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

Responsible investing is a strategy and practice to incorporate environmental, social, and governance (ESG) information in investment decisions and active ownership.<sup>1</sup> This is the definition used by the United Nations Principles for Responsible Investment (UNPRI) and aligns with Parametric's thinking and approach. One area of work, *ESG incorporation*, involves considering ESG issues when building a portfolio. The other area of work, *active ownership* or *stewardship*, involves trying to improve the ESG performance of the companies that make it into the portfolio.<sup>2</sup> These concepts are interconnected and lead to consequential decisions that can affect the performance of an investment portfolio, as well as real-world outcomes such as climate change or human rights.

This paper focuses on the first area of activity and tries to clarify two common incorporation techniques: *screening* and *integration*. Both are used to enhance the portfolio's overall ESG characteristics but are quite different in terms of implementation and outcomes. The term *integration* is particularly misunderstood: When the UNPRI first launched, integration was used to describe the use of ESG characteristics in a security valuation process. Since then the term has broadened to include quantitative approaches that reweight securities using ESG characteristics. These approaches are very different from security valuation in process and outcome, despite sharing the same name in UNPRI's nomenclature. Furthermore, any ESG incorporation, whether screens or integration, is a somewhat uneasy fit when the goal is *being* the market rather than *beating* the market. Although many investors have found ways to reconcile these conflicts, many may still look to active ownership as their primary responsible investing practice and try to use ESG incorporation quite sparingly, if at all.

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<sup>1</sup> "What is responsible investment?," United Nations Principles for Responsible Investment, accessed April 27, 2021, <https://www.unpri.org/an-introduction-to-responsible-investment/what-is-responsible-investment/4780.article>.

<sup>2</sup> In previous versions of this paper, we referred to "ESG incorporation" as "portfolio construction" and to "integration" as "tilting." We have fully adopted the UNPRI terminology at this point and no longer use those terms.

## Defining screens

Screens are arguably one of the most familiar and commonly used investment tools in the industry. They allow investors to focus on investments with desirable characteristics and are typically based on simple rules such as minimum yield, country of incorporation, or maximum price multiples. A screen identifies eligible investments but doesn't specify exactly which will make it into the portfolio or the weight at which they will be held.

An ESG screen simply expands the types of information that might be used for the rule—for example, revenue from clean energy, number of women on the board, carbon emissions, number of labor violations, or evidence of human rights abuses. Any given metric can be framed in different ways. In the example of carbon emissions, the screen could be based on absolute emissions, trend in emissions, peer-relative emissions, or emissions normalized by sales. Depending on the definition and threshold required for eligibility, the number and types of companies that pass a given screen can vary considerably. This makes screens both incredibly precise and quite flexible, and therefore they've become very popular with investors.

The result of the screen is a list of securities that can be used to build the final portfolio. In the case of multiple screens, securities must pass all of them in order to remain eligible for investment. The resulting list is just that: a list of companies. It doesn't assign weights to any of those that pass or indicate whether a company's characteristics are well above the 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 on the board is no different from a company with 10. Both may be included in the screened portfolio, and their weight will be decided in an entirely separate process that may not necessarily depend on the exact number of women on the board.

## Defining integration

As explained earlier, the term *ESG integration* is used in the industry to refer to very different investment processes. UNPRI offers a lengthy guide to help investors navigate these distinctions, which we summarize here for ease of reference.<sup>3</sup> The difference between the first one and the other three is quite clear. The differences between the last three are less clear and not necessarily commonly agreed upon, but we include them for completeness. We have marked "factor" in quotes, since the term is used by UNPRI but isn't the same as commonly recognized factors in the investment industry.

- *Fundamental or traditional*: This approach adjusts forecasted financials for the expected impact of ESG "factors."
- *Quantitative or systematic*: This approach constructs models that integrate ESG "factors" alongside commonly recognized factors such as value, size, or momentum.
- *Smart beta or factor investing*: ESG "factors" and scores can be used as a weight in portfolio construction to create excess risk-adjusted returns, reduce downside risk, or enhance portfolios' ESG risk profile.
- *Passive or indexing*: The overall ESG risk profile, or exposure to a particular ESG "factor," of passive investments can be reduced by adjusting index constituent weights.

<sup>3</sup> "Executive Summary," A Practical Guide for ESG Integration for Equity Investing, United Nations Principles for Responsible Investment, accessed April 27, 2021, <https://www.unpri.org/listed-equity/a-practical-guide-to-esg-integration-for-equity-investing/10.article>.

For the purposes of this paper, we use *integration* to refer to a quantitative process that uses company-level ESG characteristics to determine portfolio weights alongside other risk characteristics such as sector, geography, or fundamental factor. This process generally strives to overweight companies with better ESG characteristics and underweight those with worse ones in proportion to those characteristics. However, it has to balance that objective against other factors. For example, in a portfolio that’s trying to increase the average number of women on the board across its holdings, a company with 10 women would ideally be more overweighted than a company with two women. However, given the other factors driving the portfolio weights, the company with 10 women could actually end up being barely overweight or even underweight in the portfolio.

### How is integration different from screening?

The fundamental difference between integration and screening is that integration tries to take into consideration the degree of “goodness” of an ESG characteristic, as well as other factors, in the weighting decisions, while a screen simply and transparently determines “good” companies and doesn’t have any bearing on weighting. Unlike a screened portfolio, an integrated portfolio may invest in companies that have very objectionable ESG characteristics and might not necessarily overweight the best companies. This isn’t always an acceptable outcome for many investors. However, although integration does not intentionally omit any securities outright, as a screen would, it might end up choosing a weight of zero in order to achieve the desired ESG enhancement, which would make the end effect no different from a screen.

The other key difference between screens and integration is how separate ESG characteristics are handled. In a screened approach, these can easily be addressed through separate screens with specific criteria for each. But it’s more practical in integration to combine multiple ESG metrics of interest into a single composite variable that the investor can try to maximize while controlling for overall portfolio risk characteristics. This requires very careful consideration about how to create the composite metric and how it will interact with the other balancing risk characteristics. This multifaceted process can lead to undesirable outcomes if it isn’t understood or managed well.

Figure 1: Screen versus integration



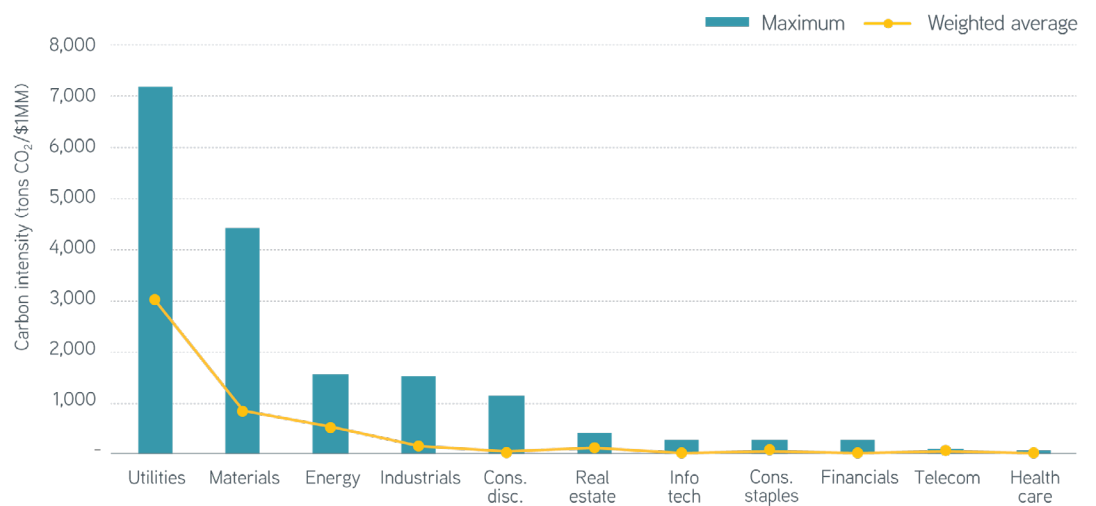
### Example: Carbon emissions

For the purposes of illustrating the difference between a screen and integration, we selected a metric that an investor could sensibly incorporate using either approach: carbon emissions. This issue isn’t typically controversial enough that investors would balk at the inclusion of some of the poorer-performing companies, and it’s possible to determine a clear threshold of acceptability that could be used for a screen. For our analysis, we use carbon intensity, which is simply a company’s carbon emissions normalized by revenues, and measure it as tons per \$1 million in revenue. This helps avoid penalizing companies simply because they’re larger and have a greater economic footprint.

For our scenarios, we selected the S&P 500® and the MSCI EAFE indexes as our target exposure. The target exposure defines the initial eligible investment universe as well as desired risk characteristics. In the screened portfolios, we attempted to minimize tracking error relative to the target via an optimization process. This is different from the approach taken in previous versions of this paper, in which we formed the final screened portfolio without any optimization.

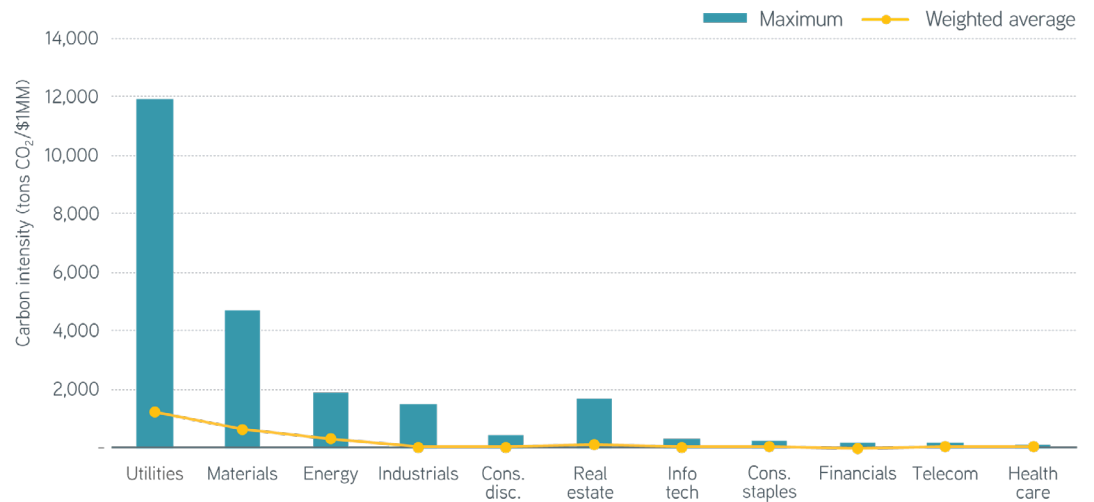
For context, the average carbon intensity is 151 for the S&P 500® and 134 for the MSCI EAFE. This of course varies considerably by sector. As figure 2 shows, companies with higher-than-average carbon intensity can be found in the utilities, materials, energy, and industrials sectors. Utilities are notably worse than the other sectors, particularly in the S&P 500®. Note that carbon intensity for the energy sector is based solely on the consumption of energy to extract and transport fossil fuels to market, not on ownership of the fossil fuels themselves.

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



Sources: Parametric, MSCI ESG Research, S&P Dow Jones Indices, 12/1/2020. For illustrative purposes only. Not a recommendation to buy or sell any security.

Figure 3: Average and maximum carbon intensity of MSCI EAFE constituents by sector



Sources: Parametric, MSCI ESG Research, S&P Dow Jones Indices, 12/1/2020. For illustrative purposes only. Not a recommendation to buy or sell any security.

We first ran three scenarios with screen thresholds of 500, 1,000, and 3,000. Because higher values are worse in this case, companies with a carbon intensity higher than the threshold fail the screen and aren't eligible for inclusion. For each screen scenario, we calculated the average carbon intensity and predicted tracking error if we simply market-cap-weighted the eligible securities, as well as if we optimized them to reduce sector and factor biases relative to the unscreened benchmark. In general, predicted tracking error was moderate, less than about 50 basis points (bps), for even the most restrictive scenarios and was reduced further via optimization. Additionally, the reduction in average carbon intensity was meaningful, about 20% to 60% for MSCI EAFE and about 30% to 70% for the S&P 500<sup>®</sup>. Interestingly, the reduction in carbon intensity was better under the market-cap-weighting approach than the optimized approach in all scenarios. This arises as the optimizer overweights companies with risk characteristics that are more similar to the companies that failed the screen.

We then ran three additional scenarios that attempted to match the average carbon intensity of the optimized screened portfolios under an integration approach for comparison. We used similar risk controls as the screened optimized scenarios and didn't explicitly try to minimize tracking error. However, the optimizer had full flexibility in selecting and weighting securities that best tried to minimize overall portfolio carbon intensity while providing benchmark-like risk characteristics. What we found was that the predicted tracking error was scarcely better than the screened optimized approach. What this tells us is that integration doesn't necessarily produce better ESG characteristics for a given unit of tracking error than if we used an optimization approach after applying a screen. We present the results in figure 4, which demonstrates that there's always a trade-off between the reduction in carbon intensity and the predicted tracking error, no matter which approach the investor takes.

Figure 4: Screened and integrated portfolio characteristics

S&P 500® Index-based simulation											
Fail criteria (carbon intensity)	Screened approach								Integrated approach		
	Market cap weighted				Optimized				Avg. carbon intensity	Predicted tracking error	Number of stocks
	Avg. carbon intensity	Reduction vs. benchmark	Predicted tracking error	Number of stocks	Avg. carbon intensity	Reduction vs. benchmark	Predicted tracking error	Number of stocks			
> 3,000	92	-39%	0.23%	486	103	-32%	0.12%	486	103	0.11%	484
> 1,000	56	-63%	0.44%	471	65	-57%	0.23%	449	65	0.21%	456
> 500	49	-68%	0.51%	451	58	-62%	0.28%	440	58	0.23%	450

MSCI EAFE Index-based simulation											
Fail criteria (carbon intensity)	Screened approach								Integrated approach		
	Market cap weighted				Optimized				Avg. carbon intensity	Predicted tracking error	Number of stocks
	Avg. carbon intensity	Reduction vs. benchmark	Predicted tracking error	Number of stocks	Avg. carbon intensity	Reduction vs. benchmark	Predicted tracking error	Number of stocks			
> 3,000	96	-28%	0.09%	886	104	-22%	0.19%	857	104	0.23%	853
> 1,000	76	-43%	0.19%	865	86	-36%	0.25%	834	86	0.25%	830
> 500	49	-63%	0.53%	823	63	-53%	0.40%	789	63	0.35%	773

Sources: Parametric, MSCI ESG Research, S&P Dow Jones® Indices, 12/1/2020. Data is provided for illustration purposes only; it is not a recommendation to buy or sell any security or adopt any investment strategy.

It's important to note that the number of stocks in the market-cap-screened approach represents all the securities that were eligible for investment after the screen was applied. As the screen threshold becomes more stringent, the number becomes lower, as expected. In the case of the optimized screened approach, the portfolio holds only securities with the desired risk characteristics that pass the screen, which may be lower than the number of eligible securities.

Similarly, although the integrated portfolio can theoretically own many more securities than the screened portfolio, in reality it seldom does. This is because it rarely needs all the securities for risk purposes, and the most expedient path to improving the portfolio's carbon profile is to underweight or completely drop the highest-emitting companies. To be clear, these aren't the same securities that the screen would remove. The integrated portfolios hold numerous high-emitting companies: The integrated S&P 500® portfolio holds 15 companies with carbon intensity greater than 3,000, including one with a carbon intensity of 6,400. The integrated MSCI EAFE portfolio holds 11 companies with a carbon intensity greater than 3,000, including one with a carbon intensity of 12,000. In some cases, particularly for especially sensitive ESG issues, this result would be unacceptable to the investor.

We point this out to address the common misconception that portfolios that eliminate certain companies altogether are bound to underperform due simply from restricting the opportunity set. The reality is far more complicated than that in our experience. Performance depends on which securities are eliminated, not the act of elimination itself—not to mention that the entire premise of stock picking is that of narrowing down the opportunity set to only the most favorable securities. Hardly anyone would argue that a portfolio with more securities will necessarily outperform one with fewer on that fact alone.

## Conclusion

Screens and integration are essential yet distinct ESG incorporation techniques, and integration is especially misunderstood, since the term is used in the industry for entirely different investment processes. Although many investors are attracted to the fact that quantitative integration doesn't necessarily omit any securities from the portfolio, the reality is that it's difficult to improve any portfolio's ESG characteristics without significantly underweighting or outright removing companies with the worst characteristics. In general, the more a portfolio differs from the benchmark on an ESG basis, the greater the predicted tracking error. Furthermore, many investors are in no mood to hold objectionable securities for the sake of reducing tracking error. In contrast, screens provide a precise and flexible way to control which companies are in the portfolio and improve its ESG characteristics, with optimization techniques that can provide equivalent risk controls to integration.

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