



Insurance-Linked Securities and Climate Change



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By investing in ILS securities, which are not tied to traditional markets, investors can potentially diversify their portfolios.

Executive summary

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- The reinsurance industry, which aims to protect insurers against the uncertain timing of severe climate events while providing opportunities for investors, has existed for nearly 200 years.
- Reinsurers continue to quickly respond to the impacts of climate change through higher deductibles, stricter terms and conditions, higher premiums, and enhanced risk selection.
- By adapting to climate changes, insurance-linked securities continue to offer investors the opportunity to earn potentially attractive, non-correlated returns over the long term.

While climate change has been a concern for the past several decades, an increase in the frequency of severe climate events has emphasized the role of the reinsurance industry. This industry takes a data-driven approach to balancing risk, allowing insurance and reinsurance carriers to transfer severe event risk to capital markets through the issuance of insurance-linked securities (ILS), including catastrophe bonds. Looking ahead, we believe the annual repricing of climate-related reinsurance means that investors could continue to be well compensated for the risks of these type of events.

The role of reinsurance

All types of reinsurance are designed to protect against the unpredictable year-to-year volatility of insured events. If the frequency and timing of these events were perfectly predictable, insurance companies would be able to budget appropriately for them, leaving little to no need for reinsurance coverage. But the uncertainty associated with these events creates demand for reinsurance, which provides support for insurance companies in the case of severe events.

These instruments can also offer benefits to investors as well as property owners and insurers. By investing in these securities, which are not tied to traditional markets, investors can help diversify¹ their portfolios while transferring risk away from insurers and those who suffer the direct impacts of these weather-related events.

Climate change, research and modeling

Since the advent of the reinsurance industry in the mid-1800s, reinsurers have continuously adapted to trends and changes in risk, including climate change, the study of which began later in the 1800s. In the mid-1970s, the concept of climate change made its way into the reinsurance industry, when Munich Re, a leading global provider of reinsurance and insurance-related risk solutions, introduced the framework into its underwriting and pricing of its offerings.

Climate change research indicates that changes in the frequency of natural catastrophes will exhibit themselves over decades, requiring an incremental approach to repricing risk. Because the reinsurance industry reprices its offerings on a year-to-year basis, it can incorporate longer-term trends into its assessments. The reinsurance industry and its stakeholders have devoted the efforts of thousands of professionals to study the science of climate risk over the short, medium and long term. To support this specialized research, catastrophe modeling uses scientifically based, complex programs and tools to represent statistically the physical characteristics of a wide range of events. Like all models, whether they forecast interest rates or a company's earnings, climate-risk models are constantly improving. Many market participants can complement these tools with other proprietary capabilities to create a more holistic framework for evaluating risk and return. The science, tool, techniques, data collection, and analysis will continue to evolve.



¹ Diversification does not guarantee a profit or protect against a loss.

The industry has implemented tools to compensate for the potential effects of climate change, including raising premiums, modifying terms and conditions, and requiring insurance companies to retain more of the risk within their businesses.

The effects of climate change on specific events

Hurricanes, wildfires and floods are examples of three distinct perils that receive significant media attention. The reinsurance industry and other stakeholders have been leading a multi-faceted response to evaluating, underwriting, pricing, and mitigating their impacts for many years. As a result, it is becoming more important for investors to better appreciate the background, data, and trends associated with this topic.

Hurricanes

There is no obvious long-term trend for the impacts of hurricanes; the National Oceanic and Atmospheric Administration has determined that hurricane path and landfall location are largely random, and the landfall location is the primary determinant of any insurable loss (see Exhibit 1). In 2005, there were hurricanes Katrina, Rita and Wilma, as well as several others the year before. Many groups attributed the increase in these event to climate change; in 2006, the Wall Street Journal published a piece "Are Hurricanes Uninsurable?" Yet, for the next 11 years, no major hurricanes made landfall in the US, the longest gap in recorded history.

Exhibit 1: Meteorological review of US hurricane season: hurricane landfall (1851-2023)



Source: National Oceanic and Atmospheric Administration, 31 Oct 2023

Wildfires

Due to a global trend toward higher temperaures and longer periods absent of rain, the current view of many researchers is that climate change is increasing the risk of wildfires². The California wildfires of 2017 and 2018 caused significant damage, leading relevant stakeholders to respond aggressively to mitigate future potential losses. Utility companies de-energized power lines with lower thresholds; local governments established more proactive evacuation protocols; insurance companies required better building standards; and the reinsurance industry increased its price for this type of risk significantly. Due to these enhancements, the impact of severe climate events on the reinsurance industry has been significantly reduced.

Floods

While there is scientific consensus that climate change could cause more floods³, this is less relevant for the US reinsurance industry because the federal government covers most residential flood risk.

How issuers of ILS adapt to climate-change trends

The global reinsurance industry has been in existence for nearly 200 years, and has offered returns to its shareholders while reducing the volatility faced by insurance companies. By repricing risk annually, the reinsurance industry is able to incorporate the risks of climate change into the risk-reward ratio it offers investors.

The industry has also implemented a variety of tools and techniques to manage its underwriting and to compensate for the potential effects of climate change. These include raising premiums, modifying terms and



² Source: National Oceanic and Atmospheric Administration, Sep 2023

³ Source: Intergovernmental Panel on Climate Change, Oct 2023

We continue to be constructive on this asset class and believe ILS is even more relevant in a diversified portfolio. conditions, reducing coverage, excluding some perils from coverage, and requiring insurance companies to retain more of the risk within their businesses. Furthermore, as they seek to mitigate their risks, investors in ILS can choose to allocate to reinsurers who have demonstrated they can profitably adapt to trends by increasing premiums or improving their operations.

According to the data, the adaptation of reinsurers has been largely successful. Serving as a proxy for the reinsurance industry, the Swiss Re Global Cat Bond Index has delivered positive absolute returns in 20 of the past 21 years, demonstrating that issuers have collected sufficient premiums to offset expected losses (see Exhibit 2). Over this span of time, there have been numerous catastrophic events, including hurricanes, wildfires, winter storms, floods, and earthquakes. In the instances of material catastrophic losses, the reinsurance industry improved its operations while also collecting additional premiums for losses.





Source: Swiss Re Global Cat Bond Index as of 30 Sep 2023. Swiss Re calculated index returns for the five years prior to the January 2007 inception of the index. Indices are unmanaged and their returns assume reinvestment of dividends and do not reflect any fees or expenses. It is not possible to invest directly in an index. Data represents past performance, which does not predict future results. The Swiss Re Global Cat Bond Index tracks the aggregate performance of all USD, EUR and JPY denominated CAT bonds, capturing all ratings, perils and triggers. The index seeks to hedge out the EUR and JPY currency risk at the inception of the bonds. However, the index does not reflect the full ILS market because it does not include private market securities. Returns do not take into account fees, charges, or other expenses.

Conclusion

The overwhelming consensus of scientists is that climate change will lead to a continued increase of severe events. We believe the annual repricing of climate-related reinsurance means that investors could continue to be well compensated for the risks of these type of events. Additionally, the diversification benefits of the asset class, which is not linked to traditional markets, continue to be attractive to investors. We continue to be constructive on this asset class and believe ILS are even more relevant in a diversified portfolio.



Index and Term Definitions

- Catastrophe bonds: High-yield debt instruments designed to raise money for insurance companies in the event that specific natural disasters, such as earthquakes or tornados, occur.
- Correlation: Measures the degree to which two variables move in relation to each other. A positive correlation signifies similar movements; negative correlation indicates opposite movement.
- Insurance-linked securities: Financial instruments that allow investors to speculate on a variety of events, including catastrophes such as hurricanes, earthquakes and pandemics.
- Longevity risk: The chance that life expectancies and actual survival rates exceed expectations or pricing assumptions, resulting in greaterthan-anticipated cash flow needs on the part of insurance companies or pension funds.
- Mortality risk: The risk associated with the variability in liability cash flows due to the incidence of death, resulting in greater-than-anticipated cash flow needs on the part of insurance companies or pension funds.
- Rate on line: The ratio of premium paid to loss recoverable in a reinsurance contract.
- Reinsurance: The insurance that an insurance company purchases from another insurance company or investor to insulate itself from the risk of a major claims event.
- Standard deviation: A measure of the amount of variation of a set of values. A low standard deviation indicates that the values tend to be close to the mean, while a high standard deviation indicates that the values are spread out over a wider range.
- Swiss Re Global Catastrophe Bond Index: An index that tracks the aggregate performance of all USD, EUR and JPY denominated CAT bonds, capturing all ratings, perils and triggers.

Important information

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