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Mitigating Catastrophic Events: Assessing the Effectiveness of Reinsurance Risk Management Mechanisms

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Abstract

The core principle of insurance risk management is the equitable distribution of losses, where the financial burden of the few is shared by the many, achieved through the pooling of premiums. This risk diffusion process primarily occurs within the realm of insurance companies, often denoted as primary insurers. However, the scope of risk management extends further, encompassing the engagement of additional stakeholders, typically known as reinsurers. Reinsurance takes the form of a contractual agreement, where one insurance company, in exchange for a premium, assumes responsibility for indemnifying another insurer against the entirety or a portion of potential losses under their insurance policies. This mutual relationship between insurers and reinsurers underscores the fundamental purpose of insurance: the efficient dispersion of policyholders' risks. The primary objective of reinsurance risk management mechanisms is to provide a robust defense against catastrophic events that unfold on a global scale.

Keywords: Reinsurance, Catastrophe, Events.

Introduction

Why is reinsurance of value to primary insurers? Financial theory explains that reinsurance is redundant in the conditions of capital market equilibrium for diversified, widely held firms (Doherty and Tinic, 1981). The most obvious explanation is that insurance companies do not have well-diversified portfolios. Reinsurance provides an alternative mechanism for further diversification of the risk but other factors such as the minimization of taxes, the effect of regulatory constraints and services provided by reinsurers, may also explain the demand for reinsurance. It is estimated that whereas only a small fraction of life insurance business is reinsured, in property and liability insurance a substantial amount of the covered risk is transferred to reinsurers. The problem of reinsurance planning at the level of a company is solved essentially according to the individual requirements of the company**.** Catastrophic events, whether natural or man-made, have the potential to impose significant financial

losses and disrupt economies on a massive scale. Any events or force of nature that has catastrophic consequences, such as avalanche, earthquake, flood, forest fire, hurricane, lightening, tornado, tsunami and volcanic eruption. In the realm of reinsurance, various contract types are utilized to manage risk.

These contracts can be categorized into two primary groups: facultative and treaty reinsurance.

Table 1

(A)	(B)	(C)
Individual	Insurance Company	Reinsurer
Insurance contract between		A&B
Reinsurance contract between		B&C
No connection between		A&C (Normally)

Table 1 explains the mechanism of reinsurance business. (A) denotes individual (B) denotes insurance company and (C) denotes the reinsurer. Individuals and firms purchase insurance from the insurance company. Insurance contract between A& B, reinsurance contract between B&C and normally there is no connection between A&C. Whenever the insured individual and firms suffers loss against the insured risk, the reinsurance company pays to the insurance company and the insurance company pays to the insured individual.

Significance of the Study

The significance of this study is to create awareness among the insurance industry, insurance companies in particular and reinsurance companies in general of the effect of mitigating the catastrophic events to the minimal to allow insurance and reinsurance companies to have more financial strength and stability by reducing the flow of funds towards meeting the catastrophic losses. The losses especially resulting from climate change hurting insurance industry immensely and thus having a sound reinsurance risk mechanism is essential.

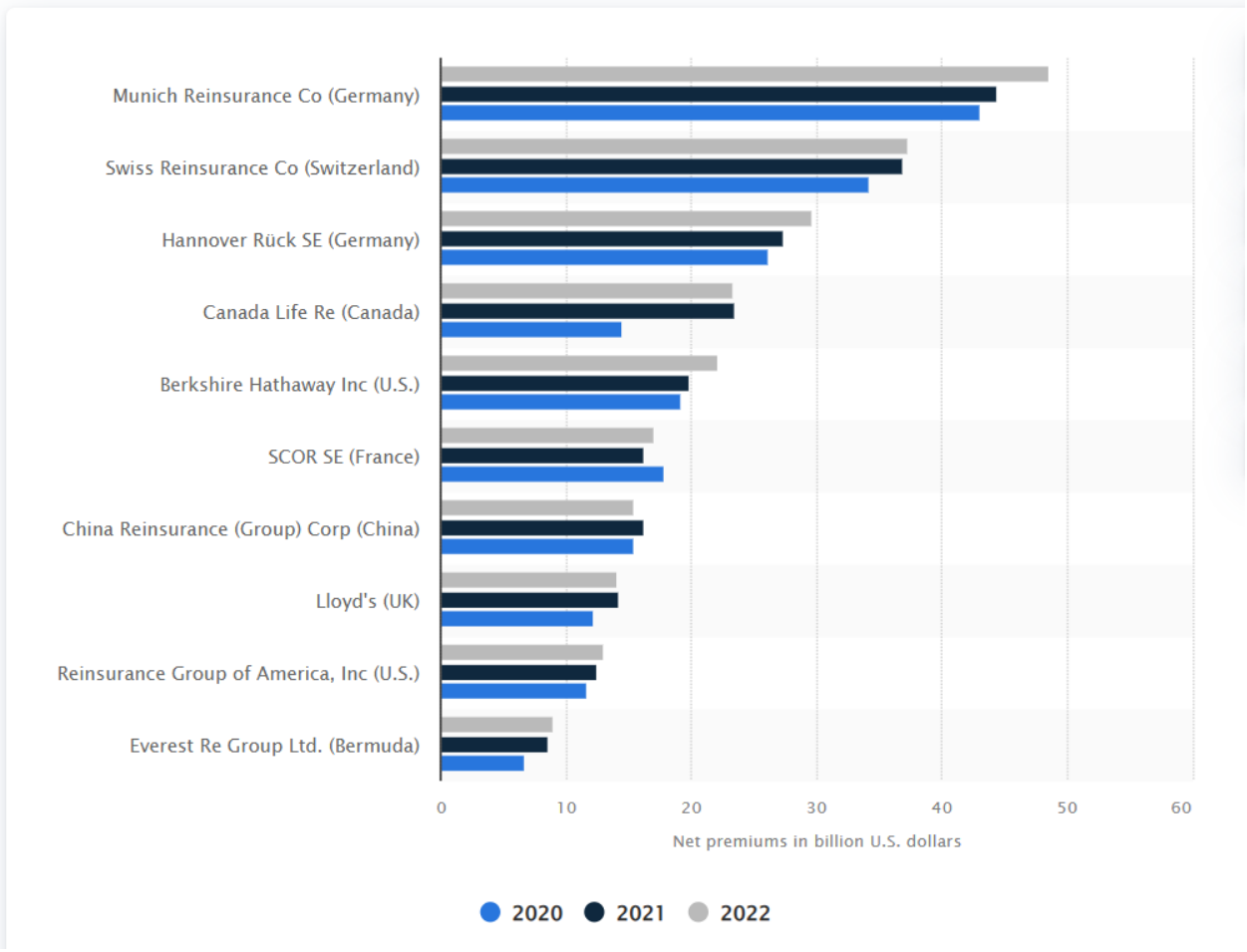
Top Ten Global Catastrophic Events in 2023

Date	Event	Location	Deaths	Economic Loss ($ billion)	Insured Loss ($ billion)
02/06-02/20	**Turkey and Syria Earthquakes**	Turkey and Syria	59,272	**92.4**	5.7
05/22-09/30	**China Floods**	China	370	**32.2**	1.4
10/25-10/26	**Hurricane Otis**	Mexico	52	**15.3**	2.1
01/01-06/30	**La Plata Basin Drought**	Brazil, Argentina, Uruguay	N/A	**15.3**	1.0
01/01-12/31	**U.S. Drought**	United States	N/A	**14.0**	6.5
05/13-05/17	**Emilia-Romagna Floods**	Italy	15	**9.8**	0.6
03/01-03/03	**Severe Convective Storm**	United States	13	**6.2**	5.0
07/21-07/26	**Severe Convective Storm**	Europe	11	**5.8**	3.0
08/08-08/17	**Hawaii Wildfires**	United States	100	**5.5**	3.5
03/31-04/01	**Severe Convective Storm**	United States	37	**5.5**	4.4
All other events			~35,100	**178.0**	84.8
Totals			**~95,000**	**380**	**118**

Approximately a quarter of all economic losses in 2023 were attributed to the disastrous earthquake sequence in Turkey and Syria, which struck the region in February. Widespread impact on property and infrastructure resulted in more than $90 billion in direct damage —

making it the costliest natural disaster recorded in both Turkey and Syria, the Middle East and the entire EMEA region in modern history. At least four other events have crossed the $10 billion-dollar economic damage threshold, with China reporting total flood damage in excess of $30 billion again, after a below-average loss year in 2022. Powerful Hurricane Otis made its devastating landfall at Category 5 intensity near Acapulco in Mexico and made history as the strongest landfalling hurricane in Eastern Pacific. Drought was prominent in North and South America. While only three severe convective storm events ranked among the top 10 individual economic losses of 2023 and none of them surpassed $10 billion, the peril was responsible for more than $94 billion in combined damage.

Largest Reinsurers Worldwide from 2000 to 2022, by net premium written (in billion U.S. dollars)



Functions of Reinsurance

The functions or advantages of reinsurance are the following

Financing: There is a limit to the amount of premiums an insurer can write which is related to the size of the surplus. When premiums are collected in advance, the company must establish an unearned premium reserve. Reinsurance enables a company to increase its surplus by reducing its unearned premium reserve. This is particularly useful to a new or growing insurance company, or even to an established insurance company entering a new field of underwriting.

Capacity: Capacity in insurance terminology means a company's ability to insure a large amount of insurance coverage on a single loss exposure (large line capacity) or to write a large

number of contracts in a line of business (premium capacity). A large capacity is necessary for marketing reasons. It would be difficult for an insurance company to explain to the agents or brokers that they have done a terrific job but that they now should stop working until the end of the year because the company has reached its surplus capacity for a particular line of business. Reinsurance also permits the acceptance of coverage on individual risks in larger amounts than the capital and surplus position of the company would allow, or more simply on risks that the management of the company would consider too hazardous.

Stabilization of Loss Experience: An insurance company, like any other business firm, likes to smooth, as far as possible, its financial results from one year to another. However, underwriting results (losses) may fluctuate widely in some lines of business for many reasons (economic, climatic or others) or because the diversification of business in a class of business is not adequate. Reinsurance is an arrangement under which the insurance company reduces the year-to-year fluctuations within some limits. Reinsurance is sometimes compared to a banking operation where the insurer borrows from the reinsurer in bad years and pays back when its loss experience is good.

Catastrophe Protection: The impact of a major catastrophe loss from a natural disaster, an industrial accident, or similar disasters, on a company's normal (or expected) loss experience may be considered the principal reason for buying reinsurance. A catastrophe loss may endanger the very existence of the company. In this particular case, a reinsurance contract is typically the insurance of the insurer.

Underwriting Assistance: Reinsurance companies accumulate a great deal of information and statistical experience regarding the various types of insurance coverage, the methods of rating, underwriting and claims adjustment. This experience is quite useful for the ceding company particularly to enter a new line of business, a new territory, or to underwrite an uncommon type of risk.

Ease of Entry and Exit from a Territory or Class of Business: Reinsurance facilities can provide extremely valuable services to enter a new market, but they are also very useful when an insurance company chooses to stop writing in a particular line of business or a particular geographic region. If an insurer decides to withdraw from a territory or class of business, it can legally be done only after all contracts are terminated. The insurer could technically cancel the contacts and refund the unearned premiums but that process would be expensive and highly criticized by policyholders, producers and regulatory authorities. The alternative method is to transfer all the portfolio of insurance policies to another insurance company or a reinsurer

Methods of Reinsurance

Facultative reinsurance involves individual risk assessment, where each risk is evaluated separately. The reinsurer has the option to accept or decline each risk presented by the primary insurer. Facultative reinsurance can be further categorized into facultative obligatory cover, where the reinsurer is obligated to accept all risks presented by the primary insurer. Disadvantages of facultative reinsurance include uncertainty in obtaining cover, time-consuming administration, and relatively higher costs. **Treaty reinsurance** is a contractual agreement that covers numerous similar risks automatically, making it more cost-effective to administer. It involves an arrangement where the primary insurer and reinsurer agree to share risks and premiums. All risks that fall within the terms of the treaty, based on factors like class and size, are automatically reinsured upon acceptance of the original risk by the primary insurer. Treaty reinsurance is characterized by a lack of individual policy selection,

and it is periodically renegotiated by the primary insurer and reinsurer. Before entering into a treaty, reinsurers evaluate the primary insurer's past performance and expected underwriting results. Proportional treaties involve the sharing of risks, premiums, and losses in agreed proportions between the primary insurer and reinsurer.

Proportional treaties include Quota Share Treaty, where a fixed percentage of every risk is ceded, and Surplus Treaty, where the surplus over the primary insurer's retention is ceded. **Non-proportional treaties** focus on sharing losses, and the reinsurer's participation in a loss depends on its size. Types of non-proportional reinsurance include Risk Excess of Loss, Event Excess of Loss (for catastrophic losses), and Stop Loss. Key Features of Proportional Reinsurance: Unlimited reinstatement, potential for commission and profit commission, and quarterly payment. Risks are shared in agreed proportions, and there is no limit on the number of claims. Key Features of Non-Proportional Reinsurance: No sharing of losses, the insurer pays all losses up to an excess point, and the reinsurer pays losses exceeding a specified limit. Non-proportional reinsurance is used when the insurer seeks protection against actual losses on specific risks. These reinsurance mechanisms play a critical role in managing and spreading risks within the insurance industry, helping insurers maintain financial stability in the face of unforeseen events.

Utmost Good Faith

Most certainly, reinsurance contracts belong to that class of contracts known as "Uberrimae fidei" which demand a high standard of good faith between the parties. There must be the fullest disclosure of any fact which is considered material. This doctrine applies equally to both treaty and facultative reinsurance. Details of every risk ceded to the reinsurer are forwarded in the form of bordereau. It includes information on the risk insured as well as an indication of the maximum possible loss, the company's net retention and the amount reinsured. Reinsurers are always bound to follow the settlements of the primary insurer and reinsurance is therefore an indemnity against payment of a claim by the insurer.

Claim Settlement

The adjustment of claims is the responsibility of the primary insurer. However, in highly technical lines of business, the reinsurance company often participates in the adjustment of claims that will ultimately result in reinsurance claims. The reinsurance company is legally obligated to make payment to the ceding company as soon as the proof of loss has been received. In practice, excess loss contracts do not come into play until the adjusted losses exceed the retention.

Conclusion

In summary, insurance and reinsurance both serve the fundamental purpose of risk sharing, with insurers essentially insuring the risk again. Reinsurance encompasses all classes of insurance and plays a critical role in the industry, with primary insurers, reinsurance companies, and international reinsurance firms providing this vital service. Reinsurance offers numerous advantages to primary insurers, including risk transfer, balance sheet protection, and increased underwriting capacity. The real-world impact of catastrophic events underscores the necessity of effective risk management mechanisms. The devastating 2023 Tornadoes outbreak in the United States and the staggering losses incurred during Typhoon Hagibis in 2019 in Japan serve as stark reminders of the potential financial consequences of such events. Additionally, the blockage of the Suez Canal in March 2021 disrupted global

trade, highlighting the interconnectedness of modern economies and the need for comprehensive risk mitigation strategies. In this context, insurance and reinsurance emerge as indispensable tools in managing catastrophic risk events, benefiting individuals, insurers, and reinsurers alike. These mechanisms facilitate resilience in the face of unforeseen disasters, ultimately safeguarding the interests of all stakeholders involved in mitigating catastrophic risks. Regardless of the type and size of an insurance company, the use of reinsurance is universal. The transaction between the primary insurer and the reinsurer is not only a transfer of money, it enhances the functioning of the insurance mechanism. The functions and methods of reinsurance are explained in this chapter. The need for risk diversification, capacity and expertise has been increasing in the past decades and is reflected in the growing importance of the reinsurance market.

Contribution of the Study

The contribution of this study is to introduce more effective reinsurance provisions both proportional and non-proportional reinsurances to combat major catastrophic events. Under proportional reinsurance quota share and surplus reinsurance arrangements needs to be based on multiple layers of protections. Under non-proportional besides working, catastrophic excess of loss, stop-loss arrangements insurance and reinsurance company need to incorporate stop loss reinsurance arrangements to protect the overall portfolio towards meeting the effects of catastrophic loss.

This study would benefit insurance companies and especially reinsurance providers around the globe. The study would also help insurance companies to have better reinsurance arrangements to curtail the losses resulting from catastrophic events by having sound reinsurance protection thus contribute in the GDP of the country's economies.

References

Harrington, S. E., & Niehaus, G. R. (2003). Risk Management and Insurance. McGraw-Hill/Irwin.

Grace, M. F., Klein, R. W., & Phillips, R. D. (2004). Risk Financing. Wiley.

Cummins, D. J., & Weiss, M. A. (2009). Convergence of Insurance and Financial Markets: Hybrid and Securitized Risk-Transfer Solutions. The Journal of Risk and Insurance, 76(3), 493-545.

Browne, M. J., & Hoyt, R. E. (2000). The demand for reinsurance: Theory and empirical tests. Journal of Risk and Insurance, 67(1), 15-38.

Global: largest reinsurers 2024, by net premiums | Statista

Swiss Re Institute. (Yearly). Sigma Report on Catastrophe Risk.

Munich Re. (Yearly). Topics Geo - Natural Catastrophes.

Federal Emergency Management Agency (FEMA). (Yearly). National Flood Insurance Program (NFIP) Reports.

National Oceanic and Atmospheric Administration (NOAA). (Yearly). National Centers for Environmental Information (NCEI) - Climate Data.

National Association of Insurance Commissioners (NAIC) USA.

Prudential Regulation Authority (PRA) UK.

Butler, J.S., The Legal Position of Reinsurance Brokers, London: ROA, 1979.

https://eb-journals.rtu.lv/eb/article/view/eb-2017-0015

Climate-and-catastrophe-insights-report.pdf (aon.com)