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## Parametric Insurance: Beneficial By Nature

Parametric payout triggers are less well known outside the insurance world than indemnity or industry-loss triggers, but they deserve to be better understood. Because its payouts depend upon natural parameters rather than physical financial damage, parametric insurance enables the transfer of more specific risks, with greater transparency. This complements traditional protection and offers real advantages to buyers, sellers and investors alike.

## **Executive Summary**

- Parametric insurance triggers lead to a payout when a specific chosen physical or natural parameter, such the magnitude of an earthquake or the wind speed of a hurricane in a defined place, exceeds a certain threshold.
- These parameters are measured by independent third parties and do not require complex and contentious loss-adjustment assessments.
- Parametric insurance is therefore well suited to transferring very specific risks in often under-insured regions, with a very high level of transparency and rapid settlement following a trigger event.
- We believe these characteristics offer real advantages to both buyers of protection and investors in insurance-linked strategy portfolios.

When we wrote in detail about the [diversification benefits of insurance-linked strategies](#) (ILS) last year, we mentioned that the payout trigger in most insurance-linked strategies is generally “based on the actual insured loss to the issuer, industry losses or parametric data.” In that paper, we focused on the first and second triggers, indemnity and industry loss. Here, we explain how parametric insurance works.

We think it’s worth spending some time on this because, while parametric payout triggers are less well-known outside the insurance industry, they are particularly well suited to providing the quick and certain settlement required to address business interruption or humanitarian aid as natural catastrophes grow in frequency and severity. They can offer a uniquely diversifying and transparent addition to insurance-linked investment strategies.

In this paper, we define parametric insurance, provide examples, and illustrate how corporate entities, governments and insurance companies can benefit from increased utilization of these products. We also show that parametric insurance is a growing opportunity for institutional investors seeking attractive, uncorrelated returns with favorable environmental, social and sustainable investment characteristics.

## **What is Parametric Insurance?**

The predefined payout trigger is a key variable in insurance-linked securities—defining at what point investors may face loss. There are three main trigger types: indemnity, industry loss and parametric.

Traditional insurance is indemnity-based, meaning the contract is triggered and paid depending on the actual loss incurred by the insured. Industry-loss triggers, most commonly seen in industry loss warranties (ILWs), measure the overall losses incurred by the industry.

By contrast, parametric triggers utilize a parameter—a metric or index that relates to the physical properties of a natural event. If the chosen parameter exceeds the predetermined trigger threshold, payment occurs. Examples of parameters include the magnitude of an earthquake or the wind speed of a hurricane. These parameters are typically measured by a third party that serves as an unbiased and transparent data reporting source. Securities that utilize parametric triggers include publicly traded catastrophe bonds and privately negotiated contracts similar to ILWs.

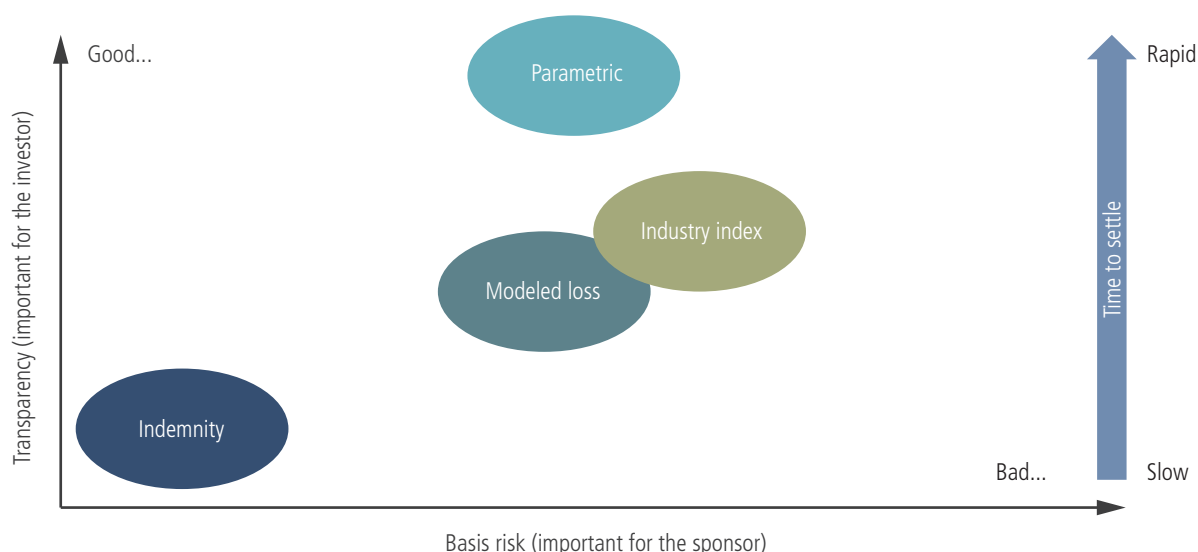
Take, for example, a parametric “cat-in-a-circle” policy for a hurricane. A pre-defined wind speed, geographic region and payout value is agreed upon inception. A loss payment occurs if, and only if, a storm (the “catastrophe”) passes through the geographic region (the “circle”) at or above the defined wind speed.

The “cat-in-a-circle” model is a mainstay of parametric policies, but new advancements in granularity, variety, and availability of data have increased the customizability and utility of these transactions.

For example, improvements in weather station and satellite capabilities have broadened the set of risks that can be insured using the parametric approach. For instance, rather than setting a geographic region as in a “cat-in-a-circle” policy, the trigger determination can be far more granular, such as the readings from a hurricane-hardened anemometer reporting wind speed adjacent to an amusement park. Take a look at the case study at the end of this paper for a typical example. By increasing the correlation between the physical payout trigger and the actual losses incurred by the insured party or sponsor (reducing their “basis risk”), the utility of the insurance is improved for the buyer and the scale and diversity of opportunities open to insurers and investors increases.

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## PARAMETRIC INSURANCE IS HIGHLY TRANSPARENT FOR INVESTORS AND RELIABLE AND EFFICIENT FOR THE INSURED SPONSOR



Source: Risk Management Solutions. Modeled loss triggers use physical catastrophe characteristics to simulate losses in a vendor catastrophe model. For illustrative purposes only.

### Whom does parametric insurance serve?

Parametric insurance can mitigate gaps in traditional insurance coverage and build additional resilience for protection buyers.

For corporate entities, parametric insurance offers coverage for items not included in traditional policies, such as business interruption without physical damage. A retailer with an overseas supplier is indirectly exposed to catastrophe risk in the supplier's country, as an earthquake or typhoon may disrupt the retailer's supply chain. With a parametric policy that covers the supplier's country, this risk is mitigated. A hotel's occupancy rates may be affected by a natural catastrophe that causes no damage to the hotel itself. As weather risk in particular is so pervasive, opportunities for parametric coverage are plenty: business disruption due to natural events is relevant for a range of industries, from generators of renewable energy and bricks-and-mortar retailers to companies in construction, transportation and tourism. Parametric insurance can be utilized as a deductible buyback, to reduce the insured exposure, and because parametric triggers are highly customizable, they can target specific event risks and function as a complement to more traditional policies.

Parametric insurance is also helping public entities close the insurance protection gap. Globally, only a small percentage of disaster losses are insured because of the prohibitive costs and administration demanded by traditional insurance. As parametric triggers do not include an indemnity component, there is no need for a loss assessment period, so payment can be provided almost immediately with little need for building expensive claims-adjusting infrastructure. This simplicity makes parametric insurance useful for countries with historically low insurance penetration, and it can enable a prompt response to catastrophe relief.

Sovereign catastrophe risk pools, in which several countries purchase collective coverage for events such as hurricanes, earthquakes and drought are a prime example of parametric insurance uptake by public entities. These pools exist in the Caribbean and Central America through the Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC); African Union Member States under the African Risk Capacity (ARC); and Pacific island Countries in the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI).

## Investor Benefits

Parametric insurance has many advantages for institutional investors.

**Transparency.** As transactions are entirely dependent on physical event characteristics, they are highly transparent. Indemnity ILS coverage is based on the underlying risk to property that is exposed to natural events, and investors depend on information provided by the insured to understand that risk. By contrast, information on extreme weather event characteristics is provided by independent third parties and widely available. It is much easier to assess the risk of Puerto Rico being affected by an event such as Hurricane Maria in 2017 than it is to assess the risk of damage to a particular building in Puerto Rico. Without the asymmetrical distribution of information between parties that exists in indemnity transactions, parametric transactions help to minimize adverse selection.

**Straightforward Analysis.** The elimination of a financial component in risk analysis—the physical infrastructure—makes parametric analysis far more straightforward to analyze than other triggers. The relationship between a hazard and corresponding financial damages is complex: a strong understanding of both the insured value exposed to the hazard and that value's vulnerability to damage is required. While catastrophe models provide a sophisticated understanding of this relationship, uncertainties and assumptions exist throughout the modeling process. As the financial exposure and vulnerability components are not included in a parametric analysis, only the natural event risk needs to be understood.

**Diversification and Uncorrelated Returns.** ILS instruments in general offer inherently uncorrelated returns, depending as they do on natural catastrophes rather than economic or financial conditions. The granular risk exposures opened up by parametric insurance diversify against financial market risks, but also against other, traditional insurance risks. As indemnity insurance is not available in many emerging countries, parametric insurance is one of the only opportunities to participate in this localized risk, and perils in these regions are entirely independent of events in countries with established insurance infrastructure. New geographic regions and corresponding perils are becoming available as additional market participants, including operating companies, countries and supranational organizations such as the World Bank, subscribe to the use of parametric risk transfer instruments. This additional layer of diversification makes parametric insurance a great potential addition to ILS portfolios.

## Conclusion

Parametric triggers serve as a complement to traditional indemnity products for both buyers and sellers of protection.

Protection buyers can use them to address the gaps in a pure indemnity policy because they can offer protection against uncovered property and a decrease in sales or disrupted supply chains caused by a natural event. The rapid payout feature of parametric policies is a key benefit, especially for governments: policies can settle within weeks, and this quick access to claims enhances resilience to natural disasters.

These transactions fit naturally into portfolios of alternative risk transfer solutions maintained by protection sellers, as they offer transparency, straightforward analysis and the opportunity to diversify risk and expand into new markets.

## Case Study: MultiCat Mexico 2012-1 Catastrophe Bond

This bond was sponsored by Swiss Re for The Fund for Natural Disasters of Mexico (FONDEN). It protected Mexico from earthquakes, Atlantic coast hurricanes and Pacific coast hurricanes through respective Class A, B, and C Notes. The Class B Notes offer a simple, practical example of a parametric trigger.

There are two potential triggering events for these Class B Notes that cover Atlantic coast hurricanes: the occurrence of a hurricane in one of two zones along the coasts of Tamaulipas and Quintana Roo, at a defined central pressure equal to or less than 920 millibars (mb), equivalent to a Category 5 hurricane. Either event would trigger the bond, forgiving FONDEN from returning the original principal amount.

The figure shows the defined Trigger Event Conditions and the geographic zones where a triggering event must occur.

Parametric policies that insure governments, like MultiCat Mexico 2012-1, have also been recently observed in Peru, Colombia, Chile and the Philippines.

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### CLASS B NOTES: TRIGGER EVENT CONDITIONS – HURRICANE ZONES

	Class B – Hurricane Zone 1	Class B – Hurricane Zone 2
Central Pressure	< 920 mb	< 920 mb

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### CLASS B NOTES: TRIGGER ZONES



Source: Artemis.bm, Standard & Poor's presale documentation.

The case study discussed does not represent all past investments. It should not be assumed that an investment in the case study listed was or will be profitable. The information supplied about the investment is intended to show investment process and not performance.

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## DEFINITIONS

**Industry Loss Warranties ("ILWs")** are private investment contracts enabling the transfer of catastrophe risk from the protection buyer to the protection seller. The term "industry loss" refers to the fact that the triggers for the contracts are typically based not on the losses of a specific insurance company but rather on insured losses across the insurance industry as reported by a third-party, independent reporting agent. ILWs are typically fully cash-collateralized by both parties, reducing credit risk. ILWs are short-term instruments, typically 180 days to 365 days in duration, and are self-liquidating. In addition, as they are privately negotiated instruments, ILWs allow for greater customization of risk and return profiles.

**Catastrophe bonds** are typically 144A securities structured as floating-rate principal-at-risk notes of 3- to 5-year maturity, and designed to transfer reinsurance risk to the capital markets. A central feature of a catastrophe bond is its trigger mechanism, which defines the type of event that would cause a principal reduction to the notes. The trigger mechanism could be based on actual insured losses of the issuer (known as indemnity cover), industry-index losses (aggregating all insured losses in the covered area) or even parametric data (e.g. wind speed measurements). Today, most catastrophe bonds are indemnity-based, approximately a quarter index-based and the rest in parametric form.

**Correlation with Other Asset Classes.** Catastrophic events are unpredictable and it is entirely possible that major losses will occur at or about the same time as other components of an investor's portfolio are also declining in value. In addition, the amount of global capital investing in insurance-related risks may be impacted to some extent by interest rates and other events affected traditional asset classes within the broader capital markets.

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