

Bringing ESG Considerations to Equal-Weight Indices

Contributors

Ben Leale-Green

Senior Analyst, Research & Design
ESG Indices
ben.leale-green@spglobal.com

Barbara Velado

Senior Analyst, Research & Design
ESG Indices
barbara.velado@spglobal.com

INTRODUCTION

Equal-weight indices can have many benefits, notably long-term outperformance—largely driven by exposures to small size and value, along with their associated risk premia—as well as reduced concentration in the largest names.¹ However, in accessing compensated factors and reducing concentration, the [S&P 500® Equal Weight Index](#) could elicit some [undesirable ESG consequences](#).

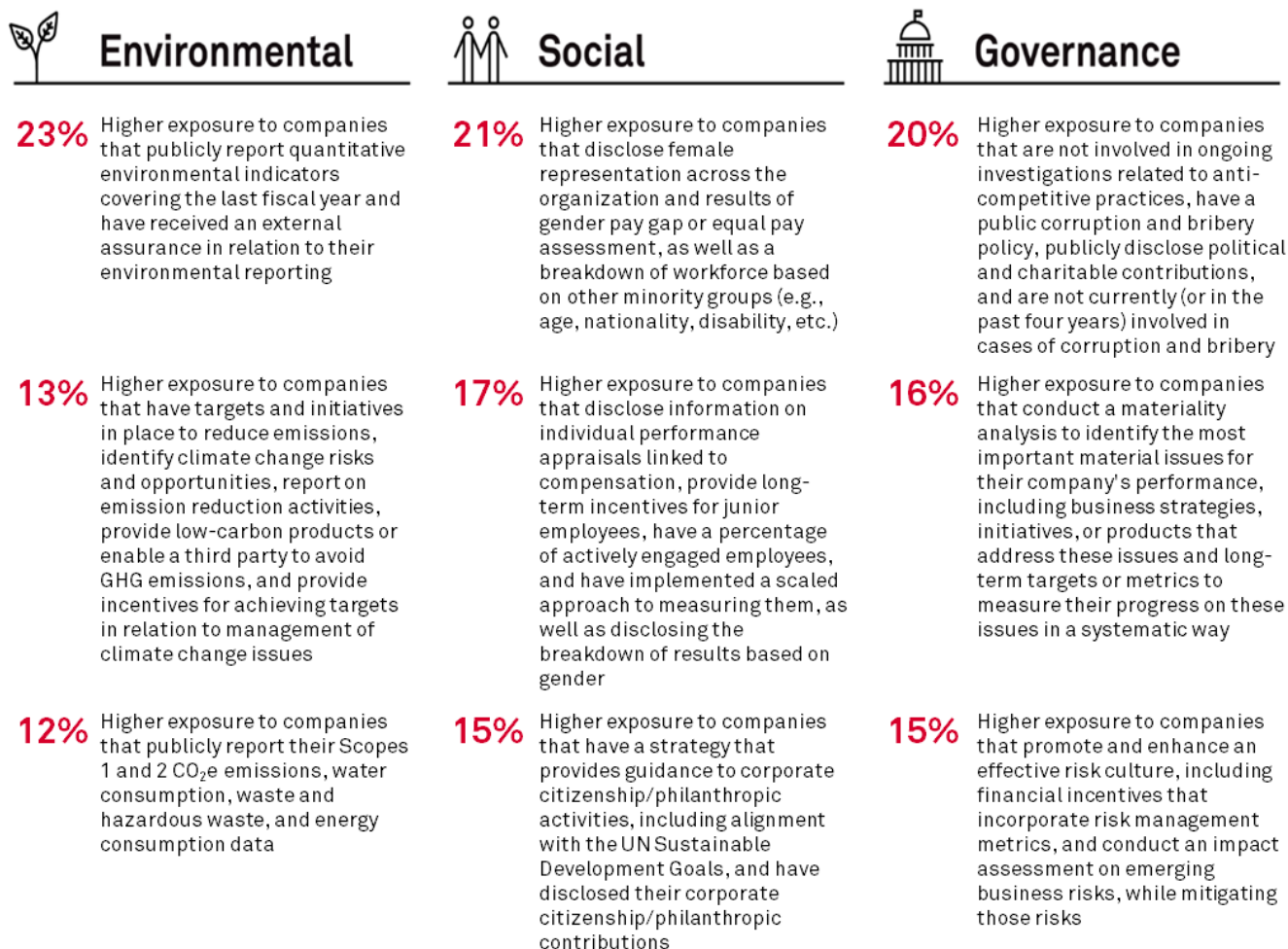
With many investors looking to integrate ESG considerations into their portfolios, we ask whether it is possible to gain the benefits of equal weighting while incorporating ESG criteria. This raises three sub-questions.

- What ESG benefits can be gained relative to the S&P 500 Equal Weight Index?
- Can the factor exposures associated with equal weighting be gained within an ESG framework?
- Can we reduce concentration in a few names, while excluding companies that are undesirable from an ESG standpoint?

Over the back-tested history, the [S&P 500 Equal Weight ESG Leaders Select Index](#) reduced exposure to many undesirable business activities and displayed a range of ESG improvements (see Exhibit 1), while having similar factor exposures and reduced concentration relative to cap weighting. The result: a comparable pattern of returns between the S&P 500 Equal Weight Index and the S&P 500 Equal Weight ESG Leaders Select Index, while adopting a best-in-class ESG framework.

¹ Rashid (2021) shows equally weighted indices have performed well during economic recovery. Bellucci and Gunzberg (2018) and Edwards, Lazzara, Preston, and Pestalozzi (2018) highlight increased exposure of equal-weight indices to small size and value, while Ganti (2021) observes value exposures by equally weighted indices. Edwards, Lazzara, Preston, and Pestalozzi (2018) and Preston (2021) discuss benefits of concentration reduction.

Exhibit 1: ESG Benefits of the S&P 500 Equal Weight ESG Leaders Select Index



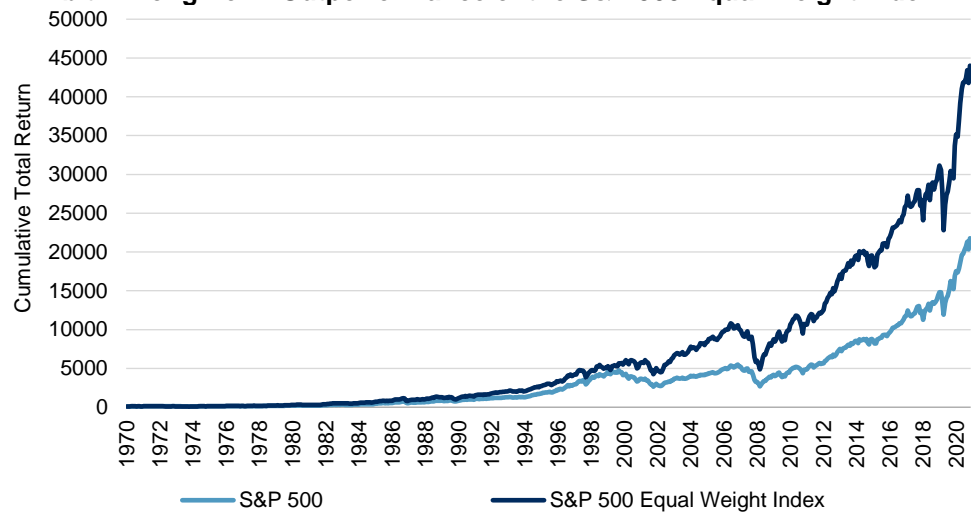
Source: S&P Dow Jones Indices LLC. Data as of October 2021. Chart is provided for illustrative purposes.

INDEX PERFORMANCE AND SECTOR EXPOSURES

Looking back to 1970, we see strong outperformance from the S&P 500 Equal Weight Index over the [S&P 500](#) (see Exhibit 2). Given that ESG scoring is a far more recent phenomenon, we do not have history back to 1970 for the S&P 500 Equal Weight ESG Leaders Select Index.

Looking back to 1970, we see strong outperformance from the S&P 500 Equal Weight Index over the S&P 500.

Exhibit 2: Long-Term Outperformance of the S&P 500 Equal Weight Index

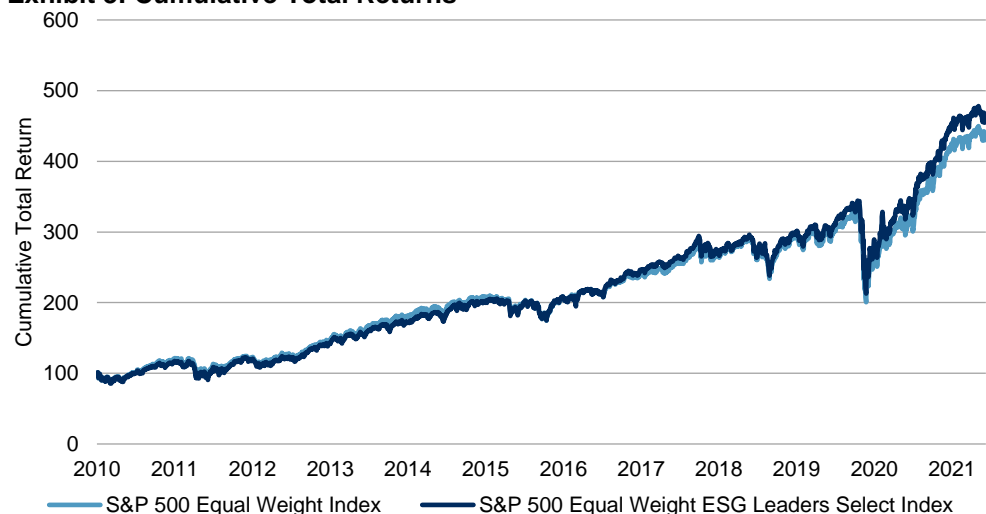


Source: S&P Dow Jones Indices LLC. Data from December 1970 to October 2021. Index performance based on monthly total return in USD. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The S&P 500 Equal Weight ESG Leaders Select Index had an excess return over the S&P 500 Equal Weight Index.

How did the S&P 500 Equal Weight ESG Leaders Select Index perform over the back-test period? We see there was an excess return over the S&P 500 Equal Weight Index (see Exhibits 3 and 4), which can be explained by the factor exposures—in particular, small size and the market beta (see Exhibit 11). This happened while maintaining stable sector weights over time, with some small active sector weights from the S&P 500 Equal Weight Index (see Exhibit 5).

Exhibit 3: Cumulative Total Returns



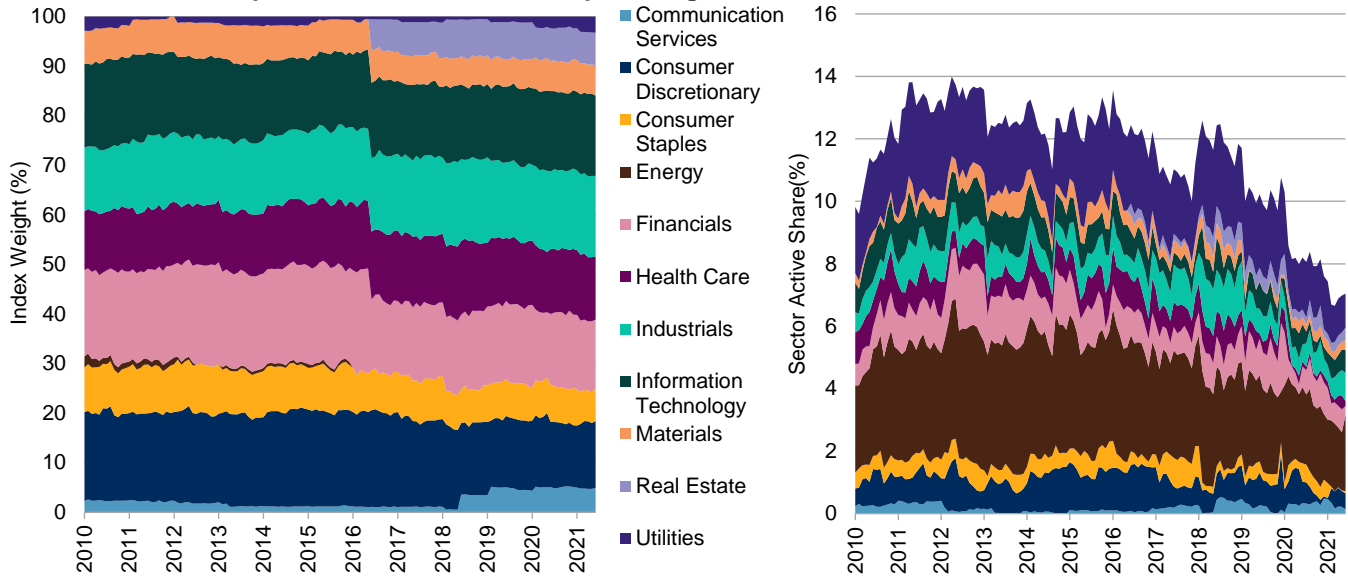
Source: S&P Dow Jones Indices LLC. Data from April 30, 2010, to Oct. 6, 2021. Index performance based on daily total return in USD. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

This can be explained by the factor exposures—in particular, small size and the market beta.

Exhibit 4: Risk and Performance Characteristics					
PERIOD	S&P 500	S&P 500 EQUAL WEIGHT INDEX	S&P 500 ESG INDEX	S&P 500 EQUAL WEIGHT ESG LEADERS SELECT INDEX	
RETURN (%)					
1-Year	30.00	40.87	29.73	37.89	
3-Year	15.99	14.29	17.37	15.89	
5-Year	16.90	14.61	17.63	15.88	
10-Year	16.63	16.00	16.89	17.06	
Since Inception	14.13	13.52	14.42	14.08	
EXCESS RETURN (%)					
1-Year	-	-	-0.27	-2.98	
3-Year	-	-	1.38	1.60	
5-Year	-	-	0.74	1.28	
10-Year	-	-	0.26	1.07	
Since Inception	-	-	0.28	0.56	
VOLATILITY (%)					
3-Year	18.81	21.87	18.61	21.24	
5-Year	15.20	17.46	15.06	17.15	
10-Year	13.26	14.94	13.13	14.90	
Since Inception	13.88	15.58	13.66	15.52	
TRACKING ERROR (%)					
3-Year	-	-	1.16	2.65	
5-Year	-	-	1.05	2.30	
10-Year	-	-	1.03	2.16	
Since Inception	-	-	1.06	2.14	
RETURN/VOLATILITY (%)					
3-Year	0.85	0.65	0.93	0.75	
5-Year	1.11	0.84	1.17	0.93	
10-Year	1.25	1.07	1.29	1.15	
Since Inception	1.02	0.87	1.06	0.91	
INFORMATION RATIO (%)					
3-Year	-	-	1.19	0.60	
5-Year	-	-	0.71	0.55	
10-Year	-	-	0.25	0.49	
Since Inception	-	-	0.27	0.26	
Active Share (%)	-	-	24.74	63.35	
Stock Count	505	505	312	185	

Source: S&P Dow Jones Indices LLC. Data as of Oct. 6, 2021. All relative figures (excess return, tracking error, information ratio, and active share) have been calculated relative to the underlying index (the S&P 500 is the underlying index for the S&P 500 ESG and the S&P 500 Equal Weight Index is the underlying index for the S&P 500 Equal Weight ESG Leaders Select Index). All figures provided are based on total returns and annualized where appropriate. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Exhibit 5: Sector Exposures of the S&P 500 Equal Weight ESG Leaders Select Index

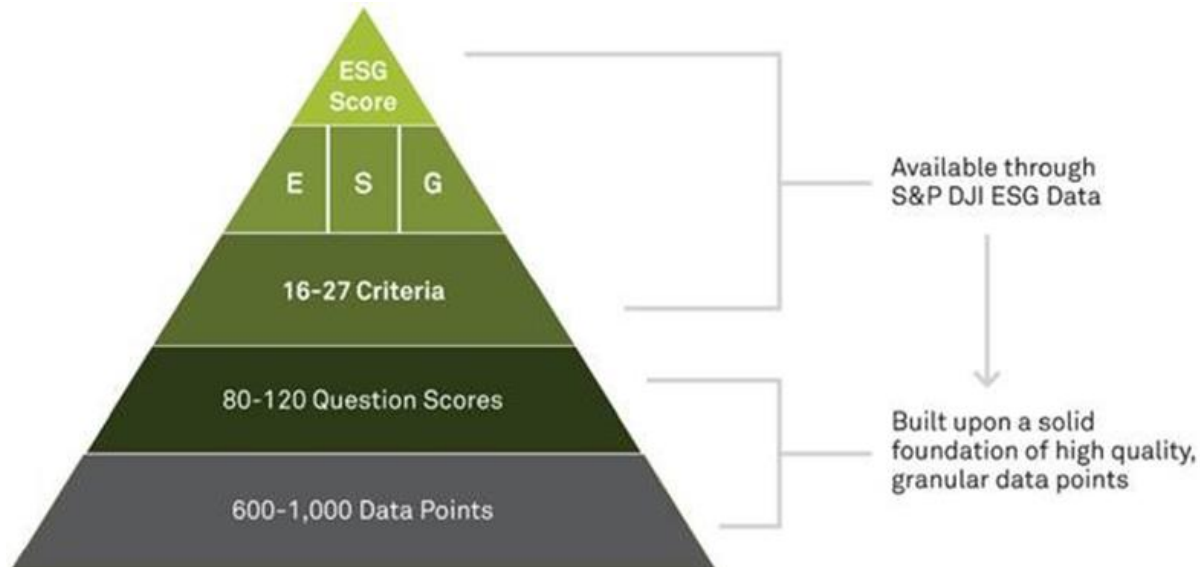


Source: S&P Dow Jones Indices LLC. Monthly data from April 30, 2010, to Sept. 30, 2021. Charts are provided for illustrative purposes.

S&P DJI ESG SCORES

The S&P DJI ESG Scores are derived from over 22 years of granular sustainability data from the industry-leading ESG assessment, the S&P Global Corporate Sustainability Assessment (CSA). The CSA is an annual evaluation of companies' sustainability practices. A key feature of the CSA is that, through active participation in the assessment, companies can disclose additional details to our analysts beyond what is publicly available. This engagement opportunity and additional granularity enables S&P Global to provide the most holistic and accurate view of a company's sustainability profile; differentiating the S&P DJI ESG Scores from other ESG scores that rely solely on data from public sources. This engagement enables S&P Global to collect 600-1,000 data points per company, which feed into the S&P DJI ESG Scores (see Exhibit 6).

Exhibit 6: S&P DJI ESG Scores

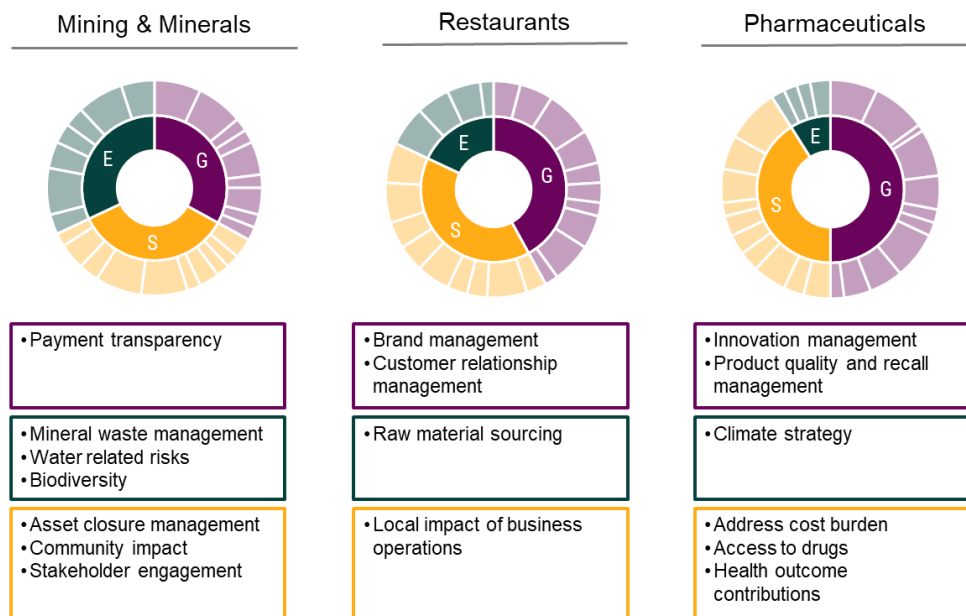


Source: S&P Dow Jones Indices LLC. Chart is provided for illustrative purposes.

The CSA and the derived S&P DJI ESG Scores are rooted in financial materiality.

The CSA and the derived S&P DJI ESG Scores are rooted in financial materiality. Industry specificity and industry agnosticism is considered, resulting in 61 different industry-specific questionnaires reflecting the financially material ESG criteria pertinent to the industry. Therefore, companies are assessed according to the sustainability issues that are weighted according to the magnitude and likelihood of their impact on a company’s business value drivers. Collecting and scoring data according to these factors ensures that companies have been measured based on the sustainability issues that are most relevant to them. The three examples in Exhibit 7 show how weights assigned to issues in different industries can vary greatly.

Exhibit 7: Financially Material Issues in Select Industries



The CSA’s 61 different industry-specific questionnaires reflect the financially material ESG criteria pertinent to the industry.

Source: S&P Global. Chart is provided for illustrative purposes.

This ESG scoring approach culminates in a score between 0-100, with 100 being highest possible score.

INDEX CONSTRUCTION

The S&P 500 Equal Weight ESG Leaders Select Index brings together the benefits of equal-weight indices with the power of the S&P DJI ESG Scores. The index rebalances annually after the close of the last business day of April and is reweighted quarterly to reduce the possibility of weights drifting too far from equality.²

The index makes the following exclusions.

Collecting and scoring data according to these factors ensures that companies have been measured based on the sustainability issues that are most relevant to them.

² Please refer to the [S&P Equal Weight ESG Leaders Select Indices Methodology](#) for more information on the S&P 500 Equal Weight ESG Leaders Select Index.

The index excludes the following companies: those with low UNGC scores, those involved in business activities considered detrimental from a sustainability perspective...

- Companies are excluded that have a UN Global Compact (UNGC) score that is in the bottom 5% of scores in the eligible universe.^{3,4}
- Companies are excluded if they are involved in specific business activities considered detrimental from a sustainability perspective.⁵
- Companies are excluded if they are involved in controversies based on the S&P Global Media and Stakeholder Analysis (MSA). The MSA monitors controversies related to economic crime and corruption, fraud, illegal commercial practices, human rights issues, labor disputes, workplace safety, catastrophic accidents, and environmental disasters. If a company is removed due to an MSA case, as determined by the S&P DJI Index Committee, it is not eligible to be included again for a full calendar year.
- Companies are excluded that have an S&P DJI ESG Score that is in the bottom 25% of scores within their GICS[®] industry group in the [S&P Global LargeMidCap](#) and [S&P Global 1200](#).

...those involved in controversies based on the S&P MSA, and those that have an S&P DJI ESG Score that is in the bottom 25% within their GICS industry group.

Once exclusions are applied:

- Companies within each GICS industry group are ranked in decreasing order of their S&P DJI ESG Score; and
- Within each GICS industry group, companies are selected for inclusion from the top down, targeting 40% of the number of constituents of the S&P 500 Equal Weight Index (or a total of 200 names).

Index constituents are then equally weighted at each annual rebalance and reweighted quarterly.

Index constituents are equally weighted at each annual rebalance and reweighted quarterly.

³ The UN Global Compact, which was established in 2000, commits its signatories—companies and nations from around the world—to abide by principles related to human rights, labor, the environment, and anti-corruption. For more information, see www.unglobalcompact.org.

⁴ Calculated by Arabesque.

⁵ Please see full list of exclusions in the Appendix.

Exhibit 8: The S&P 500 Equal Weight ESG Leaders Select Index Methodology Summary

Objective: To target 40% of the number of constituents within each GICS industry group of the S&P 500 Equal Weight Index, using the S&P DJI ESG Score.

Step 1:

Exclude companies exposed to undesirable business activities, with a low UNGC score, or involved in controversies.

Step 2:

Exclude companies with S&P DJI ESG Scores in the bottom 25% of their GICS industry group globally.

Step 3:

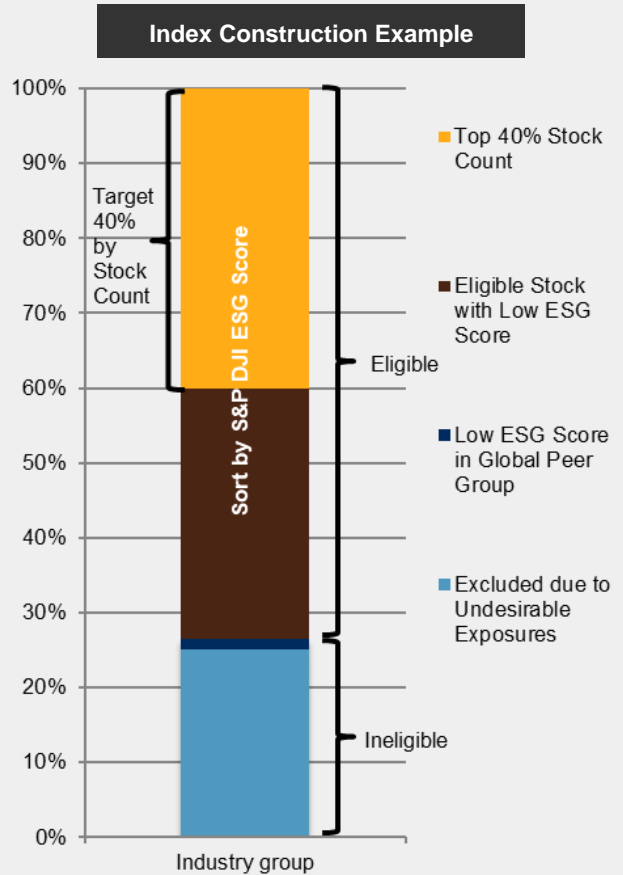
Within the S&P 500 Equal Weight Index, sort the remaining companies by their S&P DJI ESG Scores within each GICS industry group.

Step 4:

Starting from the company with the highest S&P DJI ESG Score, select companies for inclusion from the top down, targeting 40% of the number of constituents within each GICS industry group (or a total of 200).

Step 5:

Equally weight companies.



Source: S&P Dow Jones Indices LLC. Chart is provided for illustrative purposes.

As of March 31, 2021, 185 constituents were included in the S&P 500 Equal Weight ESG Leaders Select Index, totaling 62.5% of the benchmark’s index weight.

Exhibit 9: Reasons for Exclusion from the S&P 500 Equal Weight ESG Leaders Select Index

REASON FOR EXCLUSION	NUMBER OF EXCLUSIONS	WEIGHT IN S&P 500 EQUAL WEIGHT INDEX (%)
Not Part of the Top 40% of Industry Group Constituent Count	187	36.96
Exclusions Due to Business Activities	151	29.72
S&P DJI ESG Score in Bottom 25% of Industry Group Globally	45	8.92
Company Not Covered	4	0.82
Not Eligible Due to MSA Case	3	0.59
Low UNGC Score	2	0.34

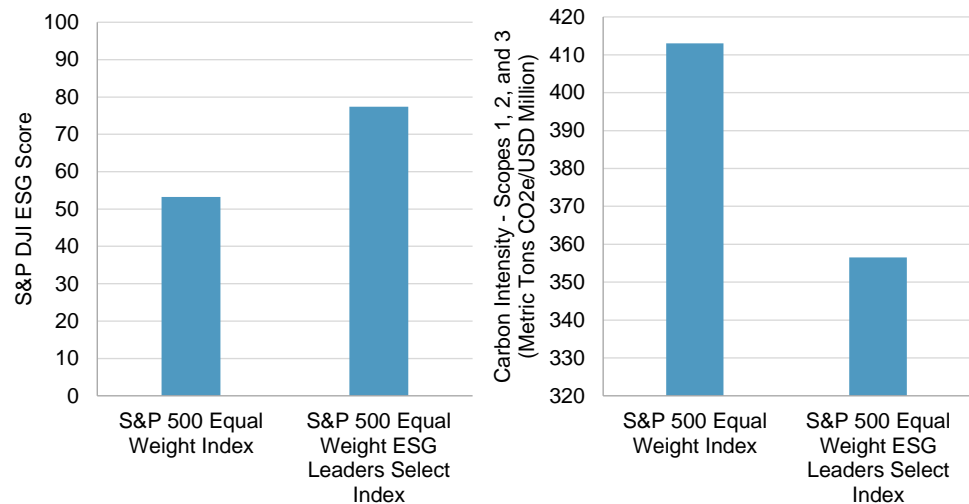
Source: S&P Dow Jones Indices LLC. Data as of March 31, 2021. Table is provided for illustrative purposes.

ESG IMPROVEMENTS

From an ESG standpoint, there were large improvements in both the S&P DJI ESG Score and carbon intensity⁶ at the index level, meaning the stocks selected for inclusion in the S&P 500 Equal Weight ESG Leaders Select Index simultaneously achieved a stronger ESG profile and lower carbon footprint (see Exhibit 10).

There were large improvements in both the S&P DJI ESG Score and carbon intensity at the index level.

Exhibit 10: S&P DJI ESG Score and Carbon Intensity Improvements



Source: S&P Dow Jones Indices LLC. Data as of Oct. 1, 2021. Charts are provided for illustrative purposes.

We see higher exposure to companies with carbon reduction targets, gender and equal pay assessment, and reporting of material issues for company performance.

When digging further, we see substantial enhancements in granular metrics such as higher exposure to companies with carbon reduction targets, gender and equal pay assessment, and reporting of material issues for company performance (see Exhibit 1).

FACTOR EXPOSURES

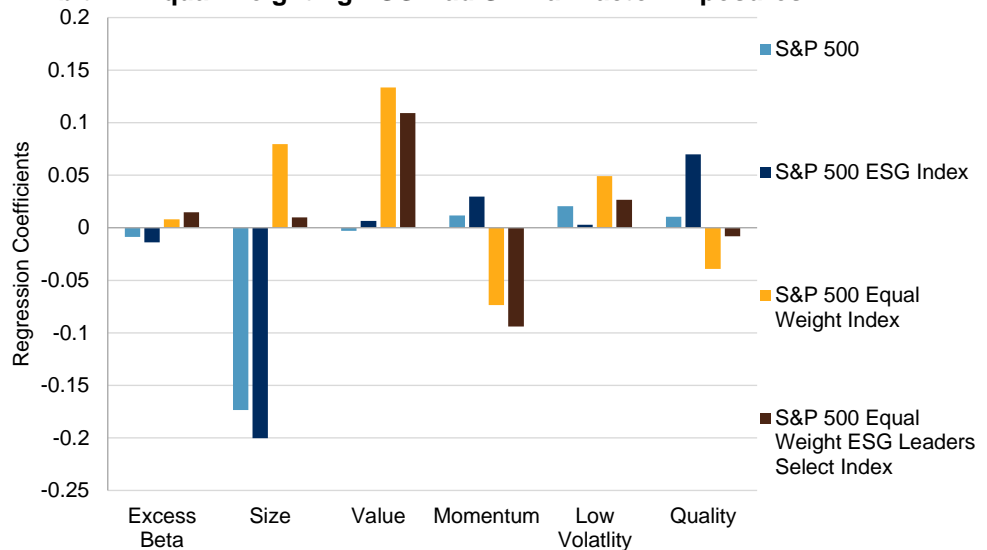
To identify factor exposures, we ran an attribution model (as specified in Appendix 2) to determine the sources of return to six factors: market beta, small size, value, momentum, low volatility, and quality,⁷ using monthly data from April 30, 2010, to Aug. 31, 2021 (see Exhibit 11).

⁶ We define carbon intensity as Scope 1 + Scope 2 + Scope 3 emissions/enterprise value including cash (EVIC).

⁷ We use the market, risk-free rate, size, and value factor exposures from the Fama-French three factor model, momentum from the Carhart model, and the AQR low volatility and quality factors. These can be seen in Appendix 2 and the factor returns come from the Kenneth French Data Library (French, Data Library, 2021) and the AQR Data Sets Library (AQR, 2021).

Exhibit 11: Equal Weighting ESG Had Similar Factor Exposures

The S&P 500 Equal Weight ESG Leaders Select Index had similar factor exposures to the S&P 500 Equal Weight Index.



Source: S&P Dow Jones Indices LLC. Monthly data from May 2010 to August 2021. The data including levels of significance behind this chart can be seen in Appendix 3. To aid visualization, we present “Excess Beta,” which is the beta coefficient minus 1. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

There was slightly less exposure to smaller names within the ESG variation, but still enough to gain the small size benefit.

We observe that the S&P 500 Equal Weight ESG Leaders Select Index had similar factor exposures to the S&P 500 Equal Weight Index. As expected, we see higher exposures to small size and value relative to the S&P 500 and S&P 500 ESG Index, along with “anti-momentum.”⁸

When comparing the two equally weighted variants, the only significantly different ($p < 0.01$) factor exposure between the S&P 500 Equal Weight Index and S&P 500 Equal Weight ESG Leaders Select Index was small size, of which there was slightly less exposure to smaller names within the ESG variation (see Appendix 2). There was, however, still significantly more small size exposure than in either the S&P 500 or S&P 500 ESG Index, thus still gaining this small size benefit.

When equally weighted indices outperform, it mostly appears to be determined by its factor, rather than sector, exposures.

Our [U.S. Equal Weight Sector Dashboard](#) has a beautifully simple chart, showing the 12-month rolling excess return between the S&P 500 Equal Weight Index and S&P 500. This illustrates when equally weighted indices outperform, which mostly appears to be determined by its factor, rather than sector, exposures.⁹ If the S&P 500 Equal Weight ESG Leaders Select Index can replicate the desired properties of equal-weight indices, we would expect to see a similar pattern of excess return against their market-cap-weighted peers—an observation proved true in practice.

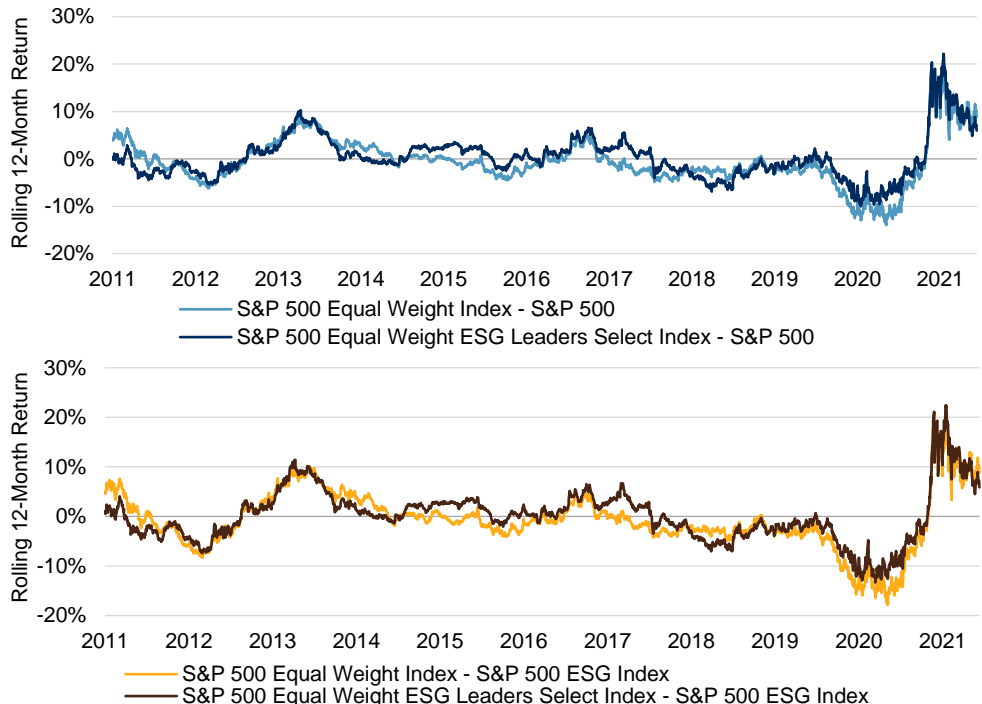
⁸ Edwards, Lazzara, Preston, and Pestalozzi (2018) show “anti-momentum” of equally weighted indices, due to the index construction. Previous winners and losers receive the same weight—different from momentum strategies, where strategies often buy winners and sell losers. Ganti (2021) shows further evidence.

⁹ Edwards, Lazzara, Preston, and Pestalozzi (2018) show outperformance is largely driven by equally weighting within sectors, rather than sector deviations.

We see strong similarities in the pattern of excess return of equally weighted indices against their cap-weighted counterparts.

As we can assess the excess return either relative to the S&P 500 (U.S. large-cap stocks) or the S&P 500 ESG Index (ESG-compliant U.S. large-cap stocks),¹⁰ we provide the rolling 12-month excess return of both vanilla and ESG equally weighted indices against both vanilla and ESG cap-weighted indices. We see strong similarities in the pattern of excess return (see Exhibit 12) of equally weighted indices against their cap-weighted counterparts—perhaps unsurprising, given the similarity in factor exposures (see Exhibit 11).

Exhibit 12: 12-Month Rolling Excess Return of Equally Weighted Minus Cap-Weighted Indices



This is perhaps unsurprising, given the similarity in factor exposures.

Source: S&P Dow Jones Indices LLC. Data from April 28, 2011, to Oct. 6, 2021. Index performance based on daily total return in USD. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

S&P DJI ESG SCORES AND SIZE EXPOSURE

While the index showed more exposure to small size than the market-cap weighted version, it had less small size exposure relative to the S&P 500 Equal Weight Index.

While the S&P 500 Equal Weight ESG Leaders Select Index showed significantly more exposure to small size than the market-cap-weighted index, it had less small size exposure relative to the vanilla S&P 500 Equal Weight Index. Why does this occur?

Large companies tend to achieve higher S&P DJI ESG Scores, a phenomenon generally observed with ESG scores.¹¹ This lean toward

¹⁰ For more information, see “[S&P 500 ESG Index: Defining the Sustainable Core](#)” or Appendix 3.

¹¹ Drempetic, S., Klein, C., and Zwergel, B. (2019). The Influence of Firm Size on the ESG Score: Corporate Sustainability Ratings Under Review. *Journal of Business Ethics*.

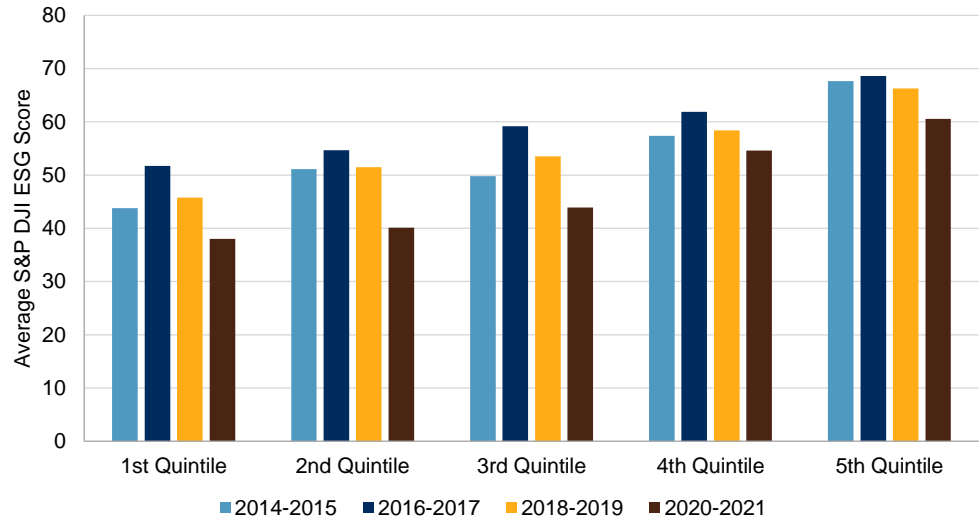
Large companies tend to achieve higher S&P DJI ESG Scores, a phenomenon generally observed with ESG scores.

larger companies within S&P DJI ESG Scores¹² is statistically significant ($p < 0.01$ across all time periods tested in Exhibit 12) and persistent. We can show this (see Exhibit 13) by breaking down the S&P 500 universe into size quintiles, from smallest to largest, and taking the average S&P DJI ESG Score of each quintile. We see a trend toward large companies scoring more highly than small companies, which is true over multiple time periods.

As a result of the size exposure present within S&P DJI ESG Scores, applying them within the S&P 500 Equal Weight ESG Leaders Select Index ultimately leads to a slight tilt toward companies with larger market cap than what has been historically exhibited in the S&P 500 Equal Weight Index. There is, however, much more information in the S&P DJI ESG Score than size, which only explains 6%-10% of score variance, leaving much of the scores to be determined by the sustainability of companies, rather than their size.

This lean toward larger companies within S&P DJI ESG Scores is statistically significant and persistent.

Exhibit 13: Mean S&P DJI ESG Score of Size Quintiles within the S&P 500



Source: S&P Dow Jones Indices LLC. Data from April 1, 2014, to April 1, 2021. Chart is provided for illustrative purposes.

This leads to a slight tilt toward companies with larger market cap than what has been historically exhibited in the S&P 500 Equal Weight Index.

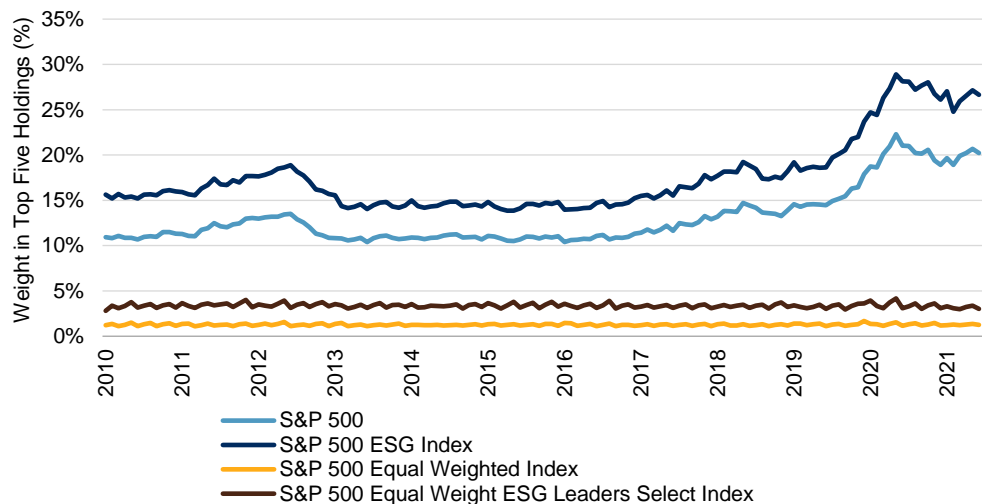
¹² Size is defined as the standardized natural logarithm of the market cap. The market cap is as of the first business day in April of the relevant year the S&P DJI ESG Score would be effective.

CONCENTRATION REDUCTION

Asset pricing theory teaches us that stock-specific risk can be reduced through diversification.

Asset pricing theory teaches us that stock-specific risk can be reduced through diversification in order to reduce portfolio level volatility. Concentration risks can occur within the S&P 500, where market-cap weights tend to be heavily skewed to the right—a common characteristic across markets. By equally weighting, the concentration in a handful of names is reduced significantly. While the S&P 500 Equal Weight ESG Leaders Select Index does not see quite such low weight in the top five holdings as the S&P 500 Equal Weight Index due to the lower stock count, it is still vastly improved compared with the S&P 500 or S&P 500 ESG Index (see Exhibit 14).

Exhibit 14: Cumulative Weight of the Largest Five Holdings



Concentration risks can occur within the S&P 500, where market-cap weights tend to be heavily skewed to the right.

Source: S&P Dow Jones Indices LLC. Monthly data from April 30, 2021, to Sept. 30, 2021. Chart is provided for illustrative purposes.

CONCLUSION

The S&P 500 Equal Weight ESG Leaders Select Index is a best-in-class ESG index that has largely maintained the desirable characteristics of equal-weight indices—size and value exposure—versus market-cap weighting, with a healthy dose of concentration reduction. We saw large ESG improvements, as measured by S&P DJI ESG Scores, as well as improvements in carbon footprint and many more granular ESG key performance indicators.

By equally weighting, the concentration in a handful of names is reduced significantly.

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APPENDICES

Appendix 1: Exclusions

Exhibit 15: S&P Equal Weight ESG Leaders Select Indices Exclusions¹³

Arctic Oil & Gas Exploration	Pesticides
Alcoholic Beverages	Riot Control
Cannabis	Shale Energy
Controversial Weapons	Small Arms
Genetically Modified Plants & Seeds	Thermal Coal
Gambling	Tobacco
Military Contracting	Low UNGC Score
Nuclear Power	Media & Stakeholder Analysis (MSA) Case
Oil & Gas	Bottom 25% Industry Group S&P DJI ESG Score
Oil Sands	Oil & Gas Storage & Transportation GICS Sub-Industry
Palm Oil	-

Source: S&P Dow Jones Indices LLC. Table is provided for illustrative purposes

Exhibit 16: Reasons for Exclusion from the S&P 500 Equal Weight ESG Leaders Select Index

REASON FOR EXCLUSION	NUMBER OF EXCLUSIONS	WEIGHT IN S&P 500 EQUAL WEIGHT INDEX (%)
Not Part of the Top 40% of Industry Group Constituent Count	187	36.96
S&P DJI ESG Score in Bottom 25% of Industry Group Globally	45	8.92
Involved in Oil & Gas	45	8.59
Involved in Military Contracting	21	4.27
Involved in Thermal Coal	17	3.49
Involved in Controversial Weapons	12	2.46
Involved in Nuclear Power	12	2.49
Involved in Tobacco Products	11	2.20
Involved in Shale Energy	10	1.78
Involved in Alcoholic Beverages	7	1.41
Involved in Gambling	5	0.88
Company Not Covered	4	0.82
Not Eligible Due to MSA Case	3	0.59
Involved in Oil & Gas Transportation and Storage	3	0.58
Low UNGC Score	2	0.34
Involved in Cannabis	2	0.39
Involved in Pesticides	2	0.40
Involved in Genetically Modified Plants & Seeds	1	0.20
Involved in Oil Sands	1	0.18
Involved in Palm Oil	1	0.21
Involved in Riot Control Weapons	1	0.21
Involved in Arctic Oil & Gas Exploration	0	0.00
Involved in Small Arms	0	0.00

Source: S&P Dow Jones Indices LLC. Data as of March 31, 2021. Table is provided for illustrative purposes. Constituents may be flagged according to multiple exclusion criteria; sums and weights may exceed totals.

¹³ For more information on exclusions, including business activities' revenue and ownership thresholds, please see the [S&P Equal Weight ESG Leaders Select Indices Methodology](#).

Appendix 2: Factor Sources and Attribution Model

Exhibit 17: Factor Sources

FACTOR	FACTOR EXPOSURE	SOURCE
Market	Market	Kenneth French Data Library
HML (High Minus Low)	Value	Kenneth French Data Library
SMB (Small Minus Big)	Size	Kenneth French Data Library
WML (Winners Minus Losers)	Momentum	Kenneth French Data Library
QMJ (Quality Minus Junk)	Quality	AQR Factor Library
BAB (Betting Against Beta)	Low Volatility	AQR Factor Library

Source: Kenneth French Data Library, AQR Factor Library. Table is provided for illustrative purposes.

The attribution model is specified as:

$$r_{it} - r_{ft} = \alpha_{it} + \beta_{im}(r_{mt} - r_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \beta_{iw}WML_t + \beta_{iQ}QMJ_t + \beta_{iB}BAB_t + \varepsilon_{it}$$

Where $r_{it} - r_{ft}$ is the excess return over the risk-free rate for index i at time t, α_{it} is alpha, $\beta_{im}(r_{mt} - r_{ft})$ is the index sensitivity to the market minus the risk-free rate, $\beta_{is}SMB_t$ is the index sensitivity to the small size factor, $\beta_{ih}HML_t$ is the index sensitivity to the value factor, $\beta_{iw}WML_t$ is the index sensitivity to the momentum factor, $\beta_{iQ}QMJ_t$ is the index sensitivity to the quality factor, $\beta_{iB}BAB_t$ is the index sensitivity to the low volatility factor, and ε_{it} is the model error.

Exhibit 18: Factor Regression Model Output Using Fama-French Market Factor

DATA POINT	S&P 500	S&P 500 ESG INDEX	S&P 500 EQUAL WEIGHT INDEX	S&P 500 ESG EQUAL WEIGHT INDEX
Alpha	0.0001	-0.0006	0.0013	0.0012
Beta	0.9913***	0.9861***	1.0081***	1.0148***
Small Size	-0.1734***	-0.2003***	0.0796***	0.0099
Value	-0.003	0.0066	0.1335***	0.1092***
Momentum	0.0116	0.0296*	-0.0736***	-0.0939***
Low Volatility	0.0204**	0.0027	0.0490**	0.0267
Quality	0.0105	0.0697**	-0.0392	-0.0081
Number of Observations	136	136	136	136
Adjusted R-Squared	0.9961	0.9902	0.9818	0.9683

Source: S&P Dow Jones Indices LLC. Data as of Aug. 31, 2021. * p value < 0.10. ** p-value < 0.05. *** p-value < 0.01. Table is provided for illustrative purposes.

Exhibit 19: Factor Regression Model Output – S&P 500 Equal Weight Index as the Market Factor

DATA POINT	500 ESG EQUAL WEIGHT INDEX
Alpha	0
Beta	1.0028***
Small Size	-0.0675***
Value	-0.0253
Momentum	-0.0215
Low Volatility	-0.0222
Quality	0.0275
Number of Observations	136
Adjusted R-Squared	0.9819

Source: S&P Dow Jones Indices LLC. Data as of Aug. 31, 2021. * p value < 0.10. ** p-value < 0.05. *** p-value < 0.01. Table is provided for illustrative purposes.

Appendix 3: S&P 500 ESG Index Construction

The S&P 500 ESG Index leverages the S&P DJI ESG Scores and is part of our sustainable core index offering. The index is rebalanced on an annual basis, after the close of trading on the last business day of April.¹⁴

The index methodology was developed with two objectives.

- To provide a similar risk/return profile to the S&P 500; and
- To avoid companies that are not managing their businesses in line with ESG principles, according to the S&P DJI ESG Scores and other relevant ESG data, while including companies that are doing so.

EXCLUSIONS

Companies are eliminated that:

- Have an S&P DJI ESG Score that is in the bottom 25% of scores within their GICS industry group in the S&P Global LargeMidCap and S&P Global 1200;
- Extract or generate electricity from thermal coal accounting for greater than 5% of their revenue;
- Produce tobacco, derive more than 10% of their revenue from tobacco-related products and services, or hold more than a 25% stake in a company involved in these activities;
- Are involved in controversial weapons;
- Are involved in controversies based on the S&P Global MSA; or
- Have a UNGC score that is in the bottom 5% of scores in the eligible universe.

CONSTITUENT SELECTION AND WEIGHTING

Once the exclusions are made, the index constituents are selected in the following manner.

1. Companies are ranked by their S&P DJI ESG Score.
2. Within each GICS industry group, companies are selected from the top down by S&P DJI ESG Score to target 75% of the float-adjusted market capitalization of the original S&P 500 GICS industry group.

The index constituents are then weighted by their float-adjusted market capitalization.

¹⁴ Please see the [S&P ESG Index Series Methodology](#) for more information on the S&P 500 ESG Index.

Exhibit 20: The S&P 500 Index Methodology Summary

Objective: To target 75% of the market capitalization within each GICS industry group of the S&P 500, using the S&P DJI ESG Score.

Step 1:

Exclude companies involved in thermal coal, tobacco, or controversial weapons, or with a low UNGC score.

Step 2:

Exclude companies with S&P DJI ESG Scores in the bottom 25% of their GICS industry group globally.

Step 3:

Within the S&P 500, sort the remaining companies by their S&P DJI ESG Scores within each GICS industry group.

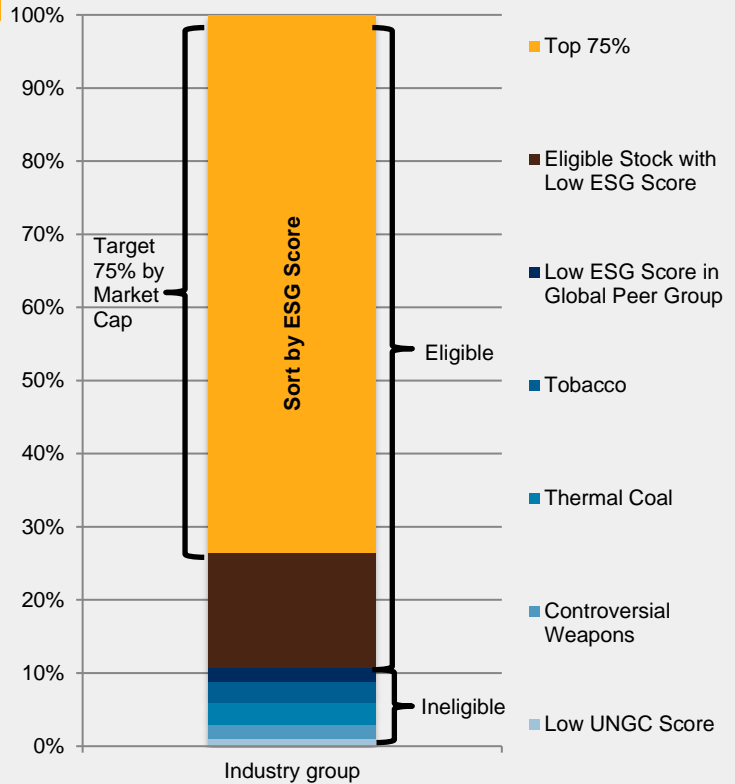
Step 4:

Starting from the company with the highest S&P DJI ESG Score, select companies for inclusion from the top down, targeting 75% of the GICS industry group.

Step 5:

Weight companies by float-adjusted market capitalization.

Index Construction Example



Source: S&P Dow Jones Indices LLC. Chart is provided for illustrative purposes.

PERFORMANCE DISCLOSURE/BACK-TESTED DATA

The S&P 500 Equal Weight Index was launched January 8, 2003. The S&P 500 Equal Weight ESG Leaders Select Index was launched October 4, 2021. The S&P 500 ESG Index was launched January 28, 2019. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at www.spglobal.com/spdji. Past performance of the Index is not an indication of future results. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results. Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations. Back-tested performance is for use with institutions only; not for use with retail investors.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate S&P DJI's ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the [FAQ](#). The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used.

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