Hedging Climate-Related Risks: Role of Insurance

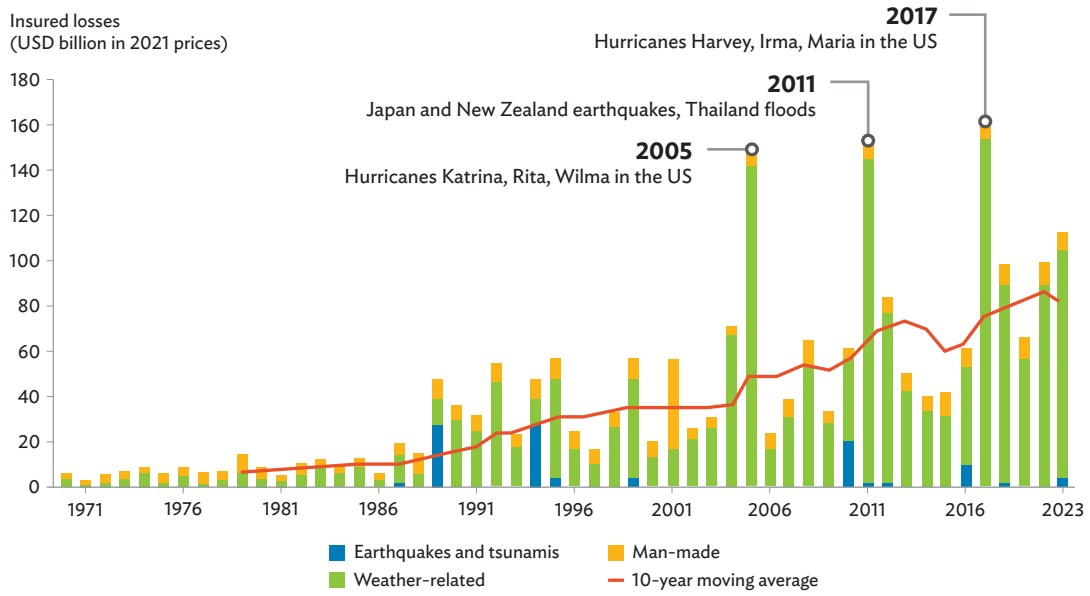
Introduction

The challenge of climate change is one of the most significant issues of our time, affecting not only environmental systems but also the global economy and financial markets. The occurrence of climate extremes represents an existential crisis for those who hold assets and the insurers who underwrite their risk. In recent years, there have been in excess of 1,000 extreme weather events globally that have caused more than USD1 trillion in damages.[13]

Figure 22 depicts the trend of insured losses by cause and year. In 2022, the global insurance industry was expected to experience a significant increase in natural-catastrophe-related claims, with such claims projected to reach 54% above the 10-year average and 115% above the 30-year average (Fantini et al. 2024). In this context, the insurance industry occupies a unique position, assuming a dual role in both the mitigation of risks and the exploration of opportunities presented by the climate crisis.

This note is based on a forthcoming paper by the author that explores these dimensions through an in-depth analysis of the ways in which the insurance sector can adapt to the evolving landscape of climate risks, while simultaneously contributing to the broader societal effort to combat climate change.

Figure 22: Insured Losses by Cause and Year



US = United States, USD = United States dollar.
Source: Adapted from Wagner, Katherine R.H. 2022. Designing Insurance for Climate Change. *Nature Climate Change* 12 (12): 1070–72.

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[13] *Bloomberg*. 2024. Natural Disasters Led to $250 Billion in Global Losses Last Year.

Literature Review: The Role of Insurance in Climate Change Management

The Multifaceted Role of Insurance

This literature review illuminates the multifaceted role that the insurance industry plays in the management of climate-related risks. Historically, insurance has been a vital means of providing financial protection against disasters triggered by natural hazards and other catastrophic events. However, the increasing frequency and severity of these events due to climate change necessitates a more proactive approach from insurers.

Notable studies, including those by Mills (2009) and Jarzabkowski et al. (2019), emphasize the necessity for insurance companies to implement adaptation strategies that foster resilience not only within their own operations but also across the broader economy. For example, Mills' study catalogued the various insurance products and services that have been developed in response to climate change, emphasizing the importance of green remediation and the necessity of addressing gaps in coverage. Similarly, Jarzabkowski et al. (2019) argued for the development of open-source climate risk models and the integration of these models into national strategies, emphasizing the role of insurance in both physical and financial adaptation to climate change.

Economic Impacts and Risk Management

The economic consequences of climate change are considerable and pervasive, impacting a multitude of sectors, including agriculture, infrastructure, and beyond. The study examines the potential for insurance to play a pivotal role in mitigating the impacts of climate change through effective risk management. For example, Michel-Kerjan's (2010) evaluation of the National Flood Insurance Program identifies areas where insurance programs can be improved to enhance their effectiveness in managing climate-related risks. Furthermore, Surminski (2014) underscores the significance of flood insurance in risk reduction, emphasizing the necessity for substantial enhancements to optimize its efficacy in mitigating the direct risks associated with flooding events.

The financial implications of climate change extend beyond the immediate recovery from disasters. As Campiglio et al. (2023) observe, the revaluation of financial assets due to climate-related risks has significant implications for financial stability. This highlights the necessity for continuous assessment and adjustment of financial assets and market premiums to account for evolving risks.

Climate Change Risks and Insurers' Risk Management

Managing Physical and Transitional Risks

Climate change risks can be reflected in various aspects of an insurance company's operations, including insurance risk, market risk, investment risk, and reputational risk. The increasing frequency and severity of disasters due to climate change can lead to a rise in insurance payouts, affecting the financial stability of insurers. To manage these risks, insurers must adopt strategies such as geographic diversification and reinsurance.

Reinsurance, in particular, plays a crucial role in maintaining resilience against climate-related risks. By distributing their exposure across diverse geographical regions, insurers can mitigate the financial impact of localized disasters. However, the forthcoming study notes that smaller insurers may face challenges due to increased reinsurance premiums, which could lead to market consolidation and the dominance of larger insurers.

The Impact on Life and Health Insurance

Climate change also has implications for life and health insurance, as extreme weather events can result in elevated mortality rates among high-risk individuals. Insurers must adjust their underwriting criteria to account for these heightened risks, particularly in the context of long-term climate change. Additionally, changes in crop and fish species due to climate change can impact loss rates and profitability for insurers in sectors such as agriculture and fisheries.

The role of reinsurance in managing these long-term risks is emphasized, as it provides diversification benefits that help insurers maintain resilience. However, the study cautions that the increasing frequency and intensity of extreme weather events may result in higher reinsurance premiums, which could pose challenges for smaller insurers.

Climate Change Risk and Asset Management

The Impact of Climate Risks on Investment Portfolios

Climate change affects insurers' asset management, particularly through changes in company valuations driven by the transition to a low-carbon economy. The implementation of low-carbon policies is expected to reduce the value of traditional industries, such as fossil fuels, while increasing the value of green industries. Insurers must adjust their investment portfolios to reflect these changes, reallocating assets to increase their holdings of green financial assets.

Even traditionally safe assets, such as government bonds, are not immune to climate risks. The study discusses how disasters triggered by natural hazards can lead to economic slowdowns, potentially resulting in downgrades of sovereign credit ratings. This is particularly relevant for bonds issued by economies that have experienced or are expected to experience severe disasters triggered by natural hazards. The study also highlights the risks associated with municipal bonds, which are contingent upon the degree of government and municipal response to disasters triggered by natural hazards.

Real Estate and Climate Risks

The study also addresses the impact of climate change on the real estate sector, noting that shifts in governmental policies and regulations related to energy efficiency can influence the value of real estate assets. The study suggests that insurers must remain agile in their asset management strategies, adjusting their portfolios to account for both physical and transitional risks associated with climate change.

The Expanding Role of Insurance in Climate Adaptation

Engaging in Risk Management Across Sectors

The role of the insurance industry in climate adaptation is evolving in response to the growing risks associated with climate change. The insurance industry is increasingly regarded as a pivotal actor in risk management across a spectrum of sectors within the real economy, encompassing manufacturing and services. This expanded role is driven by two key factors: (i) the increased occurrence of disasters triggered by natural hazards and (ii) the growing awareness of climate risks among businesses and governments.

International organizations have acknowledged the pivotal role of the financial sector, including insurance, in addressing climate change. For example, the Financial Stability Board constituted a task force in 2015 to investigate responses to climate change risks, and the European Union initiated an action plan on sustainable finance in 2018. These initiatives highlight the vital role of the insurance industry in mitigating climate risks through the development of innovative financial instruments and risk management strategies.

Systematic Integration of Climate Risk Management

To effectively address climate risks, insurance companies must systematically integrate climate risk management into their business models. This involves recognizing climate change as a fundamental risk factor in insurance underwriting, asset management, and corporate social responsibility efforts. The rise in disasters caused by climate change, often accompanied by significant financial losses, necessitates a comprehensive approach to risk management that considers both physical and transitional risks.

Physical risks include phenomena such as global warming, sea level rise, and disasters like storms, floods, and wildfires. These risks have the potential to disrupt national economic infrastructure, leading to reduced economic activity and the transfer of risk to financial markets. The study highlights the importance of understanding these risks at a macroeconomic level, as their ripple effects can have profound implications for the insurance industry.

Transitional risks, on the other hand, stem from policy shifts toward a low-carbon economy. These risks can significantly impact industries that are slow to adapt to new regulations and technological advancements. The study discusses how policy shifts, such as those mandated by the 2015 Paris Climate Agreement, can alter the economic behavior of market participants and increase market risk. Insurance companies must adapt to these changes by incorporating transitional risks into their risk assessment models and adjusting their investment portfolios accordingly.

Opportunities and Challenges for the Insurance Industry

Framework for Climate Risk Management

A framework for climate risk management has been developed with the objective of assisting insurers in the more effective management of the risks associated with climate change. The framework is structured around three principal stages: (i) before underwriting, (ii) before claims, and (iii) during or after claims.

Prior to the underwriting process, it is recommended that insurers develop more sophisticated modeling techniques and customer segmentation strategies to enhance their risk assessment capabilities. Furthermore, the study underscores the significance of product innovation, including the introduction of temporary coverage and parametric insurance, in addressing the evolving risks associated with climate change.

Prior to the occurrence of a claim, the study recommends the transfer of alternative risks through reinsurance, insurance pools, and insurance-linked securities. Furthermore, the study proposes the implementation of empirical studies and pilot programs to evaluate the efficacy of preventive measures and their impact on risk profiles.

In the period following a claim, insurers focus on reducing the cost of settling claims in the event of a catastrophe. This can be achieved through the provision of consulting services, the dissemination of risk awareness tools, and the implementation of real-time notifications and support mechanisms. Furthermore, the study highlights the importance of incorporating enhanced resilience measures into post-disaster reconstruction efforts.

Increasing Awareness and Response Among Insurance Companies

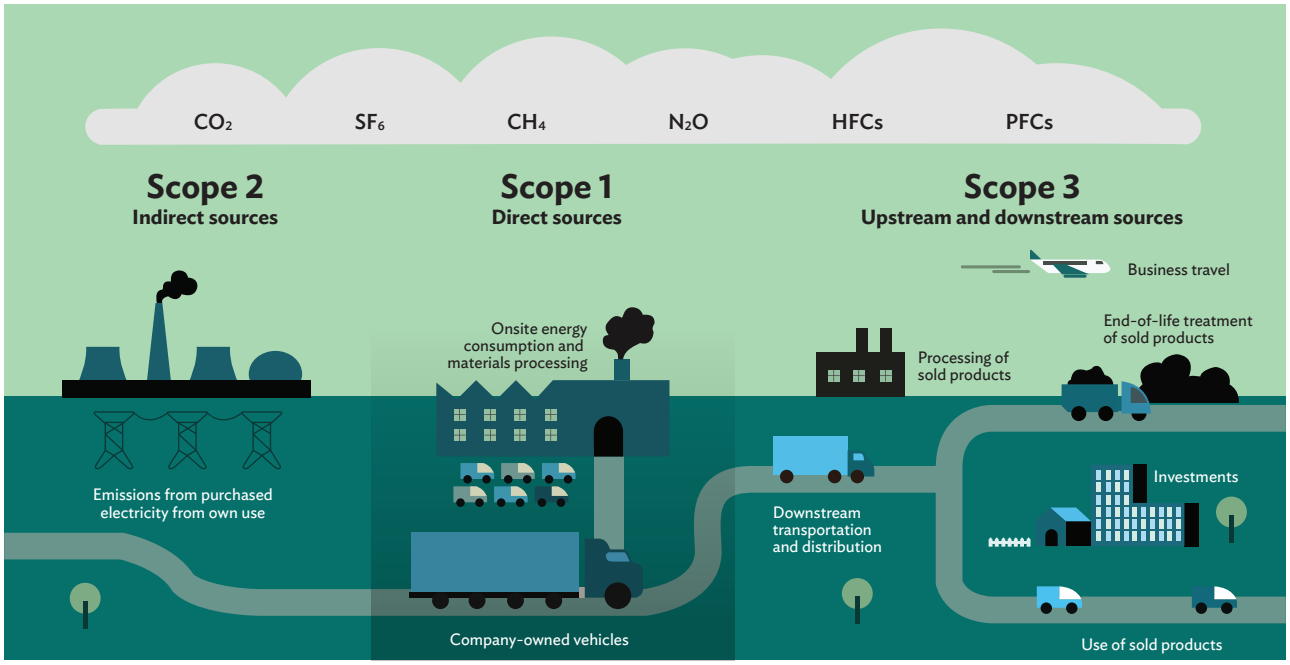
There is a discrepancy in climate risk awareness among companies, which is influenced by their exposure to different insurance categories and a general lack of awareness. Nevertheless, as the climate crisis intensifies, there is a growing awareness of the issue. It is incumbent upon each insurance company to analyze climate risk in accordance with its business model and develop a strategy that is aligned with this analysis. The crisis underscores the necessity for insurance companies to prioritize the reduction of Scope 3 greenhouse gas emissions, which are predominantly associated with their investments. In anticipation of mandatory sustainable disclosures, insurers must ascertain and differentiate between Scope 1, 2, and 3 emissions as illustrated in **Figure 23**, with a particular emphasis on distinguishing between financed emissions from asset management and insurance-related emissions from underwriting. Addressing both types is vital for attaining carbon neutrality, although facilitated emissions are less pertinent for insurers.

Conclusion

The study provides a comprehensive overview of the insurance industry's role in managing climate change risks. By adopting proactive risk management strategies and capitalizing on new business opportunities, the insurance industry can play a key role in mitigating the impacts of climate change while enhancing its own resilience and profitability. The study's framework for climate risk management, combined with the industry's growing awareness of climate risks, highlights the need for a systematic and integrated approach to managing climate-related risks.

The public sector has a critical role to play in supporting the growth of the insurance sector during the transition to a low-carbon economy by providing subsidies, tax incentives, and a regulatory framework that reduces the financial burden on insurers, thereby enabling lower premiums for consumers. They can also establish public–private partnerships to share risks, invest in technology and data infrastructure to improve risk modeling, and promote green bonds and insurance-linked securities to diversify insurers' portfolios. In addition, educational campaigns are raising awareness of climate risks and the benefits of insurance, leading to broader market penetration and, ultimately, more affordable insurance premiums.

Figure 23: Conceptualization of Scope 1, 2, and 3 Emissions



CH_4 = methane, CO_2 = carbon dioxide, HCFs = hydrofluorocarbons, N_2O = nitrous oxide, NF_3 = nitrogen trifluoride, PFCs = perfluorinated compounds, SF_6 = sulfur hexafluoride.
Source: Oliver Wyman Forum. The Climate Action Navigator.

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