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The art of underwriting

Introduction

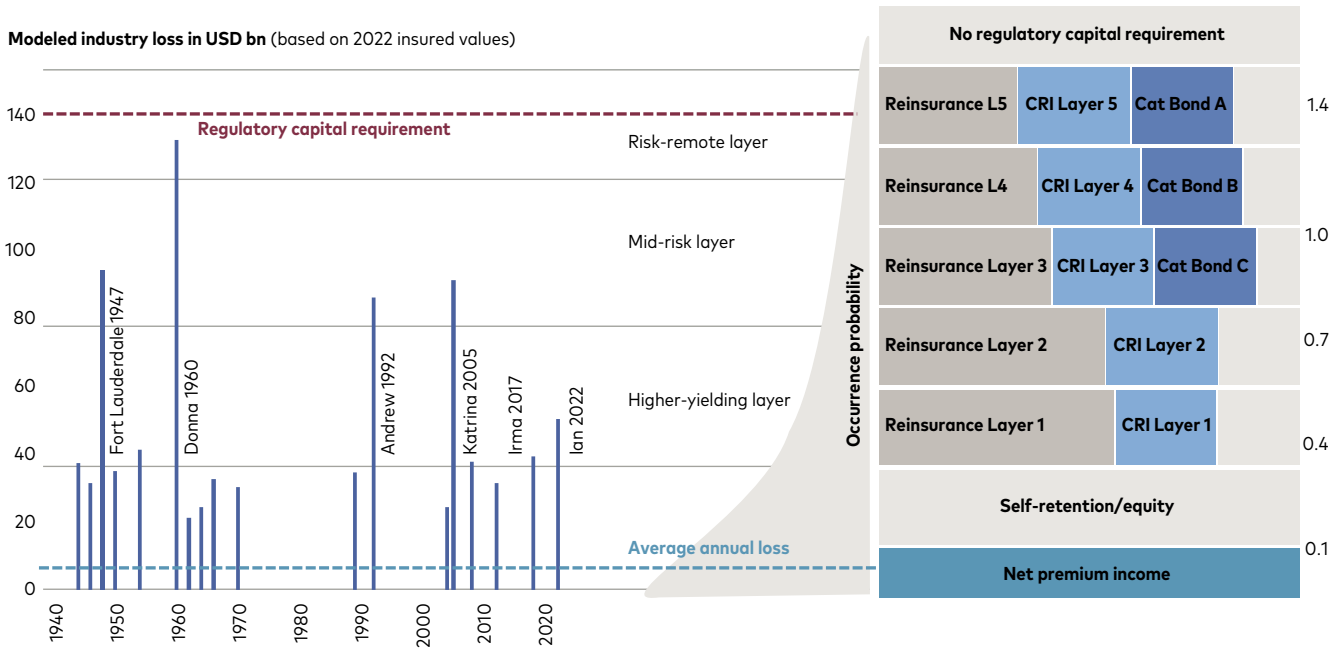
Managing a portfolio of insurance-linked strategies (ILS) requires a specific skillset. The investment selection and portfolio optimization process is commonly referred to as "underwriting". The counterparties are primary insurance companies that purchase covers to meet regulatory capital requirements and manage their balance sheets. The practice of reinsurance underwriting and reinsurance/ILS portfolio management requires a deep understanding of the market dynamics of individual peril regions, catastrophe modelling and risk assessment, negotiation skills and ultimately also strategic thinking. In this paper, we explore the key components that define the art of underwriting and provide examples of potential pitfalls.

Understanding reinsurance

The business case for reinsurance and ILS investing is rooted in the regulatory requirements that apply to primary insurance companies. For example, a natural catastrophe such as a hurricane in Florida may affect thousands of policyholders of a local Florida-based primary insurer. To protect consumer interests, regulators require insurance companies to undergo stress tests in order to ensure that they can meet their payment obligations to clients even in an extreme event scenario, enabling the insured to rebuild their homes and businesses. While insurers need to be capable of meeting these solvency requirements at all times, regulators do not stipulate that each insurer must hold regulatory capital in the form of (paid-in) on-balance sheet capital. Instead, insurers are permitted to purchase hedges against extreme event scenarios. If the hedging counterparty is regulated by an equivalent framework (referred to as Solvency II regulation), the insurer is allowed to reduce its on-balance sheet capital – a process referred to as "receiving capital relief" from reinsurance. Reinsurance is therefore a mechanism through which insurers transfer defined parts of their risk portfolios to other risk takers, such as reinsurance companies or ILS investment managers. This enables primary insurers to manage their capital in conjunction with their exposure to catastrophe events, to ultimately meet regulatory capital requirements and to maintain their financial stability.

The following illustrative chart shows the regulatory capital requirement for a primary insurance company operating in the southern states of the US. The capital requirement for an insurer depends on the impact of potential catastrophe events on the firm's in-force portfolio (i.e. policies sold) and thus differs from company to company. The dotted red line in the chart shows the return period of the stress tests that defines the regulatory capital requirement. The chart depicts some of the key (known) historical events and their estimated impact on this specific insurer. It furthermore highlights the capital structure applied by this specific insurer to meet the regulatory capital requirements, such as actual on-balance sheet capital (equity), traditional reinsurance, collateralized reinsurance (CRI) and cat bond capital.

Illustration of the regulatory capital requirement and the reinsurance structure of a US primary insurance company



Source: LGT ILS Partners, AIR
Typical regulatory capital requirements are based on a 250 years aggregate loss scenario (VaR 99.6%).
For illustrative purposes only.

The role of the underwriter

The reinsurance underwriter or – in the case of ILS – the ILS portfolio manager plays a pivotal role in the investment management and allocation process. Their key responsibility is to assess individual reinsurance/ILS transactions, including the determination of payout probability, the negotiation of the appropriate premium to assume this risk on behalf of a fund/portfolio, and ultimately the agreement on the contractual terms and conditions that align with interests of both parties – the reinsurance buyer and the capacity supplier/ILS fund. Effective reinsurance underwriting strikes a balance between efficient risk mitigation for the primary insurer and profitability of the reinsurer.

In addition to risk assessment and pricing, reinsurance underwriters and ILS managers need to focus on managing the overall portfolio of individual transactions by maintaining a balanced portfolio strategy to manage downside risk and maximize returns. By carefully selecting and diversifying individual contracts (risks), reinsurance underwriters and ILS managers can minimize the impact of large claims and ensure the long-term stability of the investment strategy.

Finally, the underwriter supports each transaction during the lifecycle of the deal – from inception to expiration. This includes ensuring that the insurer pays its premiums and – in the case of a catastrophe event – assessing the loss impact, establishing the appropriate reserve and liaising with the loss auditors to make sure any payouts are concluded in line with the contractual terms.

The art of reinsurance underwriting is founded on essential skills and expertise. Analytical skills are crucial, as underwriters must interpret complex data and identify trends that can impact risk assessment and pricing. Attention to detail is equally important, as accuracy in evaluating risk and setting premiums is vital to maintain profitability and minimize exposure to large claims. Negotiation skills are another key attribute for reinsurance underwriters: Effective communication and negotiation are necessary to secure the most favorable terms and conditions that benefit the reinsurer but still make the deal palatable for the buyer, i.e. the primary insurer. Additionally, market knowledge and strategic thinking are essential to develop strategies to manage risk and optimize the relevant portfolios. Understanding market trends, economic factors and regulatory changes can help underwriters to make informed decisions and stay ahead of the competition.

Reinsurance underwriters face several challenges, including the potential for catastrophic events to occur, regulatory changes and market competition. Natural disasters are large-scale incidents that can lead to a significant draw-down in the underwritten portfolio, forcing underwriters to carefully manage their exposure to high-risk areas. Adapting to evolving regulations and compliance requirements is another challenge, as underwriters must stay informed about evolving legal and industry standards. However, there are also significant opportunities for growth and innovation in the field of reinsurance underwriting. Technological advancements, such as data analytics and predictive modelling, enhance the risk assessments and improve the accuracy of pricing and underwriting decisions. Growth in the market is heavily influenced by construction activity, migration and inflation, leading to increases in insured values. And globalization presents opportunities to expand into new markets with untapped potential, allowing ILS managers to diversify their portfolios and their market reach.

Summary

The art of underwriting is a dynamic and complex discipline that requires a blend of technical expertise, strategic insight and market awareness. Access to a large team of skilled individuals with advanced modelling and risk assessment tools is crucial for achieving positive long-term outcomes for investors. By mastering all these elements, underwriters and ILS portfolio managers can generate attractive and sustainable returns for investors. At the same time, enabling investors to access the insurance-linked investments market and to provide capital and capacity to primary insurers is crucial to ensure the stability and resilience of the global insurance industry.

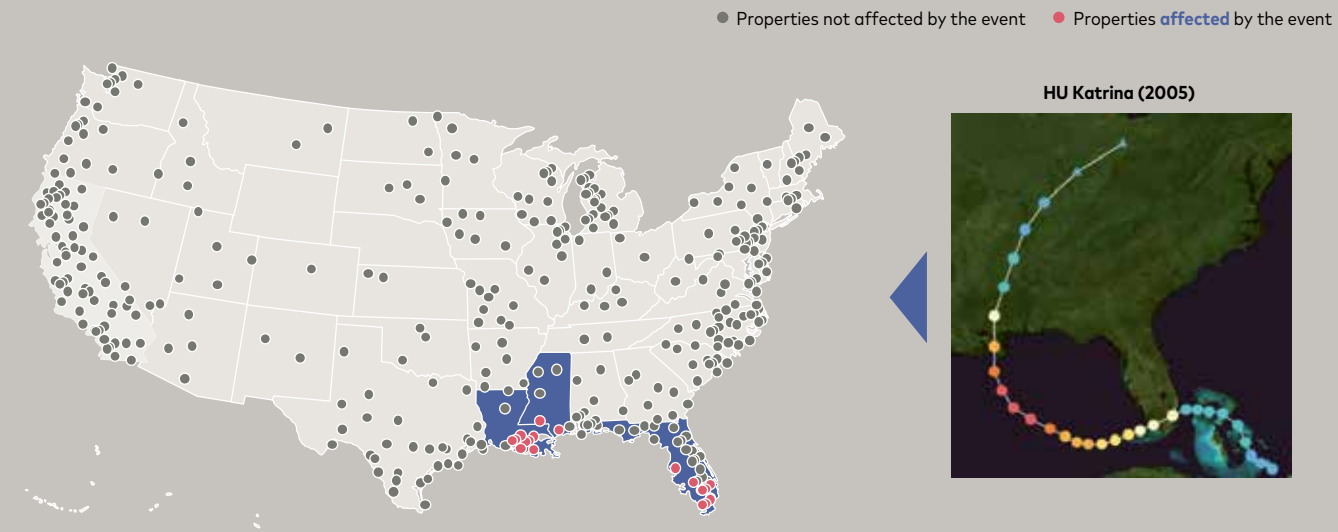
Catastrophe risk modelling and pricing

The catastrophe risk modelling tools used in reinsurance could be described as a kind of high-tech "crystal ball" that forecasts occurrence probabilities of natural disasters such as hurricanes, earthquakes, floods or wildfires and allows for calculating their potential impact on insured homes, businesses and other properties within a specific region. Catastrophe risk modelling tools use historical data, scientific research and sophisticated computer simulations to predict the likelihood and potential severity of such disasters and the extent of the damage they could cause to the insured properties in the defined area. Weather patterns, geological activity, building structures and other factors are integrated into the analysis to create detailed scenarios of potential events. Further, these tools are updated regularly to incorporate the latest scientific insights related to climate risk. In summary, catastrophe risk modelling tools make it possible to assess the estimated impact of a potential event scenario and to run actual historical events and their impact on the portfolio of a counterparty.

The following chart depicts the portfolio of a US insurer and shows how Hurricane Katrina in 2005 affected the portfolio. Based on the known attributes of the storm (such as its track and strength/ magnitude), the catastrophe model enables the event to be re-run on the specific insurer's current portfolio, based on today's insured properties. This allows for calculating the estimated loss impact on the in-force portfolio of policies if Hurricane Katrina were to occur again today:

An ILS manager applies such models to first assess individual transactions on a stand-alone basis and to then assess the overall portfolio composition as a second step. The tools allow for the benchmarking of the exposure of an ILS portfolio relative to large-scale events, which in turn enables the underwriter to optimize the portfolio composition by adding single deals that improve diversification and to measure the actual improvement. This important exercise also enables the underwriter to negotiate the premium required for a transaction, taking account of supply and demand, but also considering the individual optimization characteristics of each specific deal. In essence, catastrophe risk modelling forms the basis for informed decision-making on single investments, supporting premium negotiations and optimizing combined risk portfolios in order to inform investors about the expected maximum draw-down from extreme hypothetical natural events. The models are a powerful tool for deal underwriting, ultimately optimizing portfolios and protecting investors from undue losses.

Structures covered in a sample reinsurance/ILS portfolio



Source: LGT ILS Partners, NOAA
For illustrative purposes only.

Contractual terms

Each individual investment position – be it a private reinsurance transaction or a catastrophe bond – features an underlying contract that stipulates the actual coverage terms and defines the transfer of risk. Whilst catastrophe risk models help to assess the potential impact of extreme events and are thus used as a basis to negotiate the premium for each deal, negotiating the terms and conditions of the actual reinsurance contract is equally, if not more, important. The key concern is ambiguity in coverage terms around an event – in our case a natural catastrophe. Most recently, massive wildfires in California posed a severe threat to the reinsurance and ILS market and triggered significant losses. Wildfire is a risk commonly covered in reinsurance contracts. However, in the past, only very few wildfires were able to cause damage to a sufficiently large number of properties to trigger a payout under a reinsurance contract. The most devastating wildfire events in terms of loss of life and destruction to properties occurred in 2018, when the Camp Fire near Butte in Northern California destroyed the town of Paradise and claimed 85 casualties. A total of 18,000 buildings were destroyed, and the Camp Fire remains the most devastating wildfire event to date. At the same time in fall 2018, the Woosley Fire burned for several weeks, causing significant localized damage. The two fires were located just over 250 miles apart, as shown below:

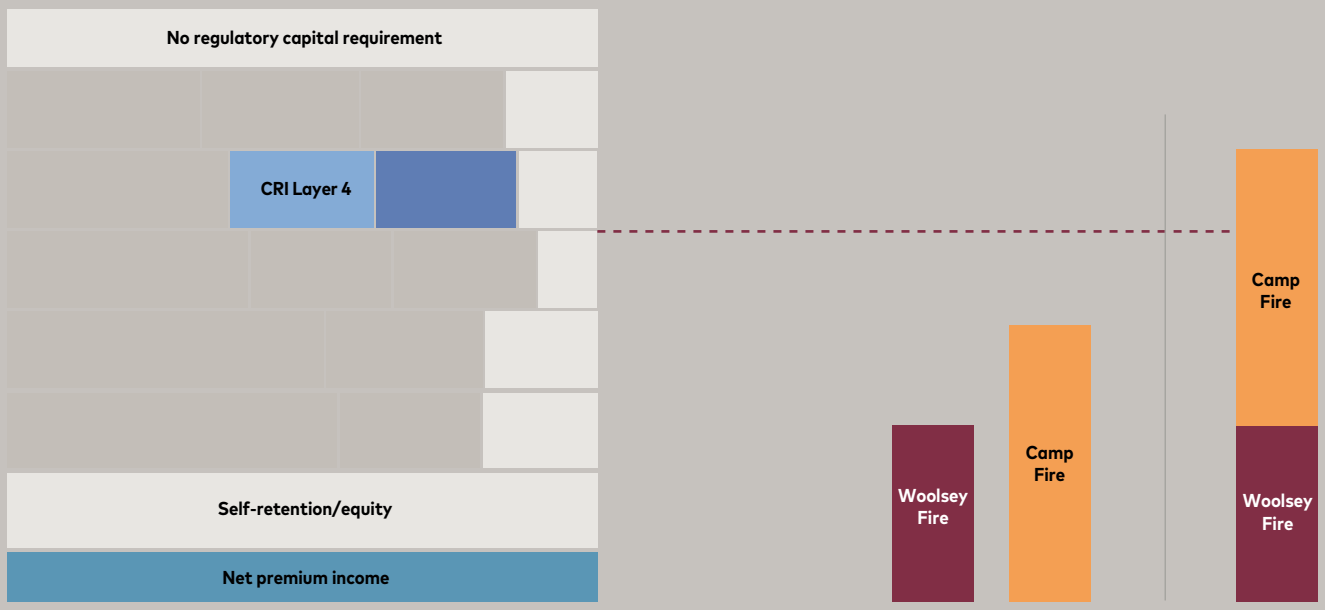
These events caused significant financial losses to the private insurance sector. The fact that the losses were triggered by more than one fire event highlights an area of potential dispute in the definition of an event: depending on the structure of the reinsurance cover, the insurance company buying the reinsurance protection may have an inherent interest in declaring this to be a single event. By accumulating the losses from the two fire events in our example and declaring the wildfires to constitute a single event, the total monetary loss amount is higher and may exceed the defined triggers for a payout, as stipulated within the reinsurance program. This results in a lower loss to the insurer, as the retention level is only borne once. For reinsurers and ILS mangers that have allocated to more senior tranches within the reinsurance structure, the combination of losses may trigger a payout and thus have a negative financial impact. The following chart depicts the loss recoveries for insurers in a scenario where the Camp Fire and the Woolsey Fire represent two individual events and highlights the level of recoveries if the two fires are considered as a single wildfire event.

Investors in CRI Layer 4 in this illustration are only affected if the event definition in the contract wording allows these two events to be combined. The exact definition of what constitutes a wildfire event is stipulated in the contract wording. The loss definition includes the time element (i.e. the events need to occur within a close time range, measured in hours) and most importantly the distance between events (measured

in miles). These elements are key determinants of the ultimate loss amount: the higher the distance negotiated by the insurer in the loss definition, the more likely a recovery becomes, giving the insurer more flexibility. An experienced ILS underwriter considers such aspects when negotiating contractual terms for the benefit of the ILS portfolio as protection seller.

As a general rule, it is important for reinsurance contracts to be drafted in clear and precise language and to incorporate exclusion clauses to address emerging risks. Another current example relates to the exclusion of risks relating to war, with contractual terms having been amended to also exclude "war-like operations and the nationalization of property" rather than solely official declarations of war. Properly defining coverage limits, exclusions and conditions help to prevent misunderstandings and disputes ultimately protects the reinsurer from unexpected financial losses.

Potential presentation of losses from Woosley Fire and Camp Fire on illustrative reinsurance structure



Source: LGT ILS Partners.
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