



Parametric insurance – beyond indemnity

In the actuarial curriculum the concept of indemnity is often presented as a cornerstone of non-life insurance. It means that the insurance cover puts the insured back in the same financial position as just before the loss, no better and no worse. This matters because it prevents the insured from profiting from a loss (no moral hazard) and it aligns incentives between insurer and insured.

However, in cases where speed, clarity, and coverage of non-traditional costs matter more than perfectly matching actual 'traditional' loss experience, alternative risk transfer solutions exist in the form of parametric insurance. This is a common means of risk transfer in a mature market in the Americas and Asia. The take-up rate in Europe however is somewhat lagging behind. Therefore, it's about time we take a closer look.

A. Gabriël MSc (left) is Managing Director of Capital and Risk at Aon Reinsurance in Amsterdam.

C. Mayer is Head of Parametric Solutions at Aon in San Francisco.



WHAT IS PARAMETRIC INSURANCE

Parametric insurance pays a claim based on the occurrence of a pre-agreed event, as reported by an independent, third-party index, rather than based on the 'traditional' claims adjustment process which calculates the actual loss sustained after an event (and then applies deductibles, sublimits, exclusions, etc.). Examples include weather events such as hurricane/typhoon, earthquake, heavy rain, high temperature, hailstorm or snow days, as well as non-natural hazard events including industry loss indices, cyber outages, etc.

Parametric insurance uses an index value or another measurable trigger as a proxy for the loss to be compensated: its payout calculation does not depend on a precise post-event assessment of the actual loss suffered, only how the proxy (index value) performs.

Of course, the proxy must have a strong correlation with the incurred real-world loss. Insurance markets, reinsurance markets and regulators alike require a link to insurable interest: you can't just 'bet on the weather'. Therefore the parametric structure must be demonstrably designed to indemnify a plausible loss, even if not perfectly.

KEY ADVANTAGES AND TARGET AUDIENCE

Parametric insurance stands out for its speed of compensation, flexibility and customization. Because the index value of the contract can be verified very quickly, the claim can be paid within days of the event. The compensation is fast and predictable, there is no claim settlement process that depends on post-event loss assessment, repair estimates or any other loss adjustment. This allows for very quick post-event liquidity to deal with the immediate aftermath of a disruptive event. Furthermore, the payment can be used by the insured for any financial expenditure following the event. From this, the coverage provided is very broad and can address expenses and losses that are typically excluded from traditional insurance coverage. In addition, the flexible design of parametric coverage allows for solving specific problems that are difficult for traditional insurance to address. This includes, amongst other use cases, contingent business interruption, difficult-to-insure risks, and supply chain exposure.

THE ABOVE FEATURES ARE ESPECIALLY ATTRACTIVE TO GOVERNMENTS, LARGE CORPORATES AND INDUSTRY ASSOCIATIONS

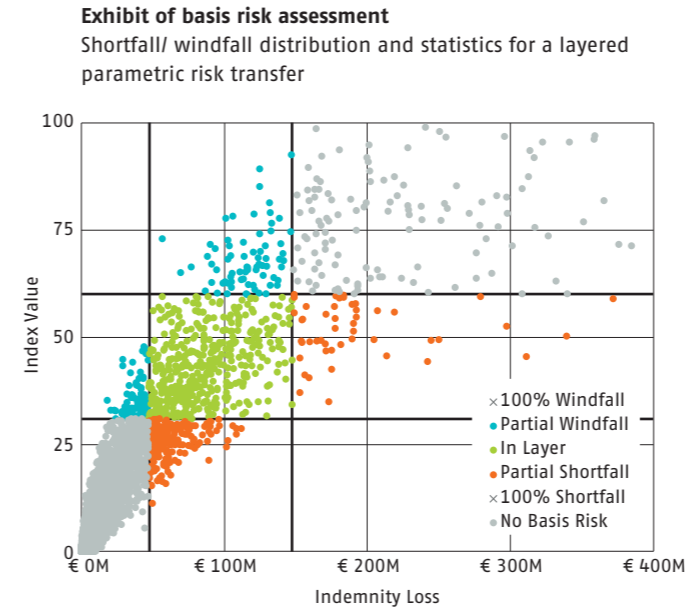
The above features are especially attractive to governments, large corporates and industry associations. Local authorities can fulfill their public duties and provide emergency relief, repairing critical infrastructure and social support to affected households. Business stakeholders enhance their resilience as it supports payroll and working capital, emergency repairs and business continuity.



	Traditional (Indemnity)	Parametric	Parametric Advantages
Loss Trigger	Physical damage or loss	Event occurs and meets objective thresholds	A set of objective, pre-defined triggers determines the loss event rather than a claims adjustment process
Loss Recovery	Actual loss sustained after detailed claims adjustment	Pre-agreed payout based on the reported parameter value	Pre-determined loss recovery provides a transparent claims payment
Basis Risk	Exclusions, deductibles, terms, sub-limits, etc.	Actual economic loss could differ from parametric payout	Form of "basis risk" is different, but either policy type can have basis risk
Claims Timeline	Longer – Months to years to adjust, depending upon claims complexity	Shorter – claims paid within 2–4 weeks	No traditional "loss adjustment" process, claims paid in days
Policy Term	Typically annual	1–3 years, longer terms sometimes possible	Longer terms provide for known costs and capacity availability
Exclusions	Outlined in policy	None	Simple coverage without financial deductibles, exclusions, sub-limits, etc.
Policy Structure	Generally standardized and rigid	Flexible and customized to the client; derivative available	Unique and bespoke solution jointly developed by parties involved

BASIS RISK

From the imperfect correlation between the index value and the actual losses sustained, basis risk is inherent in parametric insurance. Here, the role of the actuary is important to select the appropriate index and design the structure in such a way that basis risk is limited. This is done both by analyzing historical observed events and by modelling using stochastic event simulation. In cases in which parametric transfer should as closely as possible follow a traditional indemnity cover, the goal is to symmetrically minimize both the shortfall (negative basis risk) and windfall (positive basis risk). In case the parametric cover aims to provide broader compensation (e.g. for contingent loss) an optimal structure might be found where there is a bias towards the windfall scenarios.



Above Index Layer	0 events No Basis Risk	73 events +32% Avg Windfall	211 events No Basis Risk
In Index Layer	83 events +15% Avg Windfall	452 events +15% Avg Windfall	48 events -29% Avg Windfall
Below Index Layer	8,276 events No Basis Risk	180 events -15% Avg Shortfall	0 events No Basis Risk
	Below UNL Layer	IN UNL Layer	Above UNL Layer

RESILIENCE FOR A CHANGING WORLD

In today's rapidly changing world, climate and non-natural hazard events become more prominent and government is shirking ever more on public order, security and defense. In this context parametric insurance solutions offer an extra layer of protection that provides relief to both public authorities and the private sector when systems get stressed. Having proven their value in the Americas – for example paying out after numerous hurricanes like Irma or Melissa – and in Asia – for example following the Tohoku earthquake – we expect that in future years Europe will also be able to reap the benefits of this alternative risk mitigation strategy. ■

EXAMPLES OF PARAMETRIC RISK TRANSFERS

Caribbean governments – Cyclone, earthquake and rainfall covers

We take Jamaica as a good example of how small economies are using parametric solutions. Jamaica purchased natural catastrophe protection both through CCRIF (a regional Caribbean parametric insurance pool) and a parametric cat bond.

Following hurricane Melissa (2025) Jamaica has made successful recoveries. It received a USD 71 million payout under the hurricane policy and then another payout of USD 21 million under the excess rainfall policy. On top of that, Melissa triggered 100% payout of the USD 150 million principal of the parametric cat bond, bringing Jamaica's total recoveries for this single event to USD 241 million.

Global Corporates – Hurricane / earthquake liquidity covers

Many multinationals (manufacturers, retailers, logistics groups) quietly use parametric programs. Payouts provide for immediate cash to fund emergency repairs and cleanup, paying staff and securing sites and bridging non-damage business interruption) that traditional insurance often struggles to cover.

Here, maximum sustained wind speed, minimum central pressure, or modeled intensity within a radius of key sites are commonly used index values for wind hazard. For earthquake on the other hand often magnitude and distance from plant locations or sometimes peak ground acceleration from seismic networks are used.

Cognac Winegrowers (France) – Drought cover

200+ producers in the Cognac region (corporate agricultural producers and cooperatives) participate in this joint cover that serves to stabilize income facing climate-driven water stress. The index value is based on rainfall deficits during the vine-growing season, using Météo-France data.

Wind Farms and Solar Parks in Europe and U.S. – Resource Shortfall covers

These covers serve to protect project owners from revenue shortfall when nature doesn't cooperate, helping them satisfy lenders and investors. The index value for wind is based on distributions of wind speed (e.g., average wind speed or power-weighted wind index) over a defined period, for solar the index value is generally based on solar irradiance (sunshine) measured by satellites or ground sensors.