

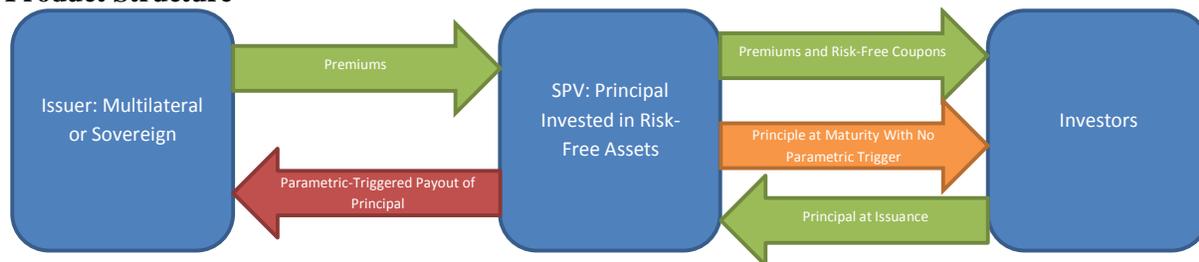
Food Security Catastrophe Bonds

Product Overview The Food Security Catastrophe Bond (FSC Bond) is a financial product that transfers food security catastrophe risk caused by drought from the issuer, such as a multilateral aid agency or government, to the financial markets. A parametric trigger (i.e. lack of rainfall) measures food security risk, and determines payout of the principal to the issuer. The FSC bond provides ex-ante disaster financing for humanitarian catastrophes caused by drought. Multilateral institutions are the intended issuers, although the product can be modified and issued by a single country or jointly by a group of countries. The FSC bond creates social value for the issuer by ensuring rapid deployment of funds in response to food security crises caused by natural disasters, mitigating humanitarian and economic harm. The FSC’s innovation lies in its application of an existing instrument, catastrophe bonds, to a dramatically new context, thereby incorporating new issuers, parameter triggers, and uses of risk financing.

Hypothetical Implementation Major humanitarian organization “Relief” responds to food security crises caused by natural disasters, including droughts. Relief is donor funded, and is concerned about donor fatigue—that it might not be able to raise sufficient funds if multiple major crises occur within the same year. Relief contacts “Modeler”, an experienced natural catastrophe modeling firm. Using historical climate data, Relief and Modeler identify several drought prone regions, and the likelihood and cost of concurrent crises caused by droughts in all regions. While Relief can raise sufficient funds to respond to a 1 in 10 year drought in any one region, simultaneous severe crises would exhaust available donor funds. Relief and Modeler conclude that Relief should insure against an unlikely, 1 in 50 year, simultaneous drought occurrence, which would require \$50 million in additional humanitarian funding. Relief then contacts “Reinsurance Company”, which structures the SPV and syndicates the product to potential investors. In exchange for a 6% annual premium, Relief receives five years of \$50 million coverage against catastrophic droughts. The typical cost of modeling, structuring, rating, underwriting, etc. is approximately 1.5%.

Market Overview Catastrophe bonds (CATs) have traditionally been issued by insurance and reinsurance companies to protect against catastrophic losses from hurricanes or earthquakes. CATs are structured to provide a payout to the issuer in the event of triggering event. Triggers have traditionally been based on natural parameters (wind speed or Richter scale measurements), indemnities, or complex model-based triggers. \$3.4 billion in CATs were issued in 2012; a total of \$14 billion in CATs is outstanding. The majority of the CAT bonds transfer US hurricane and earthquake risk from insurers to investors. Mexico is the only sovereign to have issued a CAT, selling a multi-region, multi-peril bond in 2006, and reissuing in 2009 and 2012. The Mexico MultiCat provides the Government of Mexico with ex-ante risk financing, allowing it to respond quickly in the event of a catastrophic hurricane or earthquake.

Product Structure



Coupon = Risk-Free Rate + Premium

*Premium = Average Annual Loss (Expected Loss) * Multiples (based on market risk appetite)*

The FSC bond is a form of insurance. An SPV is created by the issuer. The issuer pays premiums (the spread above the risk-free rate) to the SPV. The SPV sells the bond to investors. The principal is held in the SPV and invested in chosen risk-free instruments (generally Treasury bonds). The SPV is managed by a third party. The premium plus the risk-free payments are paid the investors as regular interest payments. If certain parameters are triggered, the principal is paid to the issuer. If the parameters are not met at maturity, the principal returns to the bondholders. CAT bonds have a maturity range of 1-5 years, with an average of 3. FSC bonds will aim to be at the higher end of the maturity spectrum, depending on market appetite for risk.

FSC Bond Parameters and Structuring We have selected drought as the parameter for the FSC bond because drought is reliably correlated to food security risk, is easily measured via trustworthy satellite data, and has already been modeled by USAID's FEWSNET. CAT bond parameters typically have an expected average annual loss between 1% to 4%, and CAT bonds are typically priced as a multiple of the expected loss. Typical multiples range from 2.5 to 3. Due to their diversification value, the multiple tends to be lower for bonds that are linked to parameters outside of the traditional North American and European regions. Mexico's 2009 issue included expected losses of over 4% - these tranches paid 12%. The FSC bond will combine multiple regions with uncorrelated drought risk to achieve the necessary risk/return profile (if only one region is chosen, the incidence may occur too frequently to allow for affordable financing). Other parameters and regional structures can be selected for different food security disasters, such as locusts or floods. Several industry-standard risk modeling firms measure expected loss – AIR and RMS are two prominent examples. One would have to be contracted by the issuer.

The bond could be tranching based on severity or number of regions affected. For example, the highest-risk tranche could be triggered if three regions are affected by the drought parameter, while less-risky tranches can be triggered after four, five, or more regions are affected. This would allow for more funding to be obtained based on needs of the issuer at differing costs.

Value for Investors The FSC bond would be attractive to investors because its risks/returns are largely uncorrelated with financial markets, and it provides relatively high rates of return in the current low-yield environment. Investors include ILS-specialist funds, hedge funds, pension funds, and other asset managers. Interest in CAT bonds is increasing, particularly from pension funds.

Social Impact and Value to Issuers Traditionally, provision of assistance in the event of a catastrophic drought in a developing country has been the responsibility of the international humanitarian system, led by the UN and international aid agencies. In the event of multiple concurrent humanitarian catastrophes, donors may be unwilling or unable to sufficiently finance multiple humanitarian responses. The successive disasters in Haiti and Pakistan in 2010 demonstrated the challenges donors face in responding to multiple disasters in quick succession, as donors were unable to finance a sufficient response in Pakistan resulted in mass displacement of affected populations and amplified long-term economic damage. In the case of drought, slow and insufficient financing costs lives and harms economic productivity, since affected farmers must liquidate productive assets in order to feed themselves and their families while waiting for assistance. FSC Bonds, therefore, have measurable short-term impact by saving lives immediately following a humanitarian disaster, and long-term economic benefits through improving the affected country's overall economic resiliency.