Beyond Conventional Coverage: The Power and Potential of Parametric Insurance

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Introduction:

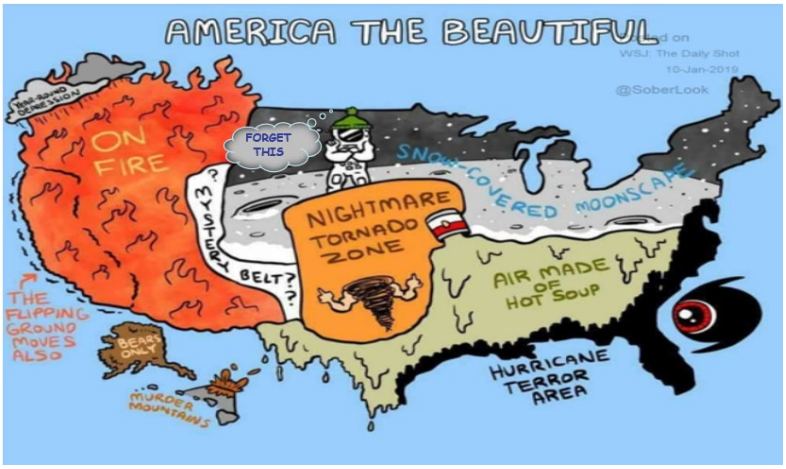
Over the last 15 years, the insurance market has been challenged in many different avenues especially when it comes to products pertaining to property and cyber. These challenges have allowed for new developments in the industry, such as the rise of insurtech companies and innovative risk management solutions like parametric treaty structures. The Parametric insurance structure is an approach to risk transfer that departs from traditional loss-based assessment methods. Instead of relying on complex claims investigations and loss adjustment processes, parametric insurance adopts predefined, data-driven parameters to trigger payouts. This unique feature allows for quick and transparent claims settlements, which will help revolutionize the way insurers handle challenges pertaining to both natural and cyber catastrophes. For example, suppose an insurance company offers agricultural insurance to farmers to protect their crop yields against adverse weather conditions. The insurer wants to mitigate its exposure to indemnity based loss. In this case, parametric insurance would be an extremely effective solution for them. The parametric insurance contract would be structured to pay out the insured when a specific weather parameter (e.g., the amount of rainfall, temperature, crop yield) falls outside of a predefined range. This range would be determined based on historical data and expert analysis, indicating the threshold beyond which crop yields are likely at a greater risk of severity. If the weather conditions trigger the parametric threshold, the insurer would make a payout to the insured according to the pre-agreed terms. The payout would not be based on actual crop losses experienced by individual farmers but on whether the defined parameter exceeded the set threshold. The advantages of parametric insurance in this scenario include quick payouts to the insured, liquidity management for the insurance carrier and this structure allows insurers to adapt treaties that align with their risk appetite. However, this new risk management tool does not come without its setbacks; in this scenario there is a possibility for basis risk, which allows for a mismatch between the parametric trigger and actual losses experienced by the insured. This problem could greatly increase during systemic events such as a widespread regional disaster. An additional issue that arises is an increase in moral hazard because there are predefined triggers, the insured could be less inclined to take adequate risk mitigation measures such as proper irrigation and drainage systems. Lastly, parametric insurance mostly relies on historical data to set these predefined triggers and because of this, it may not capture emerging risks in the farming community such as climate change. In this paper I will display that even

with the challenges that arise with parametric insurance, it can be a transformative treaty structure in the insurance industry.

Property Insurance:

The increase in severe weather and climate-related disasters from 2020-2022, resulting in significant financial losses, has undoubtedly caused apprehension among underwriters when it comes to writing property. With the year 2022 having experienced 18 separate weather and climate disasters (3rd most in recorded history) costing at least 1 billion dollars, there is a great deal of deterrence when attempting to write these treaties, “Farmers Insurance has decided to join more than a dozen other Florida insurance companies that have stopped writing home insurance policies in the state, over 100,000 homeowners are scrambling to find new coverage in a dwindling yet critical industry.” (Girod & Pensacola News Journal, 2023) By embracing parametric reinsurance and insurance options, the industry can foster a more resilient and efficient approach to managing catastrophic risks in the property market. The unprecedented frequency and severity of weather-related events in recent years have necessitated a shift in risk management strategies. Parametric insurance offers a unique value proposition, as it enables insurers and reinsurers to provide timely payouts based on objective and measurable triggers, avoiding the delays and potential disputes associated with traditional loss-based claims. An example of where parametric treaty structures could be used in the property market would be, when a company based in California understands that they have seismic exposure and may decide to explore parametric insurance. In this arrangement, the company establishes predetermined parameters to activate payouts in the case of an earthquake. They set a benchmark magnitude, such as 7.0 on the Richter scale, this would entail any earthquake meeting or surpassing this magnitude would trigger the parametric insurance payout. Additionally, they consider the proximity of each insured property to the earthquake's epicenter (most disastrous point of an earthquake). With these parameters in place, the company enters into a parametric insurance agreement with a specialized commercial insurer. Like the wind scenario explained above, one of the biggest advantages in this example is the swift payouts. The swift payouts assist insurers because it will allow companies to increase their

exposure in highly litigious areas such as Texas and Florida. These are two places that are known for large settlements and higher court payouts, “After failing for nearly 400 days to tender its policy limit of $250,000 in coverage, according to plaintiff counsel, an insurance company took an $8.5 million hit to its bottom line to settle a lawsuit involving a catastrophic injury after a wild series of events.” (Mora, 2023) Parametric insurance would allow for insurers to increase the number of clients they take on in these litigious areas because the contract would be specified so that only under certain circumstances, the insured would be paid out. For underwriters, the appeal of parametric insurance lies in its ability to address the uncertainties and financial volatility that have resulted from the escalating frequency of weather and climate disasters. The transparent and predefined nature of parametric triggers provides a level of confidence and control over potential losses, fostering an environment where underwriters may feel more comfortable expanding their capacity for property cat policies. As a result, insureds can access the coverage they need to protect their properties and assets, while insurers and reinsurers can confidently manage and diversify their risk portfolios.



The growing embrace of parametric insurance in the property market is intricately tied to the rapid advancements in technology, artificial intelligence (AI), and the emergence of insurtech companies. These technological innovations are reshaping the landscape of risk assessment and management. With the proliferation of sophisticated weather monitoring systems such as NOAA, and algorithmic risk assessment, insurers are gaining access to real-time data. The rise of insurtech companies, like Parametrix and Socius, further amplifies the momentum behind parametric insurance adoption. These startups infuse the insurance industry with innovation, flexibility, and creativity and are able leverage algorithms to swiftly analyze vast volumes of data, enabling real-time risk evaluation and

personalized policy design. For instance, they can incorporate data from weather sensors, satellite imagery, and other sources to precisely determine the occurrence of a triggering event, such as a hurricane reaching a certain wind speed. This level of data granularity and immediacy empowers insurtech to establish triggers that accurately align with the specific risks faced by policyholders in diverse regions. Furthermore, insurtech excel in streamlining claims processes, a vital facet in the parametric insurance landscape. Through algorithmic automation, they expedite claims assessment and verification, reducing the time and potential for disputes. This efficiency not only accelerates financial relief for policyholders but also enhances the overall customer experience.

Challenges for Property:

Despite the potential benefits of parametric insurance, this risk management strategy is not without significant challenges. Basis risk is a critical aspect to consider in the realm of parametric insurance. This risk arises from the potential mismatch between the predefined triggers that activate payouts and the actual losses experienced by the insured party. This discrepancy can introduce complexities and uncertainties into the insurance landscape. Picture an insurance company that provides coverage to multiple businesses in a region prone to earthquakes. The insurance contracts are structured with parametric triggers based on the magnitude of earthquakes, where a certain magnitude level would activate a payout to the primary insurers. Now, consider a scenario where a moderate earthquake of the defined magnitude strikes the region, activating the parametric trigger for payouts. However, due to robust building codes and effective disaster preparedness, the actual losses suffered by the primary insurers and their policyholders are comparatively minimal. Because of this, the payouts from the insurance company, though activated by the predefined parametric trigger, significantly exceed the real losses sustained. The treaty is compelled to make payouts based on the trigger conditions, despite the actual losses being substantially lower. As a result, the insurance company bears a financial burden that surpasses the valid claims it needs to cover. This situation can lead to considerable financial strain, impacting the insurance company's profitability and potentially affecting its ability to manage other risks in its portfolio effectively. Addressing this basic risk challenge

can lead to complications in negotiations and settlements between the insurance company and the insured. The insured parties might feel that the triggered payouts do not accurately reflect the losses they faced, potentially straining the relationships and trust between the parties. To mitigate basis risk, insurance companies must carefully calibrate their parametric triggers based on comprehensive data analysis, historical loss patterns, and risk assessments. Along with these challenges, the complexity of determining the right combination of triggers and thresholds is a concern, particularly when referring to natural disasters. They need to strike a balance between setting triggers that align with the actual risk exposure while avoiding the potential for excessive payouts due to triggers being activated without commensurate losses. By addressing basis risk, insurance companies can enhance their risk management strategies and ensure the sustainability of their operations within the dynamic landscape of parametric insurance.

Key challenges lie in the inherent limitations of relying predominantly on historical data and expert analysis to establish these triggers. The historical data and expertise used to define parametric triggers may not encompass the full spectrum of risks that could emerge in the dynamic landscape of the property market. As new perils arise or risk patterns change due to various factors such as technological advancements, environmental shifts, or economic developments, the triggers set using historical information might fail to capture these threats adequately. This can lead to a situation where policyholders do not receive adequate coverage for the risks they are facing. In cases where emerging or evolving risks are not adequately considered in historical data, insurers and reinsurers may find themselves exposed to unexpected financial liabilities. Without a comprehensive understanding of these new risk dynamics, insurers could face scenarios where the magnitude of losses surpasses what the predetermined triggers were designed to cover. With that being said, data may be insufficient, inaccurate, or even absent in certain regions or for specific perils. When such data limitations exist, it becomes challenging to establish triggers that can adequately respond to emerging risks. In instances where data reliability is compromised, the entire risk transfer mechanism of parametric insurance could falter. Insufficient or questionable data can erode the confidence in trigger accuracy, leading to

skepticism among potential policyholders and hindering the adoption of parametric policies. Also, trigger inaccuracies due to data issues might lead to delayed or inadequate payouts, causing frustration for policyholders precisely when they need support the most. Addressing these challenges requires a multi-pronged approach. It involves integrating advanced data analytics to identify evolving risks and diversifying trigger definitions to include both historical and possible future losses. By leveraging these strategies, the limitations associated with parametric insurance treaties can be mitigated, leading to more effective coverage for emerging and evolving risks in the property market.

Cyber Market:

In the rapidly expanding cyber market, parametric insurance has the potential to revolutionize risk management for businesses facing cyber threats. The increasing reliance on digital technologies and the rising sophistication of cyber-attacks have underscored the need for robust cyber insurance solutions. However, underwriters have been cautious about writing cyber policies due to challenges stemming from the relatively new cyber insurance landscape. Historical data is limited compared to well-established lines like property insurance, making it difficult to accurately define data-driven triggers for parametric policies. With these challenges, the application of parametric insurance offers a novel solution to address the dynamic nature of cyber risks. Traditional cyber insurance policies often struggle to keep pace with the rapidly changing landscape of cyber threats, leaving policyholders exposed to potential gaps in coverage. Parametric insurance, however, introduces a new approach. Imagine a scenario where a company's online services and operations rely heavily on the functionality of their website. A parametric cyber insurance policy could be structured with a predefined trigger based on specific cyberattack indicators, such as the website's response time or cloud outage. If these indicators surpass a certain threshold, indicating a potential cyberattack or service disruption, the policy could automatically trigger a predetermined payout, providing immediate financial relief to the insured company. This approach circumvents the challenges of quantifying intangible losses, like reputation damage or business interruption, by focusing on quantifiable triggers. By continuously monitoring these triggers and applying advanced analytics, the insurer can swiftly assess the severity of the situation and

expedite payouts without requiring lengthy claims investigations. This not only expedites the recovery process for the insured but also enhances the insurer's ability to manage and mitigate risks effectively. From a reinsurer's perspective, there are also advantages to parametric treaty structures, such as exposure mitigation. Like in property, many reinsurers are hesitant to write cyber policies because of their volatile nature. There is always potential for quota shares to have a full limit loss, and even with a loss ratio cap on the contract, reinsurers are hesitant to expose themselves, so in the realm of cyber insurance, this exposure mitigation holds immense appeal for reinsurers. The often rapid and disruptive nature of cyber events can lead to significant financial strain on cedents and reinsurers alike. The parametric approach acts as a safeguard, offering a buffer against extreme losses that may result from large-scale cyber incidents. This fortified protection lends reinsurers the confidence to engage in underwriting cyber policies that they might have otherwise been hesitant to consider. The predefined trigger parameters, rooted in the unique characteristics of cyber risks such as ransomware and business interruption, enable insurers to quantify their potential exposure more accurately, thereby facilitating more informed risk assessment and pricing strategies. Exposure mitigation through parametric insurance also instills a sense of stability and predictability. This stability stems from the deterministic nature of parametric triggers. Rather than grappling with the uncertainty of estimating potential losses after an event, reinsurers can rely on predetermined triggers that streamline the claims process. A parametric treaty structure would ease the concerns of the underwriters and assist in building a better relationship between the reinsurer, cedent, and broker.

Challenges for Cyber:

Cyber threats continuously evolve, and new attack vectors emerge regularly, making it challenging to establish static triggers that can effectively capture the breadth and depth of cyber risks. To address this, reinsurers must adopt flexible and adaptive parametric models that can incorporate real-time threat intelligence and adjust triggers accordingly. Furthermore, the dynamic nature of the

cyber market demands collaboration between insurers, reinsurers, and cyber security experts. Insurers need to work closely with cyber specialists to gain insights into emerging threats and vulnerabilities, which can inform the refinement of parametric triggers and the overall risk assessment process. This collaboration can foster a better understanding of cyber risk exposures and ultimately lead to more robust and effective parametric insurance solutions. The digital realm is a dynamic and ever-evolving landscape, and with it, cyber threats continuously mutate and proliferate. Attack vectors are no longer static; they change rapidly in response to technological advancements and vulnerabilities. The sophistication of cybercriminals means that businesses and individuals alike are under constant siege, making traditional insurance models ill-equipped to address this modern peril. The landscape requires an agile approach that can respond in real-time to emerging threats, and this is where parametric insurance shines. These triggers can be designed to consider real-time threat intelligence, such as the detection of a specific malware strain, a data breach, or a distributed denial-of-service (DDoS) attack. For instance, a parametric policy might stipulate that if a company's network experiences a DDoS attack that lasts for a specified duration and reaches a certain intensity level, an automatic payout is triggered. This not only expedites the claims process but also provides businesses with much-needed financial assistance during a cyber crisis when every moment counts. Parametric insurance's success in the cyber insurance arena hinges on close collaboration between insurers, reinsurers, and cybersecurity experts. Insurers need to tap into the expertise of cyber specialists who possess deep knowledge of emerging threats and vulnerabilities. This collaboration can yield valuable insights into the refinement of parametric triggers and the overall risk assessment process. Cybersecurity experts can provide real-time threat intelligence, helping insurers stay ahead of cybercriminals. They can identify trends, zero-day vulnerabilities, and novel attack vectors that may not be evident through traditional risk assessment methods. This shared knowledge can lead to the development of more robust and effective parametric insurance solutions. The potential of parametric insurance in the cyber market is evident, providing a data-driven and streamlined approach to risk management. While challenges such as limited historical data and the evolving cyber landscape pose obstacles, the integration of parametric

coverage with traditional cyber insurance policies offers a comprehensive and agile risk management strategy. As the cyber market continues to evolve, insurers must adapt and innovate, leveraging the power of parametric insurance to create resilient and adaptable cyber risk management solutions for businesses operating in the digital age.

Conclusion:

Parametric insurance stands as a transformative risk management solution that holds immense promise in reshaping the insurance and reinsurance industry. While not without its challenges, the innovative concept of parametric insurance has the potential to address critical limitations of traditional indemnity-based assessment methods, particularly in the property and cyber insurance markets. The challenges of basis risk, limited risk assessment, and lack of historical data emphasizes the need for careful consideration and continuous improvement in the implementation of parametric insurance. Insurers and reinsurers must actively address these challenges by redefining trigger definitions, adopting flexible parametric models, and collaborating with cyber specialists to ensure the effectiveness of the approach. Despite these challenges, the advantages of parametric insurance are significant and far-reaching. The quick payouts to insured parties, efficient claims settlements, and improved liquidity management are especially crucial during catastrophic events, where prompt financial support is essential for recovery. Its' potential to bolster underwriting confidence and expand underwriting capacity in both the property and cyber markets exhibits why parametric treaty structures would be advantageous to reinsurers and insurers alike.

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