ESG Investing: Systematic investment strategy based in ESG Scores

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Attachments

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   Includes ESG Score Historical Data

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Executive Summary

To what extent are ESG Scores and sustainability strategies correlated to the performance in the stock market? This paper introduces an investment strategy, which aims to beat the MSCI Word Index and to obtain statistically significant alphas using ESG ratings as a screening factor.

The paper consists of creating an annually systematically balanced strategy, comparing the performance of the different portfolios created to the benchmark, and then accepting or rejecting the portfolios based on their risk-adjusted performance. The portfolios are created by analysing Environmental, Social and Governance Scores of the MSCI World Index members and selecting the 100, 80, 60, 40 and 20 top ranked equities. 20 different portfolios are created and analysed, each of them unique in size and ESG element. The investment strategy is mainly focused on ESG Scores as a measure of corporations' management of sustainability strategies. By identifying the top scores for each element and ranking the equities, the companies that show higher ESG implication are included in the strategy.

Once created the different portfolios, the portfolio analysis helps to explain to what extend ESG Scores have been correlated to the performance. In addition, information for geographical and sectorial distributions is sourced to better understand and categorise the strategies. By comparing the returns with the benchmark, it is possible to determine if ESG has in fact an influence in performance and, in the case it does, to observe which element (Environment, Social or Governance) has higher influence on it.

Finally, a risk-adjusted performance analysis of the 20 strategies is performed through excess-return models. By analysing the weekly returns and performing a Fama-French regression, the paper finds that the systematic investment strategy based on ESG factors outperforms the MSCI World Index in the last 15-year period.

1. Introduction

This paper consists of a long-term passively managed systematic strategy that follows an ESG Score ranking for the composition of the different portfolios.

This investment strategy is born from the hypothesis that companies which implement sustainability strategies into their operations and organisations obtain higher stock returns by increasing their value perception and tend to perform better than the companies who don't.

The dissertation's main objective is to test the hypothesis by applying the investment strategy using historical data. An analysis of ESG scoring and stock prices can provide empirical evidence, if any, of a correlation between ESG Scores and Stock Prices. The formation of different portfolios using ESG, Environmental, Social and Governance Scores intends to prove to a higher degree if the different elements of the ESG term can explain the performance of each portfolio.

This investment strategy will consist of the following steps:

• Define the objectives

• Build a database

• Design the strategy

• Study the data collected

• Apply the strategy

• Analyse the results

• Conclusion

The objectives are defined according to the expected maturity and type of management being applied to the investment. The strategy objectives are set to the long-term maturity (5 to 10 years). The management in the other hand is passive, meaning there is little frequency of changes. By applying the systematic character, the portfolios rebalance once every year with the annual release of ESG Scores.

The objective therefore is to beat the benchmark with the highest possible difference in performance without showing excessive volatility. The investment strategy sources ESG Scores and by ranking all the components, the portfolios are constructed. By crossing the returns and scores, the hypothesis is tested. Portfolios that outperform the benchmark will be selected and implemented into the strategy.

2. Object of Study

We are currently living in a society where the economy, the markets and institutions have both a positive and negative impact on the environment and society. The aim of this project is to develop an investment strategy which focuses on obtaining high returns and at the same time looking for the wellbeing of our society and the natural and economic environment, through the investment in listed companies which emphasize the ESG (Environmental, Social and Governance) values and offer profitable opportunities in the long-term.

ESG investing can be referred as sustainable investing. This kind of investment seeks positive returns and the long-term impact on society, environment and business performance. It is used by investors to evaluate corporations and determine the future financial performance of companies. ESG investing criteria can be both applied on investing decisions and risk management processes.

Stripping down the ESG terms we can understand the meaning of this kind of investment strategy. First, environmental impact relates to the risks created by business activities. ESG factors include managing resources and preventing pollution, reducing emissions and climate impact. Profitability can be achieved by reducing costs or using clean energy and other efficiencies, increasing productivity, moral and reducing reputation and litigation risks. moral and reducing reputation and litigation risks.

Social risks refer to the impact business have on our society. Businesses address this matter with the promotion of safety and health, encouraging labour-management relations, protecting human right and focusing on product integrity. Improving the social factors lead to higher productivity and morale within the business, which can be translated into higher returns. Business which encourages ESG social culture have experienced to be more profitable than those who do not, as human capital is one of the most important assets within an organisation.

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Governance risks concern the way companies are run. This type of risk includes corporate risk management or excessive executive compensation, through governance activities such as increasing diversity and accountability of the board, companies reduce the financial risk and improve the management of the company through transparency and good business practice.

As young investors we are not only interested in the financial outcomes of investment. We are also interested in the impact and the promotion of global issues. We have experienced the difference between the opposite approaches and reached the conclusion that ESG businesses are more appealing to new generations, such as millennials, which nowadays represents an opportunity with a long-term vision, the opportunity to reach loyal customers. This new generations are more likely to trust ESG companies which have a social impact and a good reputation.

The social and economic environment has changed dramatically since the introduction of social media and other technological innovations (cloud technology). New channels of communication and promotion, markets organisation and reachability to new customers, which make possible the combination of profitability and responsible investments. We have seen companies embracing these innovations and experiencing significant growth rates and expansions to new markets.

3. Literature Review

"Environmental, Social and Governance (ESG) Investing has grown rapidly over the past decade, and the amount of professionally managed portfolios that have integrated key elements of ESG assessments exceeds USD 17.5 trillion globally, by some measures. Also, the growth of ESG-related traded investment products available to institutional and retail investors exceeds USD 1 trillion and continues to grow quickly across major financial markets." (Boffo, R., and R. Patalano, 2020).

What this indicates is that investors are willing to consider ESG as a factor of performance when deciding where to invest. In other words, the more people is attracted to this issue, the more capital will flow towards ESG investments and therefore increasing its value which translates into returns. By investing in ESG and other sustainability implementations at corporate level, the good performance should be linked to its capabilities and KPIs to implement such strategies and contribute environmentally, socially and governance. The hypothesis we introduce consists of testing the degree of, ESG Scores as the only selection parameter, correlation to the performance in the stock market.

"The growing investor interest in ESG factors reflects the view that environmental, social and corporate governance issues – including risks and opportunities -- can affect the long-term performance of issuers and should therefore be given appropriate consideration in investment decisions." (Boffo, R., and R. Patalano, 2020). This other citation mentions the risk it concludes. Meaning that sustainability investments are considered as a new way of investing, with higher costs but potential rewards. This type of investment strategy involves several risks:

- Market risk: The return is originating from listed equities
- ESG risk: Implementation of sustainability strategies

ESG investing is based in three main parts which are described in the paper, Foundations of ESG Investing as, firstly, "ESG integration, in which the key objective is to improve the risk–return characteristics of a portfolio. Second, values-based investing, in which the investor seeks to align his portfolio with his norms and beliefs. Third, impact investing, in which investors want to use their capital to trigger change for social or environmental purposes, for example, to accelerate the decarbonisation of the economy. (Guido Giese, Linda-Eiling Lee, 2011) This is a clear example that ESG investing impacts the performance but also the impact on the economy and the market as a whole. The reason to invest with this kind of strategies is to fund the correct development of the economy and the society. We strongly believe there is a correlation with ESG investments and better performance, as there is a common objective to do good.

"Research has been so plentiful that several meta studies have summarised: Carpenter and Wyman (2009) and Fulton, Kahn, and Sharples (2012). Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk, and Performance July 2019 the results of over 1,000 research reports and found that the correlation between ESG characteristics and financial performance was inconclusive: The existing literature found positive, negative, and non-existent correlations between ESG and financial performance, although most researchers found a positive correlation." (Guido Giese, Linda-Eiling Lee, 2011)

The methodology used previously to test the correlation between performance and ESG strategies follows a different approach to the one being presented in this paper. Other strategies try to explain with more detail the relationship with dividends and cash flows. "Studies by El Ghoul et al. (2011) and Gregory, Tharyan, and Whittaker (2014) show that a discounted cash-flow (DCF) model framework (which describes a company's value as the sum of future cash flows, discounted at the cost of capital) can be used to break down the influence of a corporation's ESG profile on equity valuations, including cash flows, risk, and cost of capital." (Guido Giese, Linda-Eiling Lee, 2011)

The findings from these valuations are very factor specific, the methodology used by us tests the relationship directly between ESG Scores and performance. The results are very similar as some portfolios show a positive, negative and zero correlation between both performance and ESG Scores. There are many factors influencing the relationship which can be analysed, some of which the geographical and industry distribution.

"Fabio Alessandrini and Eric Jondeau show that environmental, social, and governance (ESG) screening can substantially improve ESG scores for both otherwise passive and smart beta portfolios without reducing risk-adjusted returns. Starting from initially passive multi-country portfolios, ESG screening may lead to substantial regional tilts, such as overweighting Europe and underweighting the US and emerging countries or sectoral bets, for instance in favor of information technology and against financial and energy stocks. Although the broad conclusion of improved ESG profile without affecting risk-adjusted performance also holds for smart beta portfolios, aggressive exclusion of ESG low-scoring firms may lead to some reduction in exposure to targeted factors." (Fabio Alessandrini and Eric Jondeau, 2020)

In the other hand, a study conducted by Federica Ielasi, Paolo Ceccherini, and Pietro Zito in 2020, show "the results of the study empirically verify that the ESG profile of an equity portfolio built applying a smart beta strategy can be improved without reducing its risk-return performances, in particular when "Minimum volatility" or "Growth/Value" strategies are selected for smart beta allocation. The empirical test is applied both to European and US financial markets and achieves the main results independently of the geographical area involved. The findings confirm, for smart beta portfolios, the results of past research on sustainable and responsible finance: The application of SRI strategies to smart beta portfolios can maximize returns for investors at the same or lower risk level." (Federica Ielasi, Paolo Ceccherini, and Pietro Zito, 2020)

4. The Benchmark: MSCI World Index

"The MSCI World Index captures large and mid-cap representation across 23 Developed Markets (DM) countries. With 1,563 constituents, the index covers approximately 85% of the free float-adjusted market capitalisation in each country." (MSCI WORLD INDEX, Report).

In the development of the investment strategy, it is fundamental to select an index that covers the maximum percentage of the geographical locations and sectorial industries that the investment strategy is exposed to. The MSCI World Index is composed of two main subgroups. Emerging markets and developed markets.

The investment strategy is focused on ESG factors, there is no direct differentiation in the countries of origin of equities, as the hypothesis tests only ESG factors as a selecting parameter. However, this data allows us to profile each portfolio by its geographical and industry distribution. Identify those markets which are more profitable and the ESG distribution of top performers.

MSCI_MA. Market Allocation
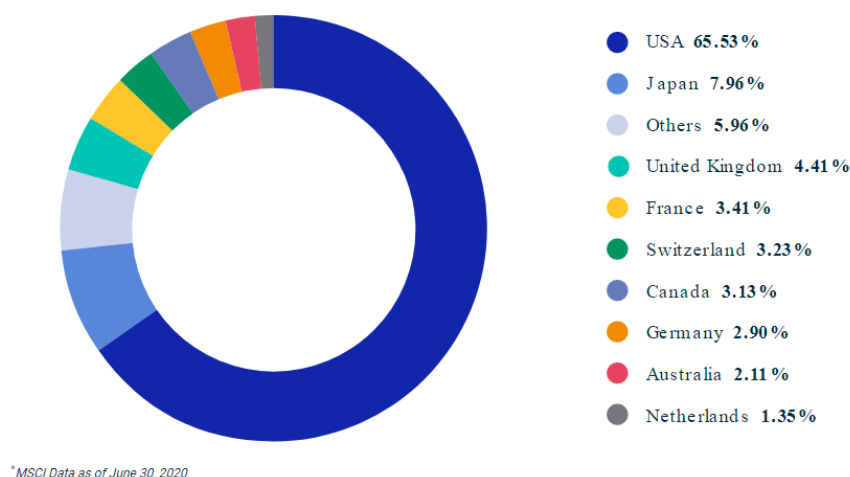
USA **65.53%**
Japan **7.96%**
Others **5.96%**
United Kingdom **4.41%**
France **3.41%**
Switzerland **3.23%**
Canada **3.13%**
Germany **2.90%**
Australia **2.11%**
Netherlands **1.35%**

*MSCI Data as of June 30, 2020

Source: MSCI Report 2021

As seen in the graph above, the exposure of MSCI World Index is 65% for USA, where the biggest and most relevant equities are located to analyse the development. Emerging markets represent 6% of the country allocation. ESG is being applied globally, so the relevance of the country allocation is reduced significantly. In terms of risk, being 95% of exposure to developed markets, the risk assessment is favourable.

MSCI_CL. MSCI WORLD INDEX Country List

MSCI ACWI INDEX					
MSCI WORLD INDEX			MSCI EMERGING MARKETS INDEX		
DEVELOPED MARKETS			EMERGING MARKETS		
Americas	Europe & Middle East	Pacific	Americas	Europe, Middle East & Africa	Asia
Canada United States	Austria Belgium Denmark Finland France Germany Ireland Israel Italy Netherlands Norway Portugal Spain Sweden Switzerland United Kingdom	Australia Hong Kong Japan New Zealand Singapore	Argentina Brazil Chile Colombia Mexico Peru	Czech Republic Egypt Greece Hungary Kuwait Poland Qatar Russia Saudi Arabia South Africa Turkey United Arab Emirates	China India Indonesia Korea Malaysia Pakistan Philippines Taiwan Thailand

Source: MSCI Report 2021

MSCI_CP. Cumulative performance

Source: MSCI Report 2021

The graph in the previous page shows the historical performance for the different indexes and the index composed of emerging and developed, MSCI World.

The performance is noticeable better for the MSCI World compared to Emerging markets, this is due to the significant economic growth and development experienced in developed markets since the 2008 crisis. Having said this, the portfolios being exposed mainly to developed markets, the performance can be expected to be higher rather than if using only emerging or developed indexes on their own. This could show higher volatility o to much exposure to only one kind of market.

The MSCI sets a benchmark to which we can compare, the exposure to all kind of markets and industries gives the opportunity to be creative when designing investment strategies. It consists of replicating an index by introducing new factors to assess the correlation with performance.

5. Defining the strategy

Following the research, literature on ESG investing and principle basic concepts of finance, the strategy is defined as a long-term systematic investment process using ESG factors as the only equity portfolio weight driver with the objective to outperform the defined MSCI World Index benchmark. Secondary strategy objectives include identifying maximum performance portfolios for short-term investment.

The principles of finance include the testing and analysis of comparing two different portfolios to achieve alpha. "Alpha is a term used in investing to describe an investment strategy's ability to beat the market, or its "edge". Alpha is thus also often referred to as excess return or abnormal rate of return, which refers to the idea that markets are efficient, and so there is no way to systematically earn returns that exceed the broad markets. Alpha is often used in conjunction with beta, high measures the broad market's overall volatility or risk, known as systematic market risk." (James Chen, 2021)

The benchmark MSCI World Index will be used to compare all the portfolios derived from the strategy. Using the same one gives the analysis of the performance a base and target to outperform at all levels and categories of portfolios.

The results from the portfolio performance will also be relevant to explain the different correlations with the basic information obtained previously. Being able to group the best performing portfolios by geographic location and industry group. The investment strategy can identify which portfolio is best suited for each country and industry. Contrasting the data obtained with public macroeconomic data, the performance of the portfolios can be explained with event driven situations and economic performance.

The strategy will now be defined and ready to be implemented. By selecting the desired portfolios and term of investment the strategy will be translated into customised ETF-like strategy with annual systematic weighting modifications from ESG scoring.

6. Data Base and Portfolio Construction

As mentioned previously the first step of the process is to collect the data for the equity components that will compose the portfolios for the investment strategy. The data to be obtained are returns and ESG score (decomposed into Environmental, Social and Governance Scores), a total of 5 different categories of data. By building a data base called "FINAL DATABASE" (attached).

This data base includes all the equities obtained from the MSCI World Index. For 1587 a key information is sourced to categorise the equities by geographic location, industry and market the stock is quoted in. This data will be relevant to analyse the correlation between the information described and the returns and performance evolution with ESG factors.

Once the data is categorised and organised the following step for the construction of the data base takes place. By sourcing all the daily quotations in the stock market for a time period of 20 years (1/1/2001 – 20/03/2021), the data base is built and designed to output the returns for each stock with a daily frequency. This section of the data is relevant to analyse the performance of each equity, by location and industry. The analysis allows to detect tendency or seasonal components. Outlier exists given major events and random factors that influence the stock price movements.

The second section of the database are the ESG factors. Sourcing from Bloomberg the ESG scores and decomposition of the score into 3 subgroups for Environmental, Social and Governance. These scores give a rating from 0 to 100 to each company compared to other companies in its industry based on the following criteria:

- Environmental – GHG, energy consumption, water consumptions and waste generation as a ratio versus revenues and % of recycled water.
- Social – Women inclusion, employee turnover, % of employees unionised and lost time incident rate.

- Governance – Independence of directors, percentage of woman board members, directors' years of expertise, meeting attendance and board size.
- ESG – a combination of the previous 3 ratings

With the output provided by Bloomberg 4 categories of data are attributed to each equity for every year. The ESG score has an annual frequency, released in June for each listed equity, analysed and published by Bloomberg analysts. This section of the data base, called FINAL DATABASE (attached) serves 2 main functions. Being the first one the organisation of preference selection of each equity for the final portfolios. By applying a rating distribution to all the components, a best score to worst score range is created. Portfolios will be constructed using the top 100, 80, 60, 40, 20 and 10 equities for each year for each category, the result is the creation of 20 annually modified portfolios:

- Based on ESG rating - ESG100, ESG80, ESG60, ESG40, ESG20
- Based on Environmental rating: E100, E80, E60, E40, E20
- Based on Social rating: S100, S80, S60, S40, S20
- Based on Governance rating: G100, G80, G60, G40, G20

It is important to understand and test the correlation between ESG factors and performance. ESG Score will change from year to year or remain neutral, by comparing the evolution of the score with the evolution of the performance simultaneously the strategy's future performance can be explained by the score's performance.

The main purpose of using ESG factors is to anticipate the annual performance of the stock and weighting the equities that compose the portfolio by the range score in order for the equities performance to have the maximum contribution to the portfolio's overall performance.

The portfolios have a long-term strategy objective. Once they have been defined by the rating distribution, the evolution of the ESG Score for an individual equity will have a direct impact in the portfolio weight and ranking. Being the position in the portfolio scale, and therefore receiving more investment nominal, will be directly correlated with the performance of the ESG score, released annually, therefore with an annual frequency of change. This translates into a systematic (annual) investment strategy.

There is a constraint with the quantity of data available. ESG Scores are only available from 2006, as the implementation of this Score is recent up to 15 years. So the data that will be used to test the hypothesis will be only between 2006 and 2021. As mentioned before ESG has gained relevance through the last years, with increasing awareness at corporate level and gaining interest from investors. The use of 15 years of data represents a sufficient amount to conduct this test.

7. Portfolio Country and Industry Distribution

This graph represents the country distribution of all portfolios. Find in attachments the Excel Sheet FINAL DATA BASE, Final Portfolio Info.

Port.CD. Country distribution off all portfolios considered in the investment strategy

Country	ESG100	E100	S100	G100	ESG80	E80	S80	G80	ESG60	E60	S60	G60	ESG40	E40	S40	G40	ESG20	E20	S20	G20	AVG
UNITED STATES	12,0%	7,0%	7,0%	22,0%	11,3%	7,5%	8,8%	18,8%	10,0%	8,3%	6,7%	16,7%	10,0%	10,0%	5,0%	22,5%	5,0%	10,0%	5,0%	5,0%	10,4%
HONG KONG	1,0%	1,0%	3,0%	2,0%	1,3%	1,3%	3,8%	2,5%	0,0%	1,7%	1,7%	3,3%	0,0%	0,0%	0,0%	5,0%	0,0%	0,0%	0,0%	0,0%	1,4%
MACAU	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
JAPAN	13,0%	29,0%	5,0%	2,0%	11,3%	30,0%	6,3%	2,5%	10,0%	33,3%	8,3%	3,3%	5,0%	45,0%	7,5%	5,0%	5,0%	55,0%	5,0%	7,5%	14,5%
GERMANY	14,0%	11,0%	10,0%	11,0%	11,3%	11,3%	7,5%	12,5%	10,0%	8,3%	8,3%	16,7%	2,5%	2,5%	10,0%	12,5%	5,0%	0,0%	15,0%	10,0%	9,5%
AUSTRALIA	8,0%	4,0%	10,0%	8,0%	8,8%	2,5%	11,3%	8,8%	6,7%	1,7%	13,3%	11,7%	7,5%	2,5%	7,5%	7,5%	5,0%	0,0%	15,0%	7,5%	7,4%
NEW ZEALAND	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
BRITAIN	7,0%	7,0%	5,0%	9,0%	7,5%	6,3%	6,3%	10,0%	8,3%	6,7%	5,0%	10,0%	12,5%	7,5%	5,0%	10,0%	15,0%	10,0%	0,0%	5,0%	7,7%
SWITZERLAND	3,0%	4,0%	3,0%	8,0%	3,8%	3,8%	3,8%	8,8%	5,0%	3,3%	3,3%	6,7%	5,0%	2,5%	2,5%	7,5%	10,0%	5,0%	0,0%	2,5%	4,6%
NETHERLANDS	1,0%	2,0%	4,0%	3,0%	1,3%	2,5%	1,3%	3,8%	1,7%	3,3%	1,7%	5,0%	2,5%	2,5%	2,5%	2,5%	0,0%	5,0%	0,0%	2,5%	2,4%
CANADA	3,0%	2,0%	7,0%	6,0%	3,8%	2,5%	6,3%	7,5%	5,0%	1,7%	6,7%	5,0%	5,0%	0,0%	7,5%	5,0%	5,0%	0,0%	10,0%	7,5%	4,8%
FRANCE	11,0%	9,0%	15,0%	13,0%	10,0%	8,8%	16,3%	10,0%	10,0%	10,0%	11,7%	3,3%	10,0%	12,5%	12,5%	5,0%	0,0%	0,0%	5,0%	12,5%	9,3%
BERMUDA	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
IRELAND	1,0%	1,0%	1,0%	0,0%	1,3%	1,3%	1,3%	0,0%	1,7%	1,7%	1,7%	0,0%	2,5%	2,5%	0,0%	0,0%	5,0%	0,0%	0,0%	0,0%	1,1%
SPAIN	7,0%	6,0%	8,0%	5,0%	8,8%	6,3%	8,8%	3,8%	10,0%	6,7%	8,3%	5,0%	12,5%	2,5%	10,0%	5,0%	10,0%	0,0%	15,0%	10,0%	7,4%
NORWAY	1,0%	1,0%	1,0%	2,0%	1,3%	0,0%	1,3%	2,5%	1,7%	0,0%	1,7%	3,3%	2,5%	0,0%	2,5%	2,5%	0,0%	0,0%	0,0%	2,5%	1,3%
BELGIUM	1,0%	1,0%	2,0%	1,0%	1,3%	0,0%	1,3%	1,3%	1,7%	0,0%	1,7%	1,7%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,7%
SWEDEN	3,0%	4,0%	3,0%	1,0%	2,5%	3,8%	2,5%	0,0%	3,3%	0,0%	3,3%	0,0%	0,0%	0,0%	2,5%	0,0%	0,0%	0,0%	0,0%	2,5%	1,6%
DENMARK	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
ITALY	6,0%	6,0%	8,0%	2,0%	5,0%	6,3%	6,3%	2,5%	6,7%	5,0%	8,3%	3,3%	10,0%	5,0%	12,5%	5,0%	20,0%	5,0%	25,0%	12,5%	8,0%
CHILE	0,0%	0,0%	1,0%	1,0%	0,0%	0,0%	0,0%	1,3%	0,0%	0,0%	0,0%	1,7%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,2%
SINGAPORE	0,0%	0,0%	0,0%	2,0%	0,0%	0,0%	0,0%	2,5%	0,0%	0,0%	0,0%	1,7%	0,0%	0,0%	0,0%	2,5%	0,0%	0,0%	0,0%	0,0%	0,4%
LUXEMBOURG	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
ISRAEL	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
AUSTRIA	2,0%	2,0%	2,0%	0,0%	2,5%	2,5%	2,5%	0,0%	3,3%	3,3%	3,3%	0,0%	5,0%	2,5%	5,0%	0,0%	5,0%	5,0%	0,0%	5,0%	2,6%
PORTUGAL	1,0%	1,0%	1,0%	0,0%	1,3%	1,3%	1,3%	0,0%	1,7%	1,7%	1,7%	0,0%	2,5%	0,0%	2,5%	0,0%	5,0%	0,0%	5,0%	2,5%	1,5%
FINLAND	5,0%	2,0%	4,0%	2,0%	6,3%	2,5%	3,8%	1,3%	3,3%	3,3%	3,3%	1,7%	5,0%	2,5%	5,0%	2,5%	5,0%	5,0%	0,0%	5,0%	3,4%
MEXICO	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
ISLE OF MAN	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
JORDAN	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
ARGENTINA	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
JERSEY	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
SAUDI ARABIA	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
GREECE	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
INDONESIA	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%

Source: Own elaboration, information sourced from Bloomberg

The locations which show higher exposure are Japan, US, United Kingdom and some European countries such as France and Spain. The industry exposure is mainly focused on financials, utilities, consumer, industrial and energy.

The following tables shows the portfolio allocation for geographical location and industry. As mentioned in other sections of the report, the portfolios are identified and constructed following the next steps:

- First identify the ESG Score to be considered
  - ESG = All composition of scores / E = Environmental / S = Social / G = Governance
- Identify the top performance by score and compose the portfolio (100, 80, 60, 40 and 20 portfolio sizes)

Environmental portfolios dominated by Japanese equities. Social portfolios include a high presence of French equities. Governance dominated by German and US equities.

Differentiating between the ESG portfolios, which are those which include a more complex scoring; Japan, Britain and Germany are the countries with the highest presence. Due to LSE where top performing equities are listed. Japanese and German equities include elaborated and implementation of sustainability processes in operations, where the good scoring is attributed.

Port.ID_1. Industry distribution off all portfolios considered in the investment strategy

Industry	ESG100 Port	E100	S100	G100	ESG80	E80	S80	G80	AVG
Energy	9,0%	7,0%	9,0%	6,0%	11,3%	8,8%	11,3%	2,5%	9,8%
Diversified	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Financial	11,0%	8,0%	30,0%	36,0%	10,0%	3,8%	28,8%	40,0%	19,2%
Industrial	19,0%	24,0%	12,0%	8,0%	18,8%	23,8%	11,3%	7,5%	14,4%
Consumer, Cyclical	17,0%	17,0%	6,0%	11,0%	15,0%	17,5%	6,3%	12,5%	10,5%
Consumer, Non-cyclical	16,0%	18,0%	14,0%	11,0%	15,0%	20,0%	15,0%	7,5%	12,5%
Basic Materials	15,0%	13,0%	11,0%	15,0%	15,0%	10,0%	8,8%	18,8%	14,1%
Utilities	10,0%	9,0%	11,0%	8,0%	11,3%	11,3%	12,5%	6,3%	11,0%
Communications	1,0%	0,0%	5,0%	4,0%	1,3%	0,0%	5,0%	3,8%	1,9%
Technology	2,0%	4,0%	2,0%	1,0%	2,5%	5,0%	1,3%	1,3%	2,1%
Funds	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%

Port.ID_2. Industry distribution off all portfolios considered in the investment strategy

Industry	ESG60	E60	S60	G60	ESG40	E40	S40	G40	ESG20	E20	S20	G20	AVG
Energy	11,7%	8,3%	15,0%	1,7%	17,5%	10,0%	20,0%	2,5%	20,0%	10,0%	25,0%	0,0%	9,8%
Diversified	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Financial	11,7%	3,3%	31,7%	40,0%	7,5%	0,0%	25,0%	50,0%	5,0%	0,0%	25,0%	45,0%	19,2%
Industrial	21,7%	26,7%	6,7%	5,0%	17,5%	27,5%	2,5%	5,0%	20,0%	35,0%	5,0%	0,0%	14,4%
Consumer, Cyclical	11,7%	18,3%	5,0%	8,3%	10,0%	17,5%	2,5%	7,5%	5,0%	10,0%	5,0%	10,0%	10,5%
Consumer, Non-cyclical	13,3%	16,7%	15,0%	8,3%	12,5%	22,5%	15,0%	5,0%	5,0%	15,0%	5,0%	10,0%	12,5%
Basic Materials	16,7%	8,3%	10,0%	23,3%	17,5%	12,5%	12,5%	17,5%	20,0%	20,0%	5,0%	25,0%	14,1%
Utilities	11,7%	13,3%	15,0%	8,3%	15,0%	5,0%	20,0%	10,0%	25,0%	0,0%	25,0%	5,0%	11,0%
Communications	0,0%	0,0%	1,7%	3,3%	0,0%	0,0%	2,5%	2,5%	0,0%	0,0%	5,0%	5,0%	1,9%
Technology	1,7%	5,0%	0,0%	1,7%	2,5%	5,0%	0,0%	0,0%	0,0%	10,0%	0,0%	0,0%	2,1%
Funds	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%

Source: Own elaboration, information sourced from Bloomberg

Industry distribution is very different to the geographical. There is more portfolio distribution between industries with more balance between the dominant (financials, energy, industrial, consumer and utilities).

Financial equities have always been able to add value through growth strategies and have more facility to promote sustainability objectives through their investment portfolios. The world is experiencing a sustainability revolution where more companies are acting, and financial institutions have noted this trend and have been able to take advantage, translated in their results for the period analysed. Financial industry dominates the governance portfolios.

The industries which have shown a greater evolution are energy and utilities. The energy sector has a more direct relation with ESG and sustainability environment than other industries. It is no surprise the scoring has positioned energy equities with greater weight for recent years. As more awareness is given into this matter. In the other hand, the utilities industry (public services) has also taken a drastic shift in the implementation of sustainability strategies and objectives given the nature of their business.

8. Portfolio Return Comparison

Once created all the portfolios, the next step is to check the performance against the benchmark and between portfolio groups.

PTSvsB_TOTAL: All Portfolios Performance vs Benchmark
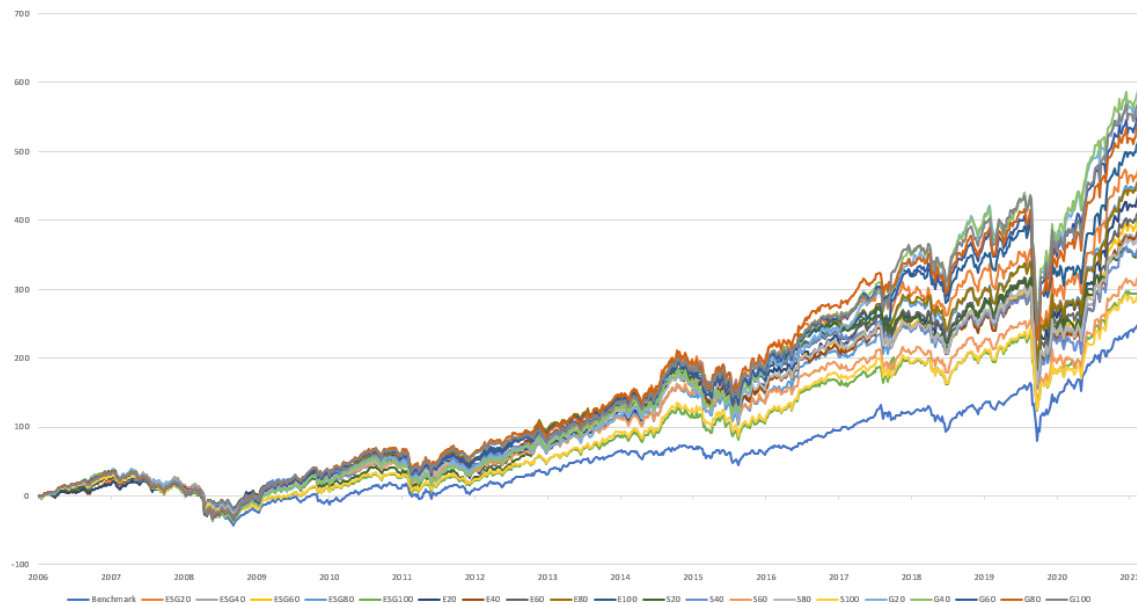
Source: Own elaboration

Analysing the accumulated performance of the different portfolios during the last 15 years (see Appendix), the main observations are:

- In the accumulated period, all portfolios outperform the benchmark in absolute terms.
- Volatility of returns shown by these portfolios is also higher, so further analysis is needed to determine if the risk-adjusted performance is better than MXWO.
- The portfolios that have performed the best are the ones designed by the Governance factor, showing all of them the highest outperformance over the index.

To analyse the performance in a risk-adjusted way, it is not sufficient to observe the historical performance chart, so new measures must be computed. The Sharpe Ratio is designed to measure the expected return per unit of risk for a zero-investment strategy. The difference between the returns on two investment assets represents the results of such a strategy (Sharpe, 1994).

$$S_h = (r_p - r_f) / \sigma$$

Being r_p the return of the investment, r_f the risk-free rate and σ the standard deviation of the returns.

In the present case, r_p is defined by the CAGR of total return of each portfolio, r_f is the average LIBOR rate during the analysed period (Macrotrends, 2021) and σ is the standard deviation of weekly returns. The results obtained are presented in the following table:

PTSvsBnchmrk_Returns: Table comparing the portfolios and the benchmark in different return indicators

	MXWO	ESG20	ESG40	ESG60	ESG80	ESG100
CAGR	8,45%	12,19%	10,98%	11,19%	11,99%	9,63%
rf	1,41%	1,41%	1,41%	1,41%	1,41%	1,41%
Volatility	18,24%	19,91%	19,33%	19,12%	19,63%	18,04%
Sharpe Ratio	0,3856	0,5414	0,4949	0,5114	0,5389	0,4553
	MXWO	E20	E40	E60	E80	E100
CAGR	8,45%	11,61%	10,95%	11,32%	11,94%	12,66%
rf	1,41%	1,41%	1,41%	1,41%	1,41%	1,41%
Volatility	18,24%	19,31%	18,70%	17,96%	17,72%	17,47%
Sharpe ratio	0,3856	0,5283	0,5098	0,5516	0,5939	0,6438
	MXWO	S20	S40	S60	S80	S100
CAGR	8,45%	10,61%	10,67%	9,90%	10,88%	9,48%
rf	1,41%	1,41%	1,41%	1,41%	1,41%	1,41%
Volatility	18,24%	19,26%	18,70%	19,34%	18,47%	17,81%
Sharpe ratio	0,3856	0,4777	0,4949	0,4391	0,5127	0,4531
	MXWO	G20	G40	G60	G80	G100
CAGR	8,45%	13,47%	13,56%	13,11%	12,93%	13,34%
rf	1,41%	1,41%	1,41%	1,41%	1,41%	1,41%
Volatility	18,24%	20,60%	19,60%	19,60%	19,60%	19,36%
Sharpe ratio	0,3856	0,5853	0,6196	0,5968	0,5876	0,6161

Source: Own elaboration

The main observation is that the ESG-filtered portfolios also show a better risk-adjusted performance in the last 15 years, showing a higher Sharpe ratio.

9. Fama-French factor analysis

Finally, the results obtained have been compared to Fama-French 3 factor model to check if he investment strategy has achieved some positive Alpha, or the outperformance can be explained by other factors. To perform this analysis the portfolio weekly returns have been compared to the 3 Fama-French factors data for international developed markets (French, 2020). The three factors are:

- Market Risk Premium - The difference between the market's expected return and the risk-free rate is known as the market risk premium. It compensates an investor for the additional volatility of returns over and beyond the risk-free rate by providing an excess return.

- Small Minus Big – It is a size effect based on a company's market capitalization. SMB is a metric that evaluates the historical advantage of small-cap enterprises over large-cap companies. The basic rationale for this component is that small-cap companies produce higher long-term returns than large-cap companies.

- High Minus Low - It is the difference in returns between companies having a high book-to-market value ratio (value companies) and those with a low book-to-market value ratio (growth companies). The factor demonstrates that value equities outperform growth stocks over time.

The first analysis was based on the CAPM model, performing a simple lineal regression between the excess return of the market portfolio presented by Fama-French and the excess return of the individual portfolios following the CAPM equation:

$$E(ri)= rf + \beta \ [E(rm) – rf]$$

Where *E(ri)* is the expected return of a specific portfolio, *rf* is the return of the risk-less asset, *β* is a measure of the sensitivity of the portfolio compared to the market and *E(rm)* is the expected return of the market portfolio.

The second analysis includes the other two factors, the small-versus-big factor and the book-to-market ratio factor, completing the Fama-French 3-factor model:

$$E(ri) = rf + \beta_1 [E(rm) - rf] + \beta_2 SMB + \beta_3 HML$$

Where SMB is the small-versus-big factor and HML the high-minus-low factor with their respective betas.

The results presented by these regressions confirm the main conclusions of the preliminary analysis: the systematic ESG strategy has overperformed the market in the last years, not only in absolute terms but also in risk-adjusted return, especially in the case of the Governance strategies. In statistical terms (see Annex), the regressions have presented significant alphas (Intercept) in 13 out of the 20 strategies under a 95% confidence interval, these strategies are: ESG20, ESG60, ESG80, E20, E60, E80, E100, G20, G40, G60, G80 and G100. Again, the results prove that the group of stocks with good Governance rating is the one that performs the best and the group of strategies based on Social ratings give worse returns than the rest of strategies.

10. Conclusions and findings of the analysis

The conclusion is structured following the same distribution as the portfolio analysis. In the appendix the graphs PTSvsB_ESG, PTSvsB_E, PTSvsB_S and PTSvsB_G show graphical representations for the cumulative performance of the portfolios compared with the benchmark MSCI World Index. The computation shows all portfolios outperform the benchmark. We conclude and assume there is a positive correlation between the ESG Scores and the portfolio performance. For all the portfolios created the portfolio group with best performance belong to the Governance Element, as seen in PTSvsB_G. Within all the governance portfolios, G40 is the top performer with a CAGR equal to 13,56% vs 8,45% for MSCI WORLD INDEX.

Each portfolio includes its geographical and industrial distributions allocation, to understand which countries and sectors tend to perform better. The information is included in Port.CD, Port.ID_1 and Port.ID_2 tables. We conclude the top performing sector is Financials and United States as location. G40 is the portfolio with the highest weights for both factors. USA Financial equities have experienced great growth rates for the period which translates into G40's performance.

There is an increasing tendency for non-US equities to perform better in ESG. For example, Japan in the Environmental element, France in the social and Italy for governance. The evolution of the construction of portfolios by reducing its components and the effect on geographical and industrial distributions, shows which countries and sectors gained relevance as the portfolios included less equities. We conclude European stocks are gaining importance and successfully implement their ESG strategies.

The Fama-French regressions also confirm the main findings of this paper, showing statistically significant alphas for 60% of the strategies developed. The significant intercepts show that there is return that can not be explained by other pre-existing factors and the risk-adjusted performance is better than the benchmark, proving that

ESG score filtering strategies would have been an outperforming strategy in the last 15 years. However, despite the systematic nature of the ESG rating and the significant alphas presented in the model, the lack of more historical data and the recent importance dedicated ESG within the economy that can be the main driver of the presented outperformance, are limiting factors to describe this strategy as a new statistical factor comparable to the ones presented by Fama and French.

An interesting finding of this study is the outperformance shown by the companies with good Governance rating. These companies have presented the best returns compared to companies with other good ratings and the strategies defined by this factor are the absolute winners in all comparisons, both in absolute and risk-adjusted terms.

By designing this ESG long term strategy and apply is to historical data we have been able to test and prove the correlation between ESG Scores and performance. Equities which implement ESG strategies efficiently tend to perform better. The graph PTSvsB_TOTAL found in the Return Comparison section of the paper shows how the benchmark is outperformed by all portfolios, difference that widens through the last years of the period as the topic has gained relevance. We conclude the strategy is efficient and we expect to continue the outperformance in the future due to the increasing importance that asset management firms and the entire financial industry is giving to ESG.

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13. Bloomberg Professional Data

Appendix

Included in the appendix can be found the portfolio template filled for the analysis, country and industry distribution with comments on performance and evolution and the return statistical report summary:

1. ESG 100 + Portfolio Return Summary
2. Environmental 100 + Portfolio Return Summary
3. Social 100 + Portfolio Return Summary
4. Governance 100 + Portfolio Return Summary
5. ESG 80 + Portfolio Return Summary
6. Environmental 80 + Portfolio Return Summary
7. Social 80 + Portfolio Return Summary
8. Governance 80 + Portfolio Return Summary
9. ESG 60 + Portfolio Return Summary
10. Environmental 60 + Portfolio Return Summary
11. Social 60 + Portfolio Return Summary
12. Governance 60 + Portfolio Return Summary
13. ESG 40 + Portfolio Return Summary
14. Environmental 40 + Portfolio Return Summary
15. Social 40 + Portfolio Return Summary
16. Governance 40 + Portfolio Return Summary
17. ESG 20 + Portfolio Return Summary
18. Environmental 20 + Portfolio Return Summary
19. Social 20 + Portfolio Return Summary
20. Governance 20 + Portfolio Return Summary

Return Comparison Graph for ESG Portfolios

Return Comparison Graph for Environmental Portfolios

Return Comparison Graph for Social Portfolios

Return Comparison Graph for Governance Portfolios

2. ESG 100

- **Name**: ESG 100

- **Constituents**: The constituents for this portfolio include the rebalancing of the top 100 ESG Score performers for each year from 01/01/2010 – 20/04/2021

- **Description**: Currency USD, fixed weights. This is the portfolio with the largest benchmark constituents, so we should expect a narrower difference than other portfolios with a lower number of constituents. Outperformance >85%.

PvsB_ESG100. Performance comparison between ESG 100 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

In the comparison with the benchmark, we can notice the portfolio ESG 100 outperforms the benchmark for most of the period being analysed. The largest period is noticeable the last/middle section of the graph. Indicating a tendency to outperform the benchmark higher within recent years. Taking this into consideration we could conclude that ESG Scoring has a stronger and relevant presence within the last 4 years and therefore the upcoming years this tendency should continue. The portfolio is accepted and included in the strategy.

Sharpe ratio 0,45 vs 0,38 and CAGR 9,63% vs 8,45%.

During 2008 and 2012 the portfolio is able to outperform the index. This is due to major events such as the financial crisis of 2008, the portfolio experiences a downturn but with a lower impact. The reason why the portfolio is experiencing lower returns is due to the composition of the portfolio. Having a lower number of constituents can translate into a higher exposure to negative movements. As mentioned before, ESG has begun taking more relevance in the recent years. So, we can conclude portfolios with top performing ESG Score in the 2000–2010 time range perform better than the MSCI components World Equities Average, as seen in the difference graph (Exhibit PvsB_ESG100).

G&ID_ESG100. Geographical and Industrial distributions for ESG100

ESG100			
Country	Port	Bench	Diff
UNITED STATES	12,0%	37,6%	-25,6%
HONG KONG	1,0%	2,2%	-1,2%
MACAU	0,0%	0,1%	-0,1%
JAPAN	13,0%	18,8%	-5,8%
GERMANY	14,0%	3,8%	10,2%
AUSTRALIA	8,0%	4,0%	4,0%
NEW ZEALAND	0,0%	0,5%	-0,5%
BRITAIN	7,0%	5,1%	1,9%
SWITZERLAND	3,0%	2,7%	0,3%
NETHERLANDS	1,0%	1,7%	-0,7%
CANADA	3,0%	5,5%	-2,5%
FRANCE	11,0%	4,5%	6,5%
BERMUDA	0,0%	0,3%	-0,3%
IRELAND	1,0%	1,0%	0,0%
SPAIN	7,0%	1,3%	5,7%
NORWAY	1,0%	0,8%	0,2%
BELGIUM	1,0%	0,8%	0,2%
SWEDEN	3,0%	2,4%	0,6%
DENMARK	0,0%	1,2%	-1,2%
ITALY	6,0%	1,3%	4,7%
CHILE	0,0%	0,1%	-0,1%
SINGAPORE	0,0%	1,3%	-1,3%
LUXEMBOURG	0,0%	0,4%	-0,4%
ISRAEL	0,0%	0,8%	-0,8%
AUSTRIA	2,0%	0,3%	1,7%
PORTUGAL	1,0%	0,2%	0,8%
FINLAND	5,0%	0,8%	4,2%
MEXICO	0,0%	0,1%	-0,1%
ISLE OF MAN	0,0%	0,1%	-0,1%
JORDAN	0,0%	0,1%	-0,1%
ARGENTINA	0,0%	0,1%	-0,1%
JERSEY	0,0%	0,1%	-0,1%
SAUDI ARABIA	0,0%	0,1%	-0,1%
GREECE	0,0%	0,1%	-0,1%
INDONESIA	0,0%	0,1%	-0,1%

ESG100			
Industry	Port	Bench	Diff
Energy	9,0%	3,5%	5,5%
Diversified	0,0%	0,3%	-0,3%
Financial	11,0%	20,4%	-9,4%
Industrial	19,0%	14,7%	4,3%
Consumer, Cyclical	17,0%	12,5%	4,5%
Consumer, Non-cyclical	16,0%	19,7%	-3,7%
Basic Materials	15,0%	6,7%	8,3%
Utilities	10,0%	5,1%	4,9%
Communications	1,0%	8,3%	-7,3%
Technology	2,0%	8,7%	-6,7%
Funds	0,0%	0,3%	-0,3%

Portfolio Return Summary ESG 100

PTS_ReturnSum_ESG100: Table containing the return summary statistics for ESG 100

CAPM

Regression Statistics	
Multiple R	0.87448925
R Square	0.76473144
Adjusted R Square	0.76443135
Standard Error	1.2178591
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	3779.681548	3779.68155	2548.362	1.465E-248
Residual	784	1162.813746	1.4831808		
Total	785	4942.495294			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.04120468	0.043535942	0.94645203	0.3442097	-0.04425613	0.12666549	-0.0442561	0.12666549
RM-RF	0.87325037	0.017298491	50.4813032	1.46E-248	0.83929353	0.90720721	0.83929353	0.90720721

FF3

Regression Statistics	
Multiple R	0.88141935
R Square	0.77690007
Adjusted R Square	0.77604419
Standard Error	1.18746133
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	3839.824932	1279.94164	907.71857	3.611E-254
Residual	782	1102.670362	1.4100644		
Total	785	4942.495294			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.05455798	0.042555149	1.28205358	0.2002038	-0.02897787	0.13809383	-0.0289779	0.13809383
RM-RF	0.83684559	0.017786196	47.0502851	2.83E-230	0.80193125	0.87175993	0.80193125	0.87175993
SMB	-0.1719418	0.053646212	-3.2051054	0.0014049	-0.2772494	-0.0666341	-0.2772494	-0.0666341
HML	0.21833758	0.040557032	5.38347039	9.667E-08	0.13872404	0.29795113	0.13872404	0.29795113

Source: Own elaboration

2. Environmental 100

- **Name**: E100

- **Constituents**: The constituents for this portfolio include the top 100 Environmental Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting environmental top performing equities.

PvsB_E100. Performance comparison between Environmental 100 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

Portfolios vary in two factors, size and ESG Score. By altering one of the factors, in this case size through the grouping of portfolios and Score by decomposing the ESG Main Score into Environmental, Social and Governance portfolios, we can analyse the effect on performance of variation in the mentioned factors.

E100 shows a stable and noticeable outperformance in the second part of the period (10 years). The trend is forecasted to continue the tendency using the strategy. The cumulative performance reaches 500% at its highest level during the last section of the period. The portfolio tests the hypothesis and outperforms considerably the benchmark. Sharpe ratio 0,64 vs 0,38 and CAGR 12,66% vs 8,45%.

Looking at the country and industry distribution, compared with the benchmark. We can first notice a significant difference in the USA weight. Our portfolio construction criteria show the top environmental portfolios have a Japanese origin, rather than American.

The rest of the geographic distribution is balance, with relevance in the German equity market, Spain, Italy and France. We can conclude there is a more environmental tendency towards Japan and European countries.

The industry distribution, as seen in other portfolios is less volatile, having industrial the highest weight at 24%, compared with 14% for the benchmark. Industrial sector has experienced a significant change in terms of regulation and environmental impact. Expect industrial equities to have a higher degree of environmental strategies implementation than other sectors.

G&ID_E100. Geographical and Industrial distributions for E100

E100 Country		Bench	Diff
UNITED STATES	7,0%	37,6%	-30,6%
HONG KONG	1,0%	2,2%	-1,2%
MACAU	0,0%	0,1%	-0,1%
JAPAN	29,0%	18,8%	10,2%
GERMANY	11,0%	3,8%	7,2%
AUSTRALIA	4,0%	4,0%	0,0%
NEW ZEALAND	0,0%	0,5%	-0,5%
BRITAIN	7,0%	5,1%	1,9%
SWITZERLAND	4,0%	2,7%	1,3%
NETHERLANDS	2,0%	1,7%	0,3%
CANADA	2,0%	5,5%	-3,5%
FRANCE	9,0%	4,5%	4,5%
BERMUDA	0,0%	0,3%	-0,3%
IRELAND	1,0%	1,0%	0,0%
SPAIN	6,0%	1,3%	4,7%
NORWAY	1,0%	0,8%	0,2%
BELGIUM	1,0%	0,8%	0,2%
SWEDEN	4,0%	2,4%	1,6%
DENMARK	0,0%	1,2%	-1,2%
ITALY	6,0%	1,3%	4,7%
CHILE	0,0%	0,1%	-0,1%
SINGAPORE	0,0%	1,3%	-1,3%
LUXEMBOURG	0,0%	0,4%	-0,4%
ISRAEL	0,0%	0,8%	-0,8%
AUSTRIA	2,0%	0,3%	1,7%
PORTUGAL	1,0%	0,2%	0,8%
FINLAND	2,0%	0,8%	1,2%
MEXICO	0,0%	0,1%	-0,1%
ISLE OF MAN	0,0%	0,1%	-0,1%
JORDAN	0,0%	0,1%	-0,1%
ARGENTINA	0,0%	0,1%	-0,1%
JERSEY	0,0%	0,1%	-0,1%
SAUDI ARABIA	0,0%	0,1%	-0,1%
GREECE	0,0%	0,1%	-0,1%
INDONESIA	0,0%	0,1%	-0,1%

E100 Industry	Port	Bench	Diff
Energy	7,0%	3,5%	3,5%
Diversified	0,0%	0,3%	-0,3%
Financial	8,0%	20,4%	-12,4%
Industrial	24,0%	14,7%	9,3%
Consumer, Cyclical	17,0%	12,5%	4,5%
Consumer, Non-cyclical	18,0%	19,7%	-1,7%
Basic Materials	13,0%	6,7%	6,3%
Utilities	9,0%	5,1%	3,9%
Communications	0,0%	8,3%	-8,3%
Technology	4,0%	8,7%	-4,7%
Funds	0,0%	0,3%	-0,3%

Portfolio Return Summary Environmental 100

PTS_ReturnSum_E100: Table containing the return summary statistics for Environmental 100

CAPM

Regression Statistics	
Multiple R	0,86272822
R Square	0,74429999
Adjusted R Square	0,74397384
Standard Error	1,22907276
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	3447,374903	3447,3749	2282,0929	2,234E-234
Residual	784	1184,325961	1,51061985		
Total	785	4631,700864			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,09936221	0,043936807	2,26147999	0,0240027	0,0131145	0,18560992	0,0131145	0,18560992
RM-RF	0,83397961	0,01745777	47,7712565	2,23E-234	0,7997101	0,86824911	0,7997101	0,86824911

FF3

Regression Statistics	
Multiple R	0,87248306
R Square	0,76122669
Adjusted R Square	0,76031068
Standard Error	1,18921332
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	3525,774317	1175,25811	831,0243	1,209E-242
Residual	782	1105,926547	1,41422832		
Total	785	4631,700864			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,11777554	0,042617936	2,76352041	0,0058526	0,03411643	0,20143464	0,03411643	0,20143464
RM-RF	0,79481873	0,017812438	44,6215581	3,73E-217	0,75985288	0,82978459	0,75985288	0,82978459
SMB	-0,1166369	0,053725362	-2,1709844	0,0302325	-0,22209993	-0,0111739	-0,2220999	-0,0111739
HML	0,28030681	0,040616871	6,90124099	1,066E-11	0,20057581	0,36003782	0,20057581	0,36003782

Source: Own elaboration

3. Social 100

- **Name**: S100

- **Constituents**: The constituents for this portfolio include the top 100 Social Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting social top performing equities.

PvsB_S100. Performance comparison between Social 100 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

In the comparison with the benchmark, we can notice the portfolio S100 outperforms the benchmark for all of the periods being analysed, this portfolio is interesting to analyse given the stable outperformance and benchmark tracking in the last 5 years, showing a similar path than other 100 portfolios. It can be concluded the effectiveness of the strategy applies to a portfolio with these characteristics. We will see the evolution of the social portfolios through the report, and see which factor is conditioning more the results, either size or ESG Score.

Sharpe ratio 0,45 vs 0,38 and CAGR 9,48% vs 8,45%.

Looking at the distribution by geography and industry for S100. There is a noticeable difference with the countries which performed better in the other ESG Scores, USA and Japan. The Social Portfolio using the ranking criteria has a more dispersed distribution through European countries, being France the maximum weight.

In the other hand, the industry financials count for 30% of the total equities. Compared to a 20% for the benchmark MSCI World Index, the sections with lower performance could be attributed to recent events in the financial industry related with social issues. For the rest of the industries, major exposure in the consumers and industrial.

G&ID_S100. Geographical and Industrial distributions for S100

Country	S100	Bench	Diff
UNITED STATES	7,0%	37,6%	-30,6%
HONG KONG	3,0%	2,2%	0,8%
MACAU	0,0%	0,1%	-0,1%
JAPAN	5,0%	18,8%	-13,8%
GERMANY	10,0%	3,8%	6,2%
AUSTRALIA	10,0%	4,0%	6,0%
NEW ZEALAND	0,0%	0,5%	-0,5%
BRITAIN	5,0%	5,1%	-0,1%
SWITZERLAND	3,0%	2,7%	0,3%
NETHERLANDS	4,0%	1,7%	2,3%
CANADA	7,0%	5,5%	1,5%
FRANCE	15,0%	4,5%	10,5%
BERMUDA	0,0%	0,3%	-0,3%
IRELAND	1,0%	1,0%	0,0%
SPAIN	8,0%	1,3%	6,7%
NORWAY	1,0%	0,8%	0,2%
BELGIUM	2,0%	0,8%	1,2%
SWEDEN	3,0%	2,4%	0,6%
DENMARK	0,0%	1,2%	-1,2%
ITALY	8,0%	1,3%	6,7%
CHILE	1,0%	0,1%	0,9%
SINGAPORE	0,0%	1,3%	-1,3%
LUXEMBOURG	0,0%	0,4%	-0,4%
ISRAEL	0,0%	0,8%	-0,8%
AUSTRIA	2,0%	0,3%	1,7%
PORTUGAL	1,0%	0,2%	0,8%
FINLAND	4,0%	0,8%	3,2%
MEXICO	0,0%	0,1%	-0,1%
ISLE OF MAN	0,0%	0,1%	-0,1%
JORDAN	0,0%	0,1%	-0,1%
ARGENTINA	0,0%	0,1%	-0,1%
JERSEY	0,0%	0,1%	-0,1%
SAUDI ARABIA	0,0%	0,1%	-0,1%
GREECE	0,0%	0,1%	-0,1%
INDONESIA	0,0%	0,1%	-0,1%

Industry	S100	Bench	Diff
Energy	9,0%	3,5%	5,5%
Diversified	0,0%	0,3%	-0,3%
Financial	30,0%	20,4%	9,6%
Industrial	12,0%	14,7%	-2,7%
Consumer, Cyclical	6,0%	12,5%	-6,5%
Consumer, Non-cyclical	14,0%	19,7%	-5,7%
Basic Materials	11,0%	6,7%	4,3%
Utilities	11,0%	5,1%	5,9%
Communications	5,0%	8,3%	-3,3%
Technology	2,0%	8,7%	-6,7%
Funds	0,0%	0,3%	-0,3%

Portfolio Return Summary Social 100

PTS_ReturnSum_S100: Table containing the return summary statistics for Social 100

CAPM

Regression Statistics	
Multiple R	0,89010392
R Square	0,792285
Adjusted R Square	0,79202005
Standard Error	1,12932978
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	3813,916552	3813,91655	2990,4024	8,963E-270
Residual	784	999,9024248	1,27538575		
Total	785	4813,818977			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,03612086	0,040371202	0,89471854	0,3712122	-0,04312758	0,11536931	-0,0431276	0,11536931
RM-RF	0,87719625	0,016041019	54,6845716	8,96E-270	0,84570782	0,90868468	0,84570782	0,90868468

FF3

Regression Statistics	
Multiple R	0,89884782
R Square	0,8079274
Adjusted R Square	0,80719054
Standard Error	1,08736215
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	3889,216229	1296,40541	1096,459	1,373E-279
Residual	782	924,6027485	1,18235646		
Total	785	4813,818977			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,05185136	0,038967887	1,33061762	0,1837027	-0,02464269	0,12834541	-0,0246427	0,12834541
RM-RF	0,83684091	0,016286877	51,3813005	7,08E-253	0,80486974	0,86881209	0,80486974	0,86881209
SMB	-0,1749398	0,049124009	-3,5611875	0,0003915	-0,27137035	-0,0785093	-0,2713703	-0,0785093
HML	0,25244663	0,037138205	6,79749151	2,112E-11	0,17954425	0,32534901	0,17954425	0,32534901

Source: Own elaboration

4. Governance 100

- **Name**: G100

- **Constituents**: The constituents for this portfolio include the top 100 Governance Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting Environmental top performing equities.

PvsB_G100. Performance comparison between Governance 100 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

This portfolio is a clear example of analysing data to find evidence of outperformance due to an ESG factor. Governance is an essential part of the composition and has built relevance during the last years. The 100 constituents are represented by 36% financials compared to 20.4% for the benchmark.

The hypothesis is accepted with this portfolio as Governance Score is positively correlated with returns. Governance 100 is so far the portfolio showing the best performance compared to the benchmark.

Sharpe ratio 0,61 vs 0,38 and CAGR 13,34% vs 8,45%.

G100 has a more balanced distribution between geographic location and less distribution within industries. The leading countries are EEUU and Japan. The portfolios distribution table show EEUU and Japan with the highest distribution weight for all Governance Portfolios. Leading industry is Financials. In comparison with other ESG Scores governance hols the highest percentage for financial equities. As mentioned before, ESG has begun taking more relevance in the recent years. So, we can conclude portfolios with top performing Governance Score in the 2000–2010 time range perform better than the MSCI components World Equities Average, as seen in the difference graph (Exhibit G100).

G&ID_G100. Geographical and Industrial distributions for G100

G100 Country		Bench	Diff
UNITED STATES	22,0%	37,6%	-15,6%
HONG KONG	2,0%	2,2%	-0,2%
MACAU	0,0%	0,1%	-0,1%
JAPAN	2,0%	18,8%	-16,8%
GERMANY	11,0%	3,8%	7,2%
AUSTRALIA	8,0%	4,0%	4,0%
NEW ZEALAND	0,0%	0,5%	-0,5%
BRITAIN	9,0%	5,1%	3,9%
SWITZERLAND	8,0%	2,7%	5,3%
NETHERLANDS	3,0%	1,7%	1,3%
CANADA	6,0%	5,5%	0,5%
FRANCE	13,0%	4,5%	8,5%
BERMUDA	0,0%	0,3%	-0,3%
IRELAND	0,0%	1,0%	-1,0%
SPAIN	5,0%	1,3%	3,7%
NORWAY	2,0%	0,8%	1,2%
BELGIUM	1,0%	0,8%	0,2%
SWEDEN	1,0%	2,4%	-1,4%
DENMARK	0,0%	1,2%	-1,2%
ITALY	2,0%	1,3%	0,7%
CHILE	1,0%	0,1%	0,9%
SINGAPORE	2,0%	1,3%	0,7%
LUXEMBOURG	0,0%	0,4%	-0,4%
ISRAEL	0,0%	0,8%	-0,8%
AUSTRIA	0,0%	0,3%	-0,3%
PORTUGAL	0,0%	0,2%	-0,2%
FINLAND	2,0%	0,8%	1,2%
MEXICO	0,0%	0,1%	-0,1%
ISLE OF MAN	0,0%	0,1%	-0,1%
JORDAN	0,0%	0,1%	-0,1%
ARGENTINA	0,0%	0,1%	-0,1%
JERSEY	0,0%	0,1%	-0,1%
SAUDI ARABIA	0,0%	0,1%	-0,1%
GREECE	0,0%	0,1%	-0,1%
INDONESIA	0,0%	0,1%	-0,1%

G100 Industry		Bench	Diff
Energy	6,0%	3,5%	2,5%
Diversified	0,0%	0,3%	-0,3%
Financial	36,0%	20,4%	15,6%
Industrial	8,0%	14,7%	-6,7%
Consumer, Cyclical	11,0%	12,5%	-1,5%
Consumer, Non-cyclical	11,0%	19,7%	-8,7%
Basic Materials	15,0%	6,7%	8,3%
Utilities	8,0%	5,1%	2,9%
Communications	4,0%	8,3%	-4,3%
Technology	1,0%	8,7%	-7,7%
Funds	0,0%	0,3%	-0,3%

Portfolio Return Summary Governance 100

PTS_ReturnSum_G100: Table containing the return summary statistics for Governance 100

CAPM

Regression Statistics	
Multiple R	0,88810685
R Square	0,78873378
Adjusted R Square	0,78846431
Standard Error	1,23855128
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4489,980176	4489,98018	2926,9576	6,909E-267
Residual	784	1202,66327	1,53400927		
Total	785	5692,643447			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,09712923	0,044275644	2,19373943	0,028547	0,01021638	0,1840421	0,01021638	0,18404207
RM-RF	0,95177301	0,017592403	54,1013646	6,91E-267	0,91723922	0,9863068	0,91723922	0,9863068

FF3

Regression Statistics	
Multiple R	0,89526454
R Square	0,8014986
Adjusted R Square	0,80073709
Standard Error	1,20208562
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4562,645754	1520,88192	1052,5063	5,329E-274
Residual	782	1129,997693	1,44500984		
Total	785	5692,643447			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,11700507	0,043079241	2,71604289	0,0067526	0,03244042	0,2015697	0,03244042	0,20156971
RM-RF	0,91796663	0,018005244	50,9832945	7,66E-251	0,8826223	0,953311	0,8826223	0,95331097
SMB	-0,0335297	0,054306897	-0,6174106	0,5371437	-0,14013421	0,0730749	-0,1401342	0,07307491
HML	0,28664654	0,041056516	6,98175516	6,23E-12	0,20605251	0,3672406	0,20605251	0,36724058

Source: Own elaboration

5. ESG 80

- **Name**: ESG80

- **Constituents**: The constituents for this portfolio include the top 80 ESG Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall ESG top performing equities.

PvsB_ESG80. Performance comparison between ESG 80 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

ESG 80 is a portfolio with a reduced exposure to the number of equities used to outperform the benchmark. The ESG component is identical to ESG100. The idea is to analyse if reducing the number of equities can help the portfolios obtain more returns. Comparing with its predecessor, the negative and positive performance are allocated very similarly, with more volatility in ESG80. The explanation is that during the financial crisis of 2008 which affected globally, top ESG equities suffered significant losses, less equities translates to more exposure and correlation between returns and components. However, ESG 80 shows better outperformance than ESG 100, so we can assume the size factors is playing a positive effect for the evolution of the portfolios.

Sharpe ratio 0,53 vs 0,38 and CAGR 11,99% vs 8,45%.

PvsB_ESG80 shows a great outperformance during the last years. In relation to other portfolios. ESG has been gaining relevance, investors use ESG as an indicator to allocate investments, which is represented with the outperformance to the benchmark.

Similar to previous portfolios, the benchmark has its most significant weight in USA, this is because is where the top relevant equities in the world are located. The ESG80 portfolio distributed the location equally between USA, Germany and Japan. Countries which are obtaining great performance and strategies in ESG.

Industry distribution is also more proportionately balanced with Industrial leading the ESG performance equities. Significant increase in Energy sector, respectively to benchmark. Energy equities implement ESG strategies continuously.

G&ID_ESG80. Geographical and Industrial distributions for ESG80

ESG80 Country		Bench	Diff
UNITED STATES	11,3%	37,6%	-26,4%
HONG KONG	1,3%	2,2%	-1,0%
MACAU	0,0%	0,1%	-0,1%
JAPAN	11,3%	18,8%	-7,6%
GERMANY	11,3%	3,8%	7,4%
AUSTRALIA	8,8%	4,0%	4,8%
NEW ZEALAND	0,0%	0,5%	-0,5%
BRITAIN	7,5%	5,1%	2,4%
SWITZERLAND	3,8%	2,7%	1,0%
NETHERLANDS	1,3%	1,7%	-0,5%
CANADA	3,8%	5,5%	-1,8%
FRANCE	10,0%	4,5%	5,5%
BERMUDA	0,0%	0,3%	-0,3%
IRELAND	1,3%	1,0%	0,2%
SPAIN	8,8%	1,3%	7,4%
NORWAY	1,3%	0,8%	0,5%
BELGIUM	1,3%	0,8%	0,5%
SWEDEN	2,5%	2,4%	0,1%
DENMARK	0,0%	1,2%	-1,2%
ITALY	5,0%	1,3%	3,7%
CHILE	0,0%	0,1%	-0,1%
SINGAPORE	0,0%	1,3%	-1,3%
LUXEMBOURG	0,0%	0,4%	-0,4%
ISRAEL	0,0%	0,8%	-0,8%
AUSTRIA	2,5%	0,3%	2,2%
PORTUGAL	1,3%	0,2%	1,1%
FINLAND	6,3%	0,8%	5,5%
MEXICO	0,0%	0,1%	-0,1%
ISLE OF MAN	0,0%	0,1%	-0,1%
JORDAN	0,0%	0,1%	-0,1%
ARGENTINA	0,0%	0,1%	-0,1%
JERSEY	0,0%	0,1%	-0,1%
SAUDI ARABIA	0,0%	0,1%	-0,1%
GREECE	0,0%	0,1%	-0,1%
INDONESIA	0,0%	0,1%	-0,1%

ESG80 Industry		Bench	Diff
Energy	11,3%	3,5%	7,8%
Diversified	0,0%	0,3%	-0,3%
Financial	10,0%	20,4%	-10,4%
Industrial	18,8%	14,7%	4,1%
Consumer, Cyclical	15,0%	12,5%	2,5%
Consumer, Non-cyclical	15,0%	19,7%	-4,7%
Basic Materials	15,0%	6,7%	8,3%
Utilities	11,3%	5,1%	6,1%
Communications	1,3%	8,3%	-7,0%
Technology	2,5%	8,7%	-6,2%
Funds	0,0%	0,3%	-0,3%

Portfolio Return Summary ESG 80

PTS_ReturnSum_ESG80: Table containing the return summary statistics for ESG 80

CAPM

Regression Statistics	
Multiple R	0.877474436
R Square	0.769961385
Adjusted R Square	0.769667969
Standard Error	1.310255149
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4505.012651	4505.012651	2624.123464	2.1734E-252
Residual	784	1345.946548	1.716768556		
Total	785	5850.959199			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.075619782	0.046838909	1.61446506	0.106828952	-0.016324736	0.167564301	-0.016324736	0.167564301
RM-RF	0.953364951	0.018610886	51.226199	2.1734E-252	0.916831885	0.989898016	0.916831885	0.989898016

FF3

Regression Statistics	
Multiple R	0.890935163
R Square	0.793765464
Adjusted R Square	0.792974283
Standard Error	1.242198084
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4644.289345	1548.096448	1003.266485	1.6378E-267
Residual	782	1206.669854	1.543056079		
Total	785	5850.959199			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.096839057	0.044516755	2.175339536	0.029903559	0.009452569	0.184225545	0.009452569	0.184225545
RM-RF	0.898385995	0.018606062	48.28458686	8.0674E-237	0.861862255	0.934909735	0.861862255	0.934909735
SMB	-0.241901672	0.056119067	-4.310507714	1.83678E-05	-0.352063525	-0.13173982	-0.352063525	-0.13173982
HML	0.341552563	0.042426534	8.050447086	3.06485E-15	0.258269185	0.424835942	0.258269185	0.424835942

Source: Own elaboration

6. Environmental 80

- **Name**: E80

- **Constituents**: The constituents for this portfolio include the top 80 Environmental Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Environmental top performing equities.

PvsB_E80. Performance comparison between Environmental 80 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

Looking at the E80 portfolio we can see the performance is stable and that there is a significant overperformance during the last part of the period. Comparing it with E100 to have a better reference of what might have happened, the comparison is similar, as E100 is able to reach the target outperformance and tests the hypothesis. The reduction of components could be the cause of the outperformance, this portfolio is to be accepted as the trend is stable and it would lead to an outperformance continuity result in the coming years if implemented in the strategy.

Sharpe ratio 0,59 vs 0,38 and CAGR 11,94% vs 8,45%.

The distribution for location and industry is very similar to E100. Japan has the biggest weight and consumer as an industry too. The explanation for the result obtained comparing it with the benchmark can be explained by the equities that compose the portfolio. The strategy tests the hypothesis of ESG Score being the main driver for performance. However, it is possible to obtain these results as the equities that compose the E80 portfolio could have a good Environmental Score, and therefore good performance during the period. Leading to the outperformance seen in Exhibit PvsB_E80.

G&ID_E80. Geographical and Industrial distributions for E80

E80 Country		Bench	Diff
UNITED STATES	7,5%	37,6%	-30,1%
HONG KONG	1,3%	2,2%	-1,0%
MACAU	0,0%	0,1%	-0,1%
JAPAN	30,0%	18,8%	11,2%
GERMANY	11,3%	3,8%	7,4%
AUSTRALIA	2,5%	4,0%	-1,5%
NEW ZEALAND	0,0%	0,5%	-0,5%
BRITAIN	6,3%	5,1%	1,1%
SWITZERLAND	3,8%	2,7%	1,0%
NETHERLANDS	2,5%	1,7%	0,8%
CANADA	2,5%	5,5%	-3,0%
FRANCE	8,8%	4,5%	4,3%
BERMUDA	0,0%	0,3%	-0,3%
IRELAND	1,3%	1,0%	0,2%
SPAIN	6,3%	1,3%	4,9%
NORWAY	0,0%	0,8%	-0,8%
BELGIUM	0,0%	0,8%	-0,8%
SWEDEN	3,8%	2,4%	1,4%
DENMARK	0,0%	1,2%	-1,2%
ITALY	6,3%	1,3%	4,9%
CHILE	0,0%	0,1%	-0,1%
SINGAPORE	0,0%	1,3%	-1,3%
LUXEMBOURG	0,0%	0,4%	-0,4%
ISRAEL	0,0%	0,8%	-0,8%
AUSTRIA	2,5%	0,3%	2,2%
PORTUGAL	1,3%	0,2%	1,1%
FINLAND	2,5%	0,8%	1,7%
MEXICO	0,0%	0,1%	-0,1%
ISLE OF MAN	0,0%	0,1%	-0,1%
JORDAN	0,0%	0,1%	-0,1%
ARGENTINA	0,0%	0,1%	-0,1%
JERSEY	0,0%	0,1%	-0,1%
SAUDI ARABIA	0,0%	0,1%	-0,1%
GREECE	0,0%	0,1%	-0,1%
INDONESIA	0,0%	0,1%	-0,1%

E80 Industry		Bench	Diff
Energy	8,8%	3,5%	5,3%
Diversified	0,0%	0,3%	-0,3%
Financial	3,8%	20,4%	-16,6%
Industrial	23,8%	14,7%	9,1%
Consumer, Cyclical	17,5%	12,5%	5,0%
Consumer, Non-cyclical	20,0%	19,7%	0,3%
Basic Materials	10,0%	6,7%	3,3%
Utilities	11,3%	5,1%	6,1%
Communications	0,0%	8,3%	-8,3%
Technology	5,0%	8,7%	-3,7%
Funds	0,0%	0,3%	-0,3%

Portfolio Return Summary Environmental 80

PTS_ReturnSum_E80: Table containing the return summary statistics for Environmental 80

CAPM

Regression Statistics	
Multiple R	0,881204478
R Square	0,776521332
Adjusted R Square	0,776236283
Standard Error	1,166003381
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	3703,6761	3703,6761	2724,16481	2,5701E-257
Residual	784	1065,898086	1,35956389		
Total	785	4769,574186			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,082485467	0,041682207	1,97891313	0,04817531	0,000663526	0,164307408	0,000663526	0,164307408
RM-RF	0,864425707	0,016561931	52,1935323	2,57E-257	0,831914727	0,896936686	0,831914727	0,896936686

FF3

Regression Statistics	
Multiple R	0,890957795
R Square	0,793805793
Adjusted R Square	0,793014767
Standard Error	1,121436422
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	3786,11562	1262,03854	1003,51369	1,5172E-267
Residual	782	983,4585654	1,25761965		
Total	785	4769,574186			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,100287813	0,040189009	2,49540396	0,01278646	0,021396699	0,179178927	0,021396699	0,179178927
RM-RF	0,823151594	0,016797253	49,0051325	1,331E-240	0,79017855	0,856124638	0,79017855	0,856124638
SMB	-0,1500064	0,05066339	-2,9608441	0,00316078	-0,249458745	-0,05055405	-0,24945875	-0,05055405
HML	0,277425708	0,038301991	7,24311451	1,0515E-12	0,202238815	0,352612601	0,202238815	0,352612601

Source: Own elaboration

7. Social 80

- **Name**: S80

- **Constituents**: The constituents for this portfolio include the top 80 Social Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Social top performing equities.

PvsB_S80. Performance comparison between Social 80 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

Following the decreasing order of portfolio analysis, the S80 portfolio shows a significant outperformance compared to the benchmark. Specially in the last section of the period where the S80 equities outperform by 100% respectively to the benchmark. S100 does show outperformance and is accepted, the hypothesis is proved consistent. Special attention to S60, S40 and S20 to analyse if there is a tendency in the social portfolios or the reduction in components improves or worsens the returns due to volatility.

Sharpe ratio 0,51 vs 0,38 and CAGR 10,88% vs 8,45%.

The geographic and industry distribution is very similar to S100. France continues to be the leading country and the distribution is more balanced for the portfolio than the benchmark. The outperformance is attributed to the returns obtained by the companies, the period where the portfolios is 100% up is characterized by the pandemic. Considering the high exposure to financials and consumer equities, in 2019 the pandemic lead to the worst performance period for these industries since the financial crisis in 2008.

Social portfolios show a tendency for increasing the weight in Energy industries. Overall, the ESG strategies are being implemented in all industries.

G&ID_S80. Geographical and Industrial distributions for S80

S80 Country		Bench	Diff
UNITED STATES	8,8%	37,6%	-28,9%
HONG KONG	3,8%	2,2%	1,5%
MACAU	0,0%	0,1%	-0,1%
JAPAN	6,3%	18,8%	-12,6%
GERMANY	7,5%	3,8%	3,7%
AUSTRALIA	11,3%	4,0%	7,3%
NEW ZEALAND	0,0%	0,5%	-0,5%
BRITAIN	6,3%	5,1%	1,1%
SWITZERLAND	3,8%	2,7%	1,0%
NETHERLANDS	1,3%	1,7%	-0,5%
CANADA	6,3%	5,5%	0,7%
FRANCE	16,3%	4,5%	11,8%
BERMUDA	0,0%	0,3%	-0,3%
IRELAND	1,3%	1,0%	0,2%
SPAIN	8,8%	1,3%	7,4%
NORWAY	1,3%	0,8%	0,5%
BELGIUM	1,3%	0,8%	0,5%
SWEDEN	2,5%	2,4%	0,1%
DENMARK	0,0%	1,2%	-1,2%
ITALY	6,3%	1,3%	4,9%
CHILE	0,0%	0,1%	-0,1%
SINGAPORE	0,0%	1,3%	-1,3%
LUXEMBOURG	0,0%	0,4%	-0,4%
ISRAEL	0,0%	0,8%	-0,8%
AUSTRIA	2,5%	0,3%	2,2%
PORTUGAL	1,3%	0,2%	1,1%
FINLAND	3,8%	0,8%	3,0%
MEXICO	0,0%	0,1%	-0,1%
ISLE OF MAN	0,0%	0,1%	-0,1%
JORDAN	0,0%	0,1%	-0,1%
ARGENTINA	0,0%	0,1%	-0,1%
JERSEY	0,0%	0,1%	-0,1%
SAUDI ARABIA	0,0%	0,1%	-0,1%
GREECE	0,0%	0,1%	-0,1%
INDONESIA	0,0%	0,1%	-0,1%

S80 Industry		Bench	Diff
Energy	11,3%	3,5%	7,8%
Diversified	0,0%	0,3%	-0,3%
Financial	28,8%	20,4%	8,4%
Industrial	11,3%	14,7%	-3,4%
Consumer, Cyclical	6,3%	12,5%	-6,2%
Consumer, Non-cyclical	15,0%	19,7%	-4,7%
Basic Materials	8,8%	6,7%	2,1%
Utilities	12,5%	5,1%	7,4%
Communications	5,0%	8,3%	-3,3%
Technology	1,3%	8,7%	-7,4%
Funds	0,0%	0,3%	-0,3%

Portfolio Return Summary Social 80

PTS_ReturnSum_S80: Table containing the return summary statistics for Social 80

CAPM

Regression Statistics	
Multiple R	0,89611278
R Square	0,80301812
Adjusted R Square	0,80276687
Standard Error	1,14099291
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4160,840082	4160,84008	3196,0615	8,265E-279
Residual	784	1020,662025	1,30186483		
Total	785	5181,502107			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,05725153	0,040788135	1,403632	0,1608244	-0,02281535	0,13731841	-0,0228154	0,13731841
RM-RF	0,91622405	0,016206682	56,5337202	8,27E-279	0,88441042	0,94803768	0,88441042	0,94803768

FF3

Regression Statistics	
Multiple R	0,90698414
R Square	0,82262023
Adjusted R Square	0,82193974
Standard Error	1,08411789
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4262,408433	1420,80281	1208,8733	4,248E-293
Residual	782	919,0936739	1,1753116		
Total	785	5181,502107			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,07475757	0,038851622	1,92418144	0,0546944	-0,00150825	0,15102339	-0,0015082	0,15102339
RM-RF	0,86897891	0,016238283	53,5142106	1,24E-263	0,83710312	0,90085469	0,83710312	0,90085469
SMB	-0,2201635	0,048977442	-4,4952014	8,002E-06	-0,31630629	-0,1240206	-0,3163063	-0,1240206
HML	0,28533317	0,037027399	7,70600102	3,938E-14	0,21264831	0,35801804	0,21264831	0,35801804

Source: Own elaboration

8. Governance 80

- **Name**: G80

- **Constituents**: The constituents for this portfolio include the top 80 Governance Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Governance top performing equities.

PvsB_G80. Performance comparison between Governance 80 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

G80's returns are very similar to G100 but with improvement. By reducing the number of equities in the portfolio composition we can expect the portfolio's return to be more volatile. The comparison with the benchmark shows the strategy beats the benchmark for the whole period analysed. The portfolio exceeds the returns by 300%.c and shows a tendency towards outperformance in the future. This can be explained by the equities forming the portfolio, the governance rating is translated to best performing equities. The portfolio is accepted, and the hypothesis is tested and proved. For the portfolios analyses 80 and 100 G80 is so far the best performing.

Sharpe ratio 0,58 vs 0,38 and CAGR 12,93% vs 8,45%.

The leading origin for the portfolio equities is the USA. Different to the environmental, social and ESG portfolios, governance keeps a similarity with the benchmark of keeping USA equities at the top. We can conclude there is more implementation of governance strategies in the USA. However, there is a balance distribution with European countries with the introduction of Switzerland and Australia as the top locations. Similar distribution and performance to G100. Industry is noticeable dominated by the financials. With 40% weight, we can conclude the best governance equities are in the financial sector, and that the returns from the industry will be extremely correlated to the portfolio returns.

G&ID_G80. Geographical and Industrial distributions for G80

G80 Country		Bench	Diff
UNITED STATES	18.8%	37.6%	-18.9%
HONG KONG	2.5%	2.2%	0.3%
MACAU	0.0%	0.1%	-0.1%
JAPAN	2.5%	18.8%	-16.3%
GERMANY	12.5%	3.8%	8.7%
AUSTRALIA	8.8%	4.0%	4.8%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	10.0%	5.1%	4.9%
SWITZERLAND	8.8%	2.7%	6.0%
NETHERLANDS	3.8%	1.7%	2.0%
CANADA	7.5%	5.5%	2.0%
FRANCE	10.0%	4.5%	5.5%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	0.0%	1.0%	-1.0%
SPAIN	3.8%	1.3%	2.4%
NORWAY	2.5%	0.8%	1.7%
BELGIUM	1.3%	0.8%	0.5%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	2.5%	1.3%	1.2%
CHILE	1.3%	0.1%	1.2%
SINGAPORE	2.5%	1.3%	1.2%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	0.0%	0.3%	-0.3%
PORTUGAL	0.0%	0.2%	-0.2%
FINLAND	1.3%	0.8%	0.5%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

G80 Industry		Bench	Diff
Energy	2.5%	3.5%	-1.0%
Diversified	0.0%	0.3%	-0.3%
Financial	40.0%	20.4%	19.6%
Industrial	7.5%	14.7%	-7.2%
Consumer, Cyclical	12.5%	12.5%	0.0%
Consumer, Non-cyclical	7.5%	19.7%	-12.2%
Basic Materials	18.8%	6.7%	12.1%
Utilities	6.3%	5.1%	1.1%
Communications	3.8%	8.3%	-4.5%
Technology	1.3%	8.7%	-7.4%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary Governance 80

PTS_ReturnSum_G80: Table containing the return summary statistics for Governance 80

CAPM

Regression Statistics	
Multiple R	0,90545354
R Square	0,819846112
Adjusted R Square	0,819616324
Standard Error	1,157733618
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4782,137453	4782,137453	3567,83504	5,1282E-294
Residual	784	1050,83215	1,34034713		
Total	785	5832,969604			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,086032704	0,04138658	2,078758465	0,0379642	0,004791077	0,16727433	0,004791077	0,16727433
RM-RF	0,982250371	0,016444468	59,73135724	5,128E-294	0,949969973	1,01453077	0,949969973	1,01453077

FF3

Regression Statistics	
Multiple R	0,910854922
R Square	0,829656688
Adjusted R Square	0,829003197
Standard Error	1,127207898
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4839,362244	1613,120748	1269,57637	5,7099E-300
Residual	782	993,6073594	1,270597646		
Total	785	5832,969604			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,103858087	0,040395842	2,571009327	0,01032408	0,02456096	0,18315521	0,02456096	0,18315521
RM-RF	0,952781444	0,0168837	56,43202942	5,836E-278	0,919638704	0,98592418	0,919638704	0,98592418
SMB	-0,0207966	0,050924129	-0,4083841	0,6831035	-0,120760783	0,07916757	-0,12076078	0,07916757
HML	0,255476367	0,038499112	6,635902765	6,0237E-11	0,179902524	0,33105021	0,179902524	0,33105021

Source: Own elaboration

9. ESG 60

- **Name**: ESG60

- **Constituents**: The constituents for this portfolio include the top 60 ESG Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall ESG top performing equities.

PvsB_ESG60. Performance comparison between ESG 60 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

Looking at the comparison graph with the benchmark, there is a significant outperformance through all the 20 year period. Straight away the portfolio is accepted. Comparing it with ESG 80 and ESG 100, both followed a similar pattern with outperformance in the last years. The reduction of equities for the portfolio shows the strategy does continue to work and must be applied with lower number of components for ESG Scores. If the ESG 40 and ESG portfolio does not break this down performance tendency, the ESG portfolios will be limited to lower size factors.

Sharpe ratio 0,51 vs 0,38 and CAGR 11,19% vs 8,45%.

ESG 60 shows the energy sector taking a more relevant role in the development of the portfolio. Together with Industrial Materials and Consumer sectors, the industry distribution is balanced compared with the benchmark. In order to explain the good performance, the volatility is increased as the portfolio size is reduced, and it can be assumed that ESG rating for equities ranking 20<x<80 contribute significantly to reaching the objective and proving the hypothesis right. Top ranked ESG equities tend to be bigger and less volatile. We expect ESG 40 and 20 portfolios to either improve and outperform by +150% the benchmark or show similar or better performance than ESG 60 and previous ESG portfolios.

G&ID_ESG60. Geographical and Industrial distributions for ESG60

Country	ESG60	Bench	Diff	Industry	ESG60	Bench	Diff
UNITED STATES	10.0%	37.6%	-27.6%	Energy	11.7%	3.5%	8.2%
HONG KONG	0.0%	2.2%	-2.2%	Diversified	0.0%	0.3%	-0.3%
MACAU	0.0%	0.1%	-0.1%	Financial	11.7%	20.4%	-8.7%
JAPAN	10.0%	18.8%	-8.8%	Industrial	21.7%	14.7%	7.0%
GERMANY	10.0%	3.8%	6.2%	Consumer, Cyclical	11.7%	12.5%	-0.8%
AUSTRALIA	6.7%	4.0%	2.7%	Consumer, Non-cyclical	13.3%	19.7%	-6.4%
NEW ZEALAND	0.0%	0.5%	-0.5%	Basic Materials	16.7%	6.7%	10.0%
BRITAIN	8.3%	5.1%	3.2%	Utilities	11.7%	5.1%	6.6%
SWITZERLAND	5.0%	2.7%	2.3%	Communications	0.0%	8.3%	-8.3%
NETHERLANDS	1.7%	1.7%	0.0%	Technology	1.7%	8.7%	-7.0%
CANADA	5.0%	5.5%	-0.5%	Funds	0.0%	0.3%	-0.3%
FRANCE	10.0%	4.5%	5.5%				
BERMUDA	0.0%	0.3%	-0.3%				
IRELAND	1.7%	1.0%	0.7%				
SPAIN	10.0%	1.3%	8.7%				
NORWAY	1.7%	0.8%	0.9%				
BELGIUM	1.7%	0.8%	0.9%				
SWEDEN	3.3%	2.4%	0.9%				
DENMARK	0.0%	1.2%	-1.2%				
ITALY	6.7%	1.3%	5.3%				
CHILE	0.0%	0.1%	-0.1%				
SINGAPORE	0.0%	1.3%	-1.3%				
LUXEMBOURG	0.0%	0.4%	-0.4%				
ISRAEL	0.0%	0.8%	-0.8%				
AUSTRIA	3.3%	0.3%	3.0%				
PORTUGAL	1.7%	0.2%	1.5%				
FINLAND	3.3%	0.8%	2.6%				
MEXICO	0.0%	0.1%	-0.1%				
ISLE OF MAN	0.0%	0.1%	-0.1%				
JORDAN	0.0%	0.1%	-0.1%				
ARGENTINA	0.0%	0.1%	-0.1%				
JERSEY	0.0%	0.1%	-0.1%				
SAUDI ARABIA	0.0%	0.1%	-0.1%				
GREECE	0.0%	0.1%	-0.1%				
INDONESIA	0.0%	0.1%	-0.1%				

Portfolio Return Summary ESG 60

PTS_ReturnSum_ESG60: Table containing the return summary statistics for ESG 60

CAPM

Regression Statistics	
Multiple R	0.893786028
R Square	0.798853464
Adjusted R Square	0.798596899
Standard Error	1.193361205
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4434.191627	4434.191627	3113.655982	3.0213E-275
Residual	784	1116.502997	1.424110966		
Total	785	5550.694624			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.060650803	0.042660193	1.421718922	0.155505535	-0.023090918	0.144392524	-0.023090918	0.144392524
RM-RF	0.945841582	0.016950522	55.80014321	3.0213E-275	0.9125678	0.979115363	0.9125678	0.979115363

FF3

Regression Statistics	
Multiple R	0.904526796
R Square	0.818168724
Adjusted R Square	0.817471161
Standard Error	1.136068673
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4541.404737	1513.801579	1172.896757	6.8536E-289
Residual	782	1009.289887	1.290652029		
Total	785	5550.694624			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.079962094	0.040713387	1.964024642	0.049881083	4.16271E-05	0.159882562	4.16271E-05	0.159882562
RM-RF	0.898017397	0.017016419	52.77358138	6.305E-260	0.864614129	0.931420666	0.864614129	0.931420666
SMB	-0.196021301	0.051324435	-3.819258849	0.000144455	-0.296771279	-0.095271323	-0.296771279	-0.095271323
HML	0.306681316	0.038801747	7.903801775	9.1911E-15	0.230513402	0.382849231	0.230513402	0.382849231

Source: Own elaboration

10. Environmental 60

- **Name**: E60
- **Constituents**: The constituents for this portfolio include the top 60 Environmental Score performers for each year from 01/01/2010 – 20/04/2021
- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Environmental top performing equities.

PvsB_E60. Performance comparison between Environmental 60 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

There is a significant outperformance through all the 20 year period. Straight away the portfolio is accepted. Comparing it with E80 and E100, E80 has a similar pattern with outperformance in the last years. The reduction of equities for the portfolio shows the strategy does work and must be applied with lower number of components. If the E40 portfolio does not break this down performance tendency, the Environmental portfolios will be limited to lower size factors. As this have shown to give better performance with lower number of components, shown by the evolution of the portfolios and the different ESG Scores components combined.

Sharpe ratio 0,55 vs 0,38 and CAGR 11,32% vs 8,45%.

This portfolio's geographical location shows Japan weights 33%, a third of all the equities which indicates Japanese firms rank best in the environmental scores but also it can be deducted that the performance will be correlated to Japan more than the ideal. The year 2020 is where the outperformance of 170% takes place, with major events such as COVID 19 affecting the performance and rejecting the hypothesis.

In terms of industry distribution, the portfolio has its biggest weight in industrials, comparing with other Environmental portfolios, the distribution is very similar. We assume there is no correlation between performance and industry distribution as other Environmental portfolios have shown outperformance for +60% of the period. Location plays a more relevant role in E60.

G&ID_E60. Geographical and Industrial distributions for E60

E60 Country		Bench	Diff
UNITED STATES	8.3%	37.6%	-29.3%
HONG KONG	1.7%	2.2%	-0.5%
MACAU	0.0%	0.1%	-0.1%
JAPAN	33.3%	18.8%	14.5%
GERMANY	8.3%	3.8%	4.5%
AUSTRALIA	1.7%	4.0%	-2.3%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	6.7%	5.1%	1.6%
SWITZERLAND	3.3%	2.7%	0.6%
NETHERLANDS	3.3%	1.7%	1.6%
CANADA	1.7%	5.5%	-3.9%
FRANCE	10.0%	4.5%	5.5%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	1.7%	1.0%	0.7%
SPAIN	6.7%	1.3%	5.3%
NORWAY	0.0%	0.8%	-0.8%
BELGIUM	0.0%	0.8%	-0.8%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	5.0%	1.3%	3.7%
CHILE	0.0%	0.1%	-0.1%
SINGAPORE	0.0%	1.3%	-1.3%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	3.3%	0.3%	3.0%
PORTUGAL	1.7%	0.2%	1.5%
FINLAND	3.3%	0.8%	2.6%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

E60 Industry		Bench	Diff
Energy	8.3%	3.5%	4.9%
Diversified	0.0%	0.3%	-0.3%
Financial	3.3%	20.4%	-17.0%
Industrial	26.7%	14.7%	12.0%
Consumer, Cyclical	18.3%	12.5%	5.9%
Consumer, Non-cyclical	16.7%	19.7%	-3.1%
Basic Materials	8.3%	6.7%	1.7%
Utilities	13.3%	5.1%	8.2%
Communications	0.0%	8.3%	-8.3%
Technology	5.0%	8.7%	-3.7%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary Environmental 60

PTS_ReturnSum_E60: Table containing the return summary statistics for Environmental 60

CAPM

Regression Statistics	
Multiple R	0,88116978
R Square	0,77646018
Adjusted R Square	0,77617505
Standard Error	1,18154327
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	3801,715502	3801,715502	2723,2051	2,8612E-257
Residual	784	1094,498888	1,396044499		
Total	785	4896,214389			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,07042594	0,042237726	1,667370594	0,0958401	-0,012486479	0,153338363	-0,01248648	0,153338363
RM-RF	0,87579201	0,01678266	52,18433769	2,861E-257	0,842847746	0,908736283	0,842847746	0,908736283

FF3

Regression Statistics	
Multiple R	0,8902387
R Square	0,79252495
Adjusted R Square	0,79172901
Standard Error	1,13975046
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	3880,372069	1293,457356	995,709307	1,7071E-266
Residual	782	1015,84232	1,2990311		
Total	785	4896,214389			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,08880725	0,040845331	2,174232522	0,02998687	0,008627772	0,168986721	0,008627772	0,168986721
RM-RF	0,83649215	0,017071566	48,99914452	1,43E-240	0,802980629	0,870003674	0,802980629	0,870003674
SMB	-0,11869389	0,051490767	-2,30514899	0,02141921	-0,219770379	-0,0176174	-0,21977038	-0,0176174
HML	0,28020893	0,038927496	7,198226336	1,4329E-12	0,203794167	0,356623687	0,203794167	0,356623687

Source: Own elaboration

11. Social 60

- **Name**: S60

- **Constituents**: The constituents for this portfolio include the top 60 Social Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Social top performing equities.

PvsB_S60. Performance comparison between Social 60 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

Straight away there is an evident outperformance >95% in the period. The social portfolio with top ranking 60 equities is capable of outperforming the benchmark. The portfolio is not rejected as the hypothesis can be proved right, but in the other hand, bigger portfolios appear to be able to replicate and beat the benchmark more effectively. Both S100 and S80 were accepted, there is a pattern of social portfolios being able to reach the defined objectives. The evolution of S40 and S20 will tell the result and the application of the portfolios in the final strategy.

Sharpe ratio 0,43 vs 0,38 and CAGR 9,90% vs 8,45%.

Similar to other portfolios the geographical distribution is more balanced than the benchmark, which is distributed by size rather than ESG Ratings. We conclude the outperformance can be attributed to the reduction of components. In other portfolios where the same reduction is applied, and location and industry distributions are kept balanced and homogenous, higher ranked equities show better performance than top ranked.

For the industry distribution, financials have the highest weight, S100 and S80 show the same pattern. Financial equities rank best at Social Scores, their performance is able beat the benchmark. Energy sector gains presence and relevance, similar to financials, its performance is higher than expected.

G&ID_S60. Geographical and Industrial distributions for S60

S60 Country		Bench	Diff
UNITED STATES	6.7%	37.6%	-31.0%
HONG KONG	1.7%	2.2%	-0.5%
MACAU	0.0%	0.1%	-0.1%
JAPAN	8.3%	18.8%	-10.5%
GERMANY	8.3%	3.8%	4.5%
AUSTRALIA	13.3%	4.0%	9.4%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	5.0%	5.1%	-0.1%
SWITZERLAND	3.3%	2.7%	0.6%
NETHERLANDS	1.7%	1.7%	0.0%
CANADA	6.7%	5.5%	1.1%
FRANCE	11.7%	4.5%	7.2%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	1.7%	1.0%	0.7%
SPAIN	8.3%	1.3%	7.0%
NORWAY	1.7%	0.8%	0.9%
BELGIUM	1.7%	0.8%	0.9%
SWEDEN	3.3%	2.4%	0.9%
DENMARK	0.0%	1.2%	-1.2%
ITALY	8.3%	1.3%	7.0%
CHILE	0.0%	0.1%	-0.1%
SINGAPORE	0.0%	1.3%	-1.3%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	3.3%	0.3%	3.0%
PORTUGAL	1.7%	0.2%	1.5%
FINLAND	3.3%	0.8%	2.6%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

S60 Industry		Bench	Diff
Energy	15.0%	3.5%	11.5%
Diversified	0.0%	0.3%	-0.3%
Financial	31.7%	20.4%	11.3%
Industrial	6.7%	14.7%	-8.0%
Consumer, Cyclical	5.0%	12.5%	-7.5%
Consumer, Non-cyclical	15.0%	19.7%	-4.7%
Basic Materials	10.0%	6.7%	3.3%
Utilities	15.0%	5.1%	9.9%
Communications	1.7%	8.3%	-6.6%
Technology	0.0%	8.7%	-8.7%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary Social 60

**PTS_ReturnSum_S60:** Table containing the return summary statistics for Social 60

CAPM

Regression Statistics	
Multiple R	0,89559979
R Square	0,80209898
Adjusted R Square	0,80184656
Standard Error	1,19706674
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4553,367694	4553,3677	3177,5764	5,129E-278
Residual	784	1123,447515	1,4329688		
Total	785	5676,815209			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,0353409	0,042792658	0,8258635	0,4091327	-0,04866085	0,1193426	-0,0486609	0,11934264
RM-RF	0,95846782	0,017003156	56,369995	5,13E-278	0,92509072	0,9918449	0,92509072	0,99184492

FF3

Regression Statistics	
Multiple R	0,90821216
R Square	0,82484932
Adjusted R Square	0,82417739
Standard Error	1,12759961
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4682,517163	1560,8391	1227,5757	3,029E-295
Residual	782	994,2980466	1,2714809		
Total	785	5676,815209			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,05367162	0,04040988	1,3281805	0,184506	-0,02565307	0,1329963	-0,0256531	0,1329963
RM-RF	0,90472049	0,016889567	53,566826	6,75E-264	0,87156624	0,9378748	0,87156624	0,93787475
SMB	-0,2772016	0,050941826	-5,441533	7,072E-08	-0,37720056	-0,177203	-0,3772006	-0,1772027
HML	0,30681977	0,038512491	7,9667598	5,748E-15	0,23121966	0,3824199	0,23121966	0,38241987

Source: Own elaboration

12. Governance 60

- **Name**: G60

- **Constituents**: The constituents for this portfolio include the top 60 Governance Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Governance top performing equities.

PvsB_G60. Performance comparison between Governance 60 and MSCI WORLD INDEX
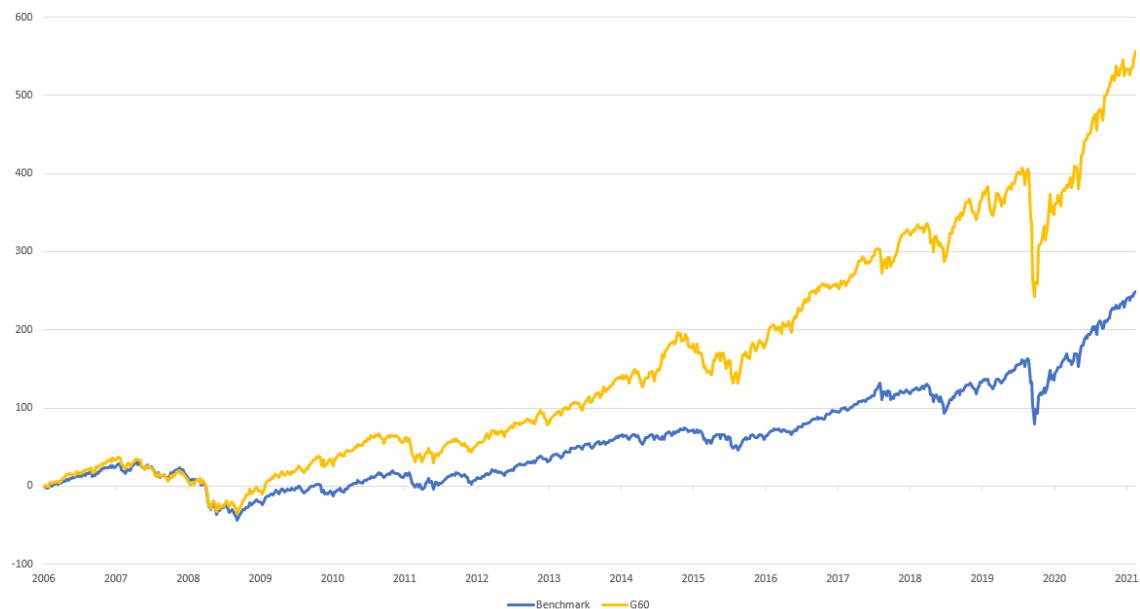
Source: Bloomberg Standard Portfolio Report, own elaboration

The portfolio is not rejected as the hypothesis proves the portfolio outperforms the benchmark in the total period, with higher momentum during the last years, as ESG has gained relevance recently, and it is forecasted to continue this tendency. G100 and G80 are both accepted in the strategy, so we assume the governance portfolios should continue the tendency. There is correlation between the top governance equities and the performance during the years. As previous Governance Portfolios, by reducing the components the portfolios outperform by +100% the benchmark cumulative. There is a significant positive correlation between small governance portfolios and performance. Sharpe ratio 0,59 vs 0,38 and CAGR 13,11% vs 8,45%.

The leading origin for the portfolio equities is the USA. Different to the environmental, social and ESG portfolios, governance keeps a similarity with the benchmark of keeping USA equities at the top. We can conclude there is more implementation of governance strategies in the USA. However, there is a balance distribution with European countries with the introduction of Switzerland and Australia as the top locations. Similar distribution and performance to G100 and G80. Industry is noticeable dominated by the financials. With 40% weight, we can conclude the best governance equities are in the financial sector, and that the returns from the industry will be extremely correlated to the portfolio returns.

G&ID_G60. Geographical and Industrial distributions for G60

G60 Country		Bench	Diff
UNITED STATES	16.7%	37.6%	-21.0%
HONG KONG	3.3%	2.2%	1.1%
MACAU	0.0%	0.1%	-0.1%
JAPAN	3.3%	18.8%	-15.5%
GERMANY	16.7%	3.8%	12.8%
AUSTRALIA	11.7%	4.0%	7.7%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	10.0%	5.1%	4.9%
SWITZERLAND	6.7%	2.7%	4.0%
NETHERLANDS	5.0%	1.7%	3.3%
CANADA	5.0%	5.5%	-0.5%
FRANCE	3.3%	4.5%	-1.1%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	0.0%	1.0%	-1.0%
SPAIN	5.0%	1.3%	3.7%
NORWAY	3.3%	0.8%	2.6%
BELGIUM	1.7%	0.8%	0.9%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	3.3%	1.3%	2.0%
CHILE	1.7%	0.1%	1.6%
SINGAPORE	1.7%	1.3%	0.3%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	0.0%	0.3%	-0.3%
PORTUGAL	0.0%	0.2%	-0.2%
FINLAND	1.7%	0.8%	0.9%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

G60 Industry		Bench	Diff
Energy	1.7%	3.5%	-1.8%
Diversified	0.0%	0.3%	-0.3%
Financial	40.0%	20.4%	19.6%
Industrial	5.0%	14.7%	-9.7%
Consumer, Cyclical	8.3%	12.5%	-4.1%
Consumer, Non-cyclical	8.3%	19.7%	-11.4%
Basic Materials	23.3%	6.7%	16.7%
Utilities	8.3%	5.1%	3.2%
Communications	3.3%	8.3%	-4.9%
Technology	1.7%	8.7%	-7.0%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary Governance 60

PTS_ReturnSum_G60: Table containing the return summary statistics for Governance 60

CAPM

Regression Statistics	
Multiple R	0,900385016
R Square	0,810693178
Adjusted R Square	0,810451715
Standard Error	1,186933042
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4729,974018	4729,974018	3357,424967	1,4101E-285
Residual	784	1104,507075	1,408810045		
Total	785	5834,481093			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,090031758	0,042430399	2,121869224	0,034161765	0,006741121	0,173322396	0,006741121	0,173322396
RM-RF	0,976878501	0,016859217	57,94329095	1,4101E-285	0,943783952	1,009973049	0,943783952	1,009973049

FF3

Regression Statistics	
Multiple R	0,90392061
R Square	0,817072469
Adjusted R Square	0,816370701
Standard Error	1,168254005
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4767,193871	1589,064624	1164,305642	7,1834E-288
Residual	782	1067,287223	1,364817421		
Total	785	5834,481093			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,103615511	0,041866815	2,474884023	0,013538929	0,021430862	0,185800161	0,021430862	0,185800161
RM-RF	0,951249423	0,017498502	54,36176259	7,6594E-268	0,916899825	0,985599022	0,916899825	0,985599022
SMB	-0,050466115	0,052778479	-0,956187379	0,339273073	-0,154070385	0,053138155	-0,154070385	0,053138155
HML	0,20065255	0,039901018	5,02875769	6,12577E-07	0,122326764	0,278978335	0,122326764	0,278978335

Source: Own elaboration

13. ESG 40

- **Name**: ESG40

- **Constituents**: The constituents for this portfolio include the top 40 ESG Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall ESG top performing equities.

PvsB_ESG40. Performance comparison between ESG 40 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

The portfolio is not rejected. In order to understand why the performance is high we must look at the other portfolios 100, 80 and 60. There is a clear outperformance tendency with the reduction of equities. By reducing the components in the portfolios, the performance is more exposed and volatile. Reducing the number of equities leads to a less similar replication of the index and therefore performance will either be much better or worse. In this case all portfolios have outperformed the benchmark, some more than others, ESG 40 and other ESG form the less profitable group of all the ESG Score components portfolios.

Sharpe ratio 0,49 vs 0,38 and CAGR 10,98% vs 8,45%.

The main characteristic and evolution of the ESG portfolios is that the energy sector gains weight with the reduction of components. Meaning that we can conclude the top performing equities are in the energy and basic materials for overall ESG Scores. Also the countries which gain more weight are Spain and Britain. This countries include energy companies in their stock exchanges with good sustainability strategies.

G&ID_ESG40. Geographical and Industrial distributions for ESG 40

ESG40 Country		Bench	Diff
UNITED STATES	10.0%	37.6%	-27.6%
HONG KONG	0.0%	2.2%	-2.2%
MACAU	0.0%	0.1%	-0.1%
JAPAN	5.0%	18.8%	-13.8%
GERMANY	2.5%	3.8%	-1.3%
AUSTRALIA	7.5%	4.0%	3.5%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	12.5%	5.1%	7.4%
SWITZERLAND	5.0%	2.7%	2.3%
NETHERLANDS	2.5%	1.7%	0.8%
CANADA	5.0%	5.5%	-0.5%
FRANCE	10.0%	4.5%	5.5%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	2.5%	1.0%	1.5%
SPAIN	12.5%	1.3%	11.2%
NORWAY	2.5%	0.8%	1.7%
BELGIUM	0.0%	0.8%	-0.8%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	10.0%	1.3%	8.7%
CHILE	0.0%	0.1%	-0.1%
SINGAPORE	0.0%	1.3%	-1.3%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	5.0%	0.3%	4.7%
PORTUGAL	2.5%	0.2%	2.3%
FINLAND	5.0%	0.8%	4.2%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

ESG40 Industry		Bench	Diff
Energy	17.5%	3.5%	14.0%
Diversified	0.0%	0.3%	-0.3%
Financial	7.5%	20.4%	-12.9%
Industrial	17.5%	14.7%	2.8%
Consumer, Cyclical	10.0%	12.5%	-2.5%
Consumer, Non-cyclical	12.5%	19.7%	-7.2%
Basic Materials	17.5%	6.7%	10.8%
Utilities	15.0%	5.1%	9.9%
Communications	0.0%	8.3%	-8.3%
Technology	2.5%	8.7%	-6.2%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary ESG40

PTS_ReturnSum_ESG40: Table containing the return summary statistics for ESG 40

CAPM

Regression Statistics	
Multiple R	0.887581406
R Square	0.787800752
Adjusted R Square	0.787530089
Standard Error	1.238977369
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4468.022578	4468.022578	2910.640794	3.8893E-266
Residual	784	1203.490897	1.53506492		
Total	785	5671.513476			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.056565113	0.044290876	1.277127884	0.201935198	-0.030377631	0.143507856	-0.030377631	0.143507856
RM-RF	0.949442905	0.017598455	53.9503549	3.8893E-266	0.914897236	0.983988575	0.914897236	0.983988575

FF3

Regression Statistics	
Multiple R	0.899102708
R Square	0.80838568
Adjusted R Square	0.807650586
Standard Error	1.178854184
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4584.770276	1528.256759	1099.704866	5.398E-280
Residual	782	1086.7432	1.389697186		
Total	785	5671.513476			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.075610804	0.042246694	1.789744854	0.07388177	-0.00731955	0.158541158	-0.00731955	0.158541158
RM-RF	0.898915013	0.017657275	50.90904452	1.8406E-250	0.864253743	0.933576283	0.864253743	0.933576283
SMB	-0.230006421	0.053257365	-4.318772054	1.77089E-05	-0.334550747	-0.125462096	-0.334550747	-0.125462096
HML	0.308786909	0.04026306	7.669235901	5.14332E-14	0.229750433	0.387823385	0.229750433	0.387823385

Source: Own elaboration

14. Environmental 40

- **Name**: E40

- **Constituents**: The constituents for this portfolio include the top 40 Environmental Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Environmental top performing equities.

PvsB_E40. Performance comparison between Environmental 40 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

The higher outperformance has become more common within the smaller portfolios and specific ESG Scores. This portfolio is not rejected from the strategy. The performance is higher for 95%.c of the period. Specially in the last section, where it reaches +150% cumulative performance levels. The portfolio is able to replicate the index during the first years when ESG factors has fewer relevance. In comparison with other environmental and 40s the performance is very similar, in exception of E100, where it seems the higher number of components plays a factor for lower return. Environmental 20 should be the higher performing portfolio of the Es.

Sharpe ratio 0,50 vs 0,38 and CAGR 10,95% vs 8,45%.

With smaller portfolios the exposure to certain locations and industry takes more relevance than in bigger portfolios. Here we find a portfolio with 40% exposure to Japanese markets. There is a pattern with Japanese firms and environmental impact. This Japanese firms obtained the higher scores, but then the portfolio is an ETF of Japanese Environmental equities, which is not what the hypothesis is trying to test. The industry distribution is more balanced with industrial overweighting energy.

G&ID_E40. Geographical and Industrial distributions for Environmental 40

E40 Country		Bench	Diff	E40 Industry		Bench	Diff
UNITED STATES	10.0%	37.6%	-27.6%	Energy	10.0%	3.5%	6.5%
HONG KONG	0.0%	2.2%	-2.2%	Diversified	0.0%	0.3%	-0.3%
MACAU	0.0%	0.1%	-0.1%	Financial	0.0%	20.4%	-20.4%
JAPAN	45.0%	18.8%	26.2%	Industrial	27.5%	14.7%	12.8%
GERMANY	2.5%	3.8%	-1.3%	Consumer, Cyclical	17.5%	12.5%	5.0%
AUSTRALIA	2.5%	4.0%	-1.5%	Consumer, Non-cyclical	22.5%	19.7%	2.8%
NEW ZEALAND	0.0%	0.5%	-0.5%	Basic Materials	12.5%	6.7%	5.8%
BRITAIN	7.5%	5.1%	2.4%	Utilities	5.0%	5.1%	-0.1%
SWITZERLAND	2.5%	2.7%	-0.2%	Communications	0.0%	8.3%	-8.3%
NETHERLANDS	2.5%	1.7%	0.8%	Technology	5.0%	8.7%	-3.7%
CANADA	0.0%	5.5%	-5.5%	Funds	0.0%	0.3%	-0.3%
FRANCE	12.5%	4.5%	8.0%				
BERMUDA	0.0%	0.3%	-0.3%				
IRELAND	2.5%	1.0%	1.5%				
SPAIN	2.5%	1.3%	1.2%				
NORWAY	0.0%	0.8%	-0.8%				
BELGIUM	0.0%	0.8%	-0.8%				
SWEDEN	0.0%	2.4%	-2.4%				
DENMARK	0.0%	1.2%	-1.2%				
ITALY	5.0%	1.3%	3.7%				
CHILE	0.0%	0.1%	-0.1%				
SINGAPORE	0.0%	1.3%	-1.3%				
LUXEMBOURG	0.0%	0.4%	-0.4%				
ISRAEL	0.0%	0.8%	-0.8%				
AUSTRIA	2.5%	0.3%	2.2%				
PORTUGAL	0.0%	0.2%	-0.2%				
FINLAND	2.5%	0.8%	1.7%				
MEXICO	0.0%	0.1%	-0.1%				
ISLE OF MAN	0.0%	0.1%	-0.1%				
JORDAN	0.0%	0.1%	-0.1%				
ARGENTINA	0.0%	0.1%	-0.1%				
JERSEY	0.0%	0.1%	-0.1%				
SAUDI ARABIA	0.0%	0.1%	-0.1%				
GREECE	0.0%	0.1%	-0.1%				
INDONESIA	0.0%	0.1%	-0.1%				

Portfolio Return Summary Environmental 40

PTS_ReturnSum_E40: Table containing the return summary statistics for Environmental 40

CAPM

Regression Statistics	
Multiple R	0.883043403
R Square	0.779765652
Adjusted R Square	0.77948474
Standard Error	1.221247859
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4140.02287	4140.02287	2775.84435	8.307E-260
Residual	784	1169.293925	1.491446332		
Total	785	5309.316794			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.059863364	0.043657083	1.37121769	0.17069945	-0.025835246	0.145561975	-0.02583525	0.145561975
RM-RF	0.913929181	0.017346625	52.68628234	8.307E-260	0.879877853	0.947980509	0.879877853	0.947980509

FF3

Regression Statistics	
Multiple R	0.893592836
R Square	0.798508157
Adjusted R Square	0.79773517
Standard Error	1.16961971
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4239.532766	1413.177589	1033.0168	1.8404E-271
Residual	782	1069.784028	1.368010266		
Total	785	5309.316794			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.079361716	0.041915758	1.893362302	0.05867863	-0.002919009	0.161642441	-0.00291901	0.161642441
RM-RF	0.868530431	0.017518958	49.5766027	1.394E-243	0.834140678	0.902920185	0.834140678	0.902920185
SMB	-0.16639801	0.052840177	-3.14908128	0.0017001	-0.270123398	-0.06267263	-0.2701234	-0.06267263
HML	0.304217821	0.039947663	7.615409814	7.5898E-14	0.225800472	0.382635171	0.225800472	0.382635171

Source: Own elaboration

15. Social 40

- **Name**: S40

- **Constituents**: The constituents for this portfolio include the top 40 Social Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Social top performing equities.

PvsB_S40. Performance comparison between Social 40 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

The social 40 portfolio has been able to outperform the benchmark with size as a variable factor. Since the beginning, found in PvsB_S100, the performance is worse at the end of the period. As analysis is applied similar, the most recent years are taken as relevant. Being so, the performance of S40 leads to a portfolio acceptance. Overall, all 40s portfolios are being accepted. Governance being the last and showing better performance in PvsB_G40.

Sharpe ratio 0,49 vs 0,38 and CAGR 10,67% vs 8,45%.

The geographical distribution is led by European countries. Other Social portfolios follow the same distributions and obtain similar outperformance. This means the top scoring equities, which's performance is sufficient to beat the benchmark, is formed by the same equities always. There has been no rejected Social portfolio for the strategy, at this point we can conclude there is correlation between the social score obtained and the performance. Industry has a growing weight for energy for smaller portfolios but dominated by financial equities, which lead the weights in all social portfolios.

G&ID_S40. Geographical and Industrial distributions for Social 40

S40					S40			
Country		Bench	Diff		Industry		Bench	Diff
UNITED STATES	5.0%	37.6%	-32.6%		Energy	20.0%	3.5%	16.5%
HONG KONG	0.0%	2.2%	-2.2%		Diversified	0.0%	0.3%	-0.3%
MACAU	0.0%	0.1%	-0.1%		Financial	25.0%	20.4%	4.6%
JAPAN	7.5%	18.8%	-11.3%		Industrial	2.5%	14.7%	-12.2%
GERMANY	10.0%	3.8%	6.2%		Consumer, Cyclical	2.5%	12.5%	-10.0%
AUSTRALIA	7.5%	4.0%	3.5%		Consumer, Non-cyclical	15.0%	19.7%	-4.7%
NEW ZEALAND	0.0%	0.5%	-0.5%		Basic Materials	12.5%	6.7%	5.8%
BRITAIN	5.0%	5.1%	-0.1%		Utilities	20.0%	5.1%	14.9%
SWITZERLAND	2.5%	2.7%	-0.2%		Communications	2.5%	8.3%	-5.8%
NETHERLANDS	2.5%	1.7%	0.8%		Technology	0.0%	8.7%	-8.7%
CANADA	7.5%	5.5%	2.0%		Funds	0.0%	0.3%	-0.3%
FRANCE	12.5%	4.5%	8.0%					
BERMUDA	0.0%	0.3%	-0.3%					
IRELAND	0.0%	1.0%	-1.0%					
SPAIN	10.0%	1.3%	8.7%					
NORWAY	2.5%	0.8%	1.7%					
BELGIUM	0.0%	0.8%	-0.8%					
SWEDEN	2.5%	2.4%	0.1%					
DENMARK	0.0%	1.2%	-1.2%					
ITALY	12.5%	1.3%	11.2%					
CHILE	0.0%	0.1%	-0.1%					
SINGAPORE	0.0%	1.3%	-1.3%					
LUXEMBOURG	0.0%	0.4%	-0.4%					
ISRAEL	0.0%	0.8%	-0.8%					
AUSTRIA	5.0%	0.3%	4.7%					
PORTUGAL	2.5%	0.2%	2.3%					
FINLAND	5.0%	0.8%	4.2%					
MEXICO	0.0%	0.1%	-0.1%					
ISLE OF MAN	0.0%	0.1%	-0.1%					
JORDAN	0.0%	0.1%	-0.1%					
ARGENTINA	0.0%	0.1%	-0.1%					
JERSEY	0.0%	0.1%	-0.1%					
SAUDI ARABIA	0.0%	0.1%	-0.1%					
GREECE	0.0%	0.1%	-0.1%					
INDONESIA	0.0%	0.1%	-0.1%					

Portfolio Return Summary Social 40

PTS_ReturnSum_S40: Table containing the return summary statistics for Social 40

CAPM

Regression Statistics	
Multiple R	0,88137253
R Square	0,77681754
Adjusted R Square	0,77653287
Standard Error	1,22939914
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4124,400536	4124,40054	2728,8209	1,528E-257
Residual	784	1184,955039	1,51142224		
Total	785	5309,355575			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,05334251	0,043948474	1,21375116	0,2252083	-0,0329281	0,13961312	-0,0329281	0,13961312
RM-RF	0,9122032	0,017462406	52,2381169	1,53E-257	0,87792459	0,94648181	0,87792459	0,94648181

FF3

Regression Statistics	
Multiple R	0,89399036
R Square	0,79921877
Adjusted R Square	0,79844851
Standard Error	1,16755967
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4243,336635	1414,44554	1037,5955	4,626E-272
Residual	782	1066,01894	1,36319558		
Total	785	5309,355575			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,07440179	0,041841932	1,77816336	0,0757655	-0,00773401	0,15653759	-0,007734	0,15653759
RM-RF	0,86235692	0,017488102	49,3110638	3,36E-242	0,82802774	0,89668611	0,82802774	0,89668611
SMB	-0,1885923	0,05274711	-3,5754054	0,0003712	-0,292135	-0,0850496	-0,292135	-0,0850496
HML	0,33010149	0,039877303	8,27792906	5,4E-16	0,25182225	0,40838072	0,25182225	0,40838072

Source: Own elaboration

16. Governance 40

- **Name**: G40

- **Constituents**: The constituents for this portfolio include the top 40 Governance Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Governance top performing equities.

PvsB_G40. Performance comparison between Social 40 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

For all the portfolios Governance has obtained the highest return, with a 150% outperformance for the last peak. There is a correlation between governance score, performance and size for portfolios. As there has been a growing tendency in the outperformance as the governance size of portfolios decreases. The portfolio is included in the strategy. The outperformance increases exponentially and is forecasted to continue growing.

Sharpe ratio 0,61 vs 0,38 and CAGR 13,56% vs 8,45%.

Governance portfolios have a very common distribution, as all include the highest weight in USA and 50% exposure to the financial industry. Both geography and sector show correlation with the highest performing equities. Governance Score select the top. Distributions are very similar to other portfolios, with increasing weights as size is reduced in the USA and Financial sectors. We can conclude that those equities are the highest performers by ESG ranking.

G&ID_G40. Geographical and Industrial distributions for Governance 40

Country	G40	Bench	Diff
UNITED STATES	22.5%	37.6%	-15.1%
HONG KONG	5.0%	2.2%	2.8%
MACAU	0.0%	0.1%	-0.1%
JAPAN	5.0%	18.8%	-13.8%
GERMANY	12.5%	3.8%	8.7%
AUSTRALIA	7.5%	4.0%	3.5%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	10.0%	5.1%	4.9%
SWITZERLAND	7.5%	2.7%	4.8%
NETHERLANDS	2.5%	1.7%	0.8%
CANADA	5.0%	5.5%	-0.5%
FRANCE	5.0%	4.5%	0.5%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	0.0%	1.0%	-1.0%
SPAIN	5.0%	1.3%	3.7%
NORWAY	2.5%	0.8%	1.7%
BELGIUM	0.0%	0.8%	-0.8%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	5.0%	1.3%	3.7%
CHILE	0.0%	0.1%	-0.1%
SINGAPORE	2.5%	1.3%	1.2%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	0.0%	0.3%	-0.3%
PORTUGAL	0.0%	0.2%	-0.2%
FINLAND	2.5%	0.8%	1.7%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

Industry	G40	Bench	Diff
Energy	2.5%	3.5%	-1.0%
Diversified	0.0%	0.3%	-0.3%
Financial	50.0%	20.4%	29.6%
Industrial	5.0%	14.7%	-9.7%
Consumer, Cyclical	7.5%	12.5%	-5.0%
Consumer, Non-cyclical	5.0%	19.7%	-14.7%
Basic Materials	17.5%	6.7%	10.8%
Utilities	10.0%	5.1%	4.9%
Communications	2.5%	8.3%	-5.8%
Technology	0.0%	8.7%	-8.7%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary Governance 40

PTS_ReturnSum_G40: Table containing the return summary statistics for Governance 40

CAPM

Regression Statistics	
Multiple R	0,89324029
R Square	0,79787822
Adjusted R Square	0,79762041
Standard Error	1,22619943
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4653,307811	4653,3078	3094,8497	2,013E-274
Residual	784	1178,795002	1,5035651		
Total	785	5832,102814			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,09831288	0,043834091	2,2428407	0,0251857	0,01226681	0,184359	0,01226681	0,18435896
RM-RF	0,96892925	0,017416957	55,631373	2,01E-274	0,93473986	1,0031186	0,93473986	1,00311864

FF3

Regression Statistics	
Multiple R	0,89567016
R Square	0,80222503
Adjusted R Square	0,80146631
Standard Error	1,21449259
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4678,65887	1559,553	1057,3296	1,271E-274
Residual	782	1153,443943	1,4749923		
Total	785	5832,102814			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,10999965	0,043523871	2,5273407	0,011689	0,02456219	0,1954371	0,02456219	0,1954371
RM-RF	0,94882146	0,018191079	52,158613	7,96E-257	0,91311233	0,9845306	0,91311233	0,98453059
SMB	-0,0222252	0,05486741	-0,40507	0,6855366	-0,12993	0,0854797	-0,12993	0,08547969
HML	0,16897759	0,041480269	4,073686	5,099E-05	0,08755173	0,2504035	0,08755173	0,25040345

Source: Own elaboration

17. ESG 20

- **Name**: ESG20

- **Constituents**: The constituents for this portfolio include the top 20 ESG Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall ESG top performing equities.

PvsB_ESG20. Performance comparison between ESG 20 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

Following the evolution of ESG portfolios and size reduction we expect an ever greater outperformance for all the 20s portfolios. Making reference to PTSvsB_ESG and all the other comparison graphs we can notice a better performance of this group. The reduction of components increases the weights for each equity and therefore the volatility in the returns. Relying on the top 20 performers the return obtained is the desired. With a cumulative performance of 500% vs 250% for the benchmark. With a CAGR of 12,19% vs 8,45% for the benchmark and a Sharpe Ratio 0,54 vs 0,38, these are the best results obtained for all the ESG portfolios.

The industry and geographical distribution follow a similar weighting to other ESG portfolios. With increasing allocation for energy, industrial and utilities. These industries follow and increasing weighting evolution with the size factor reduction, meaning the leading ESG equities belong to the same industries.

Location is led by Italy, compared with the benchmark this portfolio shows a European exposure rather than USA. Assumption are made on European Stocks obtaining better ESG Scores than American and others.

G&ID_ESG20. Geographical and Industrial distributions for ESG 20

ESG20 Country		Bench	Diff
UNITED STATES	5.0%	37.6%	-32.6%
HONG KONG	0.0%	2.2%	-2.2%
MACAU	0.0%	0.1%	-0.1%
JAPAN	5.0%	18.8%	-13.8%
GERMANY	5.0%	3.8%	1.2%
AUSTRALIA	5.0%	4.0%	1.0%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	15.0%	5.1%	9.9%
SWITZERLAND	10.0%	2.7%	7.3%
NETHERLANDS	0.0%	1.7%	-1.7%
CANADA	5.0%	5.5%	-0.5%
FRANCE	0.0%	4.5%	-4.5%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	5.0%	1.0%	4.0%
SPAIN	10.0%	1.3%	8.7%
NORWAY	0.0%	0.8%	-0.8%
BELGIUM	0.0%	0.8%	-0.8%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	20.0%	1.3%	18.7%
CHILE	0.0%	0.1%	-0.1%
SINGAPORE	0.0%	1.3%	-1.3%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	5.0%	0.3%	4.7%
PORTUGAL	5.0%	0.2%	4.8%
FINLAND	5.0%	0.8%	4.2%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

ESG20 Industry		Bench	Diff
Energy	20.0%	3.5%	16.5%
Diversified	0.0%	0.3%	-0.3%
Financial	5.0%	20.4%	-15.4%
Industrial	20.0%	14.7%	5.3%
Consumer, Cyclical	5.0%	12.5%	-7.5%
Consumer, Non-cyclical	5.0%	19.7%	-14.7%
Basic Materials	20.0%	6.7%	13.3%
Utilities	25.0%	5.1%	19.9%
Communications	0.0%	8.3%	-8.3%
Technology	0.0%	8.7%	-8.7%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary ESG 20

PTS_ReturnSum_ESG20: Table containing the return summary statistics for ESG 20

CAPM

Regression Statistics	
Multiple R	0.885380923
R Square	0.783899379
Adjusted R Square	0.78362374
Standard Error	1.288000741
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4717.941955	4717.941955	2843.939596	4.9263E-263
Residual	784	1300.613592	1.658945908		
Total	785	6018.555546			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.075274132	0.04604336	1.634853135	0.102481257	-0.015108728	0.165656992	-0.015108728	0.165656992
RM-RF	0.975635222	0.018294784	53.32860017	4.9263E-263	0.939722663	1.011547782	0.939722663	1.011547782

FF3

Regression Statistics	
Multiple R	0.900578092
R Square	0.811040901
Adjusted R Square	0.810315993
Standard Error	1.205942679
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4881.29471	1627.098237	1118.820574	2.309E-282
Residual	782	1137.260836	1.454297744		
Total	785	6018.555546			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.096728039	0.043217467	2.238170016	0.025490697	0.011892056	0.181564022	0.011892056	0.181564022
RM-RF	0.915432969	0.018063016	50.67996261	2.7594E-249	0.879975229	0.950890709	0.879975229	0.950890709
SMB	-0.294940523	0.054481149	-5.413625281	8.22152E-08	-0.401887137	-0.187993909	-0.401887137	-0.187993909
HML	0.354011695	0.041188252	8.594967713	4.49967E-17	0.273159066	0.434864324	0.273159066	0.434864324

Source: Own elaboration

18. Environmental 20

- **Name**: E20

- **Constituents**: The constituents for this portfolio include the top 20 Environmental Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Environmental top performing equities.

PvsB_E20. Performance comparison between E20 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, own elaboration

Very similar to previous portfolios with the highlight of improving performance with size factor reduced. Selecting the lowest number of components translates into higher performance for the portfolio.

Sharpe ratio 0,52 vs 0,38 for benchmark and CAGR 11,61% vs 8,45% for benchmark. The figures are very similar to other 20s portfolios.

With smaller portfolios the exposure to certain locations and industry takes more relevance than in bigger portfolios. Here we find a portfolio with 55% exposure to Japanese markets. There is a pattern with Japanese firms and environmental impact. This Japanese firms obtained the higher scores, but then the portfolio is an ETF of Japanese Environmental equities, which is not what the hypothesis is trying to test. The industry distribution is more balanced with industrial distribution 35% industrial.

G&ID_E20. Geographical and Industrial distributions for E20

Country	E20	Bench	Diff
UNITED STATES	10.0%	37.6%	-27.6%
HONG KONG	0.0%	2.2%	-2.2%
MACAU	0.0%	0.1%	-0.1%
JAPAN	55.0%	18.8%	36.2%
GERMANY	0.0%	3.8%	-3.8%
AUSTRALIA	0.0%	4.0%	-4.0%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	10.0%	5.1%	4.9%
SWITZERLAND	5.0%	2.7%	2.3%
NETHERLANDS	5.0%	1.7%	3.3%
CANADA	0.0%	5.5%	-5.5%
FRANCE	0.0%	4.5%	-4.5%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	0.0%	1.0%	-1.0%
SPAIN	0.0%	1.3%	-1.3%
NORWAY	0.0%	0.8%	-0.8%
BELGIUM	0.0%	0.8%	-0.8%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	5.0%	1.3%	3.7%
CHILE	0.0%	0.1%	-0.1%
SINGAPORE	0.0%	1.3%	-1.3%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	5.0%	0.3%	4.7%
PORTUGAL	0.0%	0.2%	-0.2%
FINLAND	5.0%	0.8%	4.2%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

Industry	E20	Bench	Diff
Energy	10.0%	3.5%	6.5%
Diversified	0.0%	0.3%	-0.3%
Financial	0.0%	20.4%	-20.4%
Industrial	35.0%	14.7%	20.3%
Consumer, Cyclical	10.0%	12.5%	-2.5%
Consumer, Non-cyclical	15.0%	19.7%	-4.7%
Basic Materials	20.0%	6.7%	13.3%
Utilities	0.0%	5.1%	-5.1%
Communications	0.0%	8.3%	-8.3%
Technology	10.0%	8.7%	1.3%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary Environmental 20

PTS_ReturnSum_E20: Table containing the return summary statistics for Environmental 20

CAPM

Regression Statistics	
Multiple R	0.881995542
R Square	0.777916136
Adjusted R Square	0.777632866
Standard Error	1.266302069
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4403.585883	4403.585883	2746.19795	2.2064E-258
Residual	784	1257.160409	1.60352093		
Total	785	5660.746293			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.068774	0.045267678	1.519273876	0.12909672	-0.020086199	0.157634199	-0.0200862	0.157634199
RM-RF	0.942571729	0.017986576	52.4041787	2.206E-258	0.907264181	0.977879277	0.907264181	0.977879277

FF3

Regression Statistics	
Multiple R	0.891746123
R Square	0.795211148
Adjusted R Square	0.794425513
Standard Error	1.217549493
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4501.48856	1500.496187	1012.18908	1.0474E-268
Residual	782	1159.257733	1.482426768		
Total	785	5660.746293			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0.088172262	0.043633421	2.020750598	0.04364594	0.00251976	0.173824765	0.00251976	0.173824765
RM-RF	0.897591274	0.018236867	49.2185029	1.022E-241	0.861792265	0.933390284	0.861792265	0.933390284
SMB	-0.16352232	0.055005512	-2.97283513	0.00304122	-0.271498261	-0.05554638	-0.27149826	-0.05554638
HML	0.302307709	0.041584676	7.269690205	8.7479E-13	0.2206769	0.383938519	0.2206769	0.383938519

Source: Own elaboration

19. Social 20

- **Name**: S20

- **Constituents**: The constituents for this portfolio include the top 20 Social Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Social top performing equities.

PvsB_S20. Performance comparison between S20 and MSCI WORLD INDEX

Source: Bloomberg Standard Portfolio Report, ow elaboration

The social 20 portfolio has been able to outperform the benchmark with size as a variable factor. Since the beginning, found in PvsB_S100/80/60/40, the performance is worse at the end of the period. As analysis is applied similar, the most recent years are taken as relevant. Being so, the performance of S20 leads to a portfolio acceptance.

Sharpe ratio is 0,47 vs 0,38 and CAGR 10,61% vs 8,45%. For all the social portfolios, S20 is the top performer. In previous examples the portfolio obtains the same return to the benchmark during the downturn at the end of 2019, but in S20 it is able to still outperform the benchmark by 100%.

The geographical distribution is led by European countries. Other Social portfolios follow the same distributions and obtain similar outperformance. This means the top scoring equities, which's performance is sufficient to beat the benchmark, is formed by the same equities always. There has been no rejected Social portfolio for the strategy, at this point we can conclude there is correlation between the social score obtained and the performance. Industry has a growing weight for energy for smaller portfolios but dominated by financial equities, equally weighted with energy and utilities sectors.

G&ID_S20. Geographical and Industrial distributions for S20

S20 Country		Bench	Diff
UNITED STATES	5.0%	37.6%	-32.6%
HONG KONG	0.0%	2.2%	-2.2%
MACAU	0.0%	0.1%	-0.1%
JAPAN	5.0%	18.8%	-13.8%
GERMANY	15.0%	3.8%	11.2%
AUSTRALIA	15.0%	4.0%	11.0%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	0.0%	5.1%	-5.1%
SWITZERLAND	0.0%	2.7%	-2.7%
NETHERLANDS	0.0%	1.7%	-1.7%
CANADA	10.0%	5.5%	4.5%
FRANCE	5.0%	4.5%	0.5%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	0.0%	1.0%	-1.0%
SPAIN	15.0%	1.3%	13.7%
NORWAY	0.0%	0.8%	-0.8%
BELGIUM	0.0%	0.8%	-0.8%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	25.0%	1.3%	23.7%
CHILE	0.0%	0.1%	-0.1%
SINGAPORE	0.0%	1.3%	-1.3%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	0.0%	0.3%	-0.3%
PORTUGAL	5.0%	0.2%	4.8%
FINLAND	0.0%	0.8%	-0.8%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

S20 Industry		Bench	Diff
Energy	25.0%	3.5%	21.5%
Diversified	0.0%	0.3%	-0.3%
Financial	25.0%	20.4%	4.6%
Industrial	5.0%	14.7%	-9.7%
Consumer, Cyclical	5.0%	12.5%	-7.5%
Consumer, Non-cyclical	5.0%	19.7%	-14.7%
Basic Materials	5.0%	6.7%	-1.7%
Utilities	25.0%	5.1%	19.9%
Communications	5.0%	8.3%	-3.3%
Technology	0.0%	8.7%	-8.7%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary Social 20

PTS_ReturnSum_S20: Table containing the return summary statistics for Social 20

CAPM

Regression Statistics	
Multiple R	0,87114475
R Square	0,75889318
Adjusted R Square	0,75858564
Standard Error	1,31645086
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4276,579162	4276,57916	2467,6707	2,19E-244
Residual	784	1358,705616	1,73304288		
Total	785	5635,284778			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,051916	0,047060393	1,10317824	0,2702883	-0,04046329	0,14429529	-0,0404633	0,14429529
RM-RF	0,92887961	0,01869889	49,6756552	2,19E-244	0,8921738	0,96558543	0,8921738	0,96558543

FF3

Regression Statistics	
Multiple R	0,88258705
R Square	0,77895989
Adjusted R Square	0,77811191
Standard Error	1,26208934
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4389,660836	1463,22028	918,60651	9,618E-256
Residual	782	1245,623942	1,59286949		
Total	785	5635,284778			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,07262674	0,045229599	1,60573476	0,1087359	-0,01615906	0,16141254	-0,0161591	0,16141254
RM-RF	0,8804204	0,018903999	46,5732344	1,01E-227	0,8433118	0,91752899	0,8433118	0,91752899
SMB	-0,1793375	0,057017699	-3,1452944	0,001722	-0,29126332	-0,0674116	-0,2912633	-0,0674116
HML	0,32358078	0,043105907	7,50664579	1,654E-13	0,23896379	0,40819777	0,23896379	0,40819777

Source: Own elaboration

20. Governance 20

- **Name**: G20

- **Constituents**: The constituents for this portfolio include the top 20 Governance Score performers for each year from 01/01/2010 – 20/04/2021

- **Description:** Currency USD. Fixed weights. Portfolio focused on targeting overall Governance top performing equities.

PvsB_G20. Performance comparison between G20 and MSCI WORLD INDEX
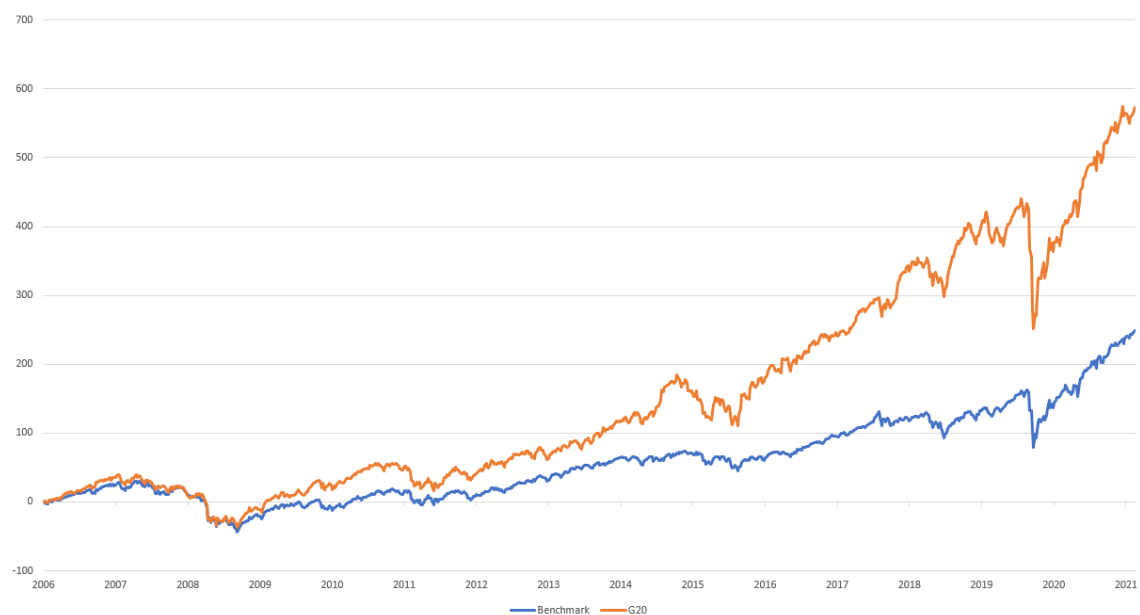
Source: Bloomberg Standard Portfolio Report, own elaboration

For all the portfolios Governance has obtained the highest return, with a 300% outperformance for the last peak. There seems to be a correlation between governance score, performance and size for portfolios. As there has been a growing tendency in the outperformance as the governance size of portfolios decreases. The portfolio is included in the strategy. The outperformance increases exponentially and is forecasted to continue growing.

Sharpe ratio 0,58 vs 0,38 and CAGR 13,47% vs 8,45%. This is the best performing portfolio of all created.

Governance portfolios have a very common distribution, as all include the highest weight in USA and 55% exposure to the financial industry. Both geography and sector show correlation with the highest performing equities. Governance Score select the top. Distributions are very similar to other portfolios, with increasing weights, as size is reduced, in the USA and Financial sectors. We can conclude that those equities are the highest performers by ESG ranking.

G&ID_G20. Geographical and Industrial distributions for G20

G20 Country		Bench	Diff
UNITED STATES	40.0%	37.6%	2.4%
HONG KONG	0.0%	2.2%	-2.2%
MACAU	0.0%	0.1%	-0.1%
JAPAN	0.0%	18.8%	-18.8%
GERMANY	10.0%	3.8%	6.2%
AUSTRALIA	10.0%	4.0%	6.0%
NEW ZEALAND	0.0%	0.5%	-0.5%
BRITAIN	5.0%	5.1%	-0.1%
SWITZERLAND	10.0%	2.7%	7.3%
NETHERLANDS	0.0%	1.7%	-1.7%
CANADA	5.0%	5.5%	-0.5%
FRANCE	0.0%	4.5%	-4.5%
BERMUDA	0.0%	0.3%	-0.3%
IRELAND	0.0%	1.0%	-1.0%
SPAIN	5.0%	1.3%	3.7%
NORWAY	5.0%	0.8%	4.2%
BELGIUM	0.0%	0.8%	-0.8%
SWEDEN	0.0%	2.4%	-2.4%
DENMARK	0.0%	1.2%	-1.2%
ITALY	5.0%	1.3%	3.7%
CHILE	0.0%	0.1%	-0.1%
SINGAPORE	5.0%	1.3%	3.7%
LUXEMBOURG	0.0%	0.4%	-0.4%
ISRAEL	0.0%	0.8%	-0.8%
AUSTRIA	0.0%	0.3%	-0.3%
PORTUGAL	0.0%	0.2%	-0.2%
FINLAND	0.0%	0.8%	-0.8%
MEXICO	0.0%	0.1%	-0.1%
ISLE OF MAN	0.0%	0.1%	-0.1%
JORDAN	0.0%	0.1%	-0.1%
ARGENTINA	0.0%	0.1%	-0.1%
JERSEY	0.0%	0.1%	-0.1%
SAUDI ARABIA	0.0%	0.1%	-0.1%
GREECE	0.0%	0.1%	-0.1%
INDONESIA	0.0%	0.1%	-0.1%

G20 Industry		Bench	Diff
Energy	0.0%	3.5%	-3.5%
Diversified	0.0%	0.3%	-0.3%
Financial	45.0%	20.4%	24.6%
Industrial	0.0%	14.7%	-14.7%
Consumer, Cyclical	10.0%	12.5%	-2.5%
Consumer, Non-cyclical	10.0%	19.7%	-9.7%
Basic Materials	25.0%	6.7%	18.3%
Utilities	5.0%	5.1%	-0.1%
Communications	5.0%	8.3%	-3.3%
Technology	0.0%	8.7%	-8.7%
Funds	0.0%	0.3%	-0.3%

Portfolio Return Summary Governance 20

PTS_ReturnSum_G20: Table containing the return summary statistics for Governance 20

CAPM

Regression Statistics	
Multiple R	0,87153407
R Square	0,75957163
Adjusted R Square	0,75926496
Standard Error	1,40550867
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4892,897878	4892,89788	2476,8465	7,254E-245
Residual	784	1548,756423	1,97545462		
Total	785	6441,654301			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,09582329	0,050244025	1,90715787	0,0568654	-0,00280545	0,194452	-0,0028055	0,19445203
RM-RF	0,99356035	0,019963869	49,7679265	7,25E-245	0,95437138	1,0327493	0,95437138	1,03274931

FF3

Regression Statistics	
Multiple R	0,87349328
R Square	0,76299051
Adjusted R Square	0,76208126
Standard Error	1,39726313
Observations	786

ANOVA

	df	SS	MS	F	Significance F
Regression	3	4914,921089	1638,30703	839,14864	6,665E-244
Residual	782	1526,733212	1,95234426		
Total	785	6441,654301			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,10687805	0,050073834	2,13440913	0,0331197	0,008583	0,2051731	0,008583	0,20517309
RM-RF	0,97526834	0,020928678	46,5996149	7,29E-228	0,9341853	1,0163514	0,9341853	1,01635138
SMB	-0,013075	0,063124476	-0,2071305	0,8359618	-0,13698849	0,1108385	-0,1369885	0,11083848
HML	0,15846928	0,047722688	3,32062764	0,0009398	0,06478953	0,252149	0,06478953	0,25214902

Source: Own elaboration

PTSvsB_ESG: ESG Portfolios Performance vs MSCI World Index

Source: Own elaboration, information for computation sourced from Bloomberg

PTSvsB_E: Environmental Portfolios Performance vs MSCI World Index

Source: Own elaboration, information for computation sourced from Bloomberg

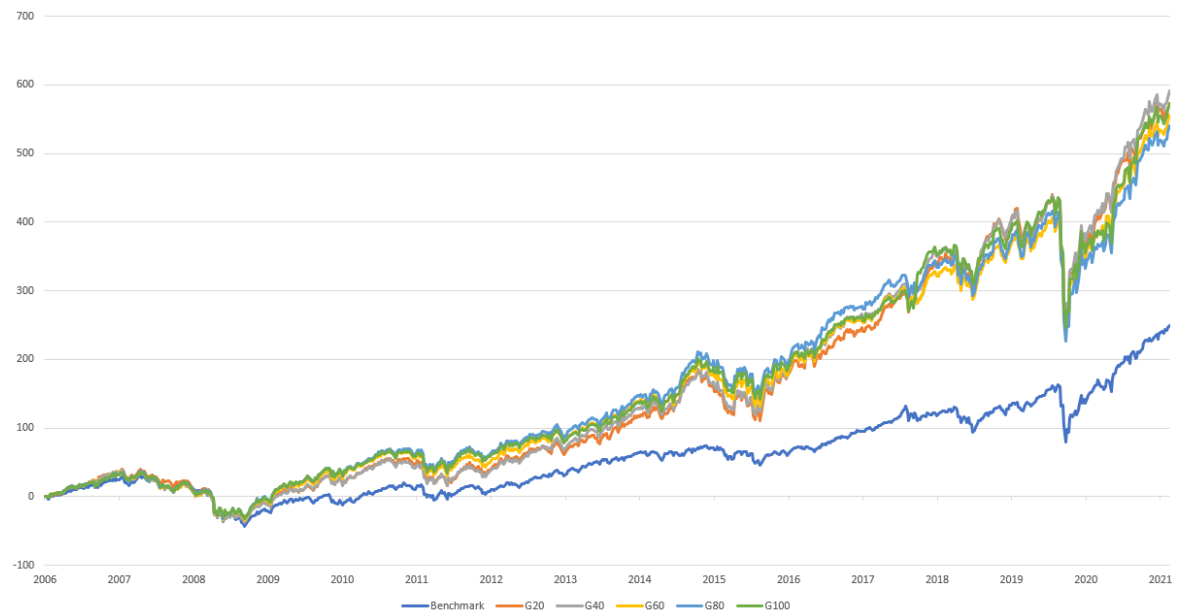**PTSvsB_S:** Social Portfolios Performance vs MSCI World Index

Source: Own elaboration, information for computation sourced from Bloomberg

PTSvsB_G: Governance Portfolios Performance vs MSCI World Index

Source: Own elaboration, information for computation sourced from Bloomberg