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Responsible Investing: What's the Difference Between Screens and Integration?

Responsible investing covers a diverse set of priorities. Yet when it comes to portfolio-construction techniques used to reflect these considerations, investors really have only two distinct methods to choose from—screens and integration (also referred to as a tilt).¹ Both can enhance a portfolio's ESG characteristics, but they're quite different in terms of implementation and impact.

A screen limits the companies in a portfolio to a subset of the eligible investment universe that meets specific ESG criteria, and it contains no guidance on portfolio weights. Integration reweights the eligible universe to reflect each company's ESG qualities but doesn't necessarily remove any securities from consideration. Portfolios may be constructed using just one of these methods, or a combination of the two may better achieve the investor's objective.

There may be specific scenarios where it's preferable to use a screen versus integration and vice versa. Screens are better suited for mandates in which the ESG criteria are of primary importance and the list of acceptable investments must be delineated very precisely. On the other hand, integration is useful when controlling portfolio impact is the primary concern and there's flexibility in the acceptable ESG characteristics of the holdings.

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¹ *Portfolio construction* refers to selecting and weighting constituents for a portfolio. This is separate from the company valuation process, where the traditional, and most common, concept of integration has applied. In this form of integration, investors adjust forecasted financials, such as revenue, operating cost, asset book value, and capital expenditure, or company valuation models, including the dividend discount model, the discounted cash-flow model, and adjusted present value model, for the expected impact of ESG issues. In contrast, quantitative integration operates by influencing a stock's weight in the portfolio rather than estimating its intrinsic value. In this sense it's actually a portfolio-construction technique. However, for ease of reference, we omit the modifier and simply refer to this as *integration*. For more information, see UN Principles for Responsible Investment, "A Practical Guide to ESG Integration for Equity Investing" (2016): <https://www.unpri.org/listed-equity/a-practical-guide-to-esg-integration-for-equity-investing/10.article>.

Screen

An ESG screen essentially divides the eligible investment universe so companies with acceptable business involvement or behaviors remain and those with objectionable characteristics are excluded. For example, if the investor wishes to hold only companies that meet certain ESG criteria, and none that don't, a screen is most appropriate. The eligible investment universe could be stocks that meet return expectations, in the case of an active manager, or stocks contained in an index, in the case of a passive manager.

To make a screen operational, the investor must specify a metric and a threshold of acceptability. For example, the investor may decide that companies that pass the screen are those with no evidence of fossil-fuel reserves, less than 20% of revenues from selling alcohol, and more than two women on the board of directors. Many mandates require the use of multiple screens in combination.

In addition to typical issues such as tobacco or alcohol production, investors can use ESG screens to address concerns surrounding topics such as environmental protection, social justice, or fair governance. And investors can define a given issue in multiple ways. As a result of this flexibility, the range of ESG screens is nearly endless. While this makes them ready tools for highly specified responsible-investing criteria, they require clearly articulated parameters to incorporate them into a portfolio.

The result of a screen is a list of securities that pass the specified criteria and can be used to build the final portfolio. In the case of multiple criteria, securities must pass all the screens to remain eligible for investment. The resulting list is simply that—a list of companies. It doesn't assign weights to any of the securities that pass, and it doesn't indicate whether a company's characteristics are well above the screen threshold or just barely above it.

For example, in a list of companies that pass a screen for at least two women on the board, a company with two women won't appear as being different from a company with 10. Both may be included in a portfolio, and their weight will be decided in a separate process from the screen that may not necessarily depend on the exact number of women on the board.

Integration

At Parametric, *integration* refers to a quantitative process that uses company-level ESG characteristics to select *and* weight portfolio holdings. This process generally strives to overweight companies with better ESG characteristics and underweight those with worse ones, but it's not designed to necessarily omit any securities outright, as a screen does.

To create a portfolio using integration, investors can use a wide variety of metrics, which would be combined into a single metric for the purposes of integration. Integration also requires a set of constraints, which serve to balance the desire to hold stocks with the best ESG characteristics with the need to maintain broad portfolio characteristics. As such, they're typically based on limiting differences relative to a non-ESG portfolio, either index based or actively managed.

Examples of constraints include limiting tracking error or controlling security, sector, or fundamental factor differences versus a reference benchmark (such as a market-cap-weighted index). The choice of constraints can lead to a significant difference in the outcomes. For example, an integrated strategy that constrains only sector deviations and one that constrains sectors and fundamental factor exposures will both achieve the goal of emphasizing stocks with stronger ESG characteristics but are likely to result in a very different set of holdings and weights. It's likely that the strategy with more constraints will track more closely to the reference benchmark.

The result of integration is a list of securities and associated weights that can be used as an investable portfolio. Note that in this integrated approach, ESG characteristics are viewed on a relative rather than absolute basis. That is, the inclusion of each security is based on comparing its ESG characteristics to other potential investments, selecting those that best satisfy both the ESG criteria and the constraints, and then weighting each security accordingly.

Figure 1: Screen versus integration



Market-cap-weighted portfolio

Consists of a mix of companies with acceptable and unacceptable business involvement or behavior.



Integrated portfolio

Uses ESG characteristics to select and weigh companies, both acceptable and unacceptable and subject to constraints, to maintain a diversified exposure.



Screened portfolio

Reconfigures the eligible investment universe to remove companies with objectionable characteristics and invests only in those with acceptable ones.

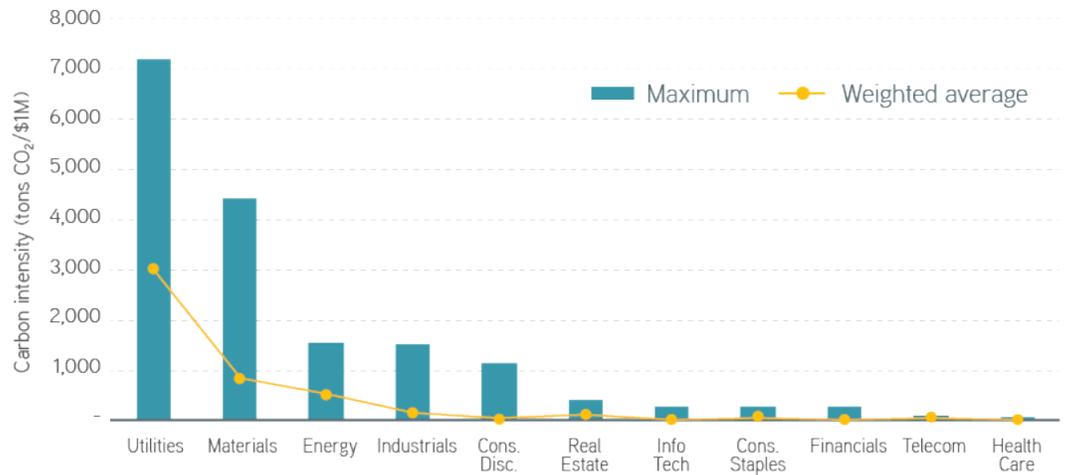
An illustrated example: carbon emissions

For the purposes of illustration, carbon emissions are an ESG metric that can be sensibly incorporated using either a screen or integration. That is, carbon emissions aren't typically controversial enough that investors would balk at the inclusion of some of the poorer-performing companies, but it's also still possible to determine an intuitive threshold for a screen. In this case we use carbon intensity, which is simply a company's carbon emissions divided by its revenues. This helps us avoid penalizing companies simply because they're larger and have a greater economic footprint.

The average carbon intensity of public companies in the S&P 500® Index is 191 tons of carbon dioxide per \$1 million in revenue, but, as might be expected, this varies considerably by sector. As figure 2 shows, companies with higher-than-average carbon intensity can be found in the utility, materials, energy, and industrials sectors. But utilities are notably worse than any other sector on this measure.²

² Carbon intensity is based solely on current consumption of carbon and not on ownership of carbon for future use (such as fossil fuel reserves). This is of particular relevance to energy companies that consume energy to extract and transport coal, oil, and gas to market. But only their actual consumption of energy in this process contributes to their carbon emissions, not any ownership of the coal, oil, or gas they sell or retain to sell later.

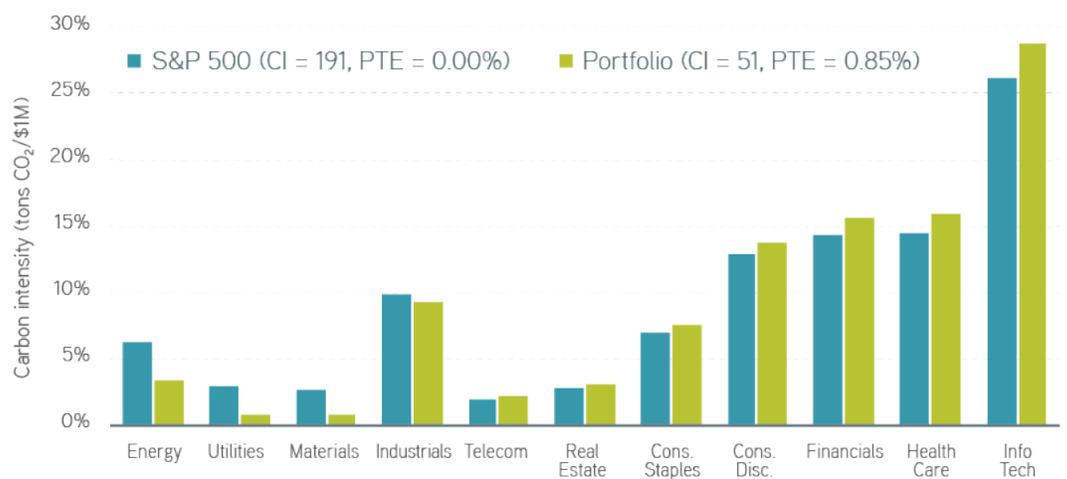
Figure 2: Average and maximum carbon intensity of S&P 500 constituents by sector



Source: Parametric, MSCI ESG Research, S&P Dow Jones Indices, 2018. Data is provided for illustration purposes only; it is not a recommendation to buy or sell any security or adopt any investment strategy.

In our example, we first consider the impact of a carbon intensity screen using a threshold of 500 tons of carbon dioxide (CO₂) per million dollars in revenue. Under this screen, companies with a carbon intensity higher than the threshold fail the screen and aren't eligible for inclusion in the final portfolio. For simplicity, we market-cap-weight all the S&P 500 members that pass. The average carbon intensity of the screened portfolio is 51 tons of CO₂ per \$1 million, which is a reduction of 73% compared with the index, with a predicted tracking error of 0.85%. Figure 3 shows that the portfolio has a clear underweight to utilities, materials, energy, and industrials and is overweight the other sectors.

Figure 3: Screened portfolio weight by sector

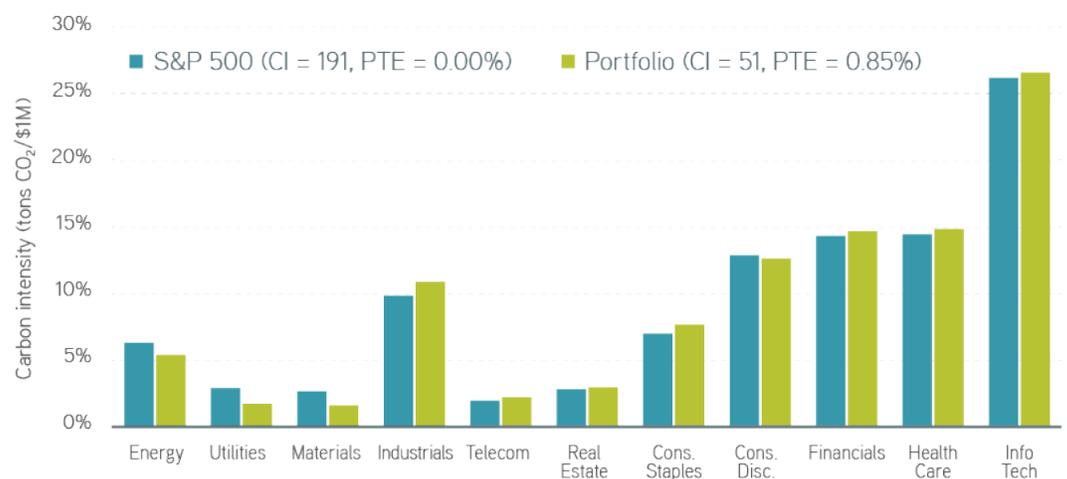


Source: Parametric, MSCI ESG Research, S&P Dow Jones Indices, 2018. Data is provided for illustration purposes only; it is not a recommendation to buy or sell any security or adopt any investment strategy.

We then consider the impact of incorporating carbon intensity into the portfolio via integration. In this case we attempt to overweight less-polluting companies and underweight the others in proportion to their carbon intensity. It's this proportionality that distinguishes integration from screens. Of course, a screened portfolio also overweights the least-polluting companies and underweights the most polluting. The difference with a screen is that it simply overweights all the companies that pass the screen by the same amount and zero-weights all those that fail. In contrast, the integrated portfolio tries to overweight the lowest emitter more than the second-highest emitter and so forth, subject to diversification constraints.

In our integrated portfolio all members of the S&P 500 Index are eligible for investment, and we constrain security, industry, sector, and fundamental factor biases relative to the original market-cap-weighted index.³ We can construct an integrated portfolio with the same carbon intensity as the screened portfolio (51 tons of CO₂ per \$1 million) but with lower predicted tracking error (0.50%) and less pronounced differences in sector weights. This is shown in figure 4.

Figure 4: Integrated portfolio weight by sector



Source: Parametric, MSCI ESG Research, S&P Dow Jones Indices, 2018. Data is provided for illustration purposes only; it is not a recommendation to buy or sell any security or adopt any investment strategy.

³ We use security constraints that allow weights to drop to zero (we don't force the portfolio to hold any names) and allow the portfolio to overweight up to two times the original benchmark weight. We've found this to be an effective way to achieve portfolio-level improvement in the desired environmental, social, or governance metric while still producing acceptable tracking error. Forcing the portfolio to hold all companies in the benchmark or choosing a different allowed upper bound would result in different average carbon intensity and predicted tracking error than those shown in this paper.

In the two scenarios presented above, both the screen and integration techniques lowered the portfolio's average carbon intensity by the same amount but did so with a different set of final holdings. To reinforce this point, we performed the same exercise with less restrictive versions of the carbon intensity screen. (Remember, the higher the threshold for carbon intensity, the higher a company's intensity is allowed to be, and the less restrictive the screen is.) For each screened portfolio we present an integrated portfolio that targets a similar level of carbon intensity. In each scenario the integrated portfolio achieves an equivalent reduction in carbon intensity with a lower predicted tracking error, while the screen was able to ensure all securities in the portfolio met a certain level of acceptable emissions. This is summarized in figure 5.

Figure 5: Screened and integrated portfolio characteristics

Screened approach				Integrated approach		
Fail criteria (tons of CO ₂ per \$1 millón)	Average carbon intensity	Predicted tracking error	Number of securities	Average carbon intensity	Predicted tracking error	Number of securities
> 3,000	116	0.26%	485	116	0.12%	452
> 1,000	85	0.39%	469	116	0.22%	424
> 500	51	0.85%	439	51	0.50%	350

Source: Parametric, MSCI ESG Research, S&P Dow Jones Indices, 2018. Data is provided for illustration purposes only; it is not a recommendation to buy or sell any security or adopt any investment strategy.

Additionally, because of the constraints we used, the lower the average carbon intensity, the lower the number of securities in both the screened and the integrated portfolio. Interestingly, the integrated portfolio actually owns fewer securities in each case. This occurs because we didn't force the integrated portfolio to own all the benchmark constituents. High-carbon-emitting companies that weren't needed from a diversification purpose could be dropped entirely.

However, to be clear, these aren't the same securities the screen removes. For example, in the most stringent scenario, targeting average intensity of 51 tons of CO₂ per \$1 million, the integrated portfolio owns nine companies that fail the screen threshold of 500 tons of CO₂ per \$1 million. In the least stringent scenario, targeting average intensity of 116 tons of CO₂ per \$1 million, the integrated portfolio owns several utilities that are among the 20 worst emitters in the S&P 500 and fail the screen threshold of 3,000 tons of CO₂ per \$1 million. To certain investors, this may be unacceptable. Yet it's this flexibility to select from any constituents in the investment universe that help the integrated portfolio minimize tracking error.

Conclusion

Screens and integration are essential yet distinct portfolio-construction tools for socially responsible investors. Screens are best for investors for whom the ESG criteria are primary and tracking error is a secondary consideration. Integration can be useful for investors who are particularly sensitive to tracking error but can be flexible about which securities are included in their portfolio. In certain cases the combination of integration and screens may yield a superior solution than one derived by applying either on its own. By assessing their sensitivity to tracking error, flexibility around ESG criteria, and the nature of the metrics used, investors can begin to determine the portfolio-construction approach that best matches their responsible-investing objectives.

Disclosure

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