

The National Flood Insurance Program (NFIP), Reinsurance, and Catastrophe Bonds

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Insurance generally serves to transfer risk from one entity who does not want to bear that risk to another entity that does. An initial insurance purchase, such as homeowners buying a policy to cover damage to their home, however, is often only the first transfer of that risk. The initial (or *primary*) insurer may then transfer (or *cede*) some or all of this risk to another company or investor, such as a *reinsurer*. Reinsurers may also further transfer (or *retrocede*) risks to other reinsurers. Such risk transfers are, on the whole, a net cost for primary insurers, just as purchasing insurance is a net cost for homeowners.

The Homeowner Flood Insurance Affordability Act of 2014 (P.L. 113-89) revised the authority of the National Flood Insurance Program (NFIP) to secure reinsurance from “private reinsurance and capital markets.” Risk transfer to the private market could reduce the likelihood of the Federal Emergency Management Agency (FEMA) borrowing from the Treasury to pay claims. In addition, it could allow the NFIP to recognize some of its flood risk up front through premiums it pays for risk transfers rather than after-the-fact borrowing, and could help the NFIP to reduce the volatility of its losses over time. However, because reinsurers charge premiums to compensate for the assumed risk as well as the reinsurers’ costs and profit margins, the primary benefit of reinsurance is to manage risk, not to reduce the NFIP’s long-term fiscal exposure.

Reinsurance

The most common form of risk transfer is a primary insurer purchasing coverage for its risks from another (re)insurer. The primary insurer typically continues to service the initial policy, while the

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reinsurer operates in the background. Reinsurance is particularly important to smaller insurers who may not be large enough to spread local risks that are spatially correlated, such as a storm hitting a particular area, across a broader geographic area. Reinsurers, however, often have the size to diversify risks on a global scale.

NFIP Reinsurance Purchases

The NFIP's first large reinsurance purchase was in January 2017, when FEMA purchased \$1.042 billion of reinsurance for an annual premium of \$150 million. The reinsurance covered 26% of losses between \$4 and \$8 billion arising from a single flooding event. FEMA has paid over \$8.7 billion in claims for Hurricane Harvey, triggering a full claim on this reinsurance.

FEMA purchased \$1.46 billion of reinsurance in January 2018, for a premium of \$235 million. This is structured to cover losses above \$4 billion for a single flooding event, covering 18.6% of losses between \$4 and \$6 billion, and 54.3% of losses between \$6 and \$8 billion.

Catastrophe Bonds

In addition to reinsurance, new forms of “alternative” risk transfer have also developed. One category of such instruments are known as insurance linked securities (ILS)—financial instruments whose values are driven by insurance loss events and which transfer major natural disaster risks to capital market investors. The most common form is catastrophe bonds (or cat bonds), which operate somewhat like other bonds, but whose payout is dependent on the occurrence of a particular catastrophe.

Catastrophe bonds are structured so that payment depends on the occurrence of an event of a defined magnitude or that causes an aggregate insurance loss in excess of a stipulated amount. Only when these specific triggering conditions are met do investors begin to lose their investment. There are three main types of triggers:

- *Indemnity*—bonds triggered by the losses experienced by the sponsoring insurer following the occurrence of a specified event (e.g., if an insurer's residential property losses from a hurricane in Florida exceeds \$25 million in 2018);
- *Industry Loss*—bonds triggered by a predetermined threshold of industry-wide losses following the occurrence of a specified event (e.g., if a total of all insurers' residential property losses from floods in 2018 exceeds \$20 billion); or
- *Parametric*—bonds triggered by physical conditions occurring during a disaster such as wind speed or earthquake size (e.g., if a 25-foot storm surge hit New Orleans in 2018).

Catastrophe bonds were first used in the private sector in the mid-1990s following Hurricane Andrew and the Northridge earthquake. The public sector has become increasingly interested in the use of cat bonds. In 2009, Mexico became the first sovereign state to issue cat bonds, and the World Bank is now one of the largest participants in the catastrophe bond market. The New York City Metropolitan Transit Authority issued cat bonds to protect against storm surge. According to the reinsurer Swiss Re, more than \$10.5 billion in catastrophe bonds were issued in 2017, with \$278.0 billion outstanding overall.

NFIP and Catastrophe Bonds

On August 1, 2018, FEMA entered into its first transfer of NFIP risk to private markets through an ILS transaction, in the form of a three-year agreement with Hannover Re, a reinsurance company. Hannover Re is acting as a “transformer,” transferring \$500 million of the NFIP's financial risk to the capital markets by sponsoring issuance of an indemnity-triggered cat bond. Hannover Re will indemnify FEMA

for a portion of claims for a single qualifying flooding event that occurs between August 1, 2018, and July 31, 2021. The agreement is structured into two tranches. The first provides reinsurance coverage for 3.5% of losses between \$5 and \$10 billion, and the second for 13% of losses between \$7.5 and \$10 billion. FEMA paid a premium of \$62 million for the first year of coverage. Unlike the earlier reinsurance purchases, which covered all NFIP flood losses, the catastrophe bond applies only to flooding resulting directly or indirectly from a named storm and covers only the 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.

Combined with the January 2018 reinsurance placement, FEMA has transferred \$1.96 billion of the NFIP's flood risk for the 2018 hurricane season to the private sector. A storm comparable to Hurricane Katrina would result in a total loss for the catastrophe bond investors, while a storm comparable to Hurricanes Sandy or Harvey would erode the principal of both tranches but not cause a total payout.

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