Low volatility and ESG investing combined: Invesco's holistic approach

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The low volatility factor in conjunction with the style factors Quality, Value and Momentum, has empirically proven to be able to moderate market risks and improve a portfolio's overall risk-return profile. By integrating ESG into such a factor portfolio, future risks may be mitigated. We present a proprietary approach to managing ESG risks that can maximize sensitivities to the desired multi-factor characteristics, and we calculate Climate VaR under different global warming scenarios.

Low volatility portfolios tend to provide more stability.

A multi-factor model can replace adverse ESG assets with better stocks without adversely affecting factor returns.

Low volatility investing has become mainstream – and so has ESG. And since Invesco is a pioneer in both fields, it seems only natural to combine the two and develop a low volatility ESG approach to equity investing.

When Invesco Quantitative Strategies started managing low volatility portfolios in 2005, they were a niche play. More than a decade later, they have gone mainstream. The most likely reason is the low volatility anomaly – the observation that lower-risk stocks have, on average, higher risk-adjusted returns. Moreover, low volatility portfolios tend to provide more stability with less-pronounced drawdowns in market corrections. Hence, they can offer better Sharpe ratios and provide a more attractive investment proposition, especially for absolute return-minded equity investors.

Similarly, we've played a pioneering role in ESG investing, having started incorporating ESG aspects two decades ago and steadily increasing the scope of ESG mandates across different regions and products. While we apply an ESG-integrated investment approach as default, a significant share of our portfolios embraces sustainability criteria beyond basic ESG integration.

In this article, we develop an approach that combines the two concepts to create a low volatility ESG strategy for equities.

Our approach to low volatility investing

Invesco Quantitative Strategies has always combined a low volatility approach with multi-factor stock selection. Instead of constructing a portfolio with risk reduction as the sole objective, we target factors that can enhance performance. This results in a portfolio that benefits from the low volatility anomaly while enhancing return potential from allocations to the factors Quality, Value and Momentum. Each of these factors can improve the portfolio's risk-return characteristics in the long term, particularly since low correlations between them provide additional diversification. Figure 1 illustrates typical factor exposures of a low volatility strategy relative to a reference index.

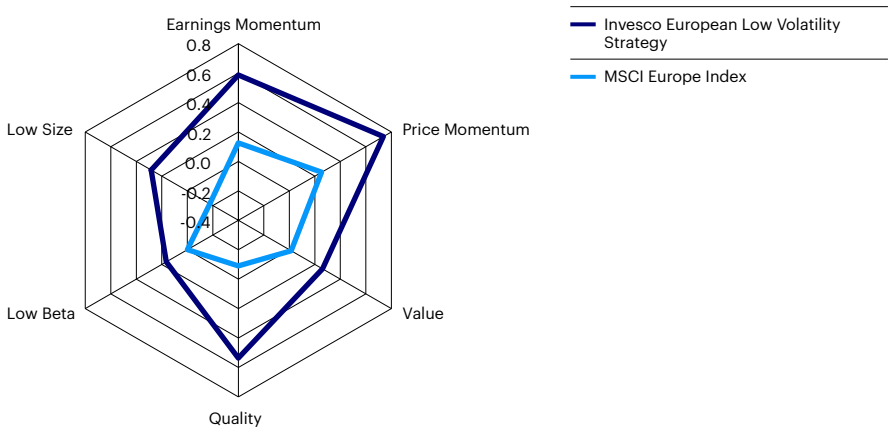
The question is how to best combine the two objectives: a low volatility positioning and exposures to other rewarded factors, Quality, Value and Momentum. While one can combine them in one optimization, you face the challenge that they may interfere with each other as large exposures to Quality, Value and Momentum will increase the portfolio volatility and reduces or even offsets the benefit of the intended low volatility positioning.[1] Therefore, we have developed an improved portfolio construction approach that separates the different objectives: first, a low-risk equity portfolio is constructed that focuses purely on capturing the low volatility anomaly. Then, we run an optimization relative to this defensive portfolio to establish intended exposures to the other factors Quality, Value and Momentum. This two-step process controls interference between the two effects.

Our tiered approach is perfectly suited to other settings, e.g., when additional aspects like ESG integration are considered. The first optimization defines a sensible starting point, which is then enhanced in a second step to target return-driving factor exposures.

Integrating ESG in low volatility portfolios

We integrate ESG aspects at multiple levels, beyond pure risk management.[2] This follows our conviction that, though certain adverse effects of weak ESG profiles may not have materialized in the past, they could – and likely will – drive capital market valuations in the future. We applied a set of well-chosen exclusions and best-in-class screening to identify companies with a higher probability of materializing ESG risks. Our research shows that a multi-factor model can replace adverse ESG assets with better

Figure 1
Standardized factor exposures in comparison



Source: Invesco. In line with previous publications. Data as at March 31, 2021. "Momentum" is split into "Price Momentum" and "Earnings Momentum". For illustrative purposes only.

ESG integration at Invesco Quantitative Strategies

Invesco Quantitative Strategies follows a fully integrated ESG investment process, built on longstanding experience in customized ESG solutions, active engagement with companies and the Invesco proxy voting approach.

In our multi-factor optimization process, we consider the impact of key ESG aspects (both explicit and implicit) at single stock, portfolio and risk management level. We incorporate proprietary aspects of governance in the Quality factor, implement a dedicated ESG exposure control in the construction phase of all portfolios and employ an adverse ESG Momentum measure to restrict companies with weak ESG scores and significant risk of ESG downgrades.

Elements of our integrated ESG investment approach

Source: Invesco. For illustrative purpose only.

Beyond broad-based integration across all portfolios, customized ESG criteria can be implemented to meet client-specific requirements as well as internationally recognized norms, conventions and ESG quality labels, such as the Eurosif Transparency Code and Febelfin Towards Sustainability, among others.

stocks without adversely affecting factor returns or substantially altering the risk-return profile.[3]

Table 1 shows the exclusion criteria for a typical low volatility portfolio. We also apply a best-in-class approach to filter out companies that lack the ability to transform into a low carbon economy. This filter, as with every element in our investment process, is applied by comparing companies against their sector and regional peers to build meaningful peer groups and ensure comparability.

Our criteria focus on environmental issues while avoiding significant harm in both the social and the governance pillar. Controversy screening is based on a proprietary methodology using data for the frequency, severity and responsiveness of a company when it comes to controversies – to filter out those with weak policies which face the risk of recurring controversies.

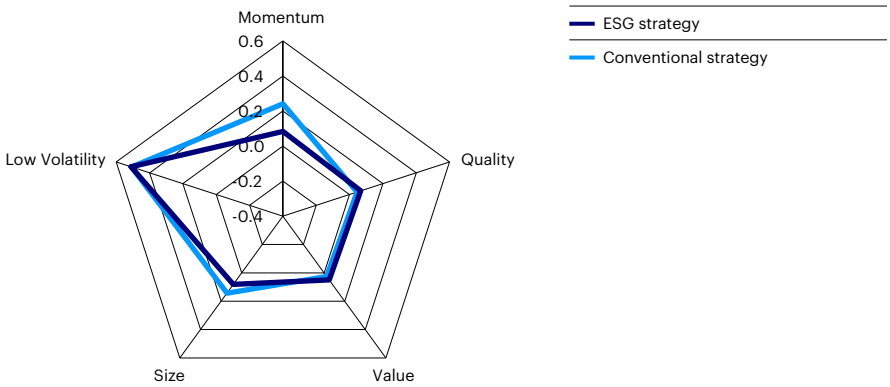
Using two optimizations, one with ESG constraints and one without, we can compare sensitivities to the desired factors. The theory of factor investing

Table 1
Invesco Quantitative Strategies criteria for ESG screening in low volatility portfolios

	Controversial Activities	Excluded if
Coal	Revenue from thermal coal mining	**Exceeds threshold**
	Revenue from burning coal for power generation	**Exceeds threshold**
	Proportion of coal in electricity generation fuel mix	**Exceeds threshold**
Unconventional oil & gas	Revenue from projects or the extraction of tar sands and oil shale, as well as the proportion of reserves in tar sands or oil shale	**Any involvement**
	Involvement in fracking activities	**Any involvement**
	Involvement in arctic drilling activities	**Any involvement**
Fossil fuel industry	Revenue from fossil fuel industries	**Exceeds threshold**
Environmental strategy	Company's commitment to defining clear objectives and appropriate measures to manage the environmental impacts of products and services	**Insufficient environmental strategy**
Chemicals of concern	Production of restricted chemicals	**Any involvement**
Biodiversity	Controversies in the field of endangering biodiversity	**Significant controversies**
Community involvement	Controversies in the field of community involvement (including, e.g. impact of operations on the local economy, responsible tax strategy, transfer of technology and skills)	**Any involvement**
Nuclear power	Revenue from nuclear power	**Exceeds threshold**
	Proportion of nuclear power in electricity generation fuel mix	**Exceeds threshold**
Civilian firearms	Manufacture or sale of civilian firearms or related products	**Exceeds threshold**
	Manufacture of civilian firearms or related products	**Exceeds threshold**
Military	Revenue related to military sales, including key parts or services for conventional weapons	**Exceeds threshold**
	Controversial weapons & financing of cluster munitions or anti-personnel landmines	**Any involvement**
Tobacco	Revenue from tobacco production and distribution	**Exceeds threshold**
	Revenue from tobacco production	**Exceeds threshold**
UN Global Compact	Failure to pass Global Compact screening	**Failures**

Source: Invesco, as at December 31, 2020.

Figure 2
Factor sensitivities in comparison
Realized sensitivities



Source: Invesco, based on data from April 12, 2019 to December 31, 2020.

> To quantify the impact of ESG aspects on portfolio risk, scenario analysis can be a useful alternative.

claims that single securities are merely the carrier of the factor exposure and that the exclusion of some stocks can be mitigated by using other securities with similar characteristics. Figure 2 shows a regression of the active return on the most prominent investment factors of two European low volatility strategies: one including the criteria from table 1 and one without. Obviously, the returns of both strategies are driven by similar factors, thus the ESG overlay does not impede harvesting of the desired factors.

As expected, the ESG strategy shows stronger ESG metrics than the conventional low volatility strategy. As an example, figure 3 compares the greenhouse gas intensity of the two strategies. The ESG strategy can massively reduce the carbon footprint of the portfolio.

ESG risks

Since most dominant ESG risks have not yet materialized, they are not evident in covariance matrices, which are based on historic data. To quantify the impact of ESG aspects on portfolio risk, scenario analysis can be a useful alternative. We applied the MSCI Climate VaR methodology[4] to three different portfolios:

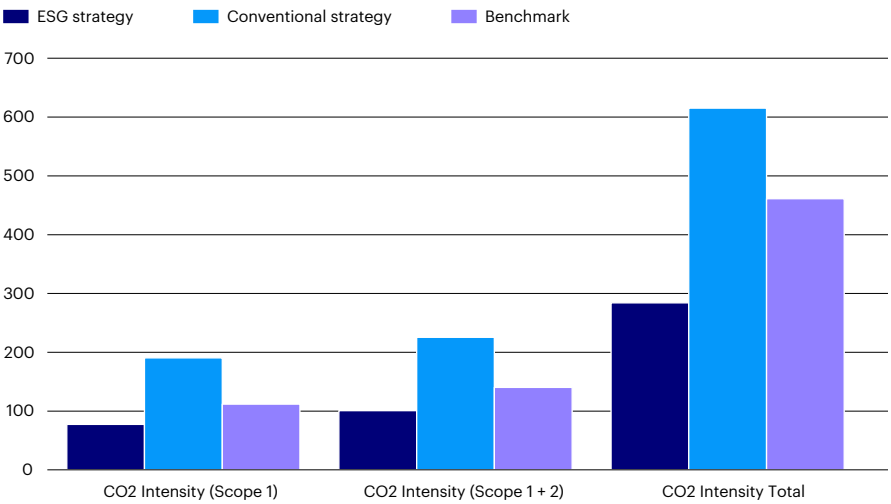
1) a conventional European low volatility portfolio

2) a European low volatility portfolio promoting ESG criteria, as described above

3) the MSCI Europe index as a reference

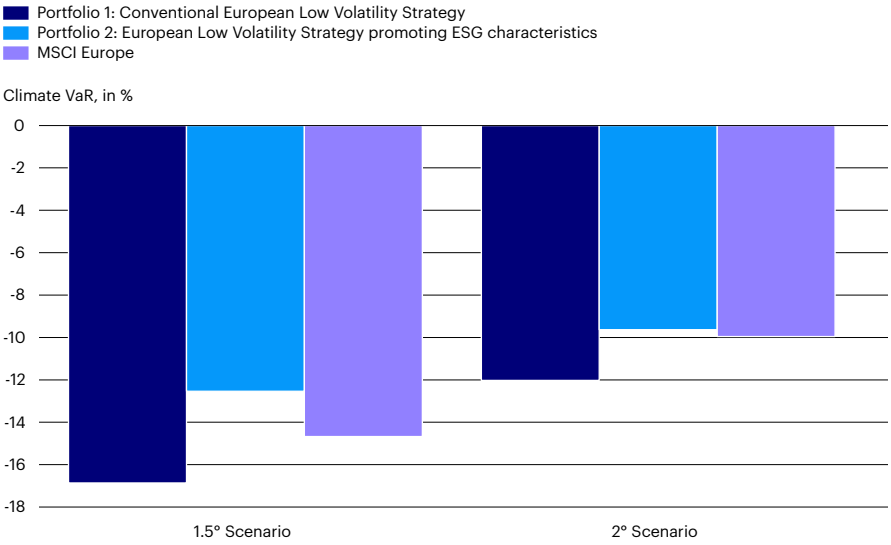
We assumed two different scenarios.[5] In scenario 1 (mitigation), global warming is limited to a 1.5°C increase in temperatures compared to pre-industrial levels – the goal set out in the 2015 Paris Agreement. This scenario will lead to high costs for companies that are not yet aligned to a net-zero greenhouse gas emission economy or that have high reserves of

Figure 3
Carbon profiles in comparison



Source: ISS Climate Solutions, Invesco, as at December 31, 2020; carbon data from 2019. Carbon intensity is calculated as the weighted average of the respective scope emissions (CO2 equivalents) per USD million of revenue.
Past performance is not indicative of future results.

Figure 4
Climate VaR of three different strategies



Source: Invesco, MSCI, as at December 31, 2020. **Past performance is not indicative of future results.**

fossil energy. Scenario 2 sets a 2°C limit – the upper limit in the Paris Agreement. This would require less in the way of greenhouse gas reduction efforts but more investment into adapting to a warmer climate.

Figure 4 shows that portfolio 1 has a higher Climate VaR than the index. While this might be counterintuitive, as the portfolio is constructed using a low volatility approach, the sector exposure of a typical low volatility strategy (overweighting utilities) leads to higher carbon intensity and, ultimately, a risk of stranded assets. The ESG portfolio (portfolio 2) can mitigate this bias. In fact, the portfolio exhibits a reduction of the Climate VaR relative to both portfolio 1 and the index. Even though we did not explicitly control for the Climate VaR calculation, the ESG criteria lead to a financial materiality in reducing exposure to mitigation risks.

These policy risks become less significant for the 2°C scenario and, since potential losses are smaller, less can be gained from mitigating them.[6]

But there are some caveats: When interpreting the difference of mitigation costs in those two scenarios, one should keep in mind that they are based on listed mid to large-cap companies only (i.e., quite a limited part of our society and economy). Furthermore, the analysis does not consider broader systemic costs and benefits due to the wider economic effects of endogenous factors such as the introduction of policy obligations or new technologies and innovations like carbon capture.

Conclusion

Invesco played a pioneering role in the mainstream establishment of low volatility and ESG investing. We have developed an approach that links low volatility investing with other return factors and ESG considerations, drawing on the established strengths of Invesco Quantitative Strategies and emphasizing measures to conserve environmental integrity and slow global warming. ESG integration improves a portfolio's Climate VaR and thus insulates it against the risks to come. While we used a European universe as an example, the robustness of our portfolio construction method means this strategy can be applied to other universes, including global equities.

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Notes

1 See also Fraikin, Gerard, Roberts (2020).
2 For a detailed explanation, please see von Ditfurth, Fraikin, Uhlmann (2018).
3 See also Elsaesser, Nerlich (2020).
4 The MSCI Climate VaR methodology (MSCI 2020) estimates the impact of different climate scenarios using a range of transmission mechanisms: the risks of climate change to business models (e.g. extreme weather, flooding), the risks of policy changes to business models (e.g. higher carbon prices) and the opportunities (e.g. higher value of patents in certain greenhouse gas mitigation techniques).
5 The scenarios utilize carbon prices from the AIM CGE model.
6 Since climate change mitigation can be more costly than adaptation to higher temperatures, one may well ask why policy makers actually care about the degree of global warming. However, the answer is obvious: the overall cost of a failure to mitigate the climate crisis will by far exceed the costs of a successful decarbonization strategy; see also OECD (2015).

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