Quantitative Equities

Value investing: avoiding climate traps

- Conventional Value investing is exposed to climate traps
- Effective Value investing can combine high value exposure and low carbon footprint
- Decarbonized Value remains attractively valued

Investors often face a dilemma when they want to both decarbonize their portfolio and get exposure to the value factor. The reason is that conventional value strategies have high environmental footprints, including greenhouse gas (GHG) emissions. Common value strategies tend to be exposed to climate traps; stocks that look cheap but will face high carbon reduction costs or even lower valuations in the future due to continuous disinvestment risk.

To address this, Robeco developed a proprietary decarbonization methodology in 2019, resulting in a 'Decarbonized Value' approach. In this note, we demonstrate that our decarbonization methodology has proven effective in reducing carbon footprint without impacting exposure to the value factor. Evaluating the strong comeback of value over the past 2.5 years, we show conventional and decarbonized value yielded comparable performances despite a sizable energies rally. At the same time, the carbon footprint was substantially reduced. Furthermore, both conventional and decarbonized value approaches continue to trade at attractive valuation spreads, relative to growth stocks.

Article
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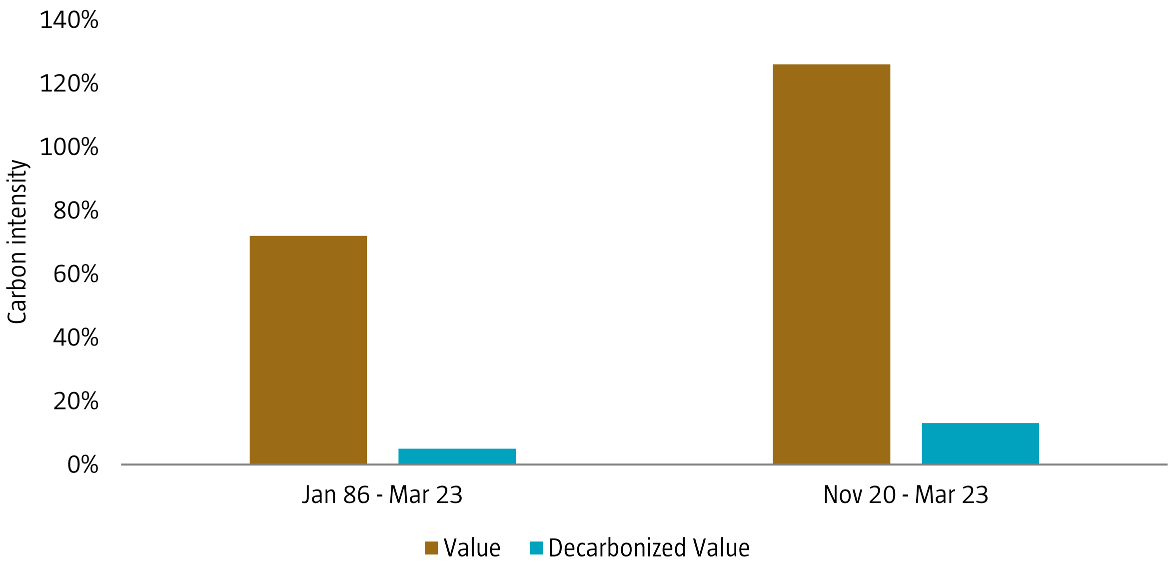
Climate traps in Value portfolios…

Our previous research[1] shows that conventional value strategies typically comprise many 'brown' companies. This is intuitive as value metrics are typically tilted towards asset-heavy sectors such as energy, materials and utilities. Unsurprisingly, the environmental footprints of these industries are high relative to other sectors when we look at GHG emissions, waste generation or water usage. However, firms with high footprints are likely to face increasing costs to offset footprints and are exposed to material sustainability risks. In fact, value strategies tend to be exposed to climate traps. Stocks may appear cheap compared to traditional valuation metrics, but this is essentially because costs related to environmental footprints are not well reflected in accounting numbers.

Also, if widescale sustainable investing policies, such as divestment and portfolio carbon footprint reduction, are effective, one can expect structurally lower valuations for high-footprint stocks. These stocks will become increasingly attractive based on simple value metrics, implying that such metrics may no longer be adequate. Therefore, effective value investing requires adjusting valuation models for these future carbon costs. Considering this, we designed an innovative methodology to derive a decarbonized value signal in 2019. This methodology adjusts the valuations of high-polluting firms, making them less attractive based on their environmental footprints and works, economically speaking, similarly to a pollution tax.[2]

Figure 1 | Carbon footprint for decarbonized and conventional Value: Global All Country (AC) universe



Source: Robeco, Refinitiv, Trucost. The graph shows the average and current carbon intensity of the highest value quintile portfolio minus the lowest value quintile portfolio as a percentage of the footprint of the equally-weighted universe for the conventional and decarbonized value composite. A positive number means value stocks have a larger footprint than non-value stocks. Carbon intensity is the total GHG emissions in tons of CO2 equivalent (tCO2eq) per one million USD revenues. The investment universe consists of all non-financial constituents of the MSCI Developed and Emerging Markets indices. The sample period is January 1986 to March 2023 (left) and November 2020 to March 2023 (right).

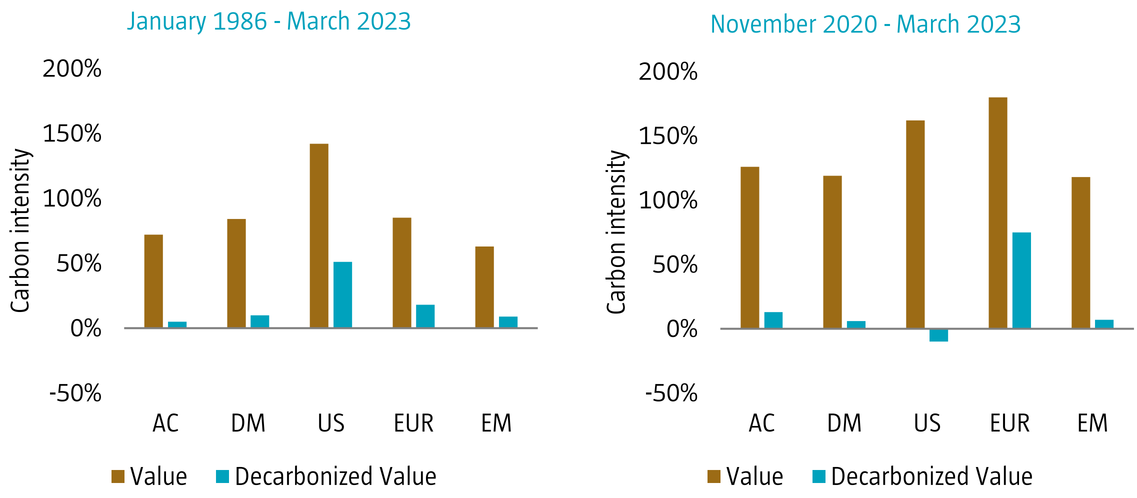
We start our analyses by showing the carbon footprint of conventional and decarbonized value strategies. To measure the carbon footprint of a value[3] strategy, we first rank all stocks in our universe on a valuation composite that we have also used in previous publications.[4] Next, we compute the carbon footprint of the value strategy as the footprint of the 20%

[1] Swinkels, L., Ūsaitė K., Zhou, W., and Zwanenburg, M., October 2019, "Decarbonizing the Value factor", Robeco article.
[2] Cf., Blitz, D., and Hoogteijling, T., April 2022, "Carbon-Tax-Adjusted Value", Journal of Portfolio Management
[3] We define value as in Blitz, D. C., and Hanauer, M. X., January 2021, "Resurrecting the value premium", Journal of Portfolio Management but do not impose region-sector or country neutralities. Details regarding the universe, value definition and carbon footprint computation are provided in the appendix.
[4] Cf., Hanauer, M. X., and Schneider, S., May 2021, "Spring has sprung for Value investing", Baltussen, G., Hanauer, M. X., Schneider, S., and Swinkels, L., September 2021, " What valuations and interest rates tell us about equity factors", or Hanauer, M. X, Baltussen, G., Blitz, D., and Schneider, S., November 2022, "Short-sightedness, rates moves and a potential boost for Value".

best value stocks minus the footprint of the 20% worst value stocks expressed as a percentage of the footprint of the benchmark.[5] This way, a positive number indicates that the best value quintile portfolio has a higher footprint than the worst value quintile portfolio, and a negative number indicates a lower footprint.

Figure 1 clearly shows that a conventional value portfolio has a high carbon footprint. On average, its footprint is 72% higher than the worst value quintile portfolio. Next, we create a decarbonized value composite by applying our decarbonization methodology to each of the valuation signals of the conventional value composite (recall that this effectively imposes a carbon tax on firms). This decarbonization has a huge impact on the carbon footprint of the value strategy as the footprint decreases from 72% to 5% for the full sample period. In other words, relative carbon footprints are virtually brought down to zero. We also repeat the analysis for the more recent period from November 2020 to March 2023. This period marks the strong comeback of the value factor and is also an out-of-sample test for our decarbonization methodology. Looking at the right-hand side of Figure 1 clearly shows that our decarbonization approach has also been effective over this more recent period. In other words, our decarbonization approach effectively reduced the carbon footprint of value strategies.[6]

Figure 2 | Carbon footprint for decarbonized and conventional Value for various regions



Source: Robeco, Refinitiv, Trucost. The graph shows the average and current carbon intensity of the highest value quintile portfolio minus the lowest value quintile portfolio as a percentage of the footprint of the equally-weighted universe for the conventional and decarbonized value composite for various regions. A positive number means value stocks have a larger footprint than non-value stocks. Carbon intensity is the total GHG emissions in tons of CO2 equivalent (tCO2eq) per one million USD revenues. The investment universe consists of all non-financial constituents of the MSCI Developed and Emerging Markets indices. The sample period is January 1986 to March 2023 (left) and November 2020 to March 2023 (right).

How does this hold across regions? Figure 2 shows the carbon footprint of conventional and decarbonized value strategies across major regions since 1986 (left-hand side chart) and since the value revival of November 2020 (right-hand side chart). Across all regions, the footprint of value portfolios was substantially reduced with a decarbonized value approach, in line with expectations.

Clients often ask us whether decarbonized value effectively reduces the value factor's exposure to the energy, materials, and utility sectors, which tend to have the largest carbon footprints. The answer is yes and no. Yes, we do see that the average overweight of the conventional value factor to these sectors, of respectively 4.2%, 6.3% and 7.7%, decreased to 2.9%, 0.4% and 5.3% for the decarbonized value factor. However, such sectorial differences have a relatively small impact

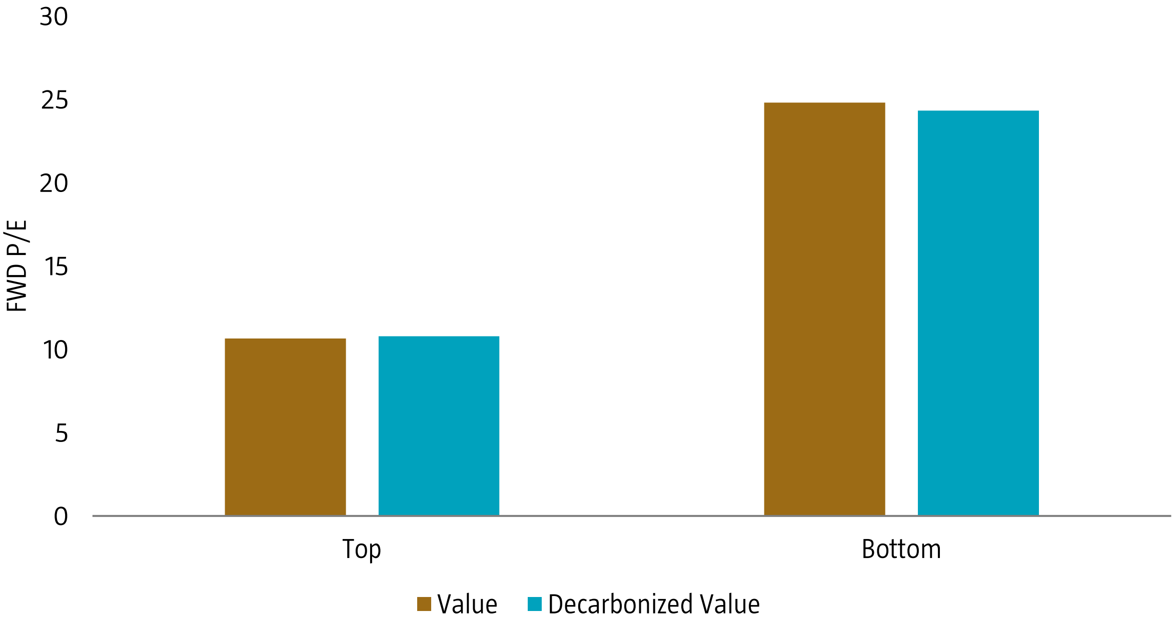
[5] We do not consider a company's carbon footprint in absolute terms but relative to its size. For this, we divide a company's emissions by its revenues.
[6] If we imposed sector neutrality, that would have helped to reduce the carbon footprint of the conventional value strategy, as tilts towards asset-heavy sectors, such as energy, utilities, and materials would have been eliminated by construction. Still, the carbon footprint for the conventional best value quintile would have remained larger than for the worst value strategy. Again, the difference would be largely removed by the decarbonized value strategy.

on the overall footprint, as most of the decarbonization of value takes place within carbon-heavy sectors. In fact, a sector-neutral value strategy can also be very effectively decarbonized. Further, we observe that the overall pattern over time is similar for both approaches. For example, in 2011, both value approaches had a negative exposure to the energy sector, while since 2018, both approaches had positive exposure to it.

Decarbonized Value is still Value…

The previous analysis has demonstrated that our decarbonization approach achieves the desired outcome in terms of sustainability improvement, and that this is robust over time and across regions. However, the question remains whether we give up part of the value premium because we reduce the attractiveness of the value stocks with a large carbon footprint.

Figure 3 | Valuation of the decarbonized and conventional Value factors



Source: Robeco, Refinitiv, I/B/E/S. The graph shows the average forward price-to-earnings ratio (FWD P/E) for the top and bottom quintile portfolios of a conventional and a decarbonized value composite. For each month, we compute the median forward price-to-earnings ratio per portfolio and take the average over time. The investment universe consists of all non-financial constituents of the MSCI Developed and Emerging Markets indices. The sample period is January 1986 to March 2023.

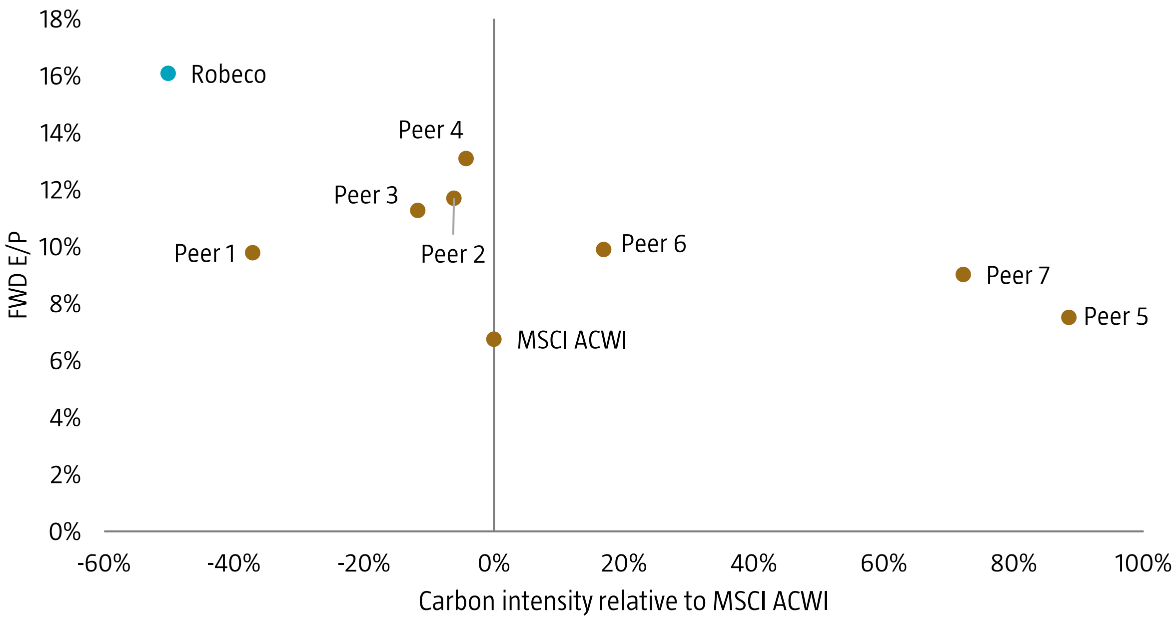
To answer this question, we perform a simulation exercise. Every month, we sort stocks into five portfolios based on their value score, using both conventional and decarbonized value measures. We then compare the forward price-to-earnings ratio (FWD P/E) of both conventional and decarbonized value portfolios. Figure 3 shows that average valuations are nearly identical for top and bottom value portfolios. This suggests that the adjustments made do not cause major changes in terms of value exposure at the portfolio level. In other words, the decarbonized value factor has a value exposure comparable to the conventional one.[7]

Next, we analyze how decarbonization worked out in actual portfolios. We take a sample of global fundamental and quantitative value managers from Morningstar and compute the forward earnings-to-price ratio (FWD E/P) and carbon footprint relative to the MSCI ACWI Index as of December 2022. Figure 4 plots these two measures for a set of value managers, including our Robeco QI Global Value Equities strategy, that applies our decarbonization approach. The x-axis

[7] Furthermore, this finding is robust for alternative valuation ratios such as book-to-price, EBITDA-to-enterprise value, or cashflow-to-price and over time.

shows the relative carbon intensity, while the y-axis shows the forward price-to-earnings ratio. Most value managers have a larger or similar carbon footprint compared to the index, while two value managers – including Robeco – have a footprint below the index. At the same time, the value metrics of the portfolio remain high on our portfolio, showing that high value exposure is combined with a low carbon footprint, and low exposure to climate traps.

Figure 4 | Value exposure versus carbon footprint of set of Value managers



Source: Robeco, Morningstar, Refinitiv, I/B/E/S. The chart shows the forward earnings-to-price ratio (FWD E/P) and the carbon intensity relative to MSCI ACWI Index for a sample of global fundamental and quantitative value managers from Morningstar as of December 2022.

Decarbonized Value offers an attractive value premium…

What is the return impact of decarbonizing value? To answer this question, we compare the return spread of top -minus-bottom conventional and decarbonized value portfolios. Figure 5 depicts the one-year rolling performance of the two value factors over time. We see that the correlation between the two value strategies is generally very high, and both performances track each other closely over the long run. Importantly, decarbonized and conventional value exposures offered comparable historical returns.

Figure 5 | One-year rolling return for the decarbonized and conventional Value factors

Source: Robeco, Refinitiv. The chart shows the one-year rolling return of a conventional and a decarbonized value composite (see the appendix for more details on the enhanced value strategy). The investment universe consists of all non-financial constituents of the MSCI Developed and Emerging Markets indices. The sample period is January 1986 to March 2023.

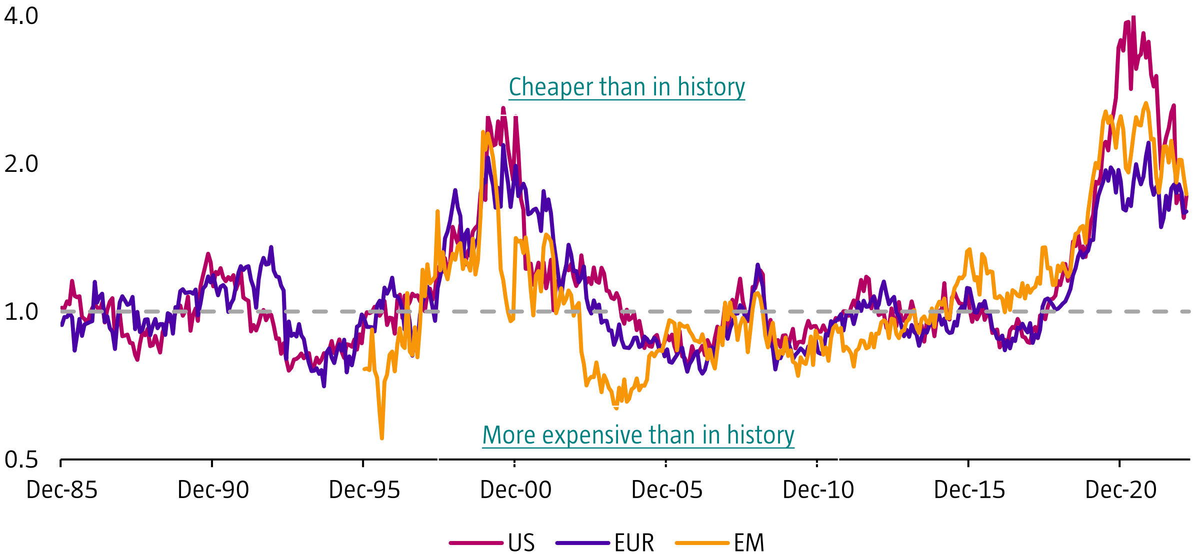
That said, performance differences do appear over shorter periods of time. Zooming into the big value rotation that followed the announcement of successful Pfizer-BioNTech Covid-19 vaccine candidate results on 9 November 2020, we see that both conventional and decarbonized value have performed very well since the announcement, although conventional value did slightly better in 2022. Last year, oil prices rose sharply, and energy stocks strongly outperformed most other stocks. As a result, decarbonized value slightly lagged conventional value given its lower energy exposure. Nevertheless, 2022 returns were high and attractive also for decarbonized value, and long run returns were comparable between both approaches. In other words, effective value investing did not require substantial energy exposure nor heavy environmental footprints, even in 2022.

Value remains very attractive from a valuation perspective...

A natural question to ask is what to think of decarbonized value versus conventional value in terms of valuation spreads. The poor performance delivered by value strategies from 2018 to 2020 was accompanied by an extreme widening of valuation multiples between value and growth stocks, with the former becoming much cheaper than the latter. This resulted in attractive valuations and expected tailwinds for value stocks, which we have seen since. The strong market rotation since November 2020 could leave some investors wondering whether the value style is less attractive now and whether this holds for decarbonized value approaches as well.

Figure 6 | Panel A: Composite valuation spreads for decarbonized and conventional Value: Global All Country (AC) universe

Panel B: Composite valuation spreads for decarbonized Value for various regions



Source: Robeco, Refinitiv. The chart shows the composite valuation spread between the top and bottom quintile portfolios of a conventional and a decarbonized value strategy (Panel A) and for decarbonized value for different regions (Panel B). The investment universe consists of all non-financial constituents of the MSCI Developed and Emerging Markets indices. The value spread is the average spread of the book-to-market (R&D adjusted), EBITDA/EV, and CF/P. The sample period is January 1986 to March 2023.

Figure 6 shows the valuation spread of the conventional and decarbonized value factors, meaning the differences in valuation multiples of value and growth stocks.[8] As we control for valuation differences normally observed between both portfolios, a valuation spread above one indicates cheapness, while a reading below one implies that the factor is relatively expensive. As for the return analysis, we observe little difference between the two value strategies. More specifically, for both strategies, the spread at the end of March 2023 is much wider than at the beginning of the value winter in 2018.

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Moreover, current spreads are at levels close to those at the peak of the dot-com bubble in 2000. Consequently, conventional and decarbonized value continue to trade at very attractive valuation levels, also across various regions.

The 'value spread' is expressed as the ratio of a basket of valuation multiples of the top and bottom quintile value portfolios. We control for value spread differences that are normally observed between both portfolios, such that a value spread above one indicates cheapness. Since cheap stocks have, by definition, higher fundamental value to price ratios than their expensive peers, it is particularly important for the value factor to scale the value spread by its historical normal level.

Conclusion

Investors face a dilemma when they want to decarbonize their portfolio but also want exposure to the value factor. The reason is that conventional value strategies have high environmental footprints, including greenhouse gas (GHG) emissions. As such, they are exposed to climate traps. To address this issue, Robeco developed a proprietary decarbonization methodology in 2019, resulting in a 'Decarbonized Value' approach. In this note, we show that the decarbonization methodology has proven effective in reducing carbon footprint without significantly impacting value exposure. Evaluating the performances, we show conventional and decarbonized value yielded attractive long-run performances, particularly since the strong comeback of the value factor over the past 2.5 years. At the same time, the carbon footprint was substantially reduced. Further, both conventional and decarbonized value approaches continue to trade at attractive valuation spreads.

ROBECO
The Investment Engineers

Appendix – factor definitions and construction

The value definition and the calculation of the value spread follow the methodology described in Blitz, D. C., and Hanauer, M. X., January 2021, "Resurrecting the value premium", Journal of Portfolio Management.

Universe

The investment universe for the two value strategies comprises all non-financial constituents of the MSCI Developed and Emerging Markets indices. Before 2001, we use the FTSE World Developed index for developed markets (going back to December 1985), and for emerging markets, the largest 800 constituents of the S&P Emerging BMI at the semi-annual index rebalance (going back to December 1995).

Factor definitions

The conventional value strategy is based on a composite of book-to-market (R&D adjusted), EBITDA/EV, CF/P, and NPY metrics. The decarbonized value strategy uses the decarbonized version of the same valuation metrics. The decarbonized value strategy is based on the same four valuation signals as the conventional value strategy: however, we apply our decarbonization methodology to each signal.

Factor construction

Stocks are sorted into quintile portfolios based on the two value composites and the quintile portfolios are equal-weighted. Factor returns are the return spreads between the top and bottom quintile portfolios.

Carbon footprint of value strategies

We compute the carbon footprint of the long-short value strategy (Figures 1 and 2) as the average carbon intensity of the highest value quintile portfolio minus the lowest value quintile portfolio as a percentage of the carbon intensity of the equally-weighted universe. For the relative carbon footprint of a set of value managers (Figure 4), we compute the value-weighted carbon intensity of the actual portfolio holdings as a percentage of the carbon intensity of the value-weighted MSCI ACWI Index. Carbon intensity is the total scope 1 and 2 GHG emissions in tons of CO2 equivalent (tCO2eq) per one million USD revenues. GHG emissions are estimated with our proprietary methodology before June 2020. Afterward, the data comes from RobecoSAM until January 2022; afterward, we use TrueCost.

Calculation valuation spread

For each multiple and month, we compute the median valuation multiple for both the cheapest and most expensive quintile and compute the spread as the ratio between the two. The three valuation multiples that we use are book-to-market (R&D adjusted), EBITDA/EV, and CF/P. For the composite valuation spread, we first standardize each of the three time series by dividing them by their median. Next, we average the three standardized spreads.

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Additional information for investors with residence or seat in Spain
Robeco Institutional Asset Management B.V., Sucursal en España with identification number W0032687F and having its registered office in Madrid at Calle Serrano 47-14º, is registered with the Spanish Commercial Registry in Madrid, in volume 19.957, page 190, section 8, sheet M-351927 and with the National Securities Market Commission (CNMV) in the Official Register of branches of European investment services companies, under number 24. The investment funds or SICAV mentioned in this document are regulated by the corresponding authorities of their country of origin and are registered in the Special Registry of the CNMV of Foreign Collective Investment Institutions marketed in Spain.

Additional information for investors with residence or seat in South Africa
Robeco Institutional Asset Management B.V. is registered and regulated by the Financial Sector Conduct Authority in South Africa.

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Additional information relating to RobecoSAM-branded funds/services
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Additional information for investors with residence or seat in the United Arab Emirates
Some Funds referred to in this marketing material have been registered with the UAE Securities and Commodities Authority ("the Authority"). Details of all Registered Funds can be found on the Authority's website. The Authority assumes no liability for the accuracy of the information set out in this material/document, nor for the failure of any persons engaged in the investment Fund in performing their duties and responsibilities.

Additional information for investors with residence or seat in the United Kingdom
Robeco is deemed authorized and regulated by the Financial Conduct Authority. Details of the Temporary Permissions Regime, which allows EEA-based firms to operate in the UK for a limited period while seeking full authorization, are available on the Financial Conduct Authority's website.

Additional information for investors with residence or seat in Uruguay
The sale of the Fund qualifies as a private placement pursuant to section 2 of Uruguayan law 18,627. The Fund must not be offered or sold to the public in Uruguay, except under circumstances which do not constitute a public offering or distribution under Uruguayan laws and regulations. The Fund is not and will not be registered with the Financial Services Superintendency of the Central Bank of Uruguay. The Fund corresponds to investment funds that are not investment funds regulated by Uruguayan law 16,774 dated 27 September 1996, as amended.