Insuring a volatile planet

Climate impacts threaten reinsurers

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Insurers may be in the business of pricing risk, but there is growing concern that industry models may be struggling to accurately predict the seemingly ever-growing frequency of wildfires, hurricanes and floods. For reinsurers, which provide insurance to primary insurers, failure to predict such events could result in improperly calculated risk exposures and increased losses. As shown in Exhibit 32, the number of relevant natural loss events grew from 249 in 1980 to 849 in 2018, an increase of over 200%.

Competitive response

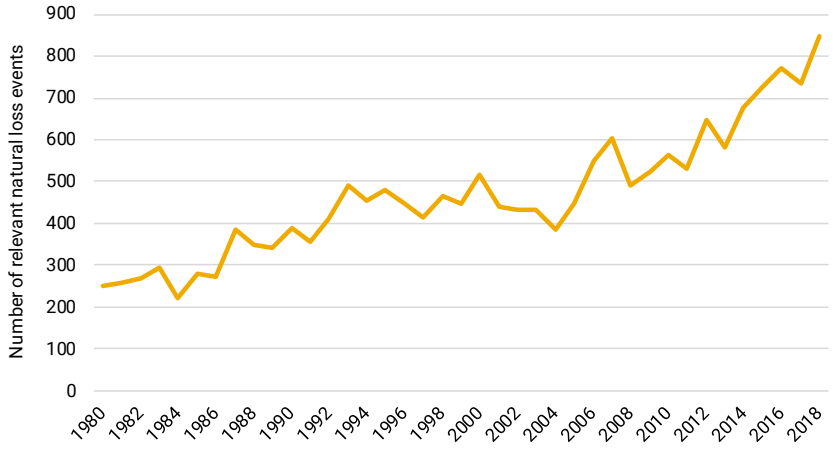
The reinsurance industry is responding to the growing threat of climate risk in a multitude of ways. Like primary insurers, reinsurers are readjusting premiums on property and casualty policies, especially in regions that are particularly prone to the physical impacts of climate change. Some reinsurers are already warning that climate change could render property insurance unaffordable for large segments of the population.[106]

Reinsurers are naturally looking to improve the accuracy of their climate models. While predicting the scope and intensity of climate impacts is clearly a daunting exercise, the industry is increasingly harnessing artificial intelligence (AI) to develop improved weather models over smaller grid areas. For instance, Munich Re's AQUALYTIX initiative uses machine learning to identify risk drivers for water-mains damage.[107]

Market interest in cat bonds and resilience bonds is mounting

Mounting climate risk is also driving the market's interest in both catastrophe (cat) bonds and resilience bonds. The market for cat bonds was estimated at USD 36.6bn in August 2019, up from USD 17.2bn in August 2006.[108] The market for resilience bonds is far less mature, but these instruments offer a potentially transformative solution in reducing municipalities' exposure to the physical impacts of climate change.[109]

Exhibit 32: Number of relevant natural loss events, 1980-2018



Sources: NatCatSERVICE, Sustainalytics[110]

Contribution to SDGs – recalibrating risk models

Potential positive SDG contribution

SDG 11 aims to ensure cities and communities are sustainable, inclusive, safe and resilient. Reinsurance companies that are improving their modelling of climate risk and innovating new risk transfer mechanisms, principally resilience bonds, can contribute to SDG 11.

Reinsurers that are leveraging AI and machine learning techniques to improve their climate modelling can more accurately identify areas of increasing natural disaster risks. SDG-focused firms then engage with cities and communities to share the improved climate-risk insights in order to support the public sector in reducing risks and improving resilience policies and programmes. In addition, through premium pricing that more accurately reflects the probability of climate catastrophes, reinsurers and primary insurers can nudge communities towards investing in more resilient infrastructure (targets 11.3 and 11.5).

Resilience bonds remain at the concept stage

Resilience bonds are a variation on cat bonds, whereby insurers take the expected impact of planned infrastructure improvements into account when pricing premiums.[111] This approach provides additional financing for cities to invest in resilience measures, such as building seawalls, and could contribute to improved disaster management (target 11.5).

While resilience bonds are in their infancy, they have experienced significant developments in recent months, and we expect the reinsurance sector's activity to increase in this area in 2020. The European Bank for Reconstruction and Development issued the world's first resilience bond worth USD 700mn in September 2019.[112] The same month saw the publication of the Climate Resilience Principles,[113] and the launch of the Coalition for Climate Resilient Investment, which includes Willis Towers Watson and Zurich Insurance Group among its members.[114]

Exhibit 33: SDG 11 – Target summaries

Target number	Target summary
11.1	By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
11.2	By 2030, provide access to sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations
11.3	By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries
11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage
11.5	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global GDP caused by disasters, including water-related disasters
11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
11.7	By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

Sources: Sustainable Development Goals Knowledge Platform,[115] Sustainalytics

Company analysis – climate-related products

ESG risks in underwriting standards

The ESG Integration – Financials MEI addresses how reinsurers are integrating environmental and social risks in their underwriting standards and how they manage their exposure to natural hazard risks. Exhibit 34 shows a selection of reinsurers from our coverage universe and their scores on this MEI.

Advanced measures to capture climate risk

Many of the firms listed in Exhibit 34 are not effectively managing their risk exposure, with scores in the high-risk range (i.e. scores between 6 and 8). However, a handful have low and negligible risk scores: Swiss Re, Munich Re and Hanover Rueck SE. Their low scores are due, in large part, to advanced measures to capture climate change risks in their underwriting practices and the development of innovative insurance products.

Industry examples

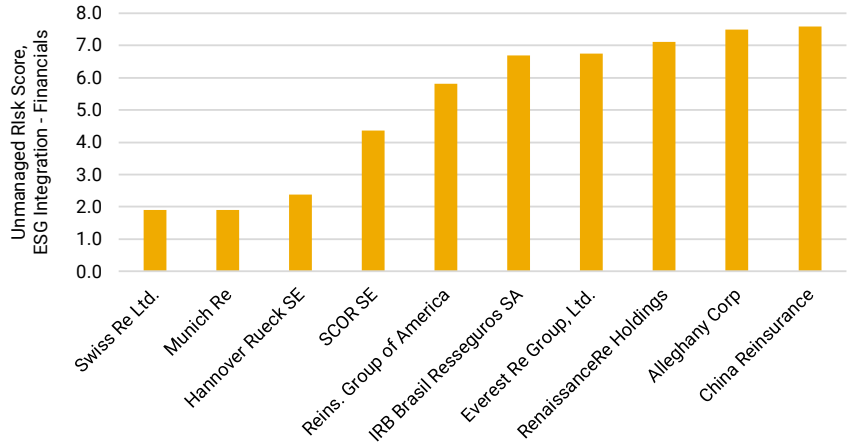
Localized risk information

For instance, Munich Re's NATHAN tool isolates location risk for flooding and storm surges down to individual postal codes. Meanwhile, Hanover Rueck committed USD 50mn in December 2019 to Germany's Natural Disaster Fund towards risk-transfer instruments for natural disaster and climate risks in developing markets. In addition, Swiss Re recently supported a parametric insurance solution with The Nature Conservancy and a Mexican state government to protect against hurricane damage on the Mesoamerican Barrier Reef System.[116]

Harnessing AI and machine learning

Considering the volatility of insurance payouts for natural catastrophe losses, we expect continued innovation to take place in climate-related insurance products. We anticipate more initiatives to integrate AI and machine learning along with human capabilities to improve climate modelling. Lastly, we forecast that reinsurers will continue to develop parametric insurance solutions that help to protect areas sensitive to natural disasters.[117]

Exhibit 34: Unmanaged Risk Score, ESG Integration – Financials



Source: Sustainalytics

Swiss Re Ltd.

Novel reinsurance products to help mitigate the impacts of natural disasters

20.2 **Overall Unmanaged Risk Score**
Medium Risk

3 out of 16 **Overall Unmanaged Risk Score, Subindustry Rank**
14th Percentile

1.9 **Unmanaged Risk Score, ESG Integration – Financials**
Negligible Risk

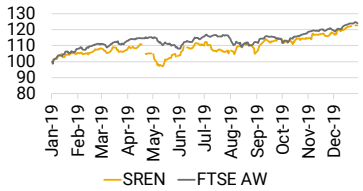
Country: Switzerland
Industry: Insurance
Subindustry: Reinsurance
Ticker: SREN (SWX)
Mkt cap (USD mn): 36,826*
**as of 31 December, 2019*

Key insights

- Swiss Re offers underwriting for coral reef systems to protect against hurricane damage, utilizing pre-determined severity thresholds.
- In 2018, the company developed a risk transfer product that protects solar farms financially in the event of reduced energy production.
- Swiss Re was among the first reinsurers to integrate ESG factors into its investment portfolio.

Overview

Stock price performance
SREN vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. Source: **Bloomberg**

Swiss Re is a Zurich-based reinsurance company that provides underwriting for both the life and health, and the property and casualty segments. The company operates 80 offices in 30 countries and has over 9,000 employees. It is the largest reinsurer globally by gross premiums underwritten. Swiss Re has spearheaded efforts on tackling environmental and social challenges in its business by addressing natural disaster and climate risks, sustainable energy and longevity issues. In 2018, Swiss Re's combined natural disaster related claims amounted to USD 2.2bn, underscoring the importance of prudent climate risk mitigation and underwriting parameters to protect from losses.

Co-developing resilience bonds

Its contribution to improving climate change resilience include co-developing resilience bonds, which allow cities and utilities to invest in mitigation infrastructure while managing associated financial risks.[118] The company recently underwrote three offshore wind farm projects in Taiwan, helping to expand offshore wind power generation in Asia. Within its underwriting business, Swiss Re has pledged not to underwrite any businesses with more than 30% exposure to coal or mining operations. It also created the Swiss Re Institute in 2017, which conducts risk research to drive better decision making in the industry and regularly collaborates with inter-governmental agencies in the US, EU and Asia/Pacific on risk resilience.

Outlook – innovation key to managing growing risks

Lower probability of experiencing material ESG Integration risks in 2020

The current rate of climate change means bold action is needed to address the increasing number and intensity of natural disasters. Swiss Re's renewable energy underwriting, parametric insurance for areas vulnerable to natural disasters and resilience bonds present opportunities to improve the management of growing climate risks. Based on the considerations above and the company's low unmanaged risk score, Swiss Re appears well prepared to manage ESG integration issues in 2020.