429)	(0.425)
MOM x DY	-0.014	0.250	-0.263	-0.073	0.086	-0.159	-0.215*	0.525**	-0.740***
	(0.097)	(0.160)	(0.172)	(0.100)	(0.168)	(0.208)	(0.110)	(0.242)	(0.222)
α	0.001	0.002	-0.000	0.002	0.002	0.000	0.001	0.004	-0.003
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)
W_1	0.4640	0.9534	0.4535	0.1785	0.9302	0.5338	0.8338	0.0315	0.0356
W_2	0.0025	0.0000	0.0000	0.1956	0.0000	0.0001	0.0168	0.0312	0.0026
W_3	0.0032	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0057	0.0000
Adj. R^2	0.9683	0.9741	0.5773	0.9728	0.9692	0.7125	0.9653	0.9519	0.5305
Observations	60	60	60	60	60	60	60	60	60

Appendix 30. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 1– Equally-weighted

This table provides the estimation results of the conditional Carhart (1997) four-factor model for equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2009. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.038***	1.035***	0.003	1.039***	1.041***	-0.002	1.016***	0.972***	0.043
	(0.030)	(0.027)	(0.042)	(0.018)	(0.037)	(0.033)	(0.025)	(0.033)	(0.035)
SMB	0.145**	0.604***	-0.459***	0.071	0.682***	-0.611***	0.195***	0.645***	-0.449***
	(0.061)	(0.063)	(0.071)	(0.046)	(0.063)	(0.073)	(0.048)	(0.072)	(0.088)
HML	0.247***	0.317**	-0.070	0.096	0.335***	-0.239**	0.229***	0.165	0.065
	(0.084)	(0.145)	(0.165)	(0.057)	(0.116)	(0.091)	(0.062)	(0.128)	(0.132)
Euribor	-0.314***	-0.604***	0.290*	-0.185***	-0.311**	0.126	-0.122	-0.582***	0.460***
	(0.096)	(0.133)	(0.161)	(0.068)	(0.142)	(0.136)	(0.095)	(0.152)	(0.153)
DY	0.006*	0.003	0.003	0.002	0.004	-0.002	0.005**	0.004	0.001
	(0.003)	(0.003)	(0.005)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)
MOM	-0.222***	-0.059	-0.163***	-0.170***	-0.102	-0.068	-0.101**	-0.250***	0.149*
	(0.049)	(0.060)	(0.055)	(0.031)	(0.072)	(0.066)	(0.039)	(0.084)	(0.077)
Mkt-rf x Euribor	5.629**	9.865***	-4.236	6.239***	11.421***	-5.182	-0.120	17.522***	-17.643***
	(2.296)	(2.678)	(3.285)	(1.417)	(3.345)	(3.533)	(2.552)	(4.121)	(4.809)
SMB x Euribor	3.203	5.443	-2.240	6.162**	-6.615	12.777*	-1.271	22.483**	-23.754***

	(4.689)	(7.322)	(7.953)	(2.959)	(7.125)	(6.404)	(4.254)	(8.393)	(8.349)
HML x Euribor	-20.633***	-9.832	-10.801	-10.514**	-37.371***	26.857***	-9.858**	-21.118***	11.260
	(6.087)	(9.639)	(9.305)	(4.248)	(7.142)	(6.879)	(4.626)	(6.615)	(6.996)
MOM x Euribor	-1.408	15.453***	-16.862***	0.277	9.772***	-9.495**	2.997	14.902***	-11.904***
	(3.017)	(2.782)	(4.206)	(1.806)	(3.165)	(3.690)	(2.627)	(2.470)	(2.796)
Mkt-rf x DY	-0.059	-0.047	-0.012	-0.111***	-0.143**	0.031	-0.085	-0.064	-0.021
	(0.053)	(0.061)	(0.084)	(0.028)	(0.060)	(0.061)	(0.054)	(0.050)	(0.062)
SMB x DY	-0.012	0.265***	-0.277***	0.125**	0.382***	-0.257**	0.228***	0.098	0.130
	(0.093)	(0.077)	(0.075)	(0.059)	(0.103)	(0.115)	(0.066)	(0.119)	(0.128)
HML x DY	0.034	0.255	-0.221	0.003	0.564***	-0.561***	-0.058	0.402**	-0.460**
	(0.105)	(0.163)	(0.156)	(0.055)	(0.182)	(0.168)	(0.115)	(0.176)	(0.200)
MOM x DY	-0.175*	-0.084	-0.091	-0.207***	-0.060	-0.147	-0.357***	0.065	-0.422**
	(0.102)	(0.149)	(0.142)	(0.060)	(0.152)	(0.143)	(0.094)	(0.180)	(0.163)
α	0.003	0.002	0.000	0.003***	0.003	-0.001	0.002	0.003	-0.002
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
W_1	0.0028	0.0002	0.1369	0.0098	0.0847	0.5533	0.0164	0.0015	0.0125
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0030
Adj. R^2	0.9866	0.9810	0.6384	0.9913	0.9811	0.7590	0.9882	0.9806	0.6404
Observations	60	60	60	60	60	60	60	60	60

Appendix 31. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 2– 25% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2010 to 2014. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.951***	1.070***	-0.119***	0.966***	1.099***	-0.133***	0.937***	1.102***	-0.165***
	(0.019)	(0.039)	(0.039)	(0.015)	(0.036)	(0.033)	(0.019)	(0.038)	(0.040)
SMB	-0.376***	0.215**	-0.591***	-0.330***	0.163*	-0.493***	-0.299***	0.247**	-0.546***
	(0.076)	(0.088)	(0.115)	(0.052)	(0.084)	(0.105)	(0.060)	(0.102)	(0.121)
HML	0.272***	-0.040	0.312***	0.147***	-0.065	0.212	0.148**	-0.053	0.201
	(0.083)	(0.119)	(0.110)	(0.050)	(0.142)	(0.128)	(0.064)	(0.138)	(0.134)
Euribor	-1.006*	-1.170***	0.164	-0.490	-0.697	0.207	-0.815	-0.420	-0.395
	(0.516)	(0.362)	(0.596)	(0.435)	(0.446)	(0.597)	(0.492)	(0.518)	(0.776)
DY	-0.005	0.014***	-0.019***	-0.003	0.011*	-0.014**	-0.001	0.003	-0.004
	(0.006)	(0.004)	(0.007)	(0.003)	(0.006)	(0.006)	(0.004)	(0.005)	(0.006)
MOM	-0.123**	0.172**	-0.295***	-0.037	0.197*	-0.234**	-0.084*	0.223**	-0.307***
	(0.058)	(0.081)	(0.076)	(0.032)	(0.112)	(0.103)	(0.044)	(0.087)	(0.083)
Mkt-rf x Euribor	8.152	-37.009***	45.161***	4.722	-21.526**	26.248**	6.991	-1.785	8.775
	(7.512)	(13.159)	(12.556)	(4.735)	(10.091)	(10.771)	(6.502)	(12.399)	(11.370)
SMB x Euribor	-27.108	52.268*	-79.376**	-38.988**	52.436	-91.424*	-40.519*	43.516	-84.035*

	(22.984)	(27.309)	(37.159)	(19.324)	(36.490)	(48.192)	(23.380)	(34.133)	(44.693)
HML x Euribor	-15.013	51.512**	-66.525**	-23.190	4.678	-27.868	-18.417	-32.904	14.487
	(21.386)	(20.656)	(31.131)	(13.920)	(26.746)	(29.263)	(21.517)	(20.153)	(28.402)
MOM x Euribor	2.869	27.412**	-24.543	9.827	18.834	-9.007	12.435	20.390**	-7.956
	(23.947)	(11.196)	(30.391)	(20.823)	(12.277)	(29.251)	(22.868)	(9.241)	(28.250)
Mkt-rf x DY	-0.007	0.244	-0.251	-0.090	0.234	-0.324*	0.012	0.169	-0.157
	(0.094)	(0.167)	(0.186)	(0.070)	(0.152)	(0.169)	(0.084)	(0.179)	(0.177)
SMB x DY	0.026	-1.004***	1.030**	0.158	-0.723	0.881*	0.047	-0.163	0.209
	(0.144)	(0.367)	(0.419)	(0.118)	(0.469)	(0.508)	(0.146)	(0.395)	(0.440)
HML x DY	0.018	-0.672*	0.690*	0.259*	-0.234	0.492	0.185	-0.072	0.257
	(0.268)	(0.368)	(0.398)	(0.141)	(0.500)	(0.498)	(0.180)	(0.432)	(0.457)
MOM x DY	-0.013	-0.653***	0.640**	0.026	-0.528**	0.554*	0.022	-0.672***	0.694***
	(0.153)	(0.229)	(0.296)	(0.117)	(0.250)	(0.286)	(0.146)	(0.208)	(0.253)
α	-0.000	-0.008***	0.008***	-0.000	-0.007**	0.007***	0.000	-0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)
W_1	0.0751	0.0002	0.0266	0.3229	0.1307	0.0858	0.2621	0.6864	0.5994
W_2	0.0009	0.0001	0.0000	0.0113	0.0922	0.0019	0.0000	0.0000	0.0000
W_3	0.0001	0.0000	0.0000	0.0105	0.0731	0.0046	0.0000	0.0001	0.0000
Adj. R^2	0.9800	0.9648	0.6014	0.9861	0.9463	0.3772	0.9803	0.9677	0.5249
Observations	60	60	60	60	60	60	60	60	60

Appendix 32. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 2– 50% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2010 to 2014. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.981***	1.050***	-0.069***	0.977***	1.069***	-0.092**	0.969***	1.074***	-0.105***
	(0.012)	(0.028)	(0.024)	(0.013)	(0.038)	(0.039)	(0.012)	(0.023)	(0.019)
SMB	-0.238***	0.116	-0.354***	-0.243***	0.169	-0.413***	-0.251***	0.078	-0.329***
	(0.049)	(0.092)	(0.100)	(0.048)	(0.109)	(0.118)	(0.049)	(0.065)	(0.068)
HML	0.120***	-0.144*	0.263***	0.120***	-0.149	0.269**	0.086***	0.010	0.076
	(0.038)	(0.076)	(0.061)	(0.035)	(0.120)	(0.114)	(0.031)	(0.096)	(0.084)
Euribor	-0.896	-0.723	-0.173	-0.757	-1.341*	0.584	-1.087*	-0.177	-0.910
	(0.628)	(0.512)	(0.594)	(0.634)	(0.682)	(0.813)	(0.590)	(0.707)	(0.676)
DY	0.001	0.010**	-0.010**	0.001	0.010**	-0.009	0.003	0.005	-0.003
	(0.002)	(0.004)	(0.004)	(0.002)	(0.005)	(0.006)	(0.002)	(0.004)	(0.004)
MOM	-0.080**	0.148**	-0.228***	-0.060	0.073	-0.133*	-0.091**	0.130**	-0.221***
	(0.039)	(0.061)	(0.051)	(0.039)	(0.077)	(0.072)	(0.040)	(0.058)	(0.054)
Mkt-rf x Euribor	0.565	-4.217	4.782	-0.341	0.234	-0.576	3.905	-15.099**	19.004**
	(3.591)	(6.984)	(6.055)	(3.453)	(9.550)	(9.035)	(4.178)	(6.346)	(7.104)
SMB x Euribor	-14.631	-6.203	-8.428	-20.785	20.110	-40.895	-15.182	-14.146	-1.037

	(13.122)	(22.957)	(24.392)	(13.448)	(24.315)	(27.430)	(11.099)	(18.191)	(13.045)
HML x Euribor	3.274	-9.793	13.067	6.385	-17.792	24.177	2.479	5.050	-2.571
	(12.261)	(20.202)	(18.314)	(12.038)	(29.864)	(29.828)	(12.686)	(24.634)	(26.268)
MOM x Euribor	14.891	13.763	1.128	15.305	16.806	-1.501	17.094	8.690	8.404
	(16.675)	(20.135)	(21.869)	(17.322)	(24.669)	(28.925)	(16.983)	(20.380)	(23.445)
Mkt-rf x DY	-0.034	0.019	-0.053	-0.017	-0.046	0.029	-0.104**	0.194**	-0.299***
	(0.038)	(0.080)	(0.089)	(0.048)	(0.106)	(0.133)	(0.040)	(0.086)	(0.100)
SMB x DY	0.024	-0.106	0.130	0.071	-0.337	0.408	-0.046	0.121	-0.167
	(0.147)	(0.299)	(0.334)	(0.168)	(0.335)	(0.413)	(0.150)	(0.226)	(0.261)
HML x DY	-0.077	0.178	-0.255	-0.090	0.144	-0.234	0.039	-0.253	0.291
	(0.112)	(0.191)	(0.184)	(0.117)	(0.335)	(0.368)	(0.104)	(0.273)	(0.289)
MOM x DY	-0.069	-0.382*	0.314	-0.075	-0.387*	0.313	-0.047	-0.428**	0.381*
	(0.116)	(0.191)	(0.205)	(0.122)	(0.219)	(0.254)	(0.125)	(0.180)	(0.214)
α	-0.000	-0.002	0.002	-0.000	-0.002	0.002	0.001	-0.004*	0.004***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
W_1	0.3115	0.0180	0.0746	0.4111	0.0363	0.2363	0.0653	0.4076	0.2962
W_2	0.8858	0.0444	0.0392	0.6956	0.0422	0.1645	0.0391	0.0000	0.0000
W_3	0.1298	0.0004	0.0250	0.3811	0.0278	0.0857	0.0106	0.0000	0.0000
Adj. R^2	0.9877	0.9713	0.5787	0.9870	0.9616	0.3621	0.9876	0.9762	0.5293
Observations	60	60	60	60	60	60	60	60	60

Appendix 33. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 2 – Exclusion of financial companies

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2010 to 2014. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.976***	1.050***	-0.074*	0.976***	1.045***	-0.069***	0.974***	1.092***	-0.117**
	(0.024)	(0.042)	(0.039)	(0.018)	(0.031)	(0.024)	(0.025)	(0.040)	(0.045)
SMB	-0.255***	0.368***	-0.623***	-0.268***	0.283***	-0.551***	-0.171***	0.314***	-0.486***
	(0.070)	(0.105)	(0.112)	(0.061)	(0.094)	(0.109)	(0.057)	(0.102)	(0.122)
HML	-0.051	-0.143	0.092	-0.078	-0.176	0.098	-0.121	-0.135	0.014
	(0.063)	(0.119)	(0.129)	(0.054)	(0.110)	(0.120)	(0.073)	(0.116)	(0.137)
Euribor	0.562**	-0.717*	1.279***	0.573**	-0.559	1.132**	0.727***	0.125	0.602
	(0.241)	(0.356)	(0.409)	(0.246)	(0.371)	(0.490)	(0.255)	(0.478)	(0.581)
DY	-0.008***	0.013***	-0.021***	-0.004*	0.010**	-0.014***	-0.002	0.003	-0.005
	(0.003)	(0.003)	(0.004)	(0.002)	(0.004)	(0.004)	(0.003)	(0.005)	(0.007)
MOM	0.007	0.226***	-0.219***	0.070*	0.234**	-0.164	0.071	0.295***	-0.224***
	(0.043)	(0.077)	(0.063)	(0.037)	(0.096)	(0.103)	(0.053)	(0.087)	(0.078)
Mkt-rf x Euribor	13.911**	-28.805**	42.716***	10.247*	-12.233*	22.480**	8.641	10.605	-1.964
	(5.387)	(10.866)	(12.665)	(5.483)	(7.244)	(8.984)	(5.955)	(11.855)	(13.160)

SMB x Euribor	-15.329	38.863	-54.192	-29.823	45.739	-75.562*	-21.783	36.559	-58.342
	(19.883)	(32.542)	(40.567)	(19.929)	(27.286)	(39.274)	(15.332)	(31.349)	(41.542)
HML x Euribor	-22.127*	36.855*	-58.982**	-21.358	1.357	-22.715	-15.322	-64.609***	49.287*
	(12.453)	(20.918)	(25.081)	(13.865)	(18.653)	(24.418)	(13.831)	(21.672)	(26.344)
MOM x Euribor	-5.823	21.204*	-27.027*	1.267	17.228	-15.961	-3.367	19.350**	-22.718**
	(6.958)	(11.087)	(13.947)	(6.655)	(13.177)	(17.297)	(4.923)	(8.826)	(10.240)
Mkt-rf x DY	-0.126	0.355**	-0.481**	-0.107	0.345***	-0.452***	-0.027	0.195	-0.222
	(0.079)	(0.159)	(0.202)	(0.070)	(0.123)	(0.150)	(0.085)	(0.169)	(0.180)
SMB x DY	-0.015	-0.711**	0.697*	0.136	-0.483	0.620	0.002	-0.029	0.031
	(0.136)	(0.352)	(0.374)	(0.150)	(0.407)	(0.463)	(0.151)	(0.360)	(0.410)
HML x DY	0.124	-0.578	0.703*	0.194	-0.456	0.650	0.204	0.127	0.077
	(0.159)	(0.371)	(0.389)	(0.155)	(0.387)	(0.452)	(0.194)	(0.369)	(0.438)
MOM x DY	-0.008	-0.304	0.297	-0.054	-0.372	0.318	-0.058	-0.685***	0.627***
	(0.114)	(0.210)	(0.213)	(0.080)	(0.265)	(0.300)	(0.119)	(0.218)	(0.200)
α	-0.001	-0.007***	0.006***	-0.001	-0.005*	0.004*	-0.001	-0.006***	0.006***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
W_1	0.0114	0.0006	0.0000	0.0496	0.0632	0.0081	0.0230	0.7934	0.5683
W_2	0.0097	0.0148	0.0002	0.2841	0.0206	0.0161	0.0130	0.0000	0.0000
W_3	0.0000	0.0019	0.0000	0.0193	0.0045	0.0003	0.0002	0.0000	0.0000
Adj. R^2	0.9791	0.9602	0.5967	0.9841	0.9657	0.5699	0.9785	0.9626	0.5064
Observations	60	60	60	60	60	60	60	60	60

Appendix 34. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 2 – Equally-weighted

This table provides the estimation results of the conditional Carhart (1997) four-factor model for equally-weighted stock portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2010 to 2014. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.030***	1.095***	-0.066**	1.026***	1.076***	-0.050*	1.057***	1.054***	0.002
	(0.028)	(0.039)	(0.025)	(0.020)	(0.039)	(0.027)	(0.028)	(0.040)	(0.034)
SMB	-0.014	0.661***	-0.675***	-0.063	0.572***	-0.634***	0.116*	0.601***	-0.485***
	(0.083)	(0.079)	(0.055)	(0.053)	(0.091)	(0.081)	(0.060)	(0.085)	(0.071)
HML	0.281***	0.173*	0.108*	0.251***	0.168	0.083	0.103	0.185	-0.082
	(0.091)	(0.095)	(0.057)	(0.056)	(0.119)	(0.078)	(0.084)	(0.124)	(0.088)
Euribor	-1.023	-0.997**	-0.026	-0.006	-0.590	0.584*	-0.950**	-0.554	-0.396
	(0.615)	(0.437)	(0.335)	(0.318)	(0.517)	(0.335)	(0.362)	(0.574)	(0.422)
DY	0.002	0.014***	-0.013***	-0.001	0.009***	-0.010***	0.006**	0.008**	-0.002
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)
MOM	-0.102*	0.082**	-0.184***	-0.010	0.126**	-0.136***	-0.038	0.108**	-0.146***
	(0.052)	(0.040)	(0.031)	(0.039)	(0.056)	(0.037)	(0.050)	(0.052)	(0.038)
Mkt-rf x Euribor	7.892	-8.184	16.076*	-8.493	-2.508	-5.985	-9.290	0.787	-10.077
	(7.742)	(8.983)	(8.672)	(5.570)	(7.627)	(6.489)	(6.159)	(10.774)	(10.687)
SMB x Euribor	-0.345	1.749	-2.094	-22.577*	2.060	-24.637	-16.338	-1.717	-14.621

	(20.513)	(21.830)	(17.291)	(12.173)	(23.752)	(20.324)	(16.379)	(17.179)	(15.229)
HML x Euribor	26.691	-3.272	29.963	13.029	-40.694	53.723***	22.945	-9.495	32.440
	(22.231)	(21.795)	(19.104)	(14.099)	(25.745)	(18.752)	(20.901)	(30.238)	(23.087)
MOM x Euribor	40.471**	3.003	37.468**	12.082	-14.697	26.779**	21.209	13.994	7.215
	(19.125)	(14.245)	(14.683)	(9.760)	(17.613)	(13.262)	(15.130)	(19.168)	(12.602)
Mkt-rf x DY	0.005	0.139	-0.133*	0.088*	0.182	-0.093	0.026	0.105	-0.079
	(0.093)	(0.103)	(0.075)	(0.050)	(0.109)	(0.084)	(0.084)	(0.119)	(0.115)
SMB x DY	-0.040	-0.576**	0.536***	-0.016	-0.374	0.359	-0.227**	-0.367	0.140
	(0.157)	(0.236)	(0.154)	(0.087)	(0.309)	(0.252)	(0.108)	(0.265)	(0.211)
HML x DY	-0.495*	-0.356	-0.138	-0.206	-0.131	-0.076	-0.171	-0.349	0.178
	(0.285)	(0.244)	(0.203)	(0.130)	(0.360)	(0.287)	(0.211)	(0.370)	(0.287)
MOM x DY	-0.644***	-0.551***	-0.093	-0.377***	-0.379**	0.002	-0.454***	-0.618***	0.165
	(0.213)	(0.134)	(0.126)	(0.094)	(0.173)	(0.136)	(0.132)	(0.202)	(0.163)
α	-0.001	-0.006***	0.005***	-0.001	-0.005***	0.004***	-0.001	-0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
W_1	0.2483	0.0001	0.0000	0.9676	0.0086	0.0021	0.0036	0.0779	0.3147
W_2	0.0001	0.0000	0.0001	0.0000	0.0000	0.0007	0.0013	0.0000	0.0834
W_3	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.1217
Adj. R^2	0.9811	0.9809	0.7566	0.9887	0.9753	0.6578	0.9837	0.9749	0.4861
Observations	60	60	60	60	60	60	60	60	60

Appendix 35. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 3– 25% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2015 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.996***	1.064***	-0.068	1.019***	1.041***	-0.022	0.982***	1.055***	-0.073
	(0.040)	(0.055)	(0.076)	(0.026)	(0.046)	(0.058)	(0.026)	(0.043)	(0.060)
SMB	-0.196**	0.557***	-0.753***	-0.416***	0.396***	-0.812***	-0.281***	0.210**	-0.491***
	(0.094)	(0.074)	(0.130)	(0.055)	(0.091)	(0.110)	(0.067)	(0.083)	(0.141)
HML	0.206***	0.130	0.076	0.228***	0.047	0.181*	0.129**	0.060	0.069
	(0.062)	(0.105)	(0.132)	(0.041)	(0.098)	(0.108)	(0.060)	(0.051)	(0.092)
Euribor	-2.251	6.047***	-8.298***	-1.919	7.974***	-9.893***	-1.669	4.528**	-6.196**
	(1.815)	(2.194)	(2.106)	(1.631)	(2.950)	(3.580)	(1.679)	(2.208)	(2.997)
DY	0.008*	0.007	0.000	0.003	0.013	-0.010	0.004	0.005	-0.001
	(0.004)	(0.006)	(0.006)	(0.004)	(0.008)	(0.007)	(0.004)	(0.007)	(0.009)
MOM	-0.106*	0.074	-0.180	0.049	0.089	-0.040	-0.007	-0.027	0.020
	(0.059)	(0.094)	(0.115)	(0.036)	(0.103)	(0.114)	(0.054)	(0.082)	(0.122)
Mkt-rf x Euribor	59.746	-62.962	122.708	-12.550	-43.646	31.096	19.660	-15.752	35.412
	(52.552)	(70.885)	(96.570)	(35.098)	(71.006)	(89.170)	(24.189)	(50.212)	(55.432)
SMB x Euribor	-253.407*	-162.079	-91.329	-90.192	-253.216	163.025	-192.755*	-45.108	-147.647

	(146.494)	(189.970)	(256.988)	(93.277)	(195.200)	(212.281)	(106.337)	(147.242)	(203.164)
HML x Euribor	-32.084	-191.588	159.504	-206.482**	-227.700	21.218	-22.023	-115.275	93.252
	(113.216)	(175.287)	(214.679)	(97.585)	(184.830)	(185.035)	(109.345)	(115.729)	(160.705)
MOM x Euribor	87.333	-258.198**	345.531**	-13.600	-159.678	146.078	10.301	-75.911	86.212
	(95.308)	(106.021)	(155.434)	(62.581)	(118.093)	(148.853)	(72.293)	(85.478)	(136.485)
Mkt-rf x DY	-0.244**	-0.114	-0.130	-0.091	-0.255	0.164	-0.183*	-0.066	-0.117
	(0.113)	(0.119)	(0.143)	(0.083)	(0.157)	(0.158)	(0.105)	(0.194)	(0.273)
SMB x DY	0.213	-0.061	0.274	0.246	-0.815*	1.061**	0.269	0.004	0.265
	(0.256)	(0.370)	(0.447)	(0.193)	(0.431)	(0.503)	(0.262)	(0.358)	(0.574)
HML x DY	-0.043	-0.719**	0.675	-0.376**	-0.457*	0.080	-0.230	-0.281	0.051
	(0.219)	(0.299)	(0.410)	(0.145)	(0.250)	(0.260)	(0.171)	(0.181)	(0.249)
MOM x DY	-0.399*	-0.425*	0.026	-0.252	-0.420	0.168	-0.233	-0.297	0.064
	(0.199)	(0.230)	(0.297)	(0.154)	(0.352)	(0.377)	(0.201)	(0.269)	(0.418)
α	-0.000	-0.008***	0.008***	-0.000	-0.006***	0.006**	-0.001	-0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.003)
W_1	0.1223	0.0021	0.0012	0.4471	0.0058	0.0147	0.5039	0.0261	0.0720
W_2	0.0001	0.0768	0.2832	0.0421	0.0408	0.4241	0.0297	0.6799	0.9373
W_3	0.0002	0.0006	0.0122	0.0697	0.0346	0.0035	0.0214	0.0394	0.2853
Adj. R^2	0.9649	0.9395	0.4112	0.9769	0.8951	0.3255	0.9680	0.9475	0.1627
Observations	60	60	60	60	60	60	60	60	60

Appendix 36. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 3– 50% cut-off

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2015 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.011***	1.012***	-0.001	1.012***	1.007***	0.005	0.998***	1.049***	-0.051
	(0.023)	(0.025)	(0.041)	(0.022)	(0.037)	(0.050)	(0.019)	(0.038)	(0.045)
SMB	-0.217***	0.155**	-0.372***	-0.260***	0.379***	-0.640***	-0.224***	0.111*	-0.335***
	(0.041)	(0.058)	(0.066)	(0.042)	(0.051)	(0.066)	(0.049)	(0.061)	(0.087)
HML	0.149***	-0.133*	0.282***	0.118***	-0.035	0.153**	0.092**	0.078*	0.014
	(0.034)	(0.067)	(0.076)	(0.033)	(0.063)	(0.069)	(0.038)	(0.039)	(0.055)
Euribor	-1.066	2.150	-3.216*	-1.358	3.856**	-5.215***	-1.056	1.629	-2.685
	(1.361)	(1.834)	(1.654)	(1.437)	(1.769)	(1.879)	(1.444)	(2.351)	(2.560)
DY	0.005	0.003	0.001	0.003	0.009*	-0.006	0.004	0.004	0.001
	(0.003)	(0.005)	(0.004)	(0.003)	(0.005)	(0.005)	(0.003)	(0.006)	(0.006)
MOM	-0.016	-0.033	0.017	-0.020	-0.014	-0.006	-0.014	-0.033	0.020
	(0.030)	(0.065)	(0.073)	(0.031)	(0.055)	(0.064)	(0.036)	(0.064)	(0.083)
Mkt-rf x Euribor	29.271	-18.393	47.664	20.390	7.035	13.356	2.044	61.053	-59.009
	(31.118)	(37.509)	(54.635)	(31.484)	(51.106)	(69.399)	(21.649)	(58.220)	(58.495)
SMB x Euribor	-108.584	-120.190	11.606	-80.727	-269.361**	188.634	-140.994*	-25.973	-115.021

	(76.010)	(179.361)	(192.422)	(83.088)	(115.615)	(135.046)	(83.724)	(106.886)	(121.790)
HML x Euribor	-43.469	-31.661	-11.808	-29.797	-111.108	81.311	-60.381	-20.815	-39.566
	(66.503)	(138.501)	(133.701)	(80.393)	(106.353)	(133.280)	(82.752)	(84.895)	(110.387)
MOM x Euribor	14.902	-89.583	104.485	22.796	-129.123*	151.919	-19.484	22.984	-42.468
	(51.020)	(73.715)	(99.738)	(51.061)	(72.544)	(100.776)	(55.155)	(68.837)	(100.600)
Mkt-rf x DY	-0.145**	-0.146	0.001	-0.121*	-0.229**	0.108	-0.171**	-0.053	-0.117
	(0.068)	(0.088)	(0.118)	(0.063)	(0.093)	(0.114)	(0.068)	(0.137)	(0.168)
SMB x DY	0.144	-0.032	0.176	0.174	-0.174	0.348	0.072	0.234	-0.162
	(0.153)	(0.225)	(0.299)	(0.129)	(0.297)	(0.328)	(0.159)	(0.311)	(0.395)
HML x DY	-0.287**	-0.159	-0.128	-0.209	-0.416**	0.207	-0.284**	-0.156	-0.128
	(0.125)	(0.231)	(0.246)	(0.130)	(0.158)	(0.170)	(0.129)	(0.148)	(0.147)
MOM x DY	-0.262*	0.042	-0.304	-0.172	-0.313**	0.142	-0.153	-0.314*	0.160
	(0.137)	(0.201)	(0.247)	(0.136)	(0.138)	(0.186)	(0.153)	(0.161)	(0.238)
α	-0.001	-0.002	0.001	-0.000	-0.004***	0.004***	-0.000	-0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
W_1	0.3671	0.3071	0.1615	0.5007	0.0067	0.0184	0.3845	0.6649	0.5737
W_2	0.0999	0.3626	0.7300	0.0741	0.0092	0.4636	0.0439	0.2913	0.5301
W_3	0.1455	0.3002	0.6376	0.1456	0.0019	0.2345	0.0476	0.0365	0.0679
Adj. R^2	0.9815	0.9530	0.3364	0.9803	0.9578	0.4765	0.9793	0.9570	0.1607
Observations	60	60	60	60	60	60	60	60	60

Appendix 37. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 3 – Exclusion of financial companies

This table provides the estimation results of the conditional Carhart (1997) four-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2015 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.965***	1.063***	-0.099	0.999***	1.017***	-0.018	0.963***	1.040***	-0.077
	(0.045)	(0.061)	(0.079)	(0.036)	(0.056)	(0.059)	(0.045)	(0.049)	(0.064)
SMB	-0.455***	0.479***	-0.934***	-0.547***	0.245**	-0.791***	-0.461***	0.114	-0.575***
	(0.084)	(0.078)	(0.107)	(0.074)	(0.112)	(0.126)	(0.109)	(0.094)	(0.178)
HML	-0.062	-0.004	-0.057	0.069	-0.047	0.116	-0.045	-0.016	-0.029
	(0.082)	(0.110)	(0.149)	(0.074)	(0.095)	(0.095)	(0.104)	(0.057)	(0.131)
Euribor	-4.730	4.114*	-8.844***	-2.904	4.767	-7.671*	-3.523	3.189	-6.712*
	(3.311)	(2.314)	(3.138)	(2.573)	(2.974)	(4.152)	(2.489)	(2.887)	(3.500)
DY	-0.008	0.003	-0.011*	-0.009	0.012	-0.020*	-0.008	0.002	-0.010
	(0.007)	(0.006)	(0.006)	(0.006)	(0.009)	(0.010)	(0.006)	(0.008)	(0.011)
MOM	-0.076	-0.008	-0.068	0.107	0.026	0.081	0.041	0.031	0.010
	(0.086)	(0.100)	(0.134)	(0.080)	(0.101)	(0.109)	(0.100)	(0.095)	(0.144)
Mkt-rf x Euribor	38.368	-3.206	41.575	-43.523	-40.966	-2.558	5.727	-32.025	37.752
	(72.803)	(81.783)	(107.286)	(50.486)	(86.362)	(76.348)	(50.411)	(67.528)	(58.790)

SMB x Euribor	41.971	-101.889	143.860	120.570	-50.967	171.537	62.389	102.120	-39.732
	(142.032)	(244.472)	(274.773)	(128.160)	(252.981)	(248.394)	(177.254)	(183.119)	(253.755)
HML x Euribor	-55.220	-66.776	11.556	-249.173*	-117.905	-131.268	-65.278	-120.744	55.466
	(173.991)	(208.127)	(260.559)	(146.339)	(191.959)	(175.715)	(175.041)	(157.500)	(215.570)
MOM x Euribor	124.988	-177.934*	302.922	-45.366	-151.138	105.772	-47.049	-116.774	69.724
	(139.217)	(103.718)	(183.729)	(119.432)	(129.112)	(153.235)	(132.905)	(98.775)	(156.793)
Mkt-rf x DY	-0.097	0.027	-0.124	0.076	-0.126	0.202	-0.022	0.020	-0.043
	(0.140)	(0.144)	(0.130)	(0.130)	(0.195)	(0.214)	(0.180)	(0.196)	(0.329)
SMB x DY	0.453	-0.345	0.799*	0.353	-1.063*	1.416**	0.278	-0.388	0.667
	(0.371)	(0.437)	(0.422)	(0.243)	(0.538)	(0.567)	(0.345)	(0.448)	(0.688)
HML x DY	-0.233	-0.528	0.295	-0.512**	-0.556*	0.044	-0.341	-0.550**	0.209
	(0.272)	(0.328)	(0.421)	(0.244)	(0.282)	(0.283)	(0.317)	(0.219)	(0.360)
MOM x DY	-0.448	-0.264	-0.184	-0.236	-0.330	0.094	-0.181	-0.286	0.104
	(0.310)	(0.246)	(0.343)	(0.309)	(0.369)	(0.390)	(0.367)	(0.265)	(0.469)
α	0.003	-0.006***	0.009***	0.002	-0.005*	0.006*	0.002	-0.001	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
W_1	0.2639	0.1512	0.0048	0.1539	0.1497	0.0331	0.0439	0.4943	0.0206
W_2	0.2898	0.3668	0.1322	0.1274	0.2737	0.2598	0.9608	0.4653	0.8198
W_3	0.0305	0.3111	0.0023	0.0029	0.2904	0.0750	0.0298	0.4835	0.0443
Adj. R^2	0.9475	0.9245	0.4618	0.9562	0.8668	0.2846	0.9376	0.9262	0.1681
Observations	60	60	60	60	60	60	60	60	60

Appendix 38. Estimation results of conditional Carhart (1997) four-factor model on portfolios based on positive screens - sub-periods analysis: period 3 – Equally-weighted

This table provides the estimation results of the conditional Carhart (1997) four-factor model for equally-weighted stock portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2015 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.080***	1.114***	-0.035	1.081***	1.094***	-0.013	1.041***	1.069***	-0.028
	(0.039)	(0.068)	(0.072)	(0.025)	(0.070)	(0.069)	(0.044)	(0.049)	(0.031)
SMB	0.022	0.786***	-0.764***	-0.113**	0.748***	-0.862***	0.228***	0.595***	-0.367***
	(0.083)	(0.083)	(0.139)	(0.049)	(0.077)	(0.096)	(0.069)	(0.075)	(0.114)
HML	0.126*	0.147	-0.021	0.188***	0.003	0.185	0.035	-0.003	0.038
	(0.070)	(0.134)	(0.128)	(0.061)	(0.150)	(0.153)	(0.062)	(0.088)	(0.069)
Euribor	-3.130	2.350	-5.480	-1.560	1.367	-2.926	0.705	0.245	0.460
	(2.452)	(3.325)	(3.890)	(1.550)	(3.643)	(3.471)	(2.553)	(2.492)	(3.404)
DY	0.009	-0.001	0.010*	-0.000	0.000	-0.000	0.006	0.002	0.004
	(0.008)	(0.007)	(0.006)	(0.005)	(0.009)	(0.008)	(0.007)	(0.005)	(0.004)
MOM	-0.244***	-0.111	-0.133	-0.134**	-0.115	-0.019	-0.238***	-0.178**	-0.060
	(0.057)	(0.127)	(0.131)	(0.051)	(0.141)	(0.145)	(0.081)	(0.078)	(0.091)
Mkt-rf x Euribor	19.987	-103.680	123.667	-59.627	-76.026	16.399	-4.393	-55.198	50.805
	(48.623)	(104.020)	(100.013)	(38.503)	(109.198)	(107.530)	(58.792)	(68.460)	(47.779)
SMB x Euribor	-63.584	-197.828	134.244	75.935	-284.615*	360.549**	-86.825	-163.694	76.869

	(106.433)	(180.964)	(215.658)	(96.624)	(156.830)	(158.372)	(103.814)	(144.872)	(149.596)
HML x Euribor	129.584	-162.219	291.804	-134.994	-41.615	-93.378	9.932	88.741	-78.810
	(108.659)	(213.765)	(218.499)	(103.548)	(219.596)	(213.737)	(98.882)	(132.688)	(108.574)
MOM x Euribor	64.117	-135.651	199.769	-31.676	-31.705	0.029	-28.235	100.642	-128.877
	(89.500)	(143.287)	(167.091)	(62.001)	(170.645)	(187.087)	(100.948)	(92.636)	(122.194)
Mkt-rf x DY	-0.338**	-0.106	-0.232	-0.150	-0.104	-0.046	-0.347***	-0.124	-0.223**
	(0.142)	(0.157)	(0.161)	(0.097)	(0.167)	(0.167)	(0.108)	(0.097)	(0.102)
SMB x DY	-0.054	0.451	-0.505	0.036	0.254	-0.218	0.189	0.357	-0.168
	(0.351)	(0.300)	(0.440)	(0.226)	(0.341)	(0.384)	(0.386)	(0.249)	(0.379)
HML x DY	-0.077	-0.448	0.371	-0.098	-0.145	0.046	-0.123	-0.067	-0.056
	(0.346)	(0.316)	(0.376)	(0.190)	(0.337)	(0.291)	(0.194)	(0.228)	(0.207)
MOM x DY	0.036	-0.436	0.472	0.086	-0.182	0.268	-0.068	-0.084	0.016
	(0.249)	(0.335)	(0.349)	(0.179)	(0.446)	(0.487)	(0.196)	(0.228)	(0.297)
α	0.000	-0.007**	0.007**	0.000	-0.006**	0.006**	-0.001	-0.003*	0.002
	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
W_1	0.2759	0.7678	0.0625	0.6009	0.9066	0.6778	0.5450	0.8639	0.6066
W_2	0.4404	0.0892	0.3693	0.1187	0.3733	0.0447	0.0077	0.0217	0.4344
W_3	0.3164	0.1711	0.2928	0.0007	0.5125	0.0569	0.0121	0.0000	0.0026
Adj. R^2	0.9562	0.9266	0.3833	0.9745	0.9195	0.4681	0.9642	0.9540	0.2813
Observations	60	60	60	60	60	60	60	60	60

Appendix 39. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 1– 25% cut-off

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2009. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.017***	1.078***	-0.061	0.967***	1.093***	-0.127***	0.995***	1.021***	-0.025
	(0.028)	(0.026)	(0.039)	(0.027)	(0.033)	(0.041)	(0.031)	(0.052)	(0.066)
SMB	-0.211***	0.246***	-0.457***	-0.265***	0.357***	-0.622***	-0.218***	0.327***	-0.545***
	(0.055)	(0.071)	(0.082)	(0.050)	(0.061)	(0.067)	(0.070)	(0.088)	(0.125)
HML	0.318**	-0.071	0.389*	0.206*	-0.190	0.395*	0.320**	0.083	0.237
	(0.143)	(0.135)	(0.209)	(0.118)	(0.163)	(0.218)	(0.141)	(0.221)	(0.343)
RMW	0.085	-0.227	0.312	0.136	-0.300*	0.436**	0.166	-0.028	0.194
	(0.121)	(0.168)	(0.226)	(0.116)	(0.163)	(0.196)	(0.146)	(0.218)	(0.328)
CMA	-0.099	-0.365***	0.265	-0.172*	-0.514***	0.342**	-0.126	-0.184	0.057
	(0.114)	(0.124)	(0.187)	(0.086)	(0.145)	(0.152)	(0.142)	(0.173)	(0.190)
Euribor	-0.026	-0.116	0.090	-0.174	0.274	-0.448*	-0.125	-0.223	0.097
	(0.288)	(0.188)	(0.285)	(0.200)	(0.239)	(0.231)	(0.330)	(0.310)	(0.605)
DY	-0.000	-0.005	0.005	-0.002	0.003	-0.005	-0.002	0.012*	-0.014
	(0.006)	(0.006)	(0.008)	(0.004)	(0.005)	(0.005)	(0.007)	(0.007)	(0.013)
Mkt-rf x Euribor	3.712	11.072***	-7.360	1.551	15.352***	-13.801**	5.281	3.028	2.252

	(3.246)	(3.915)	(5.536)	(3.112)	(4.022)	(5.177)	(3.394)	(4.498)	(7.102)
SMB x Euribor	-8.618*	3.935	-12.553*	-4.008	-4.968	0.961	-10.587*	-8.846	-1.741
	(4.845)	(5.395)	(7.308)	(3.352)	(5.032)	(5.437)	(6.263)	(9.427)	(14.039)
HML x Euribor	-2.304	-25.492***	23.188*	2.023	-56.295***	58.318***	-4.600	-44.373***	39.773*
	(10.046)	(6.616)	(12.798)	(7.638)	(7.904)	(9.914)	(9.358)	(11.746)	(19.898)
RMW x Euribor	-16.179	17.364	-33.543	-5.388	-17.035	11.647	-2.133	-43.121	40.988
	(24.443)	(17.667)	(26.379)	(16.609)	(21.081)	(23.243)	(28.022)	(28.213)	(52.606)
CMA x Euribor	5.657	18.895	-13.238	-1.698	7.749	-9.447	19.942	-22.608	42.550
	(12.484)	(15.082)	(19.413)	(8.975)	(12.695)	(15.045)	(13.529)	(15.195)	(25.735)
Mkt-rf x DY	0.041	-0.073	0.115	0.038	-0.084	0.122**	-0.012	0.059	-0.072
	(0.075)	(0.054)	(0.093)	(0.054)	(0.059)	(0.060)	(0.076)	(0.078)	(0.134)
SMB x DY	-0.178	0.406**	-0.584***	-0.074	-0.015	-0.059	-0.120	-0.193	0.073
	(0.128)	(0.155)	(0.186)	(0.096)	(0.162)	(0.177)	(0.149)	(0.224)	(0.334)
HML x DY	-0.292	0.205	-0.497*	-0.301	0.071	-0.373	-0.209	-0.046	-0.163
	(0.295)	(0.239)	(0.258)	(0.224)	(0.218)	(0.226)	(0.300)	(0.310)	(0.559)
RMW x DY	-0.122	-0.013	-0.109	-0.163	-0.404**	0.241	-0.213	-0.415	0.202
	(0.239)	(0.227)	(0.309)	(0.170)	(0.196)	(0.246)	(0.273)	(0.321)	(0.559)
CMA x DY	-0.076	0.471**	-0.547*	0.100	0.133	-0.032	0.080	0.175	-0.095
	(0.186)	(0.212)	(0.310)	(0.113)	(0.202)	(0.230)	(0.229)	(0.280)	(0.454)
α	-0.002	0.004**	-0.007**	-0.001	0.005**	-0.005**	-0.003	0.001	-0.004
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
W_1	0.9937	0.6096	0.8277	0.5366	0.5235	0.1640	0.8883	0.1104	0.5509
W_2	0.0035	0.0000	0.0000	0.0021	0.0000	0.0000	0.0003	0.0000	0.0041
W_3	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0041
Adj. R^2	0.9868	0.9812	0.4200	0.9903	0.9825	0.7255	0.9829	0.9736	0.2778
Observations	60	60	60	60	60	60	60	60	60

Appendix 40. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 1– 50% cut-off

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2009. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.966***	1.047***	-0.082*	0.969***	1.035***	-0.066	0.983***	0.981***	0.002
	(0.021)	(0.037)	(0.044)	(0.017)	(0.040)	(0.040)	(0.026)	(0.035)	(0.050)
SMB	-0.252***	0.218**	-0.469***	-0.223***	0.126	-0.348***	-0.237***	0.025	-0.262**
	(0.042)	(0.087)	(0.084)	(0.041)	(0.083)	(0.076)	(0.063)	(0.066)	(0.103)
HML	0.178*	-0.206	0.383*	0.147*	-0.106	0.253	0.151	-0.018	0.169
	(0.092)	(0.159)	(0.201)	(0.082)	(0.151)	(0.162)	(0.120)	(0.185)	(0.273)
RMW	-0.006	-0.159	0.154	0.043	-0.346***	0.389***	-0.025	-0.091	0.066
	(0.079)	(0.160)	(0.195)	(0.080)	(0.111)	(0.129)	(0.118)	(0.186)	(0.275)
CMA	-0.181**	-0.315**	0.133	-0.208***	-0.246	0.038	-0.211*	-0.259*	0.047
	(0.074)	(0.134)	(0.107)	(0.064)	(0.212)	(0.196)	(0.123)	(0.134)	(0.207)
Euribor	-0.157	-0.123	-0.034	-0.171*	-0.084	-0.087	-0.105	-0.176	0.071
	(0.129)	(0.198)	(0.295)	(0.097)	(0.167)	(0.184)	(0.253)	(0.313)	(0.555)
DY	-0.003	0.008	-0.011	-0.002	0.004	-0.006	-0.004	0.006	-0.009
	(0.003)	(0.005)	(0.007)	(0.003)	(0.004)	(0.005)	(0.005)	(0.006)	(0.010)
Mkt-rf x Euribor	5.147**	3.564	1.584	4.475**	5.041	-0.566	4.807	5.753	-0.947

	(2.358)	(3.520)	(4.702)	(2.118)	(3.504)	(4.212)	(2.913)	(3.589)	(5.472)
SMB x Euribor	-1.671	-8.375	6.704	-2.897	-4.027	1.130	-5.085	4.112	-9.198
	(2.981)	(7.270)	(8.280)	(2.670)	(4.704)	(4.677)	(4.506)	(7.111)	(10.395)
HML x Euribor	-3.259	-34.593***	31.334***	-3.672	-35.158***	31.487***	-1.166	-30.668***	29.502*
	(5.352)	(7.523)	(11.395)	(4.437)	(6.369)	(7.671)	(7.912)	(10.179)	(17.131)
RMW x Euribor	-2.704	21.106	-23.810	4.349	-6.919	11.268	-5.061	11.500	-16.561
	(10.230)	(17.376)	(23.238)	(8.237)	(14.058)	(13.925)	(20.826)	(24.187)	(43.830)
CMA x Euribor	7.317	-19.219*	26.536*	-0.104	7.825	-7.929	6.821	-8.390	15.212
	(7.294)	(10.375)	(13.451)	(6.172)	(12.533)	(13.106)	(10.269)	(11.688)	(19.236)
Mkt-rf x DY	-0.033	-0.130*	0.097	-0.057	0.005	-0.062	-0.008	-0.155**	0.147
	(0.045)	(0.069)	(0.087)	(0.040)	(0.051)	(0.045)	(0.057)	(0.066)	(0.102)
SMB x DY	-0.110*	0.316*	-0.426**	-0.072	0.201	-0.273*	-0.084	0.053	-0.137
	(0.062)	(0.178)	(0.202)	(0.054)	(0.141)	(0.144)	(0.114)	(0.190)	(0.283)
HML x DY	0.052	0.407*	-0.355	0.115	0.089	0.026	-0.181	0.783***	-0.965**
	(0.142)	(0.217)	(0.279)	(0.120)	(0.192)	(0.165)	(0.232)	(0.277)	(0.470)
RMW x DY	0.088	-0.370	0.458	0.034	-0.202	0.237	-0.124	0.298	-0.421
	(0.117)	(0.226)	(0.287)	(0.097)	(0.166)	(0.168)	(0.205)	(0.276)	(0.455)
CMA x DY	0.060	0.263	-0.203	0.096	0.136	-0.040	0.068	0.200	-0.132
	(0.105)	(0.205)	(0.272)	(0.084)	(0.192)	(0.227)	(0.169)	(0.223)	(0.371)
α	0.000	0.004**	-0.004*	0.000	0.005**	-0.005**	-0.000	0.004	-0.004
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
W_1	0.3401	0.1742	0.3377	0.2161	0.4393	0.4973	0.6838	0.5209	0.6613
W_2	0.0004	0.0000	0.0000	0.1014	0.0000	0.0000	0.2002	0.0002	0.0037
W_3	0.0000	0.0000	0.0000	0.0033	0.0000	0.0000	0.0308	0.0000	0.0024
Adj. R^2	0.9938	0.9819	0.5484	0.9949	0.9860	0.6971	0.9890	0.9801	0.1177
Observations	60	60	60	60	60	60	60	60	60

Appendix 41. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 1– Exclusion of financial companies

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2009. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.031***	1.142***	-0.111**	0.981***	1.147***	-0.166**	1.003***	1.028***	-0.025
	(0.033)	(0.039)	(0.049)	(0.034)	(0.056)	(0.063)	(0.041)	(0.056)	(0.077)
SMB	-0.163	0.398***	-0.560***	-0.249**	0.386***	-0.634***	-0.234**	0.473***	-0.707***
	(0.102)	(0.118)	(0.110)	(0.096)	(0.105)	(0.131)	(0.097)	(0.119)	(0.164)
HML	-0.255	-0.136	-0.119	-0.303	-0.491**	0.188	-0.314	0.022	-0.337
	(0.269)	(0.191)	(0.287)	(0.233)	(0.204)	(0.299)	(0.219)	(0.318)	(0.355)
RMW	0.356	-0.065	0.421	0.383*	-0.596***	0.979***	0.353	0.104	0.249
	(0.281)	(0.144)	(0.315)	(0.197)	(0.141)	(0.230)	(0.224)	(0.295)	(0.385)
CMA	0.135	-0.075	0.210	-0.046	-0.366	0.320	0.012	-0.029	0.041
	(0.124)	(0.165)	(0.217)	(0.117)	(0.271)	(0.271)	(0.164)	(0.203)	(0.269)
Euribor	0.048	-0.241	0.289	-0.054	-0.126	0.072	-0.157	-0.351	0.194
	(0.218)	(0.202)	(0.342)	(0.185)	(0.276)	(0.337)	(0.251)	(0.380)	(0.499)
DY	-0.001	-0.001	-0.001	-0.003	0.002	-0.005	0.000	0.012	-0.012
	(0.004)	(0.006)	(0.008)	(0.004)	(0.006)	(0.007)	(0.005)	(0.009)	(0.011)

Mkt-rf x Euribor	1.966	4.642	-2.676	1.116	11.384**	-10.267	5.945	3.049	2.896
	(4.701)	(4.400)	(6.377)	(3.991)	(5.113)	(6.191)	(5.266)	(4.771)	(8.031)
SMB x Euribor	-3.527	-0.101	-3.425	0.943	-4.644	5.587	0.842	-17.912	18.754
	(7.612)	(8.910)	(9.174)	(6.633)	(6.320)	(8.820)	(7.796)	(12.470)	(16.520)
HML x Euribor	7.448	2.634	4.814	4.790	-28.577***	33.367**	2.701	-37.972***	40.673**
	(10.654)	(8.462)	(13.219)	(9.470)	(10.127)	(13.341)	(9.012)	(13.995)	(19.294)
RMW x Euribor	25.285*	43.668**	-18.384	21.000*	19.044	1.956	36.513**	-26.721	63.234
	(14.403)	(19.424)	(23.377)	(11.714)	(21.364)	(21.959)	(16.638)	(35.538)	(42.847)
CMA x Euribor	-12.992	2.447	-15.439	-18.537	1.348	-19.885	2.653	-35.687*	38.339
	(17.318)	(18.496)	(24.958)	(11.226)	(18.892)	(17.087)	(18.676)	(19.066)	(29.056)
Mkt-rf x DY	0.040	-0.059	0.099	0.024	-0.101	0.125	-0.050	0.112	-0.162
	(0.076)	(0.077)	(0.094)	(0.053)	(0.091)	(0.080)	(0.068)	(0.093)	(0.138)
SMB x DY	0.060	0.564**	-0.504***	0.048	0.292	-0.244	-0.043	0.111	-0.154
	(0.157)	(0.226)	(0.183)	(0.160)	(0.177)	(0.224)	(0.134)	(0.278)	(0.301)
HML x DY	-0.265	0.149	-0.414	-0.260	0.097	-0.357	-0.267	-0.035	-0.232
	(0.245)	(0.296)	(0.289)	(0.222)	(0.294)	(0.284)	(0.247)	(0.390)	(0.525)
RMW x DY	-0.117	-0.095	-0.022	-0.078	-0.433**	0.355	-0.331	-0.517	0.186
	(0.215)	(0.224)	(0.301)	(0.206)	(0.211)	(0.284)	(0.208)	(0.426)	(0.494)
CMA x DY	0.009	0.371*	-0.363	0.050	0.178	-0.128	-0.006	0.569*	-0.574
	(0.174)	(0.201)	(0.292)	(0.137)	(0.272)	(0.328)	(0.191)	(0.329)	(0.416)
α	0.000	0.002	-0.002	0.002	0.007***	-0.005	0.000	0.000	0.000
	(0.004)	(0.002)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)
W_1	0.9232	0.4855	0.6898	0.6806	0.8181	0.6689	0.8142	0.1860	0.4916
W_2	0.0000	0.0001	0.0010	0.0000	0.0000	0.0000	0.0001	0.0000	0.0002
W_3	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9646	0.9723	0.5298	0.9702	0.9726	0.7465	0.9625	0.9585	0.5434
Observations	60	60	60	60	60	60	60	60	60

Appendix 42. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 1– Equally-weighted

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2005 to 2009. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.013***	1.031***	-0.018	1.011***	1.021***	-0.010	1.000***	0.970***	0.030
	(0.045)	(0.027)	(0.041)	(0.033)	(0.041)	(0.038)	(0.041)	(0.052)	(0.038)
SMB	0.082	0.612***	-0.530***	0.049	0.645***	-0.596***	0.098*	0.691***	-0.593***
	(0.074)	(0.073)	(0.081)	(0.062)	(0.092)	(0.084)	(0.053)	(0.099)	(0.091)
HML	0.371**	0.213	0.158	0.275**	0.258*	0.017	0.253**	0.268	-0.015
	(0.168)	(0.160)	(0.224)	(0.123)	(0.143)	(0.174)	(0.109)	(0.184)	(0.161)
RMW	-0.292**	-0.200	-0.092	-0.027	-0.291	0.265	-0.304**	-0.107	-0.197
	(0.140)	(0.160)	(0.116)	(0.083)	(0.187)	(0.161)	(0.124)	(0.251)	(0.198)
CMA	-0.204	-0.489***	0.285*	-0.155	-0.464***	0.309**	-0.285*	-0.387**	0.102
	(0.152)	(0.161)	(0.155)	(0.120)	(0.134)	(0.134)	(0.156)	(0.192)	(0.159)
Euribor	-0.387***	-0.431**	0.044	-0.147	-0.017	-0.129	-0.269	-0.333	0.064
	(0.142)	(0.186)	(0.165)	(0.101)	(0.172)	(0.168)	(0.191)	(0.322)	(0.360)
DY	0.003	-0.004	0.007	-0.000	-0.001	0.000	0.002	0.004	-0.002
	(0.005)	(0.005)	(0.007)	(0.004)	(0.005)	(0.004)	(0.005)	(0.007)	(0.008)
Mkt-rf x Euribor	9.817**	13.771***	-3.954	10.126***	15.746***	-5.620	8.643**	13.116**	-4.473

	(4.467)	(3.585)	(4.543)	(3.066)	(4.728)	(4.077)	(3.831)	(5.457)	(4.450)
SMB x Euribor	-7.993	-2.729	-5.265	-4.434	-18.269***	13.835**	-1.213	-5.944	4.731
	(5.305)	(7.858)	(6.658)	(4.003)	(6.012)	(5.754)	(3.848)	(12.110)	(12.427)
HML x Euribor	-41.172***	-54.501***	13.330*	-36.910***	-78.364***	41.454***	-26.402***	-75.408***	49.006***
	(6.085)	(7.006)	(7.271)	(4.308)	(7.042)	(6.502)	(6.411)	(10.572)	(10.217)
RMW x Euribor	-32.079**	-31.195*	-0.884	-42.892***	-46.625**	3.733	-11.782	-56.335**	44.553*
	(14.231)	(17.395)	(13.428)	(10.665)	(19.926)	(20.939)	(16.821)	(26.779)	(25.354)
CMA x Euribor	26.638*	42.082**	-15.444	26.118**	33.546**	-7.428	39.214***	39.140*	0.074
	(14.756)	(16.331)	(18.561)	(10.239)	(13.454)	(11.573)	(12.891)	(21.333)	(17.854)
Mkt-rf x DY	0.032	-0.023	0.055	0.024	-0.105*	0.129**	-0.039	0.023	-0.063
	(0.073)	(0.055)	(0.082)	(0.053)	(0.057)	(0.057)	(0.070)	(0.071)	(0.074)
SMB x DY	-0.104	0.126	-0.230	-0.013	0.154	-0.167	0.076	-0.173	0.248
	(0.127)	(0.193)	(0.144)	(0.105)	(0.168)	(0.181)	(0.097)	(0.275)	(0.274)
HML x DY	-0.113	0.324*	-0.436**	-0.230	0.388**	-0.618**	-0.081	0.098	-0.180
	(0.225)	(0.192)	(0.185)	(0.210)	(0.168)	(0.260)	(0.256)	(0.275)	(0.266)
RMW x DY	-0.285	0.319*	-0.604***	-0.241*	-0.042	-0.199	-0.377**	-0.062	-0.315
	(0.196)	(0.189)	(0.201)	(0.143)	(0.187)	(0.208)	(0.180)	(0.265)	(0.269)
CMA x DY	0.164	0.447**	-0.283	0.118	0.320*	-0.202	0.084	0.139	-0.055
	(0.191)	(0.217)	(0.250)	(0.123)	(0.176)	(0.158)	(0.149)	(0.311)	(0.306)
α	0.003	0.007***	-0.004**	0.001	0.007***	-0.006***	0.004**	0.004	-0.000
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
W_1	0.0169	0.0744	0.6342	0.3557	0.9854	0.7347	0.3418	0.2946	0.9339
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0008
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9783	0.9833	0.6074	0.9843	0.9845	0.7648	0.9829	0.9731	0.5702
Observations	60	60	60	60	60	60	60	60	60

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2010 to 2014. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.962***	1.046***	-0.084**	0.966***	1.087***	-0.122***	0.945***	1.081***	-0.135***
	(0.018)	(0.036)	(0.038)	(0.016)	(0.039)	(0.037)	(0.019)	(0.037)	(0.035)
SMB	-0.400***	0.328***	-0.728***	-0.350***	0.226	-0.576***	-0.323***	0.248*	-0.571***
	(0.060)	(0.104)	(0.095)	(0.032)	(0.138)	(0.144)	(0.042)	(0.124)	(0.126)
HML	0.291**	0.125	0.166**	0.198**	0.035	0.163	0.182**	0.014	0.168
	(0.115)	(0.141)	(0.076)	(0.083)	(0.177)	(0.124)	(0.089)	(0.204)	(0.152)
RMW	-0.127	0.375**	-0.502***	0.030	0.356	-0.326*	-0.047	0.211	-0.258*
	(0.151)	(0.167)	(0.134)	(0.114)	(0.227)	(0.190)	(0.142)	(0.227)	(0.152)
CMA	0.136	0.069	0.067	0.128	0.184	-0.056	0.144	-0.116	0.259
	(0.108)	(0.107)	(0.141)	(0.080)	(0.265)	(0.267)	(0.119)	(0.205)	(0.209)
Euribor	-0.848	-2.320***	1.472	-0.565	-1.460	0.894	-0.823	-1.394	0.571
	(0.834)	(0.493)	(0.962)	(0.700)	(1.156)	(1.080)	(0.741)	(0.867)	(1.122)
DY	-0.001	0.021***	-0.022**	0.001	0.016*	-0.015*	0.004	0.005	-0.000
	(0.004)	(0.007)	(0.009)	(0.003)	(0.009)	(0.009)	(0.004)	(0.005)	(0.006)
Mkt-rf x Euribor	-3.145	-8.994	5.849	1.692	-8.062	9.754	-1.486	8.092	-9.578

	(7.963)	(12.326)	(13.238)	(3.764)	(10.745)	(9.691)	(5.511)	(13.126)	(14.726)
SMB x Euribor	-23.637	65.957*	-89.594***	-47.408***	35.144	-82.552*	-49.437***	38.634	-88.071**
	(20.378)	(35.327)	(30.926)	(13.204)	(44.452)	(44.934)	(14.835)	(38.549)	(33.407)
HML x Euribor	3.638	45.443	-41.805	-50.409***	42.400	-92.809	-27.733	-23.049	-4.684
	(24.973)	(51.353)	(43.825)	(16.998)	(68.199)	(59.038)	(23.655)	(77.432)	(68.046)
RMW x Euribor	-12.752	118.471	-131.223	-38.127	101.435	-139.562	-33.851	66.482	-100.333
	(59.607)	(75.747)	(97.315)	(43.794)	(111.854)	(102.117)	(55.686)	(103.081)	(95.202)
CMA x Euribor	1.073	65.476	-64.403	64.641***	-0.436	65.077	44.726	53.597	-8.871
	(25.168)	(41.375)	(51.928)	(23.269)	(59.541)	(61.002)	(33.249)	(65.277)	(68.147)
Mkt-rf x DY	-0.037	0.239*	-0.276	-0.089	0.189	-0.278	-0.009	0.301*	-0.310*
	(0.078)	(0.140)	(0.172)	(0.071)	(0.163)	(0.169)	(0.072)	(0.179)	(0.169)
SMB x DY	0.060	-0.663*	0.723**	0.227*	-0.487	0.714**	0.111	0.034	0.077
	(0.123)	(0.335)	(0.302)	(0.122)	(0.341)	(0.330)	(0.117)	(0.252)	(0.234)
HML x DY	0.541	-1.453***	1.994***	0.726**	-0.963	1.689**	0.714**	-1.314*	2.028***
	(0.440)	(0.514)	(0.380)	(0.319)	(0.734)	(0.642)	(0.346)	(0.661)	(0.496)
RMW x DY	0.381	-2.243**	2.624***	0.646	-1.848*	2.495**	0.540	-2.037***	2.577***
	(0.592)	(0.845)	(0.793)	(0.488)	(1.014)	(0.979)	(0.544)	(0.713)	(0.614)
CMA x DY	-0.924**	0.776	-1.700*	-0.897**	0.355	-1.252	-1.081**	0.751	-1.832**
	(0.392)	(0.744)	(0.874)	(0.390)	(1.015)	(1.062)	(0.462)	(0.795)	(0.789)
α	-0.000	-0.006***	0.006***	-0.000	-0.006*	0.006*	-0.000	-0.003*	0.003
	(0.001)	(0.001)	(0.002)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
W_1	0.4332	0.0001	0.0567	0.7231	0.2109	0.2460	0.3956	0.2833	0.8666
W_2	0.1294	0.0119	0.0000	0.0002	0.0019	0.0003	0.0027	0.0084	0.0001
W_3	0.0000	0.0000	0.0000	0.0005	0.0001	0.0000	0.0000	0.0023	0.0000
Adj. R^2	0.9786	0.9570	0.5763	0.9845	0.9379	0.2999	0.9775	0.9630	0.5004
Observations	60	60	60	60	60	60	60	60	60

Appendix 44. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 2– 50% cut-off

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2010 to 2014. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.972***	1.062***	-0.089***	0.969***	1.080***	-0.111***	0.960***	1.076***	-0.116***
	(0.018)	(0.029)	(0.027)	(0.019)	(0.038)	(0.041)	(0.017)	(0.028)	(0.024)
SMB	-0.292***	0.072	-0.364***	-0.284***	0.086	-0.370***	-0.298***	0.016	-0.314***
	(0.038)	(0.106)	(0.095)	(0.038)	(0.112)	(0.103)	(0.038)	(0.089)	(0.080)
HML	0.194*	-0.067	0.261***	0.192**	-0.068	0.261***	0.166**	0.083	0.083
	(0.100)	(0.104)	(0.081)	(0.092)	(0.138)	(0.090)	(0.079)	(0.159)	(0.097)
RMW	0.072	0.426***	-0.354***	0.088	0.367**	-0.279***	0.074	0.347*	-0.273**
	(0.148)	(0.119)	(0.092)	(0.138)	(0.161)	(0.093)	(0.120)	(0.205)	(0.108)
CMA	0.108	0.092	0.016	0.082	0.190	-0.108	0.143*	-0.023	0.166
	(0.076)	(0.128)	(0.130)	(0.089)	(0.170)	(0.208)	(0.076)	(0.119)	(0.113)
Euribor	-0.613	-1.478***	0.865	-0.590	-1.619***	1.028	-0.655	-1.157***	0.502
	(0.429)	(0.362)	(0.612)	(0.442)	(0.467)	(0.740)	(0.407)	(0.394)	(0.525)
DY	0.002	0.014***	-0.013***	0.002	0.015**	-0.013*	0.003	0.007	-0.004
	(0.003)	(0.005)	(0.005)	(0.004)	(0.005)	(0.007)	(0.003)	(0.006)	(0.006)
Mkt-rf x Euribor	-5.431	2.947	-8.379	-2.526	-6.944	4.419	-5.667	-0.695	-4.972

	(7.058)	(8.315)	(9.833)	(7.442)	(9.171)	(11.882)	(7.168)	(8.130)	(9.038)
SMB x Euribor	-19.019	43.882*	-62.901*	-16.795	47.437*	-64.232	-19.432	23.637	-43.069
	(20.161)	(24.505)	(32.368)	(21.522)	(27.305)	(39.498)	(20.819)	(22.440)	(30.746)
HML x Euribor	-9.773	11.528	-21.301	-9.438	8.449	-17.887	-5.861	-0.384	-5.477
	(23.052)	(34.843)	(36.585)	(23.547)	(34.652)	(36.249)	(23.493)	(32.677)	(33.053)
RMW x Euribor	9.874	93.949***	-84.075**	13.698	84.289**	-70.592*	11.550	66.943	-55.393
	(29.317)	(31.387)	(31.622)	(29.131)	(37.997)	(38.894)	(25.350)	(44.957)	(37.901)
CMA x Euribor	-5.842	60.911*	-66.754*	0.234	47.773	-47.540	-10.826	72.754*	-83.579**
	(22.896)	(32.188)	(37.410)	(25.151)	(41.266)	(52.664)	(19.740)	(36.141)	(33.486)
Mkt-rf x DY	0.039	0.226*	-0.188*	0.012	0.360***	-0.348**	-0.006	0.323**	-0.329**
	(0.080)	(0.120)	(0.108)	(0.087)	(0.122)	(0.134)	(0.076)	(0.140)	(0.129)
SMB x DY	0.031	-0.287	0.319	0.047	-0.428*	0.475**	-0.047	0.036	-0.083
	(0.136)	(0.264)	(0.255)	(0.137)	(0.245)	(0.228)	(0.143)	(0.244)	(0.256)
HML x DY	0.138	-0.644*	0.782**	0.166	-0.845**	1.011***	0.298	-0.915**	1.213***
	(0.243)	(0.374)	(0.361)	(0.233)	(0.384)	(0.332)	(0.207)	(0.394)	(0.302)
RMW x DY	-0.161	-1.266**	1.105**	-0.111	-1.449**	1.338**	-0.056	-1.214**	1.158***
	(0.409)	(0.472)	(0.417)	(0.416)	(0.565)	(0.579)	(0.359)	(0.577)	(0.405)
CMA x DY	-0.203	0.324	-0.527	-0.306	0.770	-1.076*	-0.146	-0.051	-0.095
	(0.454)	(0.559)	(0.536)	(0.445)	(0.628)	(0.632)	(0.417)	(0.701)	(0.633)
α	-0.003*	-0.004*	0.001	-0.002	-0.005**	0.003	-0.002	-0.005**	0.002
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
W_1	0.3484	0.0005	0.0292	0.4002	0.0027	0.1494	0.2186	0.0145	0.6020
W_2	0.0131	0.0004	0.0002	0.0624	0.0000	0.0000	0.0055	0.0000	0.0000
W_3	0.0112	0.0006	0.0003	0.0244	0.0000	0.0000	0.0017	0.0000	0.0000
Adj. R^2	0.9886	0.9747	0.5890	0.9880	0.9696	0.4716	0.9884	0.9767	0.4850
Observations	60	60	60	60	60	60	60	60	60

Appendix 45. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 2– Exclusion of financial companies

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2010 to 2014. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	0.971***	1.031***	-0.060	0.968***	1.039***	-0.070***	0.966***	1.074***	-0.107**
	(0.018)	(0.040)	(0.043)	(0.016)	(0.029)	(0.025)	(0.019)	(0.042)	(0.042)
SMB	-0.252***	0.455***	-0.707***	-0.280***	0.356***	-0.636***	-0.177***	0.303**	-0.479***
	(0.080)	(0.126)	(0.130)	(0.057)	(0.112)	(0.116)	(0.057)	(0.125)	(0.116)
HML	0.078	-0.052	0.130	0.027	-0.090	0.117	-0.018	-0.061	0.043
	(0.102)	(0.183)	(0.153)	(0.080)	(0.181)	(0.131)	(0.097)	(0.213)	(0.178)
RMW	0.266*	0.337	-0.071	0.282**	0.325	-0.042	0.298**	0.292	0.006
	(0.141)	(0.215)	(0.174)	(0.129)	(0.221)	(0.193)	(0.141)	(0.226)	(0.183)
CMA	0.065	-0.004	0.068	0.066	-0.082	0.148	0.055	-0.244	0.299
	(0.120)	(0.117)	(0.171)	(0.097)	(0.145)	(0.107)	(0.101)	(0.235)	(0.230)
Euribor	1.043***	-1.500	2.542***	0.671*	-0.614	1.285	0.744**	-0.870	1.614
	(0.308)	(0.913)	(0.879)	(0.355)	(1.071)	(0.988)	(0.312)	(1.130)	(1.136)
DY	-0.010**	0.014**	-0.024***	-0.005	0.007	-0.012*	-0.002	0.003	-0.005
	(0.004)	(0.006)	(0.007)	(0.005)	(0.005)	(0.006)	(0.004)	(0.006)	(0.006)

Mkt-rf x Euribor	10.226	2.225	8.001	12.807**	2.818	9.989	10.034	15.892	-5.858
	(8.790)	(12.340)	(15.168)	(5.955)	(9.665)	(7.823)	(7.819)	(15.694)	(15.820)
SMB x Euribor	-27.598	41.892	-69.490	-36.099***	26.443	-62.542	-43.351**	36.066	-79.417**
	(19.141)	(54.842)	(57.617)	(13.374)	(47.581)	(49.106)	(17.324)	(43.898)	(35.917)
HML x Euribor	-62.425**	13.268	-75.693	-76.609***	-15.060	-61.549	-80.892**	-48.718	-32.174
	(23.569)	(78.131)	(76.336)	(24.574)	(86.600)	(75.042)	(37.084)	(96.541)	(76.882)
RMW x Euribor	-97.410***	53.185	-150.595	-80.636***	13.426	-94.062	-115.522***	42.034	-157.556
	(28.438)	(120.742)	(130.467)	(21.999)	(128.125)	(123.573)	(39.958)	(131.651)	(117.175)
CMA x Euribor	9.737	79.055**	-69.318	57.864**	9.986	47.878	72.112**	48.102	24.009
	(24.642)	(34.170)	(41.434)	(25.448)	(43.112)	(41.908)	(35.442)	(75.586)	(68.979)
Mkt-rf x DY	-0.134**	0.268*	-0.402**	-0.100	0.341**	-0.440***	-0.068	0.328	-0.396**
	(0.060)	(0.149)	(0.169)	(0.063)	(0.144)	(0.145)	(0.090)	(0.212)	(0.176)
SMB x DY	0.071	-0.493	0.564*	0.199	-0.237	0.436	0.103	0.032	0.072
	(0.133)	(0.350)	(0.310)	(0.146)	(0.303)	(0.287)	(0.171)	(0.251)	(0.209)
HML x DY	0.835***	-0.975	1.810***	0.709**	-1.089*	1.798***	0.832***	-1.227*	2.059***
	(0.296)	(0.591)	(0.580)	(0.314)	(0.644)	(0.641)	(0.306)	(0.649)	(0.609)
RMW x DY	1.145**	-0.937	2.082**	0.951	-1.079	2.031**	1.015*	-1.810**	2.826***
	(0.542)	(0.795)	(0.828)	(0.601)	(0.849)	(0.917)	(0.503)	(0.741)	(0.738)
CMA x DY	-0.837**	0.508	-1.345*	-0.820***	0.794	-1.614**	-1.014***	0.630	-1.643*
	(0.347)	(0.674)	(0.734)	(0.282)	(0.679)	(0.659)	(0.343)	(0.885)	(0.908)
α	-0.002*	-0.005***	0.003	-0.001	-0.002	0.001	-0.001	-0.003	0.001
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
W_1	0.0041	0.0671	0.0026	0.1756	0.3942	0.1528	0.0663	0.7453	0.3729
W_2	0.0000	0.1194	0.0066	0.0002	0.0101	0.0060	0.0000	0.0085	0.0000
W_3	0.0000	0.0008	0.0014	0.0000	0.0001	0.0003	0.0000	0.0002	0.0000
Adj. R^2	0.9834	0.9515	0.5128	0.9876	0.9606	0.5782	0.9823	0.9556	0.5239
Observations	60	60	60	60	60	60	60	60	60

Appendix 46. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 2– Equally-weighted

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2010 to 2014. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.036***	1.100***	-0.064***	1.021***	1.079***	-0.058*	1.052***	1.073***	-0.020
	(0.032)	(0.037)	(0.022)	(0.016)	(0.038)	(0.032)	(0.031)	(0.032)	(0.036)
SMB	-0.152	0.579***	-0.730***	-0.113**	0.538***	-0.651***	0.049	0.559***	-0.509***
	(0.093)	(0.087)	(0.063)	(0.053)	(0.088)	(0.079)	(0.056)	(0.075)	(0.078)
HML	0.393**	0.228	0.164*	0.384***	0.177	0.207*	0.220	0.215	0.005
	(0.159)	(0.165)	(0.096)	(0.110)	(0.190)	(0.109)	(0.150)	(0.175)	(0.106)
RMW	0.112	0.266	-0.154	0.184	0.210	-0.026	0.112	0.246	-0.135
	(0.219)	(0.196)	(0.096)	(0.166)	(0.211)	(0.096)	(0.240)	(0.184)	(0.117)
CMA	0.059	-0.055	0.114	-0.085	-0.155	0.069	-0.125	-0.171	0.046
	(0.157)	(0.105)	(0.094)	(0.106)	(0.122)	(0.131)	(0.156)	(0.134)	(0.176)
Euribor	-1.112*	-1.884***	0.772	-0.085	-1.888***	1.803***	-0.380	-1.464***	1.084***
	(0.563)	(0.391)	(0.541)	(0.284)	(0.431)	(0.362)	(0.376)	(0.398)	(0.354)
DY	0.002	0.015***	-0.013**	-0.004	0.009**	-0.013***	0.005	0.009	-0.004
	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.003)	(0.004)	(0.006)	(0.005)
Mkt-rf x Euribor	-5.052	-15.855	10.802	-11.190	1.056	-12.246	-19.218**	5.933	-25.151**

	(10.278)	(12.296)	(10.269)	(7.395)	(11.219)	(7.599)	(8.541)	(12.119)	(10.798)
SMB x Euribor	4.579	30.201	-25.622	-22.603*	45.231	-67.833**	-18.656	53.327*	-71.984***
	(30.042)	(22.328)	(32.778)	(13.007)	(28.863)	(29.078)	(16.827)	(27.995)	(22.763)
HML x Euribor	-13.328	12.392	-25.719	-15.116	26.636	-41.752	-29.329	-36.538	7.209
	(30.182)	(49.172)	(41.639)	(25.032)	(53.457)	(44.672)	(32.139)	(45.171)	(36.896)
RMW x Euribor	76.875	50.013	26.863	13.724	111.114**	-97.390***	-28.503	61.932	-90.435***
	(49.162)	(39.119)	(43.857)	(30.246)	(51.047)	(34.890)	(41.924)	(48.474)	(32.103)
CMA x Euribor	132.797***	109.460**	23.337	53.468	72.577	-19.109	50.133	150.544***	-100.411***
	(41.034)	(41.124)	(34.479)	(32.542)	(43.719)	(31.606)	(35.590)	(44.560)	(30.045)
Mkt-rf x DY	0.465***	0.465***	-0.001	0.329***	0.446***	-0.117	0.319***	0.426***	-0.107
	(0.107)	(0.152)	(0.081)	(0.087)	(0.157)	(0.108)	(0.111)	(0.149)	(0.124)
SMB x DY	0.111	-0.661***	0.772***	0.215	-0.467	0.682***	-0.129	-0.429	0.300
	(0.228)	(0.227)	(0.197)	(0.177)	(0.287)	(0.182)	(0.173)	(0.260)	(0.204)
HML x DY	-0.803	-0.823**	0.020	-0.354	-0.960**	0.606*	-0.454	-1.076**	0.622***
	(0.492)	(0.399)	(0.362)	(0.303)	(0.473)	(0.305)	(0.336)	(0.417)	(0.217)
RMW x DY	-1.301*	-0.560	-0.741	-0.589	-0.713	0.123	-0.836	-1.107**	0.271
	(0.759)	(0.496)	(0.560)	(0.512)	(0.539)	(0.319)	(0.501)	(0.499)	(0.382)
CMA x DY	-0.143	-0.462	0.319	0.112	0.531	-0.419	0.161	0.077	0.084
	(0.639)	(0.538)	(0.428)	(0.444)	(0.561)	(0.404)	(0.445)	(0.669)	(0.496)
α	-0.003	-0.007***	0.004***	-0.001	-0.005***	0.003**	-0.002	-0.005**	0.003
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
W_1	0.1552	0.0000	0.0617	0.6643	0.0002	0.0000	0.3019	0.0025	0.0092
W_2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W_3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Adj. R^2	0.9813	0.9810	0.6605	0.9900	0.9755	0.6464	0.9839	0.9789	0.4675
Observations	60	60	60	60	60	60	60	60	60

Appendix 47. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 3– 25% cut-off

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2015 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.014***	1.019***	-0.005	1.014***	1.037***	-0.023	1.006***	1.039***	-0.033
	(0.036)	(0.038)	(0.055)	(0.024)	(0.036)	(0.048)	(0.028)	(0.035)	(0.055)
SMB	-0.253**	0.595***	-0.848***	-0.390***	0.452***	-0.842***	-0.245***	0.189*	-0.434**
	(0.119)	(0.068)	(0.161)	(0.072)	(0.115)	(0.165)	(0.085)	(0.098)	(0.174)
HML	0.372***	0.294***	0.078	0.324***	-0.061	0.384**	0.164**	0.285***	-0.121
	(0.063)	(0.094)	(0.121)	(0.061)	(0.190)	(0.188)	(0.063)	(0.071)	(0.102)
RMW	0.079	0.287**	-0.209	0.237***	-0.024	0.261	0.173**	0.174	-0.000
	(0.101)	(0.119)	(0.181)	(0.083)	(0.206)	(0.232)	(0.067)	(0.110)	(0.155)
CMA	-0.194	-0.309	0.115	-0.019	0.006	-0.025	0.163	-0.368***	0.532**
	(0.121)	(0.201)	(0.180)	(0.080)	(0.340)	(0.304)	(0.134)	(0.136)	(0.226)
Euribor	-2.239	6.715***	-8.954***	-0.453	10.074**	-10.527**	-0.215	5.369**	-5.584
	(2.089)	(2.363)	(2.663)	(1.140)	(4.040)	(4.463)	(1.771)	(2.292)	(3.547)
DY	0.003	0.008	-0.005	0.004	0.019**	-0.015*	0.004	0.004	-0.001
	(0.006)	(0.006)	(0.006)	(0.004)	(0.009)	(0.008)	(0.005)	(0.007)	(0.010)
Mkt-rf x Euribor	42.232	25.295	16.937	-23.638	-22.394	-1.245	-16.831	13.985	-30.815

	(50.149)	(55.088)	(71.297)	(33.331)	(58.249)	(70.949)	(39.489)	(61.778)	(86.383)
SMB x Euribor	-220.267	-513.764**	293.497	-128.015	-539.806*	411.791	-195.854	-245.071	49.217
	(145.610)	(245.860)	(306.076)	(84.468)	(291.669)	(314.143)	(116.956)	(177.550)	(229.796)
HML x Euribor	-37.823	-201.287	163.464	-184.633**	11.947	-196.581	18.256	-111.719	129.975
	(96.761)	(203.952)	(253.833)	(76.506)	(273.003)	(275.465)	(97.168)	(148.327)	(188.199)
RMW x Euribor	192.752	-642.964**	835.716**	-54.719	-267.861	213.142	56.142	-176.718	232.859
	(150.107)	(264.224)	(356.093)	(101.898)	(383.664)	(423.228)	(141.455)	(196.984)	(286.610)
CMA x Euribor	143.217	-398.797	542.013	-65.343	-831.824	766.481	-58.743	-229.035	170.292
	(241.223)	(381.044)	(383.317)	(162.924)	(537.934)	(557.712)	(201.680)	(342.530)	(399.090)
Mkt-rf x DY	-0.407***	0.027	-0.435**	-0.296**	-0.088	-0.208	-0.331**	-0.178	-0.152
	(0.111)	(0.191)	(0.168)	(0.118)	(0.251)	(0.224)	(0.150)	(0.237)	(0.334)
SMB x DY	-0.120	-0.108	-0.012	0.011	-0.914**	0.925**	0.089	-0.210	0.299
	(0.384)	(0.287)	(0.491)	(0.289)	(0.352)	(0.444)	(0.403)	(0.394)	(0.759)
HML x DY	1.240***	-0.537	1.777**	0.493**	-1.023	1.516**	0.415	0.706	-0.291
	(0.250)	(0.670)	(0.668)	(0.243)	(0.846)	(0.698)	(0.335)	(0.495)	(0.576)
RMW x DY	1.075**	-0.313	1.387	0.644**	-1.072	1.716*	0.714***	0.501	0.213
	(0.479)	(0.856)	(0.903)	(0.300)	(0.859)	(0.894)	(0.245)	(0.666)	(0.806)
CMA x DY	-1.575**	0.051	-1.627**	-0.913*	0.457	-1.370	-0.503	-1.328**	0.825
	(0.653)	(0.839)	(0.687)	(0.500)	(1.522)	(1.275)	(0.748)	(0.603)	(1.077)
α	-0.000	-0.008***	0.008***	-0.001	-0.007***	0.006**	-0.002*	-0.003	0.000
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)
W_1	0.3956	0.0057	0.0048	0.4788	0.0079	0.0138	0.7144	0.0753	0.2689
W_2	0.0001	0.0258	0.0041	0.0003	0.0080	0.3698	0.0031	0.1077	0.8451
W_3	0.0000	0.0321	0.0003	0.0000	0.0054	0.0310	0.0028	0.0031	0.0404
Adj. R^2	0.9701	0.9420	0.5197	0.9814	0.9007	0.4450	0.9709	0.9527	0.2197
Observations	60	60	60	60	60	60	60	60	60

Appendix 48. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 3– 50% cut-off

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 50% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2015 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.025***	1.008***	0.017	1.020***	1.022***	-0.002	1.012***	1.044***	-0.032
	(0.021)	(0.021)	(0.031)	(0.021)	(0.031)	(0.041)	(0.021)	(0.023)	(0.030)
SMB	-0.197***	0.185***	-0.382***	-0.244***	0.432***	-0.677***	-0.204***	0.141*	-0.345***
	(0.054)	(0.048)	(0.071)	(0.059)	(0.069)	(0.109)	(0.060)	(0.074)	(0.106)
HML	0.269***	0.005	0.264***	0.261***	0.022	0.238***	0.166***	0.351***	-0.185**
	(0.041)	(0.100)	(0.098)	(0.045)	(0.080)	(0.084)	(0.051)	(0.075)	(0.091)
RMW	0.189***	0.192*	-0.002	0.210***	0.135	0.074	0.163**	0.283***	-0.120
	(0.058)	(0.107)	(0.116)	(0.066)	(0.093)	(0.125)	(0.062)	(0.102)	(0.119)
CMA	-0.027	-0.120	0.093	-0.056	-0.014	-0.041	0.039	-0.300***	0.339***
	(0.071)	(0.154)	(0.129)	(0.068)	(0.166)	(0.143)	(0.094)	(0.088)	(0.112)
Euribor	0.709	1.391	-0.681	-0.201	5.247**	-5.448**	-0.387	4.411*	-4.798
	(1.243)	(1.465)	(1.595)	(1.081)	(2.295)	(2.159)	(1.398)	(2.587)	(3.162)
DY	0.004	0.007	-0.003	0.003	0.012**	-0.009**	0.005	0.003	0.002
	(0.004)	(0.005)	(0.005)	(0.003)	(0.005)	(0.004)	(0.003)	(0.007)	(0.007)
Mkt-rf x Euribor	5.244	9.969	-4.725	1.791	20.818	-19.027	-12.595	56.087	-68.682

	(29.475)	(38.603)	(47.102)	(28.954)	(47.837)	(56.813)	(26.195)	(48.271)	(50.228)
SMB x Euribor	-166.746*	-273.584	106.838	-120.012	-506.476***	386.465**	-164.732	-268.431	103.699
	(90.280)	(219.457)	(215.891)	(99.056)	(175.829)	(171.911)	(103.372)	(182.365)	(193.637)
HML x Euribor	-76.834	-20.113	-56.721	-65.834	-83.844	18.011	-30.038	-198.983	168.945
	(61.651)	(216.130)	(202.436)	(81.640)	(129.119)	(129.549)	(78.377)	(149.309)	(151.007)
RMW x Euribor	-76.916	30.300	-107.217	0.983	-278.821	279.804	72.273	-426.558**	498.831**
	(84.782)	(223.469)	(224.076)	(92.065)	(207.991)	(214.054)	(109.727)	(173.404)	(212.237)
CMA x Euribor	-53.887	-127.484	73.597	13.225	-391.665	404.890	-33.522	-178.453	144.932
	(165.191)	(322.701)	(245.545)	(178.837)	(331.829)	(293.030)	(168.710)	(367.900)	(343.344)
Mkt-rf x DY	-0.291***	-0.125	-0.166	-0.291***	-0.101	-0.190	-0.305***	-0.095	-0.210
	(0.093)	(0.192)	(0.169)	(0.104)	(0.166)	(0.162)	(0.113)	(0.165)	(0.183)
SMB x DY	-0.092	-0.055	-0.038	-0.032	-0.286	0.255	-0.111	0.042	-0.153
	(0.229)	(0.276)	(0.410)	(0.205)	(0.215)	(0.304)	(0.241)	(0.297)	(0.444)
HML x DY	0.487**	-0.294	0.781	0.580**	-0.638	1.218***	0.275	0.497	-0.222
	(0.232)	(0.674)	(0.569)	(0.267)	(0.456)	(0.305)	(0.291)	(0.458)	(0.415)
RMW x DY	0.603**	-0.417	1.020*	0.643**	-0.553	1.197**	0.416**	0.352	0.064
	(0.258)	(0.543)	(0.515)	(0.255)	(0.593)	(0.584)	(0.190)	(0.762)	(0.757)
CMA x DY	-0.930*	-0.006	-0.924*	-0.915*	0.106	-1.021	-0.685	-0.794	0.109
	(0.471)	(0.767)	(0.525)	(0.495)	(0.778)	(0.640)	(0.562)	(0.575)	(0.583)
α	-0.002**	-0.003***	0.001	-0.001	-0.006***	0.005***	-0.002**	-0.004*	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
W_1	0.3974	0.3074	0.8239	0.6558	0.0084	0.0108	0.2937	0.2443	0.1939
W_2	0.0000	0.2913	0.0228	0.0017	0.0100	0.0101	0.0057	0.0286	0.0302
W_3	0.0000	0.3364	0.0412	0.0038	0.0211	0.0051	0.0045	0.0120	0.0160
Adj. R^2	0.9850	0.9547	0.4311	0.9850	0.9549	0.5553	0.9810	0.9632	0.2318
Observations	60	60	60	60	60	60	60	60	60

Appendix 49. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 3– Exclusion of financial companies

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for value-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off with the exclusion of financial companies. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2015 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.017***	1.044***	-0.027	1.002***	1.036***	-0.034	1.005***	1.025***	-0.020
	(0.032)	(0.053)	(0.066)	(0.036)	(0.052)	(0.060)	(0.048)	(0.035)	(0.073)
SMB	-0.331***	0.529***	-0.860***	-0.408***	0.350**	-0.758***	-0.294***	0.154	-0.448**
	(0.092)	(0.087)	(0.146)	(0.079)	(0.159)	(0.198)	(0.106)	(0.124)	(0.188)
HML	0.253***	0.244**	0.010	0.204***	-0.032	0.235	0.062	0.229**	-0.167*
	(0.050)	(0.111)	(0.102)	(0.061)	(0.180)	(0.183)	(0.049)	(0.094)	(0.097)
RMW	0.554***	0.290**	0.265	0.526***	0.130	0.396*	0.533***	0.369***	0.164
	(0.096)	(0.137)	(0.163)	(0.087)	(0.214)	(0.224)	(0.074)	(0.119)	(0.141)
CMA	0.036	-0.363*	0.399*	0.181**	0.002	0.178	0.394***	-0.250	0.644***
	(0.089)	(0.206)	(0.209)	(0.074)	(0.316)	(0.322)	(0.122)	(0.173)	(0.210)
Euribor	-0.681	5.752*	-6.433**	0.786	8.111	-7.325	0.490	4.919	-4.429
	(1.891)	(3.014)	(2.942)	(1.675)	(4.957)	(5.706)	(2.116)	(3.024)	(4.189)
DY	0.002	0.007	-0.006	-0.000	0.022**	-0.022**	0.001	0.007	-0.006
	(0.006)	(0.007)	(0.006)	(0.004)	(0.010)	(0.008)	(0.005)	(0.008)	(0.011)

Mkt-rf x Euribor	-45.654	47.878	-93.532	-82.092	-38.938	-43.154	-63.295	-11.362	-51.933
	(55.931)	(76.202)	(101.586)	(52.833)	(78.241)	(95.864)	(64.782)	(67.315)	(114.851)
SMB x Euribor	-85.409	-533.728*	448.319	-34.294	-452.394	418.101	-88.389	-120.401	32.012
	(146.218)	(299.143)	(330.483)	(126.616)	(377.467)	(381.778)	(165.957)	(245.066)	(247.963)
HML x Euribor	-194.985*	-92.489	-102.495	-232.773**	-18.558	-214.215	-52.395	-87.766	35.371
	(103.061)	(246.651)	(259.069)	(110.332)	(284.743)	(280.413)	(116.159)	(200.884)	(192.596)
RMW x Euribor	35.827	-499.977	535.804	-188.884	-396.547	207.663	-103.670	-169.252	65.583
	(186.956)	(303.428)	(369.683)	(141.181)	(435.383)	(468.724)	(200.666)	(226.957)	(311.328)
CMA x Euribor	-124.382	-601.883	477.500	-342.929	-880.930	538.001	-367.768	-332.038	-35.730
	(273.174)	(403.253)	(457.587)	(204.993)	(538.514)	(565.378)	(225.255)	(407.040)	(440.788)
Mkt-rf x DY	-0.354**	0.164	-0.517**	-0.171	0.102	-0.273	-0.220	-0.193	-0.027
	(0.149)	(0.233)	(0.202)	(0.158)	(0.297)	(0.251)	(0.202)	(0.249)	(0.380)
SMB x DY	-0.155	-0.442	0.287	0.069	-1.195**	1.264**	0.020	-0.701	0.721
	(0.375)	(0.372)	(0.499)	(0.264)	(0.505)	(0.587)	(0.414)	(0.513)	(0.867)
HML x DY	0.542	-0.640	1.182*	0.024	-1.545*	1.569*	-0.103	0.443	-0.546
	(0.356)	(0.722)	(0.685)	(0.397)	(0.915)	(0.778)	(0.406)	(0.553)	(0.556)
RMW x DY	0.110	-0.685	0.795	0.313	-1.620*	1.933**	0.253	0.349	-0.096
	(0.777)	(0.877)	(0.850)	(0.558)	(0.946)	(0.847)	(0.467)	(0.783)	(0.920)
CMA x DY	-1.499**	-0.049	-1.450*	-0.349	0.574	-0.923	0.024	-1.371**	1.395
	(0.629)	(0.869)	(0.798)	(0.543)	(1.406)	(1.237)	(0.757)	(0.648)	(1.163)
α	-0.002	-0.008***	0.006***	-0.002	-0.008**	0.006	-0.003***	-0.003	-0.000
	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)	(0.004)	(0.001)	(0.002)	(0.003)
W_1	0.8659	0.0714	0.0485	0.8958	0.0413	0.0257	0.9690	0.2718	0.5679
W_2	0.0001	0.0260	0.1080	0.0000	0.0855	0.1673	0.1223	0.4386	0.5810
W_3	0.0001	0.0401	0.0024	0.0000	0.1429	0.1231	0.0059	0.3991	0.0556
Adj. R^2	0.9642	0.9356	0.5434	0.9695	0.8805	0.3710	0.9559	0.9357	0.2351
Observations	60	60	60	60	60	60	60	60	60

Appendix 50. Estimation results of conditional Fama and French (2015) five-factor model on portfolios based on positive screens - sub-periods analysis: period 3– Equally-weighted

This table provides the estimation results of the conditional Fama and French (2015) five-factor model for equally-weighted portfolios formed on individual ESG dimensions and using positive screens, considering a 25% cut-off. It provides results for the high- and low-rated portfolio, as well as for the long-short portfolio. Mkt-rf denotes the excess return of the market portfolio over the risk-free rate. SMB denotes the return difference between a small and a large capitalization portfolio in month t. HML denotes the return difference between a high and a low book-to-market portfolio in month t. MOM denotes the return difference between portfolios of stocks with high and low returns over the past twelve months. α denotes the abnormal return of each portfolio. The public information variables are the 3-month Euribor rate (Euribor) and the dividend yield of the STOXX Europe 600 index (DY). The observation period is from 2015 to 2019. ***, ** and * indicate significance level at 1%, 5% and 10% level, respectively. Standard errors in parenthesis are computed using the Newey-West (1987) method. W_1, W_2 and W_3 correspond to the probability values of the Wald test on the hypothesis that the coefficients of the conditional alphas, conditional betas and conditional alphas and betas, respectively, are jointly equal to zero.

	Environmental			Social			Governance		
	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short	High-rated	Low-rated	Long-short
Mkt-rf	1.156***	1.140***	0.016	1.110***	1.140***	-0.030	1.108***	1.105***	0.003
	(0.058)	(0.058)	(0.068)	(0.036)	(0.050)	(0.050)	(0.043)	(0.045)	(0.044)
SMB	0.043	0.793***	-0.750***	-0.103	0.806***	-0.909***	0.261***	0.587***	-0.326**
	(0.115)	(0.134)	(0.176)	(0.073)	(0.114)	(0.112)	(0.088)	(0.129)	(0.153)
HML	0.452***	0.275**	0.177	0.420***	0.130	0.290*	0.303***	0.170	0.133
	(0.117)	(0.128)	(0.163)	(0.070)	(0.145)	(0.168)	(0.072)	(0.109)	(0.107)
RMW	0.148	0.041	0.107	0.176**	0.052	0.124	0.183*	-0.022	0.204
	(0.162)	(0.154)	(0.226)	(0.070)	(0.164)	(0.199)	(0.099)	(0.148)	(0.163)
CMA	-0.181	-0.235	0.054	-0.152	-0.096	-0.056	-0.100	-0.200	0.100
	(0.169)	(0.193)	(0.145)	(0.138)	(0.215)	(0.183)	(0.158)	(0.137)	(0.140)
Euribor	-1.502	2.275	-3.777	-1.101	2.664	-3.765	1.005	0.943	0.061
	(2.713)	(4.066)	(2.808)	(2.000)	(3.832)	(2.773)	(2.197)	(3.284)	(2.996)
DY	0.014	0.003	0.011	0.001	0.010	-0.009	0.008	0.001	0.007
	(0.009)	(0.011)	(0.007)	(0.005)	(0.011)	(0.010)	(0.008)	(0.008)	(0.007)
Mkt-rf x Euribor	-36.930	-71.211	34.281	-68.280	-93.777	25.497	-22.240	-80.492	58.252

	(85.732)	(88.938)	(84.400)	(60.872)	(79.035)	(79.343)	(78.489)	(64.696)	(70.816)
SMB x Euribor	-170.309	-457.277	286.967	-76.256	-486.253**	409.997**	-264.684	-312.564	47.881
	(193.617)	(274.545)	(256.174)	(161.173)	(218.671)	(177.855)	(179.280)	(241.988)	(204.393)
HML x Euribor	-73.048	-92.343	19.295	-234.759	-68.422	-166.337	-171.003	-51.115	-119.889
	(202.116)	(282.380)	(260.810)	(166.521)	(278.371)	(229.637)	(152.615)	(187.555)	(146.187)
RMW x Euribor	229.622	-69.531	299.153	11.182	40.164	-28.982	24.749	-10.646	35.395
	(286.051)	(340.822)	(366.222)	(168.862)	(372.788)	(369.380)	(182.682)	(251.752)	(248.763)
CMA x Euribor	138.332	-416.794	555.126*	-52.372	-292.155	239.782	44.382	-73.193	117.575
	(439.735)	(498.965)	(317.733)	(350.611)	(508.627)	(337.799)	(361.013)	(422.004)	(211.182)
Mkt-rf x DY	-0.534***	0.063	-0.597**	-0.188	-0.051	-0.137	-0.253	0.002	-0.254
	(0.176)	(0.346)	(0.252)	(0.160)	(0.312)	(0.253)	(0.206)	(0.208)	(0.168)
SMB x DY	-0.496	0.178	-0.674	-0.071	-0.060	-0.011	-0.010	0.295	-0.305
	(0.338)	(0.359)	(0.402)	(0.239)	(0.407)	(0.460)	(0.386)	(0.253)	(0.412)
HML x DY	0.522	-0.624	1.145**	0.108	-0.526	0.634	-0.240	-0.221	-0.019
	(0.529)	(0.737)	(0.555)	(0.493)	(0.669)	(0.512)	(0.450)	(0.539)	(0.394)
RMW x DY	-0.247	-1.012	0.765	-0.013	-1.295	1.282	-0.515	-0.280	-0.235
	(0.896)	(0.851)	(0.813)	(0.673)	(0.854)	(0.784)	(0.696)	(0.736)	(0.590)
CMA x DY	-2.459**	-0.623	-1.836***	-0.731	-0.912	0.181	-0.747	-0.263	-0.483
	(1.103)	(1.238)	(0.613)	(0.868)	(1.385)	(1.146)	(0.895)	(1.001)	(0.512)
α	-0.004	-0.009***	0.005**	-0.002	-0.009***	0.007***	-0.005***	-0.005*	-0.001
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
W_1	0.2254	0.8198	0.1723	0.7827	0.4382	0.0884	0.5127	0.9516	0.5473
W_2	0.1361	0.2160	0.0009	0.2500	0.0786	0.0090	0.2471	0.6045	0.8826
W_3	0.0295	0.3348	0.0018	0.0000	0.0797	0.0001	0.3326	0.5997	0.7724
Adj. R^2	0.9544	0.9176	0.4328	0.9716	0.9166	0.4810	0.9498	0.9472	0.1816
Observations	60	60	60	60	60	60	60	60	60