

Case Studies of Financial Decision-Making using Near-Real-time Earthquake Information

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In the immediate aftermath of a damaging earthquake, billions of dollars of relief, recovery and insurance funds are in the balance. Much of these funds are now distributed via new financial instruments that allow those with resources to hedge against disasters and those at risk to limit their earthquake losses and receive funds for response and recovery. Many of these mechanisms—such as catastrophe bonds (catbonds)—have come to rely on near real-time (NRT; typically minutes to a few hours) earthquake information that allows those affected by the consequences of a disaster to quickly access financial capital. Catbonds are in place in many countries around the globe that face earthquake risks; in fact, there are a number of active catbonds for earthquake coverage for large areas of both the United States and Japan, and several have been triggered (paid out) in the last few years.

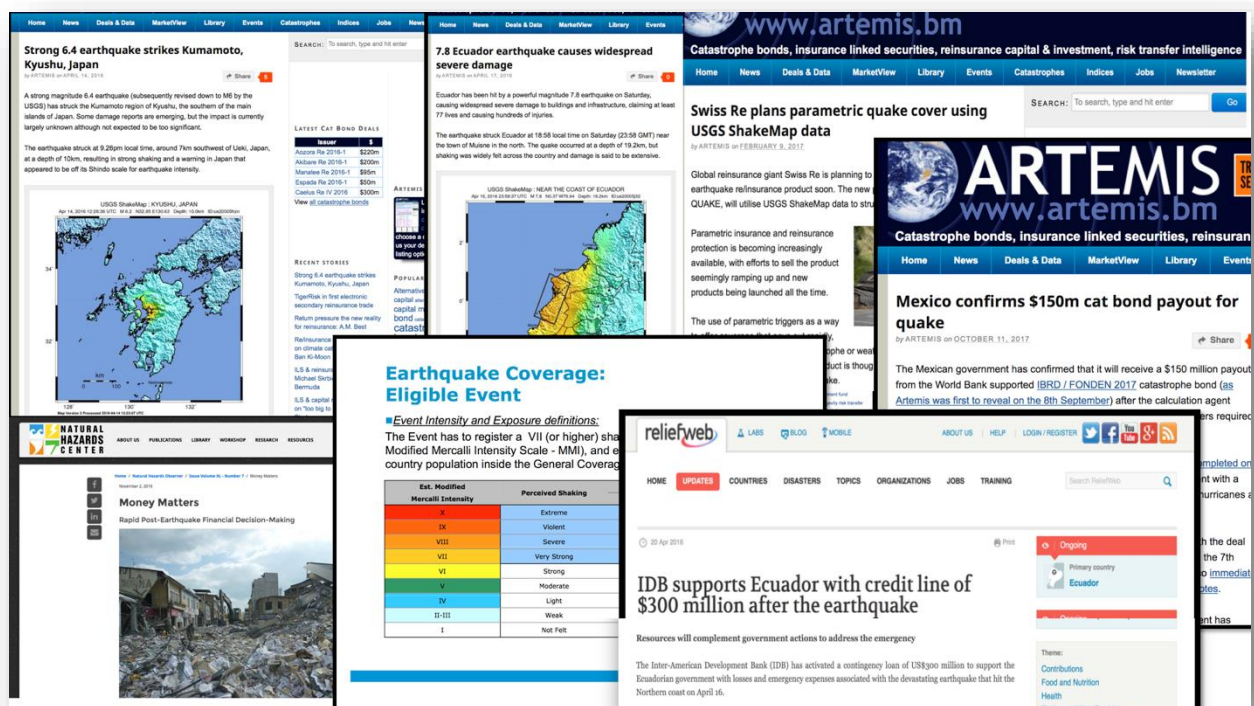


Figure 1. Examples of catastrophe bonds (catbonds), their triggers and reporting in recent years. Sources: Reliefweb (<https://reliefweb.int>) and Artemis (<http://www.artemis.bm>).

NRT products had been routinely used for situational awareness, to support response and facilitate aid, and as such they are of interest to those in the earthquake hazard and risk communities. Such financial strategies can have significant benefit for stakeholders: They facilitate risk transfer, foster sensible management of risk portfolios, and assist in disaster response and recovery. Yet, making funds available for at-risk populations also provides opportunities for investors who benefit from financial diversification.

We will discuss the general categories of post-earthquake financial decision-making that benefit from detailed NRT earthquake hazard input: (1) Rapid damage assessments that guide disaster response and aid deployment; (2) estimation of monetary loss to a portfolio of industrial, commercial, or residential exposures to guide the claims adjustment process; and (3) the triggering of so-called parametric transactions—insurance instruments that rely on the physical measurement of event characteristics to determine if the insured party receives compensation and how much.