

## Active is:

# Managing Tail Risks through Active Integrated ESG investing

Systematic evidence that actively managing ESG tail risks may help to deliver sustainable investment performance over a market cycle

*“Much of the real world is controlled as much by the ‘tails’ of distributions as by means or averages: by the exceptional, not the mean; by the catastrophe, not the steady drip... We need to free ourselves from ‘average’ thinking.”*

Philip Anderson,  
Nobel Prize recipient in Physics, 1997

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### Key findings

- ESG factors materialise mostly on portfolio downside risk – not upside.
- Avoiding large portfolio drawdowns triggered by ESG risks can help contribute to better risk/adjusted returns over market cycles.
- While focusing on ESG tail risks is important, simple ESG risk avoidance is not a sound investment recipe.
- A proprietary, intrinsic ESG risk/reward analysis is important, as nearly all ESG factors are “grey” and not “black or white”.
- External ESG ratings cannot be solely relied upon.
- The performance of ESG investment indices is often driven by unintended factor changes.
- Passive, rules based ESG index strategies can be challenged.
- Active Integrated ESG investment can help unleash long-term compound alpha opportunities.
- While the performance impact of active stewardship through corporate engagement and proxy voting is hard to measure in the short term, there is strong evidence that it adds value in the medium term.

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# Tail Risks in ESG

## Introduction

Environmental, Social and Governance (ESG) factors are increasingly recognised as critical determinants in the success or failure of corporations. Investors, too, are paying more attention to ESG factors because incorporating them into investment decisions can help manage risk and generate the potential for more sustainable long-term returns. Some legislators, especially in the EU, are even planning to mandate that all funds manage ESG risk going forward.

In this new research we aim to find answers to key ESG investment integration questions:

- Do ESG factors materialise mostly on financial downside risk?
- Do improving ESG factors price the portfolio upwards?
- Are there valid investment rules that can be applied, such as gearing portfolios to higher ESG risk ratings?

### If yes

Should investors focus on passive ESG strategies?

### If no

Is there evidence that active investing improves long-term ESG performance potential?

## About this study

Our study explores three strains of analysis on ESG. First, we provide evidence for the materiality of ESG factors from a risk, rather than reward, perspective. Second, we analyse which lens investors should use to identify the ESG portfolio risks affecting investment performance. Third, we discuss whether active ownership through corporate engagement and proxy voting adds value.

### Note:

a tail event is a very unlikely and severe event capable of sending shock waves through financial markets as a whole or specific asset classes. A tail risk generally refers to the risk of a tail event with a negative market effect.

## Our ESG risk framework

ESG Risk	Macro	Sector	Portfolio (scope of this paper)	Issuer
Financial Impact	Loss of Gross Domestic Product (GDP)	Sector devaluation	Portfolio tail risk	EPS revisions credit downgrades
Modelling	ESG extended econometric models ESG Integrated assessment models	Sector ESG materiality framework (SASB <sup>1</sup> proprietary)	ESG (tail) risk portfolio modelling	ESG extended DCF <sup>2</sup> models ESG in credit ratings
Real-life examples	GDP at risk due to climate change	Coal sector devaluing	Carbon price stress testing	Daily newspaper
Regulatory ESG risk (i.e. ESG litigation, CO2 Tax and Trade)				
Applies to nearly all asset classes				

<sup>1</sup>Sustainability Accounting Standards Board

<sup>2</sup> Discounted Cash Flow

### ESG Macro Risk

ESG macro risk is the economic risk originating from political or long-run systemic events linked to negative ESG characteristics, which can have a widespread, cross-sectoral impact. Examples include the studies pioneered by Nobel award winners William Nordhaus and Paul Romer, who discussed the impact of innovation and climate change on the global economy (2018). Nordhaus and Romer focused particularly on the impacts of climate change and technology in endogenous growth. Allianz Global Investors also focuses on macro ESG impact in studies such as [Accelerating economic growth through sustainability](#). Transforming inequality through the tax system (Happe, 2019) and how ESG factors could play a role in Emerging Markets’ transition to higher income levels.

The infographic features the Allianz Global Investors logo at the top right. The main text asks 'How to finance the estimated USD 6tn p.a. to reach the 17 Sustainable Development Goals until 2030?' and directs readers to a whitepaper. A central illustration shows a person standing next to a globe with icons for wind turbines, solar panels, a tree, a house, and a bicycle, representing the Sustainable Development Goals. A small disclaimer at the bottom left states: 'Investing involves risk. The value of an investment and the income from it may fall as well as rise and investors might not get back the full amount invested. Past performance is not a reliable indicator of future results.'

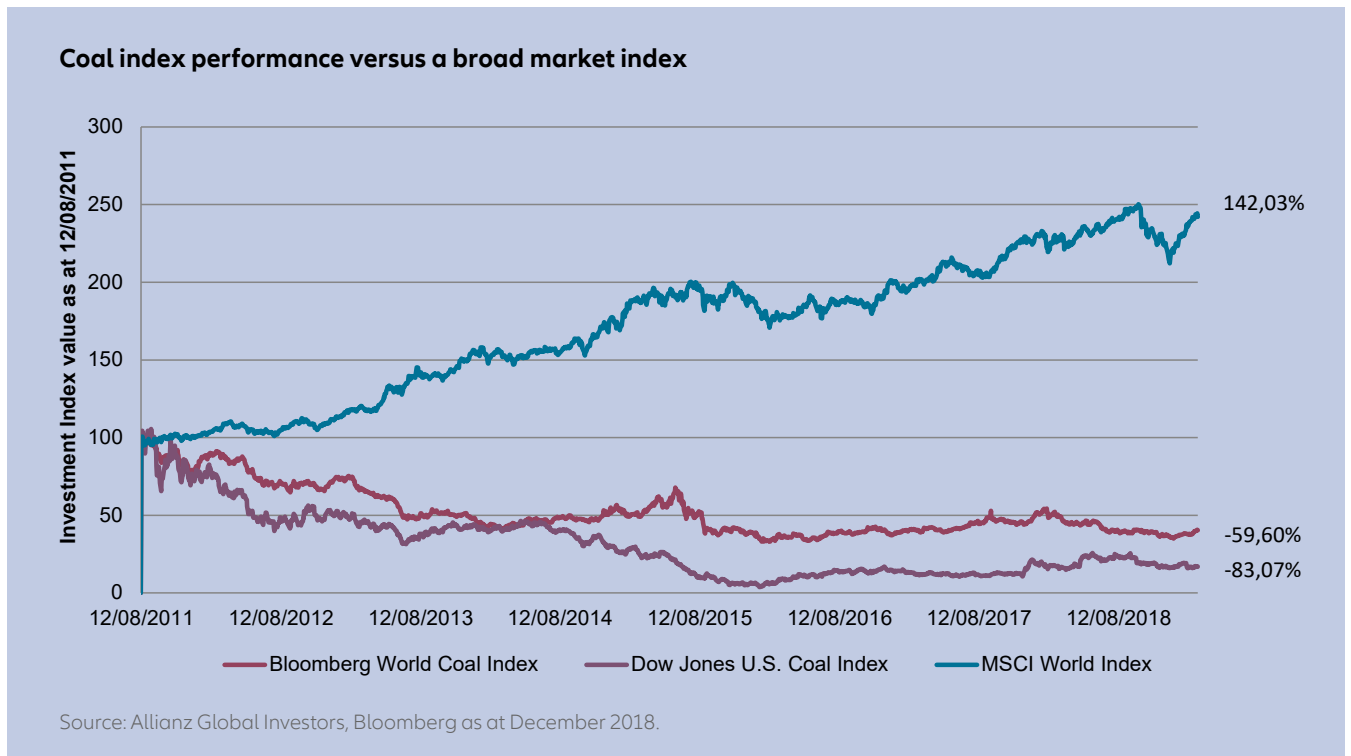
See more in our whitepaper:

1. [Being prepared for ESG Regulation](#)
2. [Accelerating economic growth through sustainability](#)

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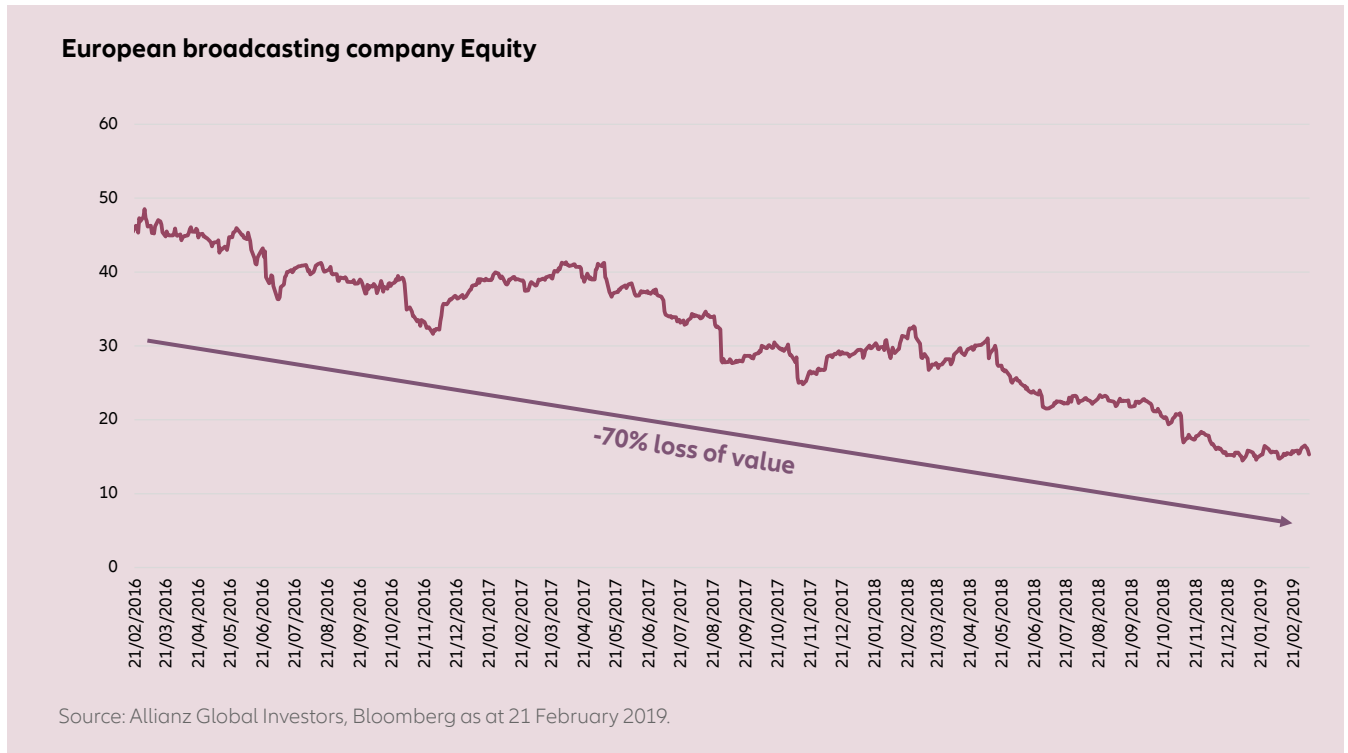
### ESG Sectoral Risk

ESG sectoral risk is the risk of adverse movements in a sector’s overall performance due to its systematic ESG characteristics, or long-run ESG trends. Examples of sectoral risk include: a coal mining company’s exposure to environmental risk, an arms producer’s social risk or the extraction industry’s governance risk.

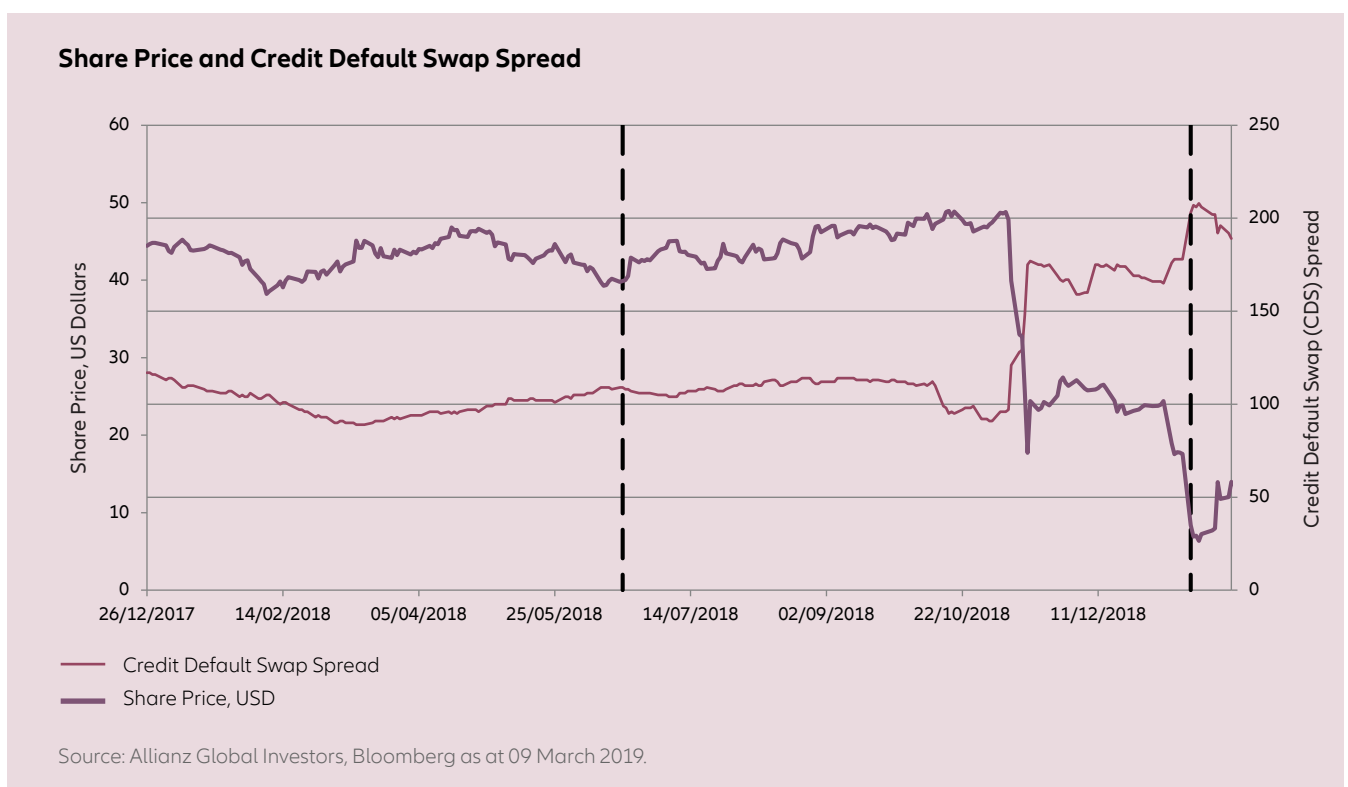


### ESG Issuer Risk

ESG issuer risk is the downside risk to a company’s financial performance due to its individual ESG position or a negative ESG position compared to its sector. Issuer ESG risk can be more easily managed through diversification and should be assessed from a risk/return perspective. Examples of these include the governance challenges recently materialising in a European broadcasting company, or the physical climate risks of an electricity company. As the graph below illustrates, certain issuers will underperform others in the same sector.



The graph below demonstrates another example: an electricity utility filing for bankruptcy due to physical climate risk.



## ESG Portfolio Risk

ESG portfolio risk is the aggregate risk originating from underlying holdings and their cumulative ESG characteristics. In assessing ESG portfolio risk we try to quantify how much of the portfolio's overall risk/return is affected by the sum of the holdings' ESG profiles, taking into account the ESG risk concentration and diversification. Quantitatively, the tail risk in portfolios can be defined by (conditional) value-at-risk and maximum portfolio drawdown. It is important to analyse the potential impact of extreme ESG loss risks on portfolio performance.

The table below illustrates the relevance of ESG risk in a concentrated equity portfolio with 30 holdings. It shows how long it would hypothetically take to recover each portfolio from different levels of loss.

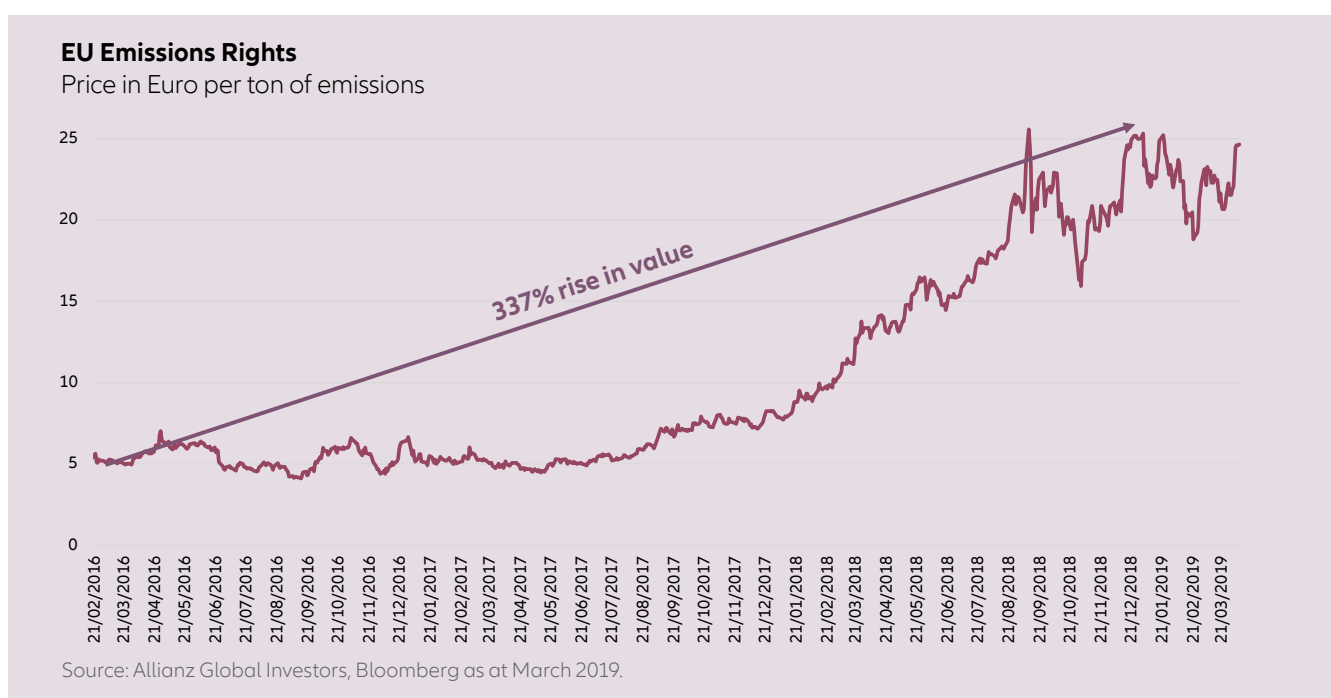
**How to read:** for a portfolio with 30 holdings, a single holding's drawdown of 70%, hypothetically triggered by corporate specific ESG risk, "torpedoes" performance significantly. It takes the portfolio almost half a year (177 days) to recover the initial value assuming mean reversion.

Example: Concentrated equity portfolio	Assumed portfolio return 5% p.a.		
No. of holdings affected	1	2	3
<b>50% Drawdown</b>			
<b>30 Holdings in Portfolio</b>	€ 983.33	€ 966.67	€ 950.00
% Loss	1.67%	3.33%	5.00%
Time to recover at 5% returns per annum	126 days	254 days	384 days
<b>70% Drawdown</b>			
<b>30 Holdings in Portfolio</b>	€ 976.67	€ 953.33	€ 930.00
% Loss	2.33%	4.67%	7.00%
Time to recover at 5% returns per annum	177 days	358 days	543 days
<b>90% Drawdown</b>			
<b>30 Holdings in Portfolio</b>	€ 970.00	€ 940.00	€ 910.00
% Loss	3.00%	6.00%	9.00%
Time to recover at 5% returns per annum	228 days	463 days	706 days

Portfolio beginning Net Asset Value of €1,000. Hypothetical example for illustrative purposes only. Figures provided for illustrative purposes only and is not indicative of past or future performance of any AllianzGI investments product or service.

## Regulatory ESG Risk

Regulatory ESG risk is a strategic risk to a corporation from governmental, regulatory or legal changes. For example, a company incurring earnings revisions due to unexpected expenses from carbon tax and trade.



## Three investment hypotheses

We believe that financial materiality must be considered as a priority when assessing ESG factors. To understand how ESG materiality and tail risks impact portfolio strategies, we analysed whether simple rules based ESG strategies pay off, or whether a fully active ESG investing approach yields a more promising risk/return profile. We looked into three investment hypotheses:

1. ESG factors alone do not lift portfolio returns upwards but can negatively impact the downside risk.
2. A risk/reward trade-off on holdings with low ESG ratings is more relevant than simple portfolio tilts towards high ESG rated companies.
3. Active management of ESG factors adds to portfolio risk/reward performance.

## The ESG Quant Analysis

To test these hypotheses, we analysed historic investment performance of European and global portfolios from 2008 to 2018, rebalanced using MSCI ESG Ratings. We took leading global and European equity indices as a starting point, with constituents ranked according to their aggregated industry neutral ESG score. We built 10 portfolios into which the ranked equity index constituents were allocated. The constituent allocation was

determined by the security's ESG score – the first (top 10%) portfolio included the highest scoring ESG securities. The 10th (bottom 10%) portfolio included the worst scoring ESG securities. The securities within a portfolio were then weighted by market cap. **Our findings indicate that ESG risk can signal material financial downside.**

Our work aims to complement research that focuses on the significance of ESG factors on financial and investment performance (Krueger, 2015), (Bank of America Merrill Lynch, 2018) as well as the role of ESG factors as an indicator of risk (Dunn, et al., 2018), (Nofsinger, et al., 2018). Our research also builds on studies showing the added value of corporate engagement (Dimson, et al., 2018), (Hoepner, et al., 2018) and elaborates further on the investment indications of ESG ratings (Bernstein, 2018)

## Results

### 1. ESG factors alone do not lift portfolio returns upwards, but can negatively impact the downside risk

For this assumption, we sought to test whether portfolios systematically tilted towards better ESG performers would, on average, generate better returns than portfolios with worse ESG performers. Our findings, in general, are in line with other academic findings that ESG on its own does not generate positive return delta (Humphrey, et al., 2012). However, we found that there is a connection between the ESG profile of a portfolio and its exposure to volatility risks. This is summarised in the table below. However, this does not capture downside risk adequately, which is addressed later in the paper through maximum drawdown and value-at-risk.

ESG Rank	Portfolios A Europe	Portfolios A Global	Portfolios B Europe	Portfolios B Global	Portfolios C Europe	Portfolios C Global
Standard Dev.	0.00164** (3.62)	0.0000301 (0.09)	0.00207*** (5.15)	-0.000278 (-1.75)	0.00243** (3.89)	0.000295 (0.91)
Alpha	-0.000141 (-0.69)	0.000147 (1.97)	-0.000208 (-1.39)	0.000180 (1.59)	-0.000267 (-1.03)	0.000133 (1.13)
Beta	0.00903 (0.87)	-0.000552 (-0.10)	0.0204 (2.06)	-0.00660 (-1.32)	0.0209 (1.83)	0.00236 (0.43)

t statistics in parentheses; \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

## 2. Avoiding low rated holdings is more relevant for compound return potential than simple portfolio tilts towards high ESG rated companies in portfolios

While a lot of research has been done to examine absolute portfolio differences from a “good-minus-bad” perspective, we compared ESG investment risk/return profiles versus a benchmark. We found that all but the low-rated portfolios delivered a very similar risk profile to the benchmark, whereas the lower tranche differed significantly, potentially indicating ESG tail risk.

ESG risk, in our view, is not a story about the average risk, but rather about the extreme events that are financially material for an investment and stem from an ESG source. This is an important point to consider in light of Myron Scholes’s quote, “Compound returns are enhanced most by mitigation of tail losses and participation in tail gains”.

In our research, we found further proof of the importance of integrating ESG as a tail risk hedge – a lower ESG rated portfolio is not significantly indicative of changed average returns (skewness). However, a lower ESG rated portfolio is significantly indicative of a much wider distribution of returns (kurtosis) and is therefore riskier.

ESG Rank	Portfolios A Europe	Portfolios A Global	Portfolios B Europe	Portfolios B Global	Portfolios C Europe	Portfolios C Global
Skewness	-0.00925 (-0.23)	-0.0520** (-3.39)	-0.0397 (-1.26)	-0.0340* (-2.67)	-0.0421 (-1.20)	-0.0406 (-1.67)
Kurtosis	0.240 (1.34)	0.296* (2.96)	0.370* (2.49)	0.0271 (0.89)	0.512* (2.35)	0.272* (2.84)
Beta	0.00903 (0.87)	-0.000552 (-0.10)	0.0204 (2.06)	-0.00660 (-1.32)	0.0209 (1.83)	0.00236 (0.43)

t statistics in parentheses; \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

Alpha refers to the average investment outperformance ( $\alpha$ ) of the 10 portfolios constructed from each investment universe Carhart 4-Factor model. Beta refers to the average market beta ( $\beta_{mkt}$ ) of the 10 portfolios constructed from each investment universe.

Kurtosis refers to a measure of the combined weight of a distribution’s tails relative to the centre of the distribution of the returns.

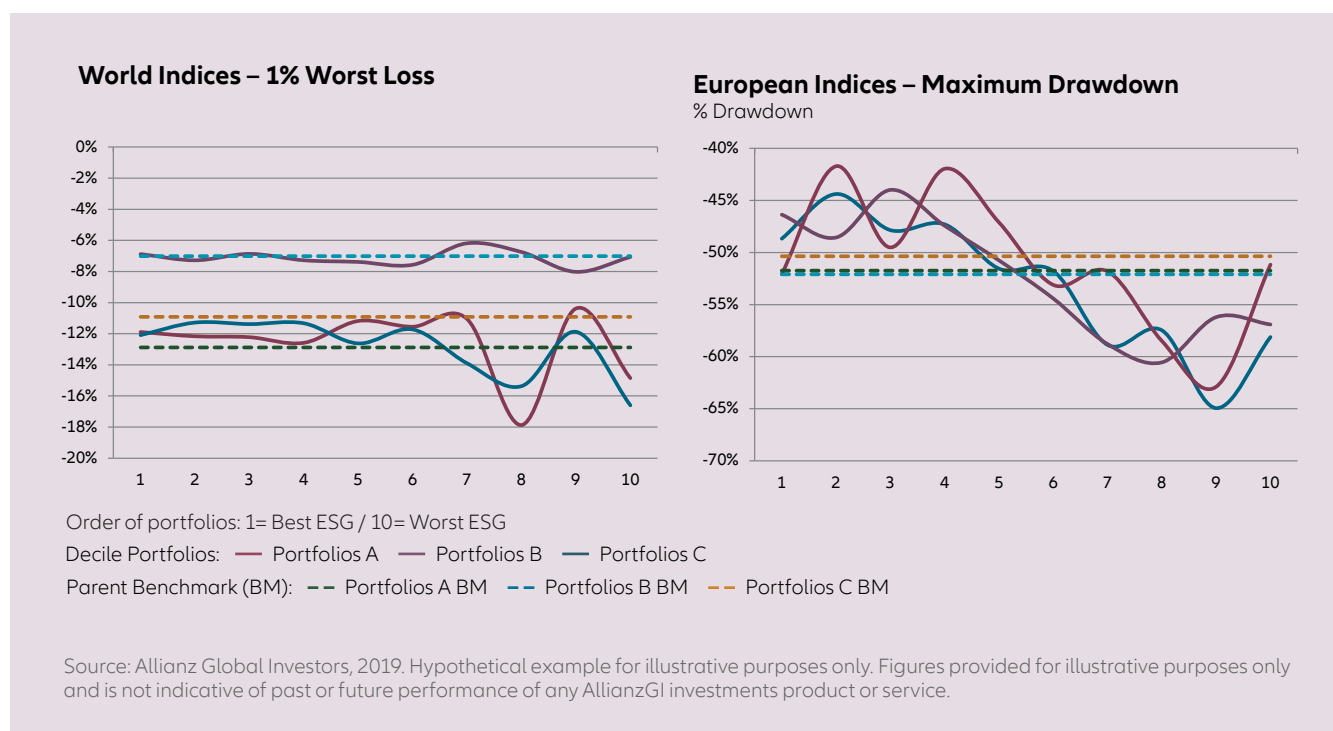
Skewness refers to the degree of distortion from the symmetrical bell curve in a set of returns data.

Standard deviation refers to the measures the dispersion of a dataset relative to its mean and is calculated as the square root of the variance

The factor data has been sourced from the Kenneth French database, [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)

All remaining errors are that of our own.

For the most precise conclusion, understanding the negative risk is key. To do this we examined whether an aversion to low-rated portfolios pays off by studying the additional financial damage incurred in the worst 1% and 5% events, and how far a portfolio will fall before it recovers, otherwise known as maximum drawdown.





### 3. We believe active management of ESG factors adds to portfolio risk/reward performance

Active ESG portfolio risk management offers a more promising solution for investors seeking an enhanced investment risk/return framework. As we found no upward pricing, it is evident that simply skewing a portfolio towards top ESG ratings does not pay off.

In our analysis, we found strong evidence of downward risk exposure from poorly performing ESG portfolios. We suggest investors focus on the lower-rated holdings to assess ESG “torpedoes”- which may introduce increased negative risk and can harm a portfolio’s performance. Caution must be exercised with passive strategies, which may exclude companies that are making great advances on their ESG efforts and may become potential winners of tomorrow, instead rewarding high ESG ratings without materiality.

#### Conclusion: Active ESG investment management is key

To address portfolio ESG risk, investors must be mindful of the constantly changing macro and regulatory ESG dynamics, as well as corporate ESG events that can quickly transform from irrelevant to highly material. Passive investment strategies based on ESG indices assume that ESG risk can be integrated through a static rules-based skewing of an investment index based on third party ESG ratings. Our research found that such an approach can be challenged.

Firstly, ESG ratings methods differ significantly by provider. Our analysis shows very low correlation between the major ESG ratings providers for the same investment universe. Further, we found evidence that the outperformance of ESG indices vs parent indices stems more from an unintended factor tilt rather than picking the right holdings. Our research demonstrates that investors can be inadvertently be exposed to hidden risks by investing in passive ESG strategies due to factor-biases and a heavy reliance on third party ratings, which can take opposite views on a holding depending on the provider.

If you are interested in more details of our research and findings, an extended version of this paper will be published in Autumn 2019.

**Active is: Integrating ESG factors in an effort to avoid portfolio tail risks, which can have significant downside impact on risk-adjusted returns and long-term compound returns. Our research highlights that passive or tilted ESG strategies do not deliver better returns, rather, investors end up overpaying to concentrate assets without a benefit to returns.**

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## Further Publications

ESG in Asset Classes:

- [ESG in Equities](#)
- [ESG in Corporate Bonds](#)
- [ESG in Sovereign Bonds](#)

ESG Insights and Outlook:

- [Accelerating Economic Growth Through Sustainable Development](#)

[Sustainable Investing Report 2019](#)

[AllianzGI PRI Transparency Report 2019](#)

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