

PARAMETRIC INSURANCE FOR DISASTERS*

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The concept of parametric insurance, while not new, is getting increased attention as a way to provide faster and more flexible funds to victims of disasters and as a tool to provide post-disaster funds for emerging and otherwise difficult-to-insure risks. There is also hope that parametric policies can broaden disaster insurance coverage, improving financial resiliency to ever-worsening climate extremes. Applications in the U.S. to achieve these public policy goals have been limited to-date, but are now starting to expand. This primer explains the concept of parametric insurance with a focus on its use in providing financial protection against disasters.

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WHAT IS PARAMETRIC INSURANCE?

Most consumers are familiar with insurance that reimburses them for the damages they sustain or the costs they incur after a specified incident. After a car accident, insurance will reimburse the costs of repair. When there is a fire in a home, homeowners insurance pays the cost of fixing the damage. For these insurance policies, the insurance company must know the exact cost or loss. For damage to a home, for instance, the insurance company sends a loss adjuster to assess the damage. This common understanding of insurance—that it compensates exactly for a loss (subject, of course, to deductibles and limits) in order to restore an asset to its pre-damage state—is referred to as indemnity insurance. But it isn't the only way to structure insurance.

In contrast, with parametric (sometimes also called index-based) insurance, the amount of the payout is dictated by an objective measure of the causal event, instead of the damage sustained. For example, the payout could be related to wind speed in a location or the height of a river above flood stage. The indicator that determines the payout is referred to as the trigger. Since the payout is not linked to property damages, it is a useful approach for covering a wider range of disaster losses, such as business interruption.

WHAT ARE POSSIBLE TRIGGERS?

The trigger that determines the payout on a parametric policy can take a number of forms. Indeed, the only criteria are that it is independent, objectively measurable immediately after the disaster, and correlated with the actual losses. Many triggers for disaster parametric policies are related to measures of the intensity of an event. For example, a parametric insurance policy for hurricanes might provide a set dollar amount whenever wind speeds exceed a certain level in a particular location.

Or an earthquake parametric product might pay a certain amount when the peak ground acceleration exceeds a threshold at a pre-defined location. Triggers could also be based on total losses in an industry for a given event, for example, as reported by a third-party, or on estimated losses for a given event from a catastrophe model. Some parametric products may have more than one trigger that must be met before payout occurs.

WHAT ARE THE BENEFITS OF PARAMETRIC INSURANCE?

There are three key benefits of parametric insurance:

- (1) faster payouts,
- (2) flexibility, and
- (3) the possibility to provide coverage for difficult-to-model losses.

Pay-outs for indemnity insurance cannot occur until the conclusion of often lengthy loss adjustment processes. Since parametric insurance instead pays out based on an observed and independently measured event, payment can be made extremely rapidly—often within days. In contrast, the claims process in indemnity policies can take months from the notification of a claim to receiving insurance funds. Not needing to undertake loss



adjustment also makes the overhead costs associated with parametric insurance substantially less than indemnity policies. This can make it possible to use parametric insurance to cover smaller losses where the overhead would otherwise be too large to make insurance cost-effective using an indemnity model.

Second, the design of parametric insurance policies is highly customizable. The trigger and payout can be designed to meet many different needs. The amount of the payout can also vary with the intensity of the disaster, such as paying 100% for a

category 5 storm, 75% for a category 4 storm, and 50% for a category 3 storm.

Finally, the payout from a parametric policy can be used to cover any economic loss that has affected the client as a consequence of the covered event. This gives the insured freedom to direct funds where most needed. This flexibility also makes parametric insurance ideal for new and emerging risks, which may not (yet) be insurable through indemnity policies given the high degree of uncertainty over potential losses



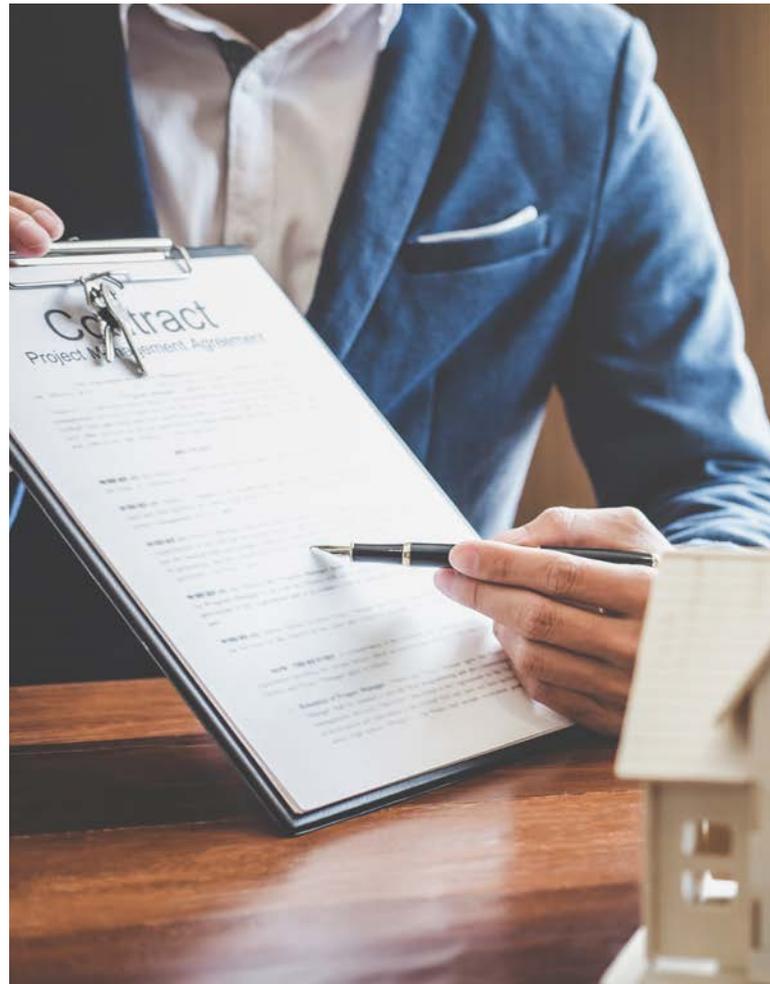
WHAT IS THE DOWNSIDE OF PARAMETRIC INSURANCE?

The benefits of parametric insurance come with a couple drawbacks. The first is the possibility that the payout does not fully cover losses. This is known as basis risk. Since the payout is not related to actual losses or costs incurred, it could be more or less than the economic damage sustained by the insured. Of course, with an indemnity policy, the insured still retains some of the risk through a deductible, sublimits, and exclusions. But, if the insured reads the fine print of their indemnity policy, these should be known retentions; parametric insurance adds an element of risk about the how much of losses the policy will cover. Because of this, it is critical that the consumer understand the trigger design, since this determines the circumstances in which payment will be made.

With careful design, basis risk can be limited, but it cannot be fully eliminated. In addition, if the payout from a parametric policy is greater than damages, this windfall could be a taxable event, depending on the regulatory context. While it is difficult to compare prices on parametric and indemnity policies since the terms of coverage are so different, parametric can be costly when they offer wide coverage. These aspects of parametric insurance mean that it will not be the right product for all risk transfer needs. For instance, it is unlikely to replace standard homeowners policies, where guarantees of indemnification will be important to most homeowners.

CONSUMER LITERACY

While in some ways parametric products may be easy to understand—the insured gets a certain payment when a specific type of disaster occurs—there remains regulatory concern that consumers, particularly residential consumers, may confuse parametric products with indemnity products, with which they are more familiar. Consumers may also not fully understand the range of disaster scenarios in which their product would be triggered and those in which it would not. At a household level, current parametric products are marketed as complements, not substitutes for standard homeowners insurance. Larger businesses and governments may be more sophisticated buyers who understand the niche a parametric product may play in their risk financing.



PROOF-OF-LOSS REQUIREMENTS

It is important to note that “parametric” describes the type of trigger that leads to a payout and does not necessarily have to describe only insurance products. There are examples of parametric triggers in other risk transfer instruments, like catastrophe bonds and other insurance-linked securities — indeed, most derivatives.

For a parametric product to be considered insurance in the U.S. market, it typically must also have a “proof-of-loss” requirement. To differentiate gambling or financial speculation from actual insurance, regulators require that insurance

claims only be paid when the insured has suffered a loss. As discussed above, this is done through loss adjusting with standard homeowners policies. The key to effective use of parametric insurance (as opposed to other parametric products), is to identify a proof-of-loss that is acceptable to regulators and that does not add to the cost or slow the payment, either of which would undercut key benefits of a parametric approach. Examples might be text messages from customers or using drone or satellite imagery to confirm damages.



EXAMPLE APPLICATIONS

The majority of parametric policies have been written for commercial clients, from hotels to manufacturing plants. Parametric policies may be chosen by firms when they have concentrated assets in an area of high risk for a particular peril. They are useful, as well, to cover non-property related losses, such as business interruption, and for faster post-disaster liquidity. These policies can be designed with a peril-agnostic trigger to cover multiple potential sources of loss. For example, a hotel could purchase a product that pays when bookings or revenues fall below some threshold. Some specific types of loss can also more easily be covered with a parametric policy, such as travel or event insurance, in which the insured is paid a set amount if a certain cancellation occurs.

But parametric insurance policies can—and have been—written at all scales, from insuring an individual to insuring a country. At one end of the scale is parametric microinsurance. Microinsurance policies are low-limit and low-cost, often targeted at low-income households or microenterprises.

There have been many pilots of parametric insurance for farmers and small landholders in developing economies to help prevent poverty-traps from disasters. For these insureds, parametric insurance is necessary since loss adjustment expenses would swamp premiums, there may not be the necessary infrastructure to quickly adjust claims, and it may be difficult to establish a market value or replacement cost for losses. One example of a parametric microinsurance product comes from the World Food Programme and their R4 Rural Resilience Initiative, pioneered in partnership with Oxfam America. It provides protection from weather extremes to over 450,000 people in Ethiopia, Kenya, Malawi, Senegal, Zambia, and Zimbabwe. The insurance is triggered based on an index of rainfall.

Parametric insurance is now starting to be offered in the developed world to residential clients to cover gaps in standard property insurance and to provide immediate liquidity post-disaster, while waiting for other sources of recovery funds, such as indemnity

policies, loans, or other aid. At least three such policies are currently available in the U.S. market. Two are from surplus lines insurers. Surplus lines insurers tend to provide coverage for difficult-to-insure or new risks. They do not face rate and form regulations and are not backed by state guarantee funds, although they do face capital requirements. The first is Jumpstart, a parametric earthquake product for residents and businesses in California, which pays \$10,000 for an eligible event. Proof-of-loss simply requires policyholders to respond to a text message to confirm they have incurred extra expenses because of the earthquake. The second product is StormPeace, offered in Florida for named hurricanes. It is designed to be supplemental to homeowner's insurance and pays within 72 hours of the event. The parameters for triggering a payout are strength of the hurricane and distance of the insured property from the center of the hurricane eye at its closest point. The third product is a new admitted policy in Hawaii called FirstTrack, designed to cover below-deductible expenses from a hurricane. In addition, a new admitted parametric microinsurance policy for hurricanes will be introduced in Puerto Rico in the coming months by Raincoat. Enabled by new regulations on the island aimed at fostering parametric microinsurance solutions, there are no proof-of-loss requirements for the customer and the premium is limited to 2% of a minimum wage salary.

Finally, parametric insurance has been used to help countries, referred to as sovereign insurance. Often this is done through regional risk pools. The first of these to be established is the CCRIF SPC (formerly the Caribbean Catastrophe Risk Insurance Facility), founded in 2007. The CCRIF offers parametric

insurance policies to Caribbean and Central American countries for tropical cyclones, earthquakes, excess rainfall, and for fisheries. These policies provide short-term liquidity for disaster response. The payouts to member nations are determined by the parameters each specific country has selected in the pool and are triggered based of hydrometeorological parameters, like rainfall and windspeed. Parametric products are useful in this case since they lower costs and speed payment and sovereign countries are positioned to handle the basis risk. CCRIF promises to pay affected countries within 14 days of the event, with notification that a payment is on its way within 2 to 3 days after the event strikes.

