



INVESTING FOR CLIMATE RISK

CLIMATE CHANGE IS A REAL MARKET RISK IN THE NEXT FIVE YEARS. INVESTORS SHOULD FACTOR IT IN THEIR PORTFOLIO CONSTRUCTION PROCESS.

Although the world is currently in the grips of the COVID-19 pandemic, and global carbon emissions have declined sharply, we expect climate risk to come back on the political agenda before long. There have been calls to preserve environmental gains such as better air quality in urban areas and there will be a push to “remake” economies in a more sustainable manner. As a result, even though climate risk may not seem as pertinent as before, it is still important for investors to think about climate risk and its potential implications.

What Does Climate Risk Mean to Investors?

From an investor’s perspective, climate changes pose a great threat, which could negatively impact economic growth, inflation and investment returns. We differentiate between two types of climate risk: physical risk and transition risk. Physical risk is the risk of damage to land, buildings or infrastructure because of droughts, storms and flooding. Transition risk is the risk to businesses or assets because of policy, legal and market changes as the world seeks to transition to a lower-carbon economy.

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OVERVIEW

- Climate risk is the threat that global warming could negatively impact economic growth, inflation and investment returns.
- The market likely will re-price securities well ahead of the regulations and physical damage that climate change will cause.
- There is tremendous value in preparing for climate risk with strategies that tilt investors away from the biggest risks.

EXHIBIT 1: PREPARING FOR THE STORM

We expect the main climate-change risk to investments over the next 10 years to be regulations that companies face to address the physical risks that follow.

Risk Magnitude Related to Climate Change



Source: Merritt Research Services

Conceptually, Exhibit 1 demonstrates the expected growth of these risks over the decades to come. Rising transition risk dominates in the decade ahead as a worsening carbon emission trajectory becomes the focal point of a regulatory response. From 2030 to 2050, transition risk and physical risk may rise almost in unison, with transition risk rising in tandem with the emission trajectory and physical risk growing as the world surpasses 1.5°C of warming. From 2050 to 2100, we expect physical risks to dominate. Transition risk should still be there if attempts are not made to course correct. The growth in transition and physical risk depicted in Exhibit 1 will evolve differently depending on the extent, path and timing of climate change. That’s why any assessment of climate risk includes a review of the main scenarios for global warming. It is also important to note that transition risk is political in nature and can be expected to move in cycles.

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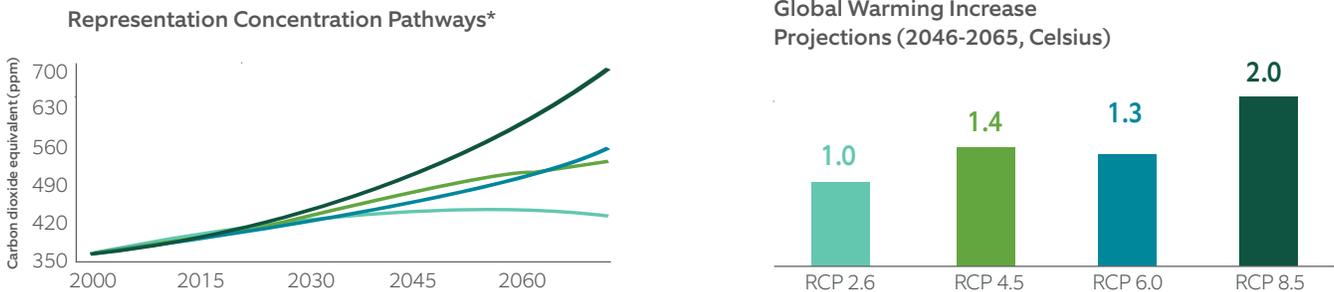
The Global Warming Scenarios

The Intergovernmental Panel on Climate Change (IPCC) has provided four main scenarios for future carbon emissions and associated global warming projections called representative concentration pathways (RCPs). They are based on human emissions of greenhouse gases from all sources. The IPCC chose the scenarios to represent a broad range of climate outcomes. In effect, each scenario has a certain “carbon budget” that puts a limit on global emissions. As the world uses up that budget, future physical climate risks will increase along with the likelihood of a regulatory response. We believe full implementation of the 2015 Paris Agreement to address the negative effects of climate change is aligned with the “RCP 4.5,” with an annual global warming increase of 1.4°C a year from 2046 to 2065.

The scenarios show that climate risk has a long lead time, limiting their impact on economic growth and inflation over the next five years. For instance, even if the Paris Agreement is implemented in full, its impact over the next five years would be small. Even more, since the first evaluation is scheduled for 2023, any changes in targets or implementation methods would occur after our strategic investment horizon.

EXHIBIT 2: CLIMATE CHANGE SCENARIOS

There are several climate-change scenarios, but their impact on the economy and inflation have a long lead-time. Investors should focus on business changes that may occur as countries and companies prepare for the negative effects of climate change.



Source: Northern Trust Asset Management, Assessment Report by the International Panel on Climate Change (IPCC). *Four representation concentration pathways (RCPs) were selected by the IPCC and defined by their total radiative forcing (cumulative measure of human emissions of greenhouse gases from all sources expressed in watts per square meter) pathway and level by 2100. The RCPs were chosen to represent a broad range of climate outcomes, based on a literature review, and are neither IPCC forecasts nor policy recommendations.

That being said, we assume that climate risk grows as the world uses up its carbon budget associated with different levels of global warming. The political will to confront climate change likely will grow, which should result in more business regulation in the next five years. Investors will start picking winners and losers.

When Climate Risk Affects Investors, and How

Obviously, it is very difficult to not only predict how climate risk will evolve over time but also how it will impact investors. The scenario analysis above gives investors a high-level sense of what the future may hold, but we shouldn't stop there. There is tremendous value in proactively building resilience into portfolios to mitigate the biggest climate risks. This allows investors to lower climate risk exposure without needing to predict exactly how climate risk will evolve and impact financial markets.

On a high level, we believe transition risk will be the key climate-change risk in the next five years, which as a reminder means the potential for significant climate-related regulations on businesses. We expect transition risk will be reflected in those asset classes that are most exposed to it — most notably natural resources, global listed infrastructure and an assortment of equity sectors. Financial markets are almost always one step ahead and we don't think this time will be different.

For natural resources, with its large carbon-intensive fuel exposure, future transition risk will act as a headwind. We have lowered our return expectations accordingly. The reverse is true for global listed infrastructure. Large investments will be made in areas like sustainable energy, electricity grids and water management. These investments represent growth opportunities. Some sectors, such as utilities, energy and materials will likely face headwinds because of their carbon-intensive footprint. Sectors such as health care, communication services and information technology will either not be affected or only to a very limited degree. In fact, within technology there will likely be some opportunities to aid the transition to a lower carbon world, for instance among semiconductor producers.

Utilizing Implementation Strategies to Position for Climate Risk

The first step to prepare an investment portfolio for climate risk is to take advantage of the wholesale gathering of company data and sustainability ratings, both spurred by the rise of sustainable investing strategies and the adoption of frameworks such as the Financial Stability Board Task Force on Climate-related Financial Disclosure (TCFD). TCFD is a consortium established in 2015 to develop a voluntary, consistent framework for use by companies to disclose climate-related financial risk to investors and other stakeholders. As of 2019, it has been adopted by more than 1,100 companies, and we expect this to only grow in the coming years. One goal of this framework is to support companies in defining the standardized disclosure necessary to facilitate the financial markets to measure, price and manage climate risks. The standards also service as a framework for engagement to encourage companies to standardize this reporting.

Beyond the TCFD, data providers continue to evolve and enhance their climate modelling along both the physical and transition lines with several of those metrics allowing investors to measure companies' exposure to environmental related risks and evaluate the financial impact of climate-related shocks.

The trajectory of global emissions over the next five years matters because it likely will be increasingly unacceptable politically. The added political urgency should result in more business regulation in the next five years, and investors will start picking winners and losers.

Of course, before diving into the analysis we have to acknowledge that there are limitations with each data provider and that their ratings may not necessarily correlate with each other. The analysis below uses the MSCI Environmental constituent ratings which are collated and modified to help provide actionable guidance for managing the risks of our clients' portfolios.

ESG Scores and Their Limitations

A fund level environmental score is simply a weighted average summary of the scores of the fund's holdings. Each company receives a score on exposure to a risk and the ability to manage it, with zero being the worst and 10 being the best. The fund level scores are valuable when comparing multiple products and benchmarks to authenticate environmental features. The fund level scores are valuable not just to provide an asset class or total portfolio score, but also to compare products against their benchmarks and each other.

Exhibit 3 presents the environmental scores from MSCI's ESG ratings for five alternatively weighted indices, including two ESG focused along with non-ESG counterparts. For illustration purposes, these indices will be benchmarked against the MSCI USA Investable Market Index.

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EXHIBIT 3: HOW SUSTAINABLE INDEXES COMPARE VS. NON-SUSTAINABLE

Sustainable indexes report high environmental scores vs. non-ESG focused counterparts, demonstrating their value to investors looking to engage environmental risks of indexes or funds.

Environment Score on Select Indexes

	Mstar US Sust Leaders	MSCI USA SRI	MSCI USA Enh. Value	MSCI USA High Div Yld	MSCI USA Divr Multi-Factor	MSCI USA IMI
Climate Change	8.7	8.6	8.0	8.5	7.8	7.8
Carbon emission	9.4	9.3	9.0	9.1	8.4	8.6
Product carbon footprint	6.0	8.4	5.2	8.4	5.4	5.6
Climate change vulnerability	8.7	6.1	5.5	3.9	4.1	4.9
Financing environmental impact	n/a	3.3	6.9	2.8	7.5	5.3
Environmental Opportunities	5.0	5.0	5.1	5.3	4.7	4.7
Opportunities in clean tech	4.9	4.9	4.9	5.1	4.3	4.6
Opportunities in green building	6.1	6.6	6.0	n/a	5.7	5.7
Opportunities in renewable energy	6.9	n/a	5.6	5.9	5.3	5.6
Natural Resources	7.8	7.1	7.1	6.6	6.4	7.0
Water stress	8.3	7.4	7.2	7.1	6.7	7.3
Biodiversity and land use	2.9	4.2	4.1	4.3	4.2	4.0
Raw material sourcing	5.6	5.8	4.9	5.9	5.4	5.5
Pollution & Waste	5.4	6.4	5.2	5.8	4.4	4.8
Toxic emissions & waste	5.4	6.2	4.9	5.4	4.5	5.0
Packaging material & waste	n/a	7.0	4.5	7.8	3.7	6.3
Electronic waste	n/a	0.0	6.8	4.7	4.3	2.8

Source: MSCI BarraOne, FactSet, Morningstar Direct. Index holdings as of February 28, 2020. See index definitions on the last page

Note that the Morningstar U.S. Sustainable Leaders Index holds a high overall environmental score versus the U.S. market index. The Morningstar index's strong climate change score is based on the underlying companies' proficient management of carbon emissions and footprint. The utility of the scoring system is synonymous to that of credit ratings within fixed income.

Competing products may have a similar top-level environmental score, but performance can vary significantly depending on the selection and weighting of constituents that sum up to an overall score. Therefore, the scores in isolation do not provide any context for expected returns or performance variability of the funds.

Climate Risk by Sector

To provide insight into how these scores can be used to prepare for climate risk, we begin by creating a climate risk factor and then use that factor to perform a scenario stress test analysis. This analysis is useful to measure potential losses if and when a climate-related market stress event occurs. For our factor, we selected the MSCI carbon emissions score which captures a company's carbon intensity as well as their efficiency in managing their emissions per unit of sales.

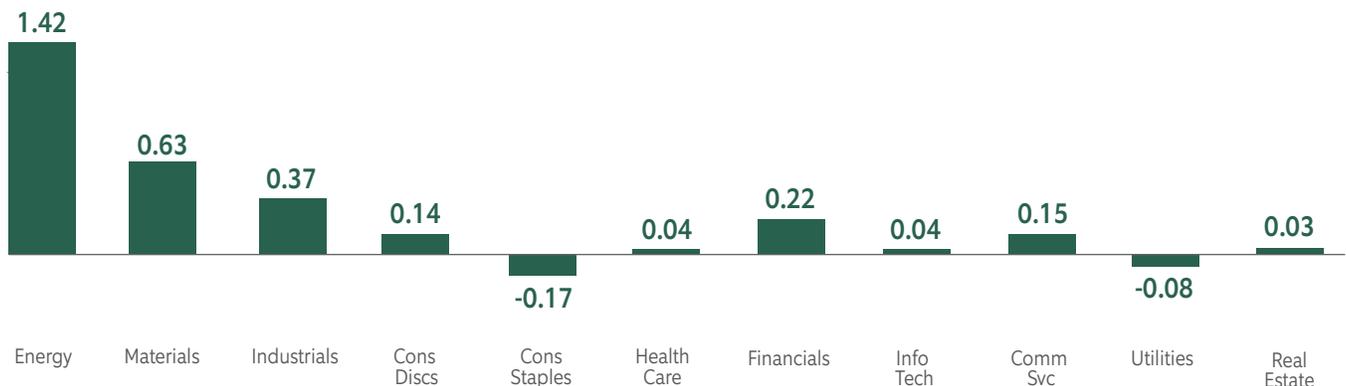
To create the carbon emissions risk factor, we first group all companies in the MSCI USA IMI Index into four quartiles based on their carbon emissions scores. The fourth quartile contains companies with lower emissions scores, which are very likely to face increased costs linked to carbon pricing or regulatory caps versus peers in the first quartile. The risk factor's return series is then constructed by going long companies in the fourth quartile and shorting those in the first quartile. The long-short process creates a market-neutral factor amplifying the return differences between companies found in both quartile groups. A product with a high sensitivity to the return variation of this factor indicates a positive exposure to companies with poor carbon emissions scores, thus higher carbon risk.

The utility of the scoring system is synonymous to that of credit ratings within fixed income. Competing products may have a similar top-level environmental score, but performance can vary significantly depending on the selection and weighting of constituents that sum up to an overall score.

EXHIBIT 4: SECTORS MOST AFFECTED BY CLIMATE CHANGE

Investors should consider the high sensitivity of the energy sector to climate change when constructing their long-term allocations. Interestingly, utilities have committed to reducing their carbon emissions and are not as risky as some may expect.

Sensitivity of Sectors to Climate Risk Factor (beta)



Source: MSCI BarraOne, FactSet, Morningstar Direct. Index holdings as of February 28, 2020. See index definitions on the last page.

To validate the factor, we performed a regression analysis between the MSCI USA IMI Index sectors and the carbon emissions factor as explained above. We expected to see carbon-intensive sectors such as energy have a higher sensitivity (beta) to changes in the factor. We also expected sectors such as health care, financials and information technology to have low sensitivity. Exhibit 4 illustrates the regression results in alignment with these expectations, with the energy sector reporting a sensitivity of 1.4 while health care, financials and info tech registered sensitivities closer to 0. We recognize the perceived carbon intensity of the utilities sector, but upon further analysis we found that many companies in the sector have made commitments to reduce their carbon footprint. This supports the utility sector’s lower sensitivity to the carbon emissions factor.

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The Sensitivity of Indexes to the Carbon Emissions Factor

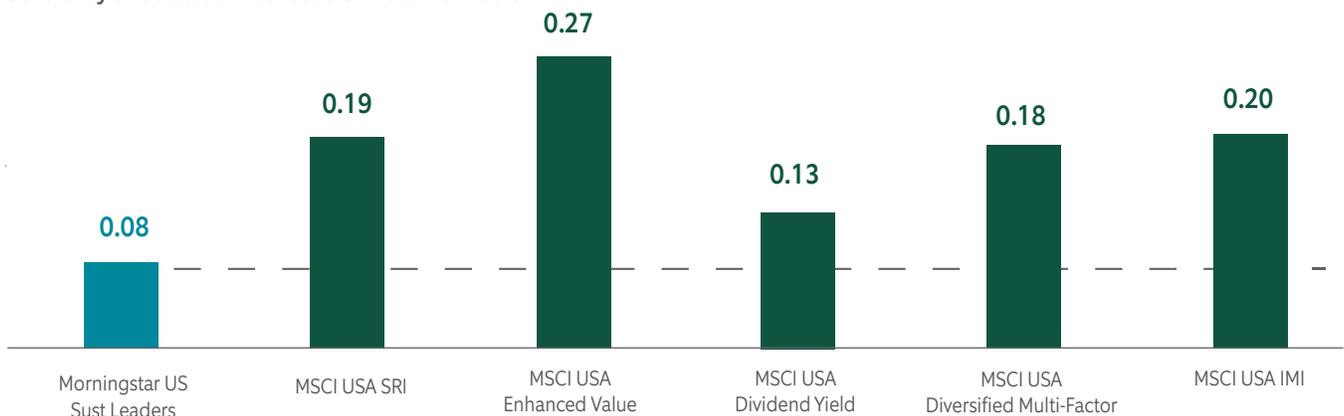
Revisiting our benchmark and list of indices, we are able to quantify and compare climate related risk using the carbon emissions factor. With its clean environment focus, we expect the Morningstar U.S. Sustainable Leaders Index to have a low sensitivity to the carbon emissions factor. The regression analysis in Exhibit 5 confirmed this with the Index reporting the lowest sensitivity (beta = 0.08), thus supporting its strong focus on selecting companies that manage climate risk efficiently. This low beta implies that as the carbon emissions factor’s performance varies by +/- 1%, we expect the index to have the smallest performance impact varying by +/- 0.08%.

By applying a +/- 20% return shock to the carbon emissions factor, we can quantify an expected return spread for each index and the benchmark. Indices with a lower sensitivity to the factor are expected to be less vulnerable to the factor’s price gyrations.

EXHIBIT 5: SELECTED INDEXES MOST AFFECTED BY CLIMATE CHANGE

The effectiveness of scoring is demonstrated with the Morningstar U.S. Sustainable Leaders Index, which shows a much lower risk to carbon emissions than other market-oriented indexes.

Sensitivity of Selected Indexes to Climate Risk Factor



Source: MSCI BarraOne, FactSet, Morningstar Direct. Index holdings as of February 28, 2020. See index definitions on the last page.

A key assumption is that the underlying companies continue their efforts to either reduce their carbon intensity or adopt policies to maintain/reduce carbon emissions. Exhibit 6 highlights the return spread of the sample index list where all non-climate focused comparisons have a wider spread of returns in the event of a carbon price shock. The MSCI USA Enhanced Value Index in particular can vary by up to 3.4x of the Morningstar sustainable index with a return spread of +/-5.3% versus the tighter +/-1.6% found with the Morningstar index.

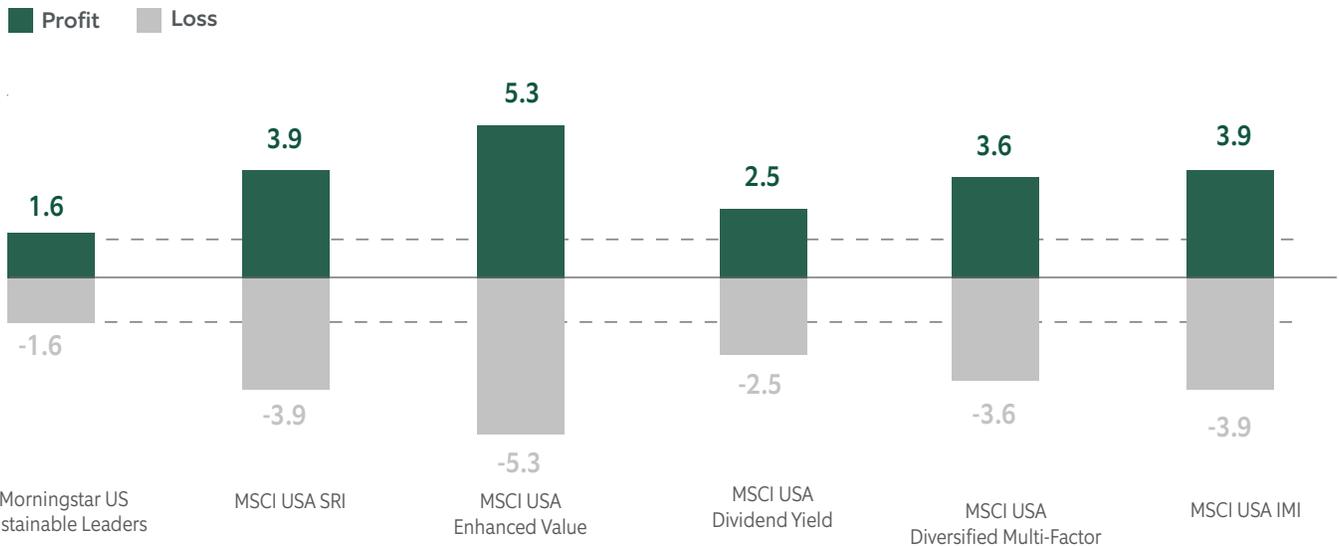
The combination of environmental scores, factor regression analysis, and scenario stress test analysis provides a comprehensive risk management framework to identify, measure, and monitor climate related risks in an investor's portfolio. We demonstrate a process of creating a factor to assist in the identification of portfolio sensitivities. This process can be applied to any data provider's environmental categories to create alternative climate-related risk factors. Lastly, applying these factors within a scenario stress test analysis helps to provide a measurable financial impact of climate-related stress event.

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EXHIBIT 6: SCENARIO STRESS TEST ANALYSIS

The Morningstar U.S. Sustainable Leaders Index volatility of expected returns is lower under a shock in the carbon emissions factor.

Expected Return (%) to a +/- 20% Shock to Carbon Emissions Factor



Source: MSCI BarraOne, Morningstar Direct. Returns are from January 2013 to December 2019. Past performance is no guarantee of future results. See index definitions on the last page.

Conclusion: Get Ahead of The Climate Change Curve

Over the next five years, we think the primary threat to investors is a material repricing of future scenarios around climate risk. This is because the market will be forward-looking, well ahead of physical or transition risks caused by global warming. The impact of climate risk on economic growth and inflation lie further into the future than our five-year strategic investment horizon.

We expect some transition risk will affect companies and industries most exposed to carbon emissions or assets, most notably natural resources, global listed infrastructure and sectors including energy, materials and utilities. More importantly, however, is that investors must become aware of climate risk and its different manifestations. As that awareness grows, we expect stocks and bonds to be repriced accordingly. Investors should aim to be ahead of the curve.

And being ahead of the curve does not necessarily mean mapping out every global warming scenario and analyzing every possible climate risk. Using ESG criteria while evaluating investments is an important way to mitigate long term climate risk that cannot yet be quantified and analyzed. It will actively tilt investors away from companies with business models that are more exposed to the negative impacts of climate change while pointing them towards those that are more likely to benefit from the new environment.

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