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Environmental, Social and Governance investing: Does rating matter?

Vincenzo Pacelli[1] | Francesca Pampurini[2] | Anna Grazia Quaranta[3]

[1]University of Bari "Aldo Moro", Taranto, Italy

[2]Università Cattolica del Sacro Cuore, Milano

[3]University of Macerata, Macerata, Italy

Correspondence
Francesca Pampurini, Università Cattolica del Sacro Cuore, Largo Gemelli 1, Milano, Italy.
Email: francesca.pampurini@unicatt.it

Abstract

In the last decade, the demand for sustainable and social investments has improved. The mutual funds industry has responded to market needs by offering a number of investment products focused on Environmental, Social and Governance (ESG) companies. The aim of this article is to understand if an ESG score can actually be considered a valid criterion that portfolio managers could adopt, along with traditional risk–return optimisation, in selecting asset portfolios. The paper analyses the link between the performance and the ESG score of different sectoral portfolios (one for each sector of the Global Industry Classification Standard), entirely composed of ESG assets, in the search for a clear and strong positive correlation that could suggest an overall advantage to focus on an ex ante choice of assets with high ESG scores.

KEYWORDS

ESG scores, mutual funds, portfolio selection, risk–return performance, sustainable investments

1 | INTRODUCTION

This paper contributes to the empirical literature on sustainable finance and, in particular, on Environmental, Social and Governance (ESG) investment strategies. Sustainable finance generally refers to the process of taking ESG considerations into account in investment decision-making, leading to increased investments in longer-term and sustainable activities (Alda, 2021; Pedersen et al., 2020). Therefore, ESG investment strategies consist of medium-long-term-oriented investment policies that integrate financial analysis with environmental, social and governance needs, in order to create value for investors, shareholders and stakeholders as a whole.

The issue of ESG investment strategies has become an increasing priority for financial operators, intermediaries and investors, especially following the growing attention of international political authorities. By adopting the Paris Agreement on climate change and the UN 2030 Agenda for Sustainable Development in 2015, Governments from around the world have chosen a more sustainable path for our planet and our economy. In addition, even more attention is being paid today, especially in Europe, following the adoption of the 'Next Generation EU' with the priority objective of sustainable transition.

Starting from the Action Plan of 2018, the European Commission has attributed specific responsibilities to financial intermediaries in order to re-orient capital flows towards sustainable investment to achieve sustainable and inclusive growth, explicitly requiring portfolio managers to integrate factors relating to sustainability into their process. Moreover, this has been done to manage financial risks stemming from climate change, resource depletion, environmental degradation and social issues and to foster transparency and long-termism in financial activity and portfolio management. To support

Abbreviations: ATExR, annualised total extra-return; ATR, annualised total return; CVaR, Conditional Value at Risk; ESG, Environmental, Social and Governance; ETFs, exchange-traded funds; GICS, Global Industry Classification Standard; IDD, Insurance Distribution Directive; MiFID II, Markets in Financial Instruments Directive; SRI, socially responsible investments; TExR, total extra-returns; TR, total returns; VaR, Value at Risk.

the need for sustainable investments, some providers introduced new ESG ratings in response to the needs for reliable data on the social behaviour and performance of firms (Avetisyan & Hockerts, 2017).

The Markets in Financial Instruments Directive (MiFID II) and the Insurance Distribution Directive (IDD) require investment firms and insurance distributors to offer suitable products to meet their clients' needs when offering advice. For this reason, these firms now need to ask about their clients' ESG preferences and consider them when assessing the range of financial instruments and insurance products to be recommended, that is, in the product selection process and suitability assessment (Cordazzo et al., 2020).

Furthermore, investment firms are required to provide customers with adequate information on sustainable financial instruments, integrating ESG factors into the general description of the nature and risks of financial instruments, as well as providing a report to the client explaining how their recommendation satisfies his ESG preferences.

In addition to the growing international political attention, the increasing interest of institutional investors and portfolio managers in ESG strategies could also be further supported by the sensitivity shown by Millennials who feel they play an important role in the sustainable development of the planet. In fact, 93% of the new generations consider positive impact on the environment and society to be decisive when making their investment choices (PwCs top trends financial services, 2019).

The aim of this paper is to understand if ESG scores can be actually considered an additional criterion in selecting asset portfolios. This idea represents the main contribution of our study to scientific literature and gives our paper its originality since, to the best of our knowledge, this specific issue has not been studied in previous works.

Since the financial industry seeks to respond to the new market needs that are increasingly oriented towards investing in firms engaged in sustainable activities offering a set of funds that invest in ESG companies, the industry could benefit from knowing whether it would be advisable to run traditional bi-criteria portfolio selection models starting from assets with the highest ESG scores (Berry & Junkus, 2013).

To this aim, the paper will analyse the link intensity and its direction between performance and ESG score (considered overall, as well as in relation to its own main components E, S, G) of different sectoral funds composed entirely of ESG assets.

In this way, it is possible to search for a clear and strong positive correlation that could suggest an overall convenience for portfolio managers to focus, particularly, on the choice of assets appreciated for their high ESG score. In this case, the ESG score could turn out to be a useful tool in driving financial choices.

As for the portfolio selection procedure, we decided to refer to the approach based on Conditional Value-at-Risk (CVaR) as a risk measure, since it is robust in the presence of skewed return distributions, as usually occurs in the real markets. We considered all the Global Industry Classification Standard (GICS) sectors; daily data (from Refinitiv data set) referred to the years 2017–2019.

The paper is organised as follows: Section 1 introduces the topic. In Section 2 the literature review. Section 3 illustrates the data set used, while Section 4 describes the methodology employed. In Section 5 the empirical results and their discussion. Section 6 concludes.

2 | LITERATURE REVIEW

In the last decade, a growing strand of literature has started to focus on ESG issues as new frontiers of investment.

The structure of an investment portfolio depends on several factors, but it depends mainly on the investor's goals. According to the Markowitz theory (Markowitz, 1952), fund managers select assets by taking different principles into account, such as return maximisation and risk minimisation. However, in the last few years, the growing attention of both investors and regulators in socially responsible investments (SRI) has increased the importance of ESG factors in investment decisions (Alda, 2021; Pedersen et al., 2020; Van Duuren et al., 2016).

Most previous literature that studies the impact of SRI on the financial performance of funds reveals that the investments on socially responsible stocks do not always yield significant positive risk-adjusted returns (Pei-yi Yu et al., 2018; Rajesh & Chandrasekharan, 2020; Xie et al., 2018). Although Galema et al. (2008) do not find a positive relationship between the US SRI and alphas, they show that SR investing impacts stock returns by lowering the book-to-market ratio. In a critical review of the studies about SRI, Renneboog et al. (2008) demonstrate that existing studies at portfolio level hint, but do not univocally demonstrate, that SRI funds perform worse than conventional funds. Utz and Wimmer (2014), examining a broad sample of socially responsible and conventional mutual funds, do not document differences in financial performance. Furthermore, they show that the label 'SR mutual fund' does not in any way guarantee the exclusion of clearly unethical firms. Using a regression model, Halbritter and Dorfleitner (2015) underline how the effect of ESG factors, in terms of magnitude and direction, depends on the rating provider, the company sample and the particular subperiod. They reveal a significant influence of several ESG variables, but they state that investors cannot easily exploit this relationship and, as a result, ESG portfolios do not state a significant return difference between US companies with high and low ESG ratings. Therefore, they conclude that investors do not have different performances in trading a portfolio with high and low ESG rated firms.

The fact that ESG ratings evaluated by different providers are not homogeneus is a problem discussed by many authors (Widyawati, 2020). As a consequence of the lack of standardised rules, each provider developed a customised procedure starting from very different quali-quantitative information. The result is that ESG scores attributed by different providers to the same subject may differ even by a large margin (Lee et al., 2016).

Staub-Bisang (2012) and Berry and Junkus (2013) highlight that an active management strategy, aimed at exploiting ESG levers to optimise the risk–return combination in the long term, can produce several advantages, such as a positive impact on long-term

performance and lower return volatility due to lower exposure to operational and idiosyncratic risks, as well as a reduction in the risk premium required by the market due to the greater disclosure of ESG compliant issuers.

In more recent studies, Dimson et al. (2020) and Alda (2021) find that the ESG factors do not affect the financial performance of mutual funds. Specifically, Dimson et al. (2020) state that ESG ratings, used in isolation, are unlikely to make a material contribution to portfolio returns, whereas Alda (2021), by comparing the mainstream SRI in UK conventional and SRI pension funds through a panel regression, shows that the inclusion of these factors into conventional funds evolves over time, despite the fact that ESG factors do not affect the financial performance. Finally, Plagge and Grim (2020) underline that the significant return and risk differences of ESG funds appear to be mainly driven by fund-specific criteria rather than by a homogeneous ESG factor.

Looking at the behaviour of the financial performance and the effect of ESG factors during crisis and no-crisis periods, the empirical papers do not provide a unique conclusion. Specifically, by comparing conventional mutual funds and socially responsible mutual funds, Nofsinger and Varma (2014) conclude that there is an asymmetric return pattern that is even more evident for mutual funds focusing on ESG factors. Therefore, the mutual funds that take ESG factors into account would experience an outperformance during periods of market crises, whereas in non-crisis periods these funds would underperform with respect to the market. In the opposite direction, the findings of Muñoz et al. (2014) show that, in normal periods, the US and EU SR funds underperform compared to the market, but they have an insignificant financial performance in crisis periods. The recent paper by Folger-Laronde et al. (2020) that uses ANOVA and multivariate regression models, highlights that the involvement of exchange-traded funds (ETFs) in sustainable investments does not safeguard investments from financial losses during a severe market downturn.

Although previous literature has demonstrated that the financial performance of SR funds is not affected by ESG rating, some recent papers have underlined a possible difference between the performance of firms with high or low ESG ratings (Kotsantonis et al., 2016). Brian et al. (2019) show that the performances of ESG stocks differ from those of non-ESG stocks. In particular, the returns of ESG stocks are lower compared to those of non-ESG stocks. However, after factor-adjusting the returns and risks, the differences in the stocks' returns disappear in portfolios with positive alpha, whereas for portfolios without statistically significant alpha, the portfolios of ESG stocks have lower residual volatility than portfolios of non-ESG stocks. Although the main findings of Steen et al. (2020) confirm the absence of abnormal risk-adjusted returns (alphas) in Norwegian mutual funds, they demonstrate the presence of a geographical bias in the distribution of sustainability ratings. Specifically, in analysing the European funds separately, Steen et al. (2020) find significantly higher returns and (positive) alphas for the top ESG quintiles. Therefore, they highlight that performance improves with the improvement of ESG ratings, implying that there may be a financial return in investing in companies with a high ESG rating or, this positive effect may be incorporated into the fund's rating. By investigating how ESG components affect stock returns of Eurostoxx50 companies, other studies show that the financial performance of these companies is not affected by ESG ratings. However, by running a sectorial analysis, they show that ESG ratings are key factors in some particular sectors such as energy and utilities. Therefore, they conclude that the impact of ESG factors on financial performance varies from company to company. Madhavan and Sobczyk (2020) highlight a negative relationship between a fund's total returns and the investment in firms with high ESG scores. This negative relationship derives from the composition of bond portfolios. Funds with higher ESG scores tilt towards higher quality, and they hold higher-rated bonds that are less volatile. Finally, regarding the possible mitigating effect of the systemic risk of ESG investments, Cerqueti et al. (2021) find evidence that the relative market value loss of high ESG ranked funds is lower than the loss experienced by the low ESG ranked counterparts in the time span with lower volatility.

Stating the above, our study tries to understand if ESG scores can be considered an additional criterion in portfolios selection. To the best of our knowledge, this specific issue has not been studied in previous works; for this reason, with our contribution, we would like to shed light on this topic hoping to stimulate a scientific debate about it.

3 | DATA

To investigate the topic of this paper, and then also to select the minimum CVaR portfolios entirely composed of ESG securities, we will start considering the daily data from Refinitiv related both to prices and ESG scores of a wide group of listed companies having the headquarter in a European country. Then, we will consider, for each GICS sector (i.e., Consumer, Communication, Energy, Financial, Health, Industrial, IT, Materials, Real Estate and Utilities), the daily prices of the 30 stocks that, primarily, registered a valid ESG score for each day in the considered time window 2017–2019 (i.e., 784 trading daily scenarios) and, at the same time, were also the ones with the highest capitalisation levels, and then with relevant levels of liquidity.[1] The choice to include 30 stocks for each sector is because, in the case of Utilities, only 30 stocks satisfied the previous double criteria. We then decided to consider the same number of securities in relation to each GICS sector for the sake of comparability.

With more detail, the Refintiv ESG scores seem to be particularly suitable for our purpose thanks to their high informative power and widespread application in the financial industry. This database covers over 70% of global market capitalisation.

ESG scores from Refinitiv measure a company's relative ESG performance, commitment and effectiveness, based on company-reported data. The Refinitiv scores calculation methodology provides an overall ESG combined (ESGC) score, which comprises significant

[1]Data available upon request.

ESG controversies impacting the corporations, as well as single scores referred to each E, S and G component. The scores are expressed as a value between 0 and 100 and are obtained on the basis of both publicly-reported information and surveys on 10 key aspects, among which, emissions, environmental product innovation, human rights and shareholders. These scores are based on relative performance of ESG factors within the company's sector (for environmental and social) and country of incorporation (for governance). Each measure is processed manually for each company and undergoes a process to standardise the information and ensure it is comparable across the entire range of companies.[2] At the moment, Refinitiv ESG scores are available until 2019 because subsequent data from the previous quoted surveys is still being processed and verified.

4 | METHODOLOGY

As stated before, the goal of the paper is to understand if the ESG score can be considered an additional criterion in selecting asset portfolios. Indeed, in recent times, while the demand for green and sustainable financial products from investors increased, several studies underlined that this particular choice does not necessarily threaten the well-known basic rule of risk–return optimisation that, on the contrary, is the portfolio manager's leading goal.

Therefore, the financial industry, which responds to market needs also by offering a set of funds that invest in ESG companies, could be interested to know if it is suitable to run the bi-criteria portfolio selection models starting from assets with the highest ESG scores.

To this aim, the paper will analyse both the intensity and the direction of the link between the performance and the ESG score (considered overall, as well as in relation to its own main components E, S, G) of different sectoral funds composed entirely of ESG assets.

Thus, a clear and strong positive correlation could suggest an overall advantage convenience for portfolio managers to focus on, particularly regarding the choice of assets appreciated by the markets thanks to their high ESG score. Consequently, the ESG score turns out to be a useful tool in driving financial choices.

As for the portfolio selection procedure, we decided to refer to the well-known and established approach based on Conditional Value-at-Risk (CVaR) as a risk measure. As it is well known, such a measure quantifies an investment portfolio's tail risk (Hull, 2018; Rockafellar & Uryasev, 2000) and it is derived by taking a weighted average of the extreme losses in the possible returns' tail distribution, beyond considering Value at Risk (VaR) as the cut-off point.

Therefore, as the average of the values that fall beyond the VaR, the CVaR can be expressed by the following formula

$$\mathrm{CVaR} = \frac{1}{(1-a)} \int_{-1}^{\mathrm{VaR}} r p(r) \mathrm{d}r \tag{1}$$

where a is the cut-off point on the distribution where the VaR breakpoint is fixed, VaR is the agreed-upon VaR level and $p(r)\mathrm{d}r$ is the probability density of getting a return's value equal to r.

There are, basically, two reasons that explain the preference of CVaR as a risk measure in the portfolio selection context.

First, it is robust in the presence of skewed return distributions, as usually occurs in real markets. In more detail, since positive and negative deviations of the returns from their average value play an asymmetric role in the investor's perception, financial practice and related theory have showed increasing interest towards quantile-based measures (Cesari & Quaranta, 2013; Quaranta & Zaffaroni, 2008; Stoyanov et al., 2010).

Secondly, various studies considered coherent risk measures (Artzner et al., 1997, 1999), and in particular, the CVaR, as the function to be minimised in portfolio selection models (Pflug, 2000).[3]

Stated the above, the optimisation model considered in this study is the following

$$\max_{\mathbf{x}} \left\{ \mathbf{r}'^{\mathrm{T}} \mathbf{x}, \mathrm{CVaR} \leq \gamma, \mathbf{1}^{\mathrm{T}} \mathbf{x} = 1 \right\} \tag{2}$$

where $\mathbf{x} \in \mathrm{R}^{\mathrm{N}}$ is the vector of the portfolio weights, γ is the choosen risk threshold and $\mathbf{r}' \in \mathrm{R}^{\mathrm{N}}$ is the vector of the assets expected return. We will construct CVaR portfolios using exponentially weighted expected daily returns obtained via historical data and a rolling estimation window.

The methodology employed for the CVaR calculation requires for its estimation a historical simulation of the portfolio return distribution based on the latest daily data. Since the best practice adopted by professional asset managers is to consider 250/500 daily prices, to obtain the CVaR values we will refer to a rolling 2-year period starting from 2017.

For the CVaR portfolios, we will adopt the Rockafellar and Uryasev approach (Rockafellar & Uryasev, 2000, 2002). In particular, for the CVaR portfolios we will

- set 784 scenarios (one for each day in the period from 1 January 2017 to 31 December 2019);
- choose a simulation method based on empirical distribution using t-copula (Stoyanov et al., 2010). Indeed, a t-copula can be thought of as representing the dependence structure implicit in a multivariate t-distribution (Embrechts et al., 2001; Fang et al., 2002). Consequently, it is a model that has received much attention in the context of modelling multivariate financial return data, in particular daily data (Demarta & McNeil, 2005). Moreover, many researchers (such as Breymann et al., 2003; Mashal & Zeevi, 2002) have shown that the empirical fit of the t-copula is generally superior to that of the Gaussian copula thanks to its ability to better capture the phenomenon of dependent extreme values, which is often observed in financial return data and hence it should be taken into account during CVaR quantification;

[2] For more detailed information about Refinitive ESG scores see Refinitiv (2021).

[3] For a complete review of the pros and cons of most common risk measures (see Biglova et al., 2004; Pflug, 2000; Rachev et al., 2008; Stoyanov et al., 2011).

- simulate the empirical asset scenarios using a function that, sequentially, (i) transforms the data to the copula scale (unit square) using a kernel estimator of the cumulative distribution function, (ii) fits a t-copula to the data, (iii) generates a random sample from the copula and, finally, (iv) transforms the random sample back to the original scale of the data;
- set a threshold of 0.95 for VaR identification.

For each portfolio selected through the bi-criteria model described above, in relation to each day of the year 2019—which, as underlined before, is the last year for which ESG scores are available—we will measure both the performance—via classic performance indices—and the weighted average value of the ESG scores of portfolio assets (the overall score and those related to its main components E, S and G).

As for the mentioned classic performance indices we will refer to the (i) annualised total return (ATR), the annualised total extra-return (ATExR) measured against MSCI Europe and MSCI World and the total return distribution skewness, to summarise the performance in terms of return, (ii) the Rachev index (Biglova et al., 2004; Ortobelli et al., 2004) values in correspondence to different tails definitions[4] and the values of the maximum drawdown (Lehoczky, 1977; Taylor, 1975), to give information about performance in terms of risk, (iii) the concentration index (Herfindahl, 1950; Hirschmann, 1964) and (iv) the portfolio turnover ratio (PTR).[5]

Subsequently, we will analyse the link between the two previous quantities to measure its intensity and direction via both overall connection (χ^2 and Cramer V), dependence (Pearson Ratios) and correlation (Bravais–Pearson correlation index) measures (Cramér, 1946).

5 | EMPIRICAL RESULTS

In this section, we discuss the results of the empirical experiments. Figures 1–6 show, respectively, the portfolios daily weighted average of ESG, E, S and G scores, the daily returns mean of the portfolios, the portfolios daily total returns (TR), the portfolios daily total extra-returns (TExR) measured against the MSCI Europe index referred to each GICS sector, the mean of the portfolios daily performance indexes and the mean of the portfolios daily extra-performance indexes with respect to the benchmark considered in each sector.

As for the selection of the historical prices needed to obtain the CVaR values, also the choice of the MSCI Europe index as a benchmark was made to take into account the best practices in asset allocation by professional assets managers. We actually also compared these results to the MSCI World index referred to each sector considered and, substantially, we obtained the same evidence. In Figure 4 we preferred to show the extra-return measured against MSCI Europe since most of the stocks in each portfolio are traded in euros.

The above results show that, in any case, the average return of all the minimum CVaR portfolios made up of the considered ESG securities is positive. Portfolio total return is very high in relation to each sector, in particular for Industrial and Utilities. The same occurs for portfolio total extra-return of all the GICS sectors, except for Consumer that registers a final value of only slightly lower than 100.

In order to offer a more accurate representation of the overall quality of the minimum CVaR portfolios entirely composed of ESG securities that we obtained, we report (i) in Table 1 the annualised total return (ATR), the annualised total extra-return (ATExR) measured against MSCI Europe and MSCI World and the total return distribution skewness (to summarise the performance in terms of return); (ii) in Table 2, the Rachev index values in correspondence to different tails definitions and the values of the maximum drawdown (to give information about performance in terms of risk)[6]; (iii) finally, in Table 3 the values of the concentration index and of the portfolio turnover ratio (PTR).

The performance results in terms of return, as previously discussed, are also confirmed by the values reported in Table 1 that also show a negative return distributions skewness. Moreover, this good portfolio performance is associated with encouraging results in terms of risk. Indeed, Table 2 shows low maximum drawdown values as well as good Rachev Ratio levels that indicate a satisfying offset capacity of profits versus losses.

The relatively low concentration index values in Table 3 assess a good level of portfolio diversification for each GICS sector. The values of the turnover ratio are completely in line with the high portfolio performance in terms of return.

In Table 4, the correlation index values (all significant at 99%) between each score and the TR or TExR of the portfolios are reported.

From the data shown in Table 4 it is therefore not possible to assess a unique intensity and direction of the relationship between the realised performance, in terms of return, and the ESG, E, S and G score, for all the GICS sectors. Indeed,

i. for Health and IT sectors there seems to be a weak link (less than 60%), while for the Energy sector it is even weaker;
ii. Financial, Real Estate and Utilities sectors show a strong and basically negative link;

[4]As for the different tails definitions, we will consider the same combinations of α and β—belonging to (0,1)—used in Biglova et al. (2004), to identify, respectively, the expected tail loss (ETL) and the expected tail return (ETR). As regards the values of the risk-free rate, we will show the Rachev Ratios obtained considering the Euro OverNight Index Average (EONIA) rate since most of the ESG assets in the minimum CVaR portfolios obtained are traded in Euros. We will also consider the case of no riskless asset (in line with Biglova et al., 2004).

[5]The PTR is the rate at which assets in a portfolio are bought and sold by portfolio managers and refers to the percentage change of the assets in a portfolio over a 1-year period. It is calculated as the minimum of securities bought or sold (i.e., the total amount of new securities purchased or the total amount of securities sold—whichever is less) to average net assets.

[6]We obtained about overlapping results in relation to the case of no riskless asset (data available upon request).

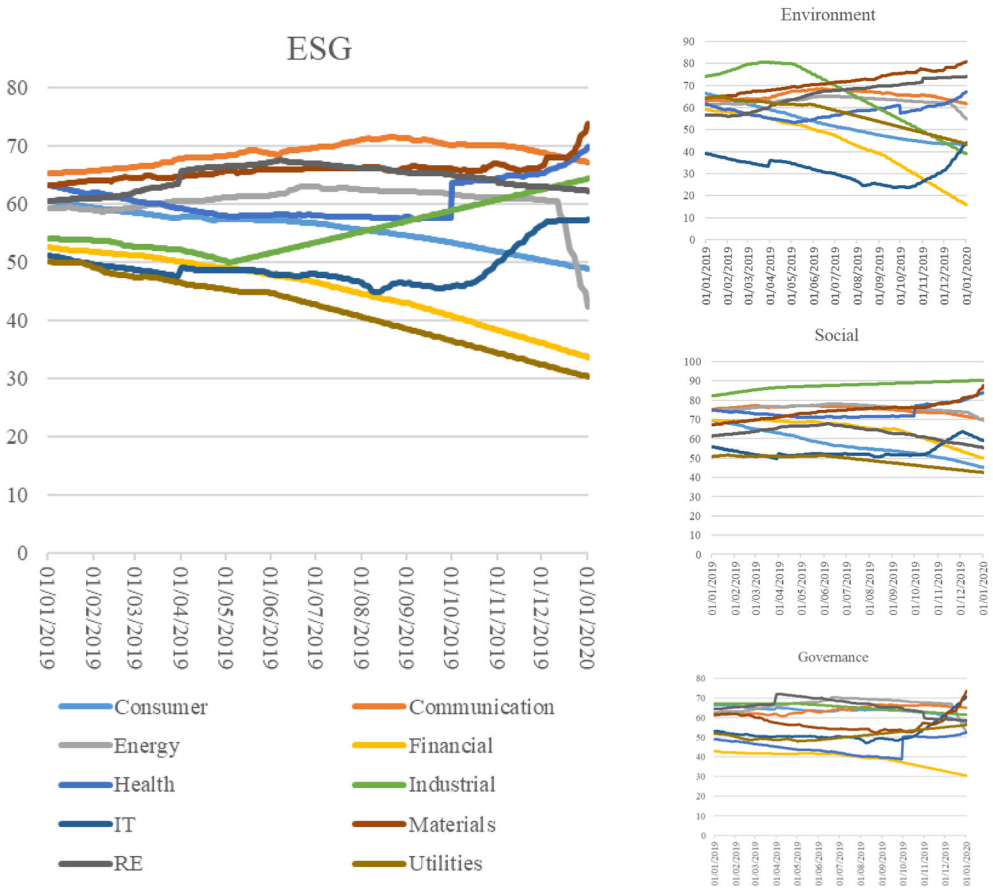

FIGURE 1 Portfolios daily weighted average of the Environmental, Social and Governance (ESG), E, S and G scores

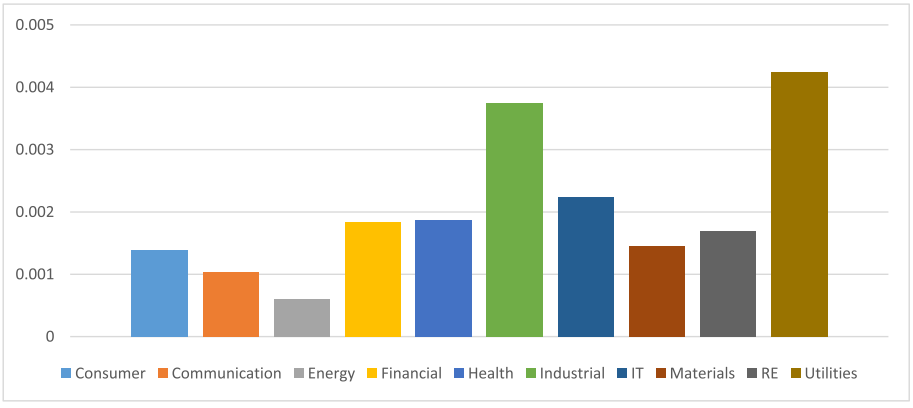

FIGURE 2 Daily returns mean of the portfolios

iii. on the other hand, there is a strong and substantially positive relationship for the Communications and the Materials sectors;
iv. the Consumer sector shows an appreciably intense and negative relationship between performance and scores, but it is not possible to assess the presence of a link between extra-performance and scores;
v. the relationship between TR and TExR and the various scores is, finally, very high for the Industrial sector, although its direction is not constant with respect to the various scores considered. In fact, this situation occurs, albeit to a lesser extent, in other sectors as well.

To seek further confirmation of the results obtained so far which, substantially, would seem not to indicate a particular advantage for portfolio managers to focus on, specifically, on an ex ante choice of high ESG score assets, we proceeded with a more careful analysis of the securities that assumed, over time, the highest weights in the different minimum CVaR portfolios that we obtained.

From this study, it emerged that,[7] although, as already mentioned, all the portfolios built achieved particularly positive results in terms of return (also compared to their respective market benchmarks), risk,

[7]Data available upon request.

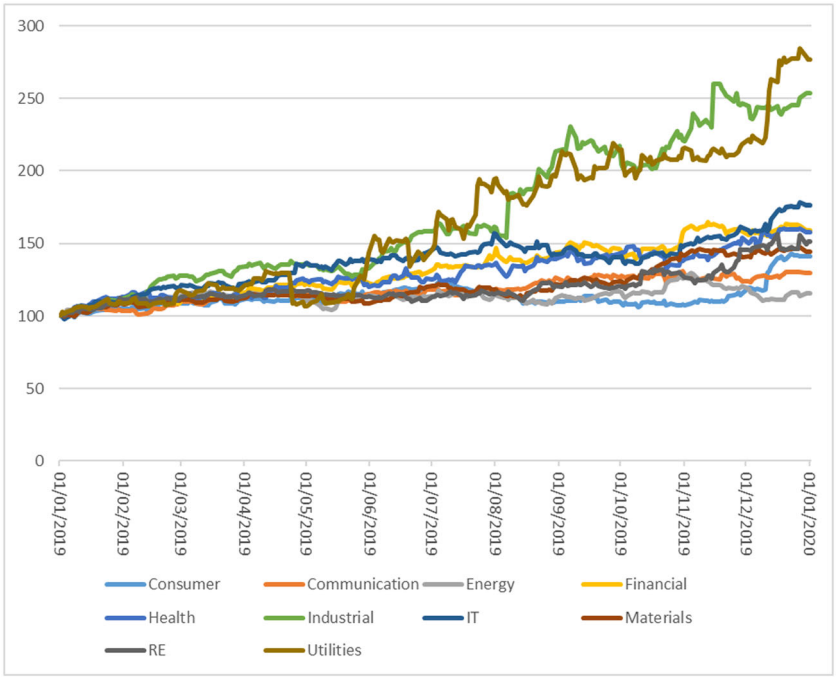

FIGURE 3 Portfolios daily total returns

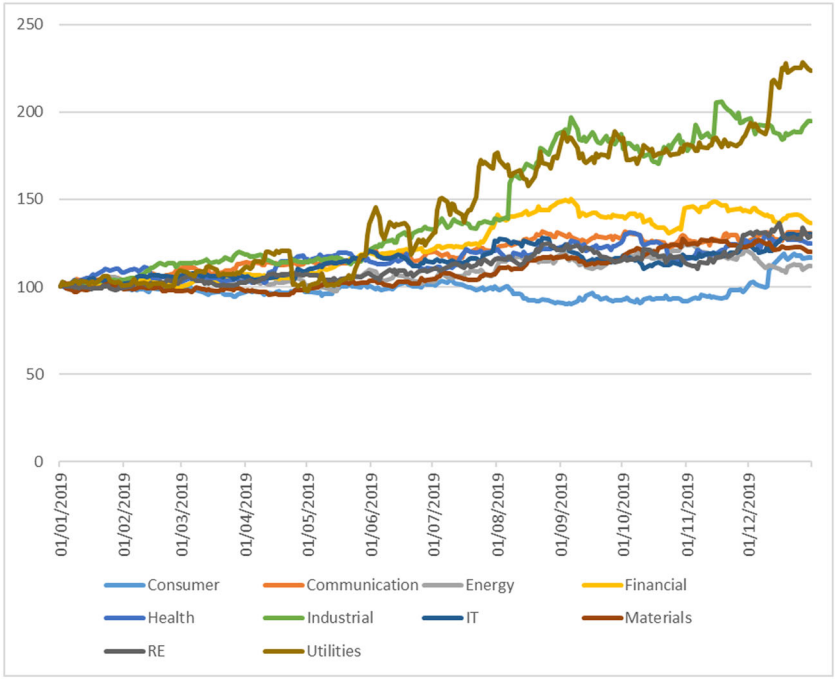

FIGURE 4 Portfolios daily total extra-returns measured against the MSCI Europe Index referred to each GICS sector

diversification and turnover, the securities that occupied the largest shares within them were not systematically characterised by a high ESG score, therefore suggesting a lack of any particular advantage for asset managers to focus on for an ex ante choice of high ESG score assets to include in their portfolios.

However, currently, we do not believe that this evidence can be considered conclusive because, in our opinion, ESG scores are not yet able to fully and unambiguously capture sustainability in terms of environmental, social and governance commitment. This is demonstrated by the fact that each provider calculates its ESG scores starting from very different information, including quali-quantitative ones, and implementing different methodologies. This means that ESG scores attributed by different providers to the same entity may differ even by a large margin, thus sending different signals to asset managers and investors (Boiral et al., 2020; Chatterji et al., 2016; Dimson et al., 2020; Dorfleitner et al., 2015).

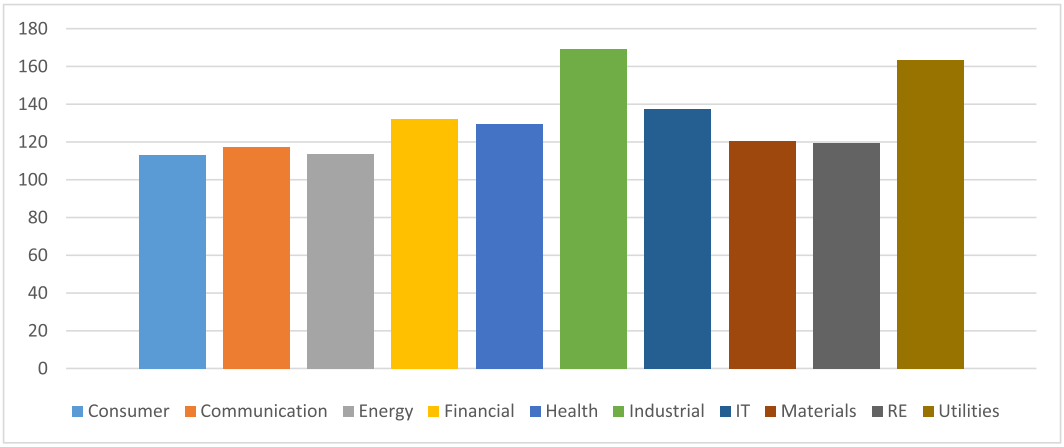

FIGURE 5 Mean of the portfolios daily performance indexes

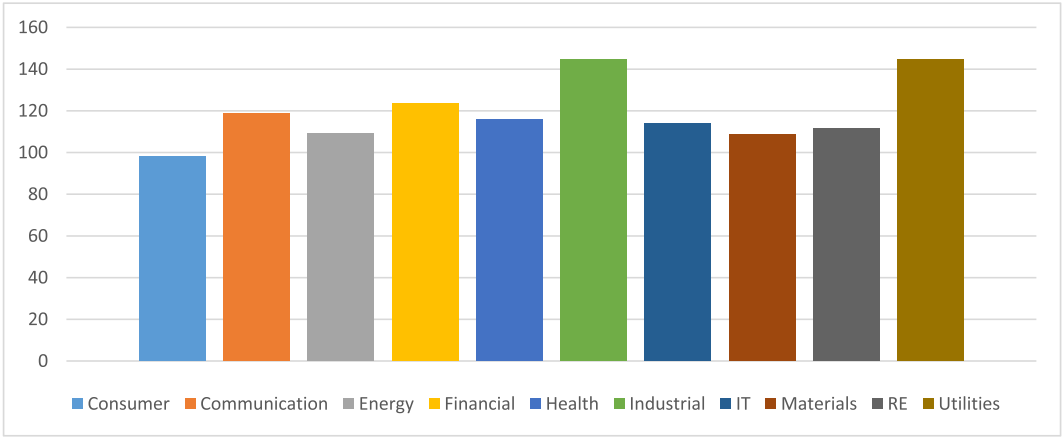

FIGURE 6 Mean of the portfolios daily extra-performance indexes with respect to the benchmark considered in each sector

TABLE 1 Returns of the minimum CVaR portfolios of ESG assets (%)

	ATR	ATExR (Europe)	ATExR (World)	Return distribution skewness
Consumer	41.36	16.9	12.41	−2.26
Communication	29.88	30.44	2.13	−0.20
Energy	15.44	11.72	5.67	−0.11
Financial	58.88	36.58	29.7	−0.25
Health	58.09	24.86	29.45	−0.25
Industrial	153.57	94.6	102.03	−2.77
IT	176.46	29.87	19.15	−0.58
Materials	44.47	19.75	20.24	−0.40
RE	51.61	29.06	26.25	−0.89
Utilities	176.73	123.59	131.07	−0.46

Note: ATR is the annualised total return; ATExR is the annualised total extra-return measured against MSCI Europe and MSCI World.

TABLE 2 Rachev ratio and maximum drawdown of the minimum CVaR portfolios of ESG assets

	Rachev ratio					Maximum drawdown (%)
	$\alpha = \beta = 0.01$	$\alpha = \beta = 0.05$	$\alpha = \beta = 0.09$	$\alpha = 0.5\ \beta = 0.05$	$\alpha = 0.5\ \beta = 0.01$	
Consumer	0.31	0.45	0.46	1.27	1.75	13.89
Communic.	0.56	0.54	0.52	1.17	1.62	5.65
Energy	0.74	0.63	0.60	1.45	2.35	14.63
Financial	0.62	0.62	0.57	1.40	2.26	7.59
Health	0.71	0.78	0.72	1.91	3.44	10.76
Industrial	0.31	0.44	0.44	1.31	2.26	13.43
IT	0.46	0.51	0.49	1.24	1.64	13.27
Materials	0.47	0.47	0.45	1.05	1.36	7.88
RE	0.57	0.54	0.51	1.42	2.73	7.24
Utilities	0.90	0.61	0.58	1.91	3.98	18.68

TABLE 3 Concentration index and turnover ratio for the minimum CVaR portfolios of ESG assets

	Concentration index	Turnover ratio
Consumer	0.38	1.49
Communication	0.39	1.90
Energy	0.34	0.93
Financial	0.44	0.54
Health	0.50	0.82
Industrial	0.58	0.74
IT	0.29	1.08
Materials	0.26	1.60
RE	0.48	0.88
Utilities	0.59	0.45

TABLE 4 Correlation values between each score and the total return (upper part) or the total extra-return (lower part) measured against the MSCI Europe index of each portfolio

	ESG score and TR	E score and TR	S score and TR	G score and TR
Consumer	−0.57	−0.52	−0.62	−0.81
Communication	0.70	0.13	−0.75	0.87
Energy	0.03	−0.02	−0.18	0.17
Financial	−0.97	−0.97	−0.90	−0.90
Health	0.44	0.58	0.61	0.18
Industrial	0.91	−0.95	0.89	−0.97
IT	0.37	−0.34	0.50	0.54
Materials	0.74	0.92	0.89	0.14
RE	−0.10	0.75	−0.76	−0.71
Utilities	−0.96	−0.96	−0.94	0.87

TABLE 4 (Continued)

	ESG score and TExR	E score and TExR	S score and TExR	G score and TExR
Consumer	−0.14	0.02	−0.10	−0.47
Communication	0.80	0.25	−0.69	0.92
Energy	0.08	−0.02	−0.37	0.27
Financial	−0.90	−0.89	−0.77	−0.78
Health	0.26	0.42	0.43	0.03
Industrial	0.90	−0.94	0.86	−0.96
IT	0.20	−0.44	0.36	0.38
Materials	0.66	0.92	0.84	−0.05
RE	0.13	0.88	−0.63	−0.61
Utilities	−0.95	−0.95	−0.93	0.86

However, a further problem remains, since now we cannot be sure that in assigning an ESG score, providers are really able to distinguish operations, attitudes and behaviours of true attention to ESG aspects from the widespread practice of 'green washing', that is, the well-known phenomenon of disseminating information that is false or incomplete about environmental, social and governance factors (Haller et al., 2018; Marquis et al., 2016). To avoid the proliferation of disinformation and increase the reliability of information, a mediation role is played by external auditors (and therefore only by organisations like Bloomberg, Refinitiv, MSCI, etc.) that provide an independent evaluation of sustainability reports (Boiral et al., 2019; Manetti & Toccafondi, 2012; ODwyer & Owen, 2005).

Having stated the above, only when ESG scores provided by different providers converge on similar firms' rankings, will it be possible to confirm the results achieved in this study with greater certainty, rather than suggest different conclusions.

6 | CONCLUSIONS

In the last decade, the desire of investors to channel their savings towards financial instruments issued by companies that are particularly sensitive to sustainability and socio-environmental issues has clearly emerged and increased. This circumstance is also confirmed, on the one hand, by the constant supply growth of investment funds that are ESG-company-oriented and, on the other, by the increasing scientific community research interest in these topics.

The aim of the paper was to understand if an ESG score can really be considered an additional criterion in selecting asset portfolios. Indeed, it could be useful for institutional investor management teams to know if running the traditional bi-criteria portfolio selection models starting from assets with the highest ESG scores is really advisable.

To this aim, the paper analysed the link's intensity, as well as its direction, between the risk–return performance and the average ESG score of different sectoral funds entirely composed of ESG assets.

Our analysis showed (i) that the average return of all the portfolios made up of the considered ESG assets is positive and (ii) that the portfolio performance index is very high in relation to almost all the GICS sectors—also compared to their respective market benchmarks—but, (iii) that, as regards the link between risk–return performance and average ESG score, it is not possible to assess a unique intensity and direction of the relationship for all the GICS sectors. In general, in line with previous literature (de Souza Cunha et al., 2020), our results suggest that sustainable investment performance is still heterogeneous worldwide.

Furthermore, we empirically verified that the securities that assumed the highest weights over time in the different CVaR portfolios were not systematically characterised by a high ESG score.

Therefore, our results would not seem to indicate a particular advantage for asset managers to focus, specifically, on an ex ante choice of high ESG score securities.

In the light of this empirical evidence, it seems reasonable to conclude that, for the moment, an ESG score cannot yet be considered an additional and uniformly valid ex ante criterion in selecting assets.

In any case, we think that it is not yet possible to definitively assess this evidence because such a result could depend on the fact that ESG rating evaluation methodologies, generally, are still immature and, consequently, the ESG score values used failed to completely grasp the essence of the topic. This circumstance offers an opportunity to develop further research. In addition, a sensitivity analysis should be able to assess if the portfolios average ESG score changes when the CVaR threshold a varies.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ORCID

Francesca Pampurini https://orcid.org/0000-0001-6624-2772

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