



THE EUROMONEY
INTERNATIONAL DEBT CAPITAL MARKETS HANDBOOK
2011

The World Bank's MultiCat Program: using catastrophe bonds to insure against natural disaster risks¹

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IN RESPONSE TO REQUESTS FROM ITS MEMBER COUNTRIES, THE WORLD BANK HAS DEVELOPED A MENU OF INNOVATIVE FINANCIAL SOLUTIONS TO DEAL WITH THE CONSEQUENCES OF UNPREDICTABLE CATASTROPHES. AMONG THESE SOLUTIONS, CATASTROPHE BONDS ISSUED UNDER THE WORLD BANK'S MULTICAT PROGRAM PRESENT UNIQUELY ATTRACTIVE OPPORTUNITIES FOR COUNTRIES LOOKING TO BROADEN THEIR ACCESS TO INSURANCE COVERAGE ON EFFICIENT TERMS AS WELL AS FOR INVESTORS SEEKING RELATIVELY UNCORRELATED ASSETS WITH ATTRACTIVE YIELD POTENTIAL. THE FLEXIBILITY OF THE MULTICAT PROGRAM ALLOWS POOLING OF RISKS ACROSS COUNTRIES, REGIONS AND PERILS, AND THE BENEFITS OF RISK DIVERSIFICATION TRANSLATE INTO LOWER INSURANCE PREMIUMS FOR THE COUNTRIES AND REDUCED OVERALL RISK ASSUMED BY THE INVESTORS INTERESTED IN ADDING UNCORRELATED ASSETS TO THEIR PORTFOLIOS TO ENHANCE YIELD POTENTIAL.

In addition to the devastating human toll, natural catastrophes can have calamitous economic consequences for disaster prone countries, especially for emerging countries which typically have extremely low rates of insurance penetration. For example, in 1998, Hurricane Mitch generated uninsured losses in Honduras equal to 34% of GDP and 158% of government revenues. Such events have a significant negative impact on public finances as governments are called upon to cover the costs of emergency and relief efforts, as well as reconstruction work. Especially in emerging economies, natural disasters negatively impact public finances as governments face a smaller revenue base due to decreased economic activity following a disaster and rising expenditures for emergency relief and recovery operations. Consequently, resources are



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often diverted from other important development programs to fund disaster relief and recovery operations, which has a significant adverse impact on economic development. The growing frequency and severity of natural disasters in recent years has intensified the negative economic impact. And yet, most governments do not have access to insurance against such events due to high costs or the insurance industry's inability or unwillingness to absorb the risks of catastrophic events, particularly in high risk areas.

With over US\$100 trillion in assets, the international capital markets have the capacity to absorb these risks if managed well. Various financial instruments have evolved for this purpose, including catastrophe bonds (also known as 'cat bonds'), an ex-ante risk management tool that insures against natural disasters. Cat bonds pay much higher interest rates to compensate for the risk of the issuer not repaying the principal in the event of a major catastrophe.

Ex-ante planning for catastrophe risk management can ease the burden on public finances post disaster and ameliorate the negative consequences for economic growth and development. Ex-ante catastrophe risk financing solutions are most effective as part of a broader strategy involving layering of resources based on the projected severity and frequency of natural disasters. For example, economic losses resulting from high frequency but low severity disaster events may be covered by building national reserves and using contingent financing to access capital post disaster, and relatively more severe but less frequent losses may be covered with insurance and/or reinsurance. The extremely low frequency, catastrophic natural disaster risk may be transferred to the international capital markets through securities such as catastrophe bonds.

The World Bank's MultiCat Program is a multi-issuer platform designed for sovereign entities to transfer a portion of their natural catastrophe risk to investors through the capital markets. The platform provides a ready-made infrastructure that permits the World Bank's member governments to access the catastrophe bond in a fast and efficient manner.

Catastrophe bonds and natural disaster risk management

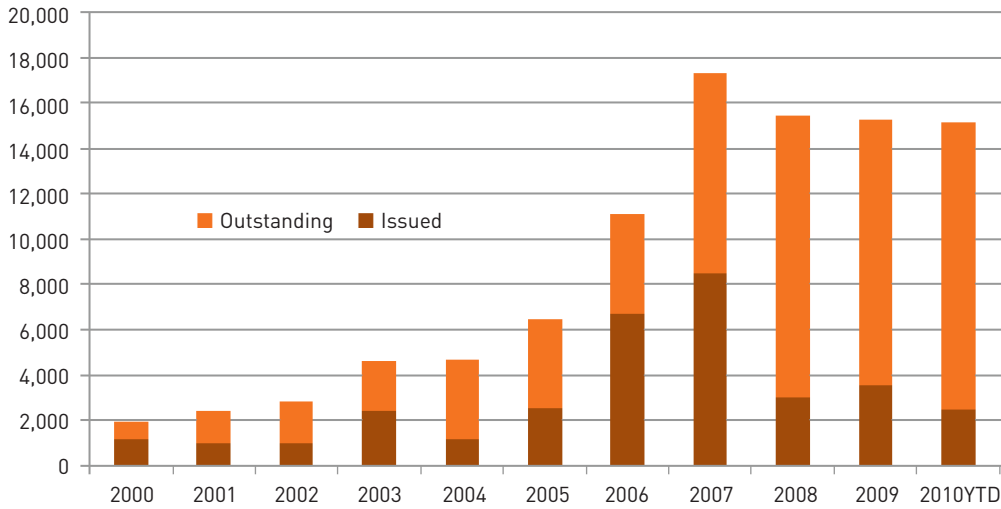
The catastrophe bond market came into being in the early nineties. In the initial years of its existence, the catastrophe bond market offered insurers a risk management alternative to reinsurance whereby an insurer (or re-insurer) could transfer its insurance risk to cat bond investors worldwide. Today, the catastrophe bond market offers a viable alternative to other entities as well, such as governments and companies, to transfer part of their natural disaster risk to the capital markets. For insurers and re-insurers, this risk transfer opens up capacity to generate new insurance contracts while providing a market-based pricing reference for most common perils. For investors, the advantages of cat bonds include limited correlation to equity and bond markets and general disruptions in economic conditions. This low level of correlation provides investors an opportunity to diversify their portfolios, thus improving their risk-return trade-off. In addition, cat bonds usually offer investors higher potential returns in relation to other investment alternatives. The catastrophe bond market has grown rapidly in recent years, especially after Hurricane Katrina in 2005. With new investors continuing to enter catastrophe bond market in search of attractive yield opportunities and portfolio diversification, the market is expected to grow significantly in the future. Exhibit 1 shows issuance volumes over the period 1997-2010.

While the catastrophe bond market suffered a decline in 2008 and 2009 in the wake of the financial crisis, it proved to be quite resilient, bouncing rapidly back from the crisis and attracting new players, both issuers and investors alike. The cat bond market has out-performed both high yield bond market and equity markets in the US, and markedly so during the financial crisis (see Exhibit 2).

Cat bonds are natural catastrophe-related insurance-linked securities (ILS) which pay periodic coupons to the investors during the life of the bond. Concurrently, they provide the insured entity (sponsor) insurance coverage against a pre-defined set of natural disasters. In a simple structure under a typical cat bond, the sponsor enters into an insurance contract with a special purpose vehicle (SPV)

Total non-life cat bond issuance, 1997-2010 (as of June 30, 2010)

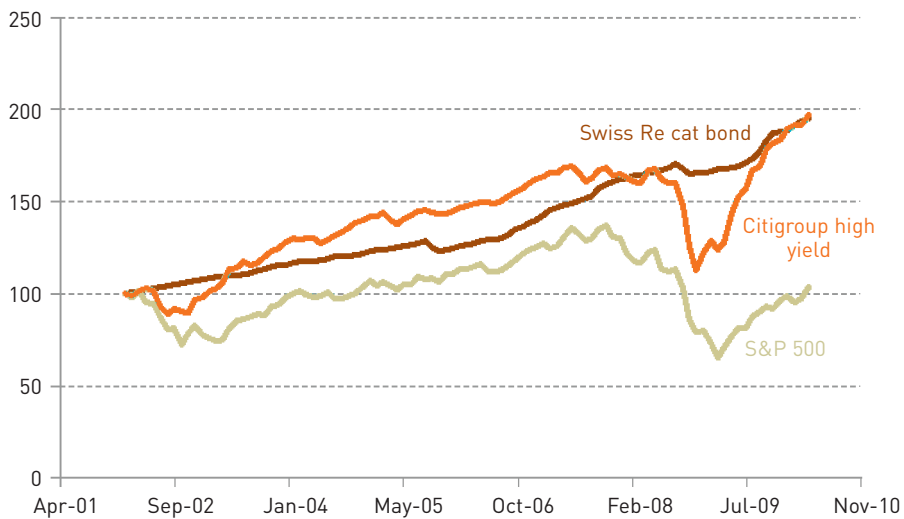
Exhibit 1



Source: Swiss Re Capital Markets

Cumulative performance from January 2002

Exhibit 2



Source: Bloomberg

that issues notes to capital markets investors through financial institutions. The SPV thus acts as special purpose insurer as well as a special purpose issuer. It invests the proceeds of the notes in highly rated assets² (AAA-rated assets such as US Government securities) and transfers the return of this investment, along with the insurance premiums paid by the sponsor under the insurance contract, to the buyers of the notes as the periodic coupons. The assets are held in a collateral trust.

Catastrophe bonds specify the type of natural disaster that they cover (e.g. earthquake, hurricanes). A typical component of the cat bond is the trigger mechanism used to determine the insurance payment under the bond. There are several types of triggers which differ in complexity as well as in terms of the residual (or basis) risk that the sponsor is left with. Some commonly used triggers, of increasing complexity but decreasing basis risk for the sponsor, are as follows:

- **Parametric index:** This trigger is based on objective measures (or ‘parameters’) of the physical event, such as magnitude and epicentre location and depth of earthquakes, and wind speed and central pressure of hurricanes. If the disaster event occurs at or above a specified value of the parameter, the bond is triggered. Information characterising a disaster event is provided by independent measuring agencies within days following the event. Because the amount of the insurance payout can be determined based on these published values of the parameters, the payout can be made quite rapidly following a disaster event (within a few weeks, if not days after the disaster event occurs), thus enabling the insured governments to meet their immediate liquidity needs in support of emergency relief and recovery operations.
- **Modelled loss index:** This trigger is based on a catastrophe model used to calculate expected loss. Losses from a disaster event are determined by inputting specified parameters of the event. If an event occurs and calculated losses reach a pre-determined level, the bond is triggered.

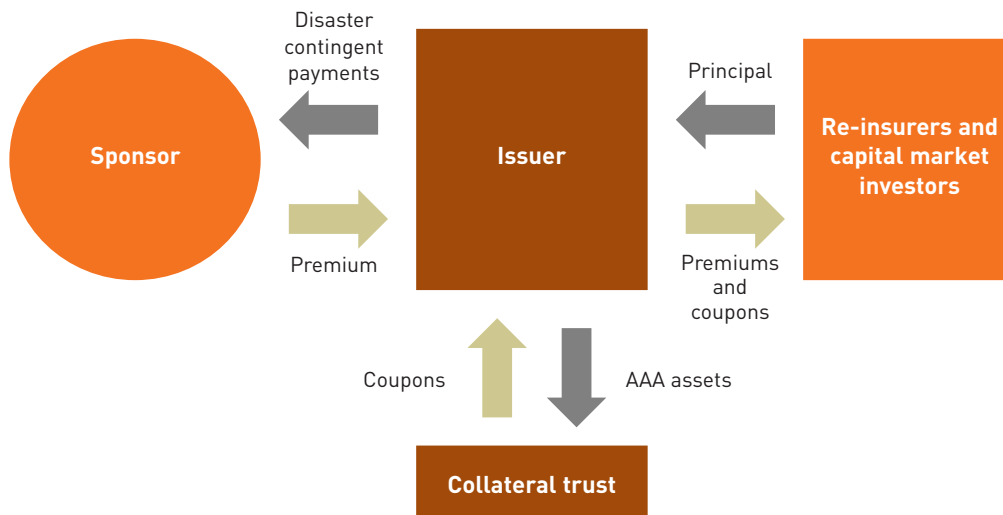
- **Indemnity:** An indemnity trigger is based on the sponsor’s actual losses resulting from a disaster event. This trigger nearly eliminates basis risk for the insured entity. However, insurance payouts typically are made months after the event occurs, because they are based on actual on-the-ground assessments of damage and loss, which is time consuming and often subject to legal disputes.

If a specified disaster event occurs and the trigger condition is met, the SPV liquidates the assets held in the collateral trust and uses the proceeds to make an insurance payout to the sponsor in accordance with the provisions of the insurance contract. In such a case, investors suffer a loss of their principal. If no event occurs during the life of the bond, the SPV returns the entire principal to the investor. Thus, investors in the bond take the risk that all or part of their principal may be lost if a covered event occurs during the life of the bond, and receive a coupon that reflects this risk.

Exhibit 3 depicts a simple, basic structure underlying a cat bond transaction. In practice, many variations are incorporated, reflecting the perils covered, choice of trigger mechanism, etc.

The World Bank’s MultiCat Program

As part of the World Bank’s efforts to partner with its member countries in the implementation of strategies to manage their natural catastrophe exposure, the World Bank Treasury established the MultiCat Program in 2009, a standard framework for countries to have access to the catastrophe bond markets in order to transfer part of their natural disaster exposure to market participants in a transparent and efficient way. The objectives of the Program are to facilitate access of member governments and public entities to insurance coverage on better terms; enlarge the traditional investor base for catastrophe bonds by offering yields uncorrelated with financial markets; and ensure governments’ access to immediate liquidity to finance emergency relief and reconstruction work after a natural disaster.



Source: The World Bank

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The MultiCat Program provides a standard documentation framework that allows the issuance of notes covering multiple perils and for multiple zones. Some of its key features are:

- Common documentation, legal and operational framework for each offering: The MultiCat Program offers World Bank member countries the possibility of accessing the cat bond market using a framework already in place and facilitates the legal preparatory work needed for any cat bond transaction.

- 'MultiCat' brand name: Any transaction under the Program will benefit from the assistance and support of the World Bank.
- Structural flexibility: The MultiCat program allows for countries to tailor-make the type of protection needed, as it allows for multiple types of perils, triggers and areas of coverage.

The World Bank Treasury acts as arranger for all MultiCat issues. As arranger, it assists the country on its overall natural disaster risk-management policy and any technical

Highlights of the World Bank's MultiCat Program

- The MultiCat Program helps member countries access the international capital markets for insurance against the risk of natural disasters.
- The Program supports a wide variety of structures, including the pooling of multiple risks (earthquakes, floods, hurricanes and other wind storms) in different regions.
- Mexico was the first country to issue notes using the MultiCat Program, with a four tranche US\$290m transaction in October 2009.

aspects related specifically to the transaction, and works together with other parties involved in the deal (underwriters, legal counsel, modelling agencies, and other service providers) to ensure a smooth and efficient execution process. The process to become an issuer under the MultiCat Program is relatively simple and straightforward, with no formal application process. A service agreement is signed between the country and the World Bank detailing the characteristics of the proposed transaction and the steps to be followed in order to comply with the country's internal regulations, and the work to prepare and execute the transaction begins immediately after that.

The MultiCat Program is an important addition to the World Bank's catastrophe risk financing menu, which also includes the Catastrophe Deferred Drawdown Option – a natural disaster contingent loan – and intermediation for weather hedges.

The first transaction under the Program – MultiCat Mexico 2009

In the first transaction under the MultiCat Program, Mexico's FONDEN, a federally administered reserve fund

created with the objective of assisting Mexican citizens in the event of natural disasters, sponsored a three-year, US\$290m parametric transaction covering high-magnitude earthquakes in and around Mexico City, as well as strong windstorms in specified geographical regions along the Atlantic and Pacific coasts of the country. The transaction was highly successful, with the order book more than two and a half times oversubscribed and the final pricing in the tight end of the original price guidance. Exhibit 4 summarises the final terms of the transaction.

Catastrophe bonds present several benefits to sovereign countries

Catastrophe bonds provide countries with an efficient tool to transfer some of their natural disaster risk to the capital markets at transparent and attractive costs. In developing countries where private insurance capacity is limited, the government bears the primary financial burden when natural disasters strike the country. In some cases, and for lower-magnitude, higher-recurrence perils (e.g. floods during rainy seasons), countries are able to budget for damage control. However, for extreme events

MultiCat Mexico 2009, summary of final terms

Exhibit 4

	Class A	Class B	Class C	Class D
Peril	Earthquake	Pacific hurricane	Pacific hurricane	Atlantic hurricane
Notional (US\$m)	140	50	50	50
Risk period	3 years	3 years	3 years	3 years
Trigger type	Parametric	Parametric	Parametric	Parametric
Trigger*	7.9; 8.0	944	944	920
AIR modelled annualised expected loss	4.65%	3.94%	4.00%	2.36%
S&P ratings	B	B	B	BB-

* Trigger for earthquake is magnitude and for hurricane it is central pressure (milibars)

Source: The World Bank

where emergency funds are needed right away for relief and recovery efforts, such as high-magnitude earthquakes, devastating hurricanes or tsunamis, catastrophe bonds present a viable alternative to standard insurance coverage.

Principal advantages of cat bonds over traditional insurance

- **Reduce credit risk:** Cat bonds provide collateralised coverage of the risks insured and therefore, depending on the nature of the collateral arrangement, present almost no credit risk in respect of the insurance payouts. In contrast, in the case of traditional insurance, insured countries will face the credit risk of the re-insurer.
- **Reduced volatility of premium rates:** Cat bonds typically have maturities of three to five years and permit locking in fixed premium rates for multiple-year periods. By contrast, traditional insurance contracts are written by re-insurers generally for one-year periods only and insurance rates exhibit substantial volatility and could potentially increase significantly following a future catastrophic event.

Advantages of issuing cat bonds through the MultiCat Program

Participation in the MultiCat Program for issuing a cat bond may produce significant additional benefits for member countries through the economic efficiencies that can be so achieved:

- **World Bank 'MultiCat' brand name recognition:** Investors in the MultiCat Mexico 2009 transaction clearly communicated to the World Bank the comfort they had derived from the involvement of the World Bank in the transaction. A part of the more than two and half times over-subscription of the bond was attributable to this comfort experienced by the investors. The success of the bond issue allowed the bond to be priced very tightly (near the bottom of the target pricing range) resulting in significant cost savings

for Mexico. The investors also gained as the pooling of risk across perils and regions reduced the overall risk faced by them in the transaction due to diversification.

- **Diversification benefit through risk pooling:** Under the MultiCat Program, the World Bank could arrange to pool the catastrophe risk of a public entity in a member country with an uncorrelated risk of a public entity in another member country in order to realise benefits of risk diversification for both entities. Typically, pooling risk in this way raises the concern among the insured entities that there may be insufficient funds available to cover their risk if a covered event triggered first in, and payouts were made out first to, the other insured entities in the pool. World Bank Treasury can design cat bond structures which would address this concern. Using such structures would reduce the risk of insufficiency of funds and, at the same time, potentially reduce the insurance premium for each entity.
- **Established operational and legal issuance framework:** The MultiCat Program's established operational and legal framework means that executing transactions under the Program is more efficient, in terms of both time and cost, than doing stand-alone issuance. Governments and public bodies that use the MultiCat Program also benefit from the expertise the World Bank has acquired in the process of preparing and executing cat bond transactions in the international capital markets.
- **Cost savings on sovereign bonds:** Countries that are seen as being pro-active in protecting their public finances from natural disasters will likely be rewarded over time by lower funding costs in the traditional sovereign debt markets as well. If sovereign bond investors know that a country that is prone to natural disasters has taken steps to insulate its finances from the potentially devastating consequences of those events, they will likely require a smaller credit risk premium for the country's bonds.

Concluding remarks

The structuring flexibility inherent in the design of the World Bank MultiCat Program potentially provides benefits to both insured countries and cat bond investors. The Program helps enhance the cost efficiency of insurance coverage for the insured countries by pooling risks across countries, regions, and perils, and directing the benefits of the risk diversification to the insured countries in the form of reduced insurance premiums. Investors also gain from pooling of risks as the overall risk faced by them in such a cat bond transaction is reduced due to the effects of diversification.

The catastrophe bond market can become an efficient alternative for countries looking to mitigate the exposure of public finances to the negative impact of natural disasters. With the scientific and technological improvements in risk modelling that provide the foundations for this type of transactions, cat bonds are gaining visibility among policy-makers in the developing world looking for ways to hedge natural disaster risk. The World Bank's MultiCat Program is one tool that should make accessing this market simpler and more efficient for governments and public bodies.

In this context, cat bonds also present an opportunity for the financial industry in general. The MultiCat Program presents potential benefits for various market players:

- For governments, it allows a more efficient natural disaster risk management framework;
- For investors, it offers a new, return-enhancing product for their portfolios that has very low correlation with other asset classes they typically hold;

- For reinsurers, it offers an entirely new set of perils to a natural catastrophe market that is highly concentrated in a relatively small set of developed market perils; and
- For financial intermediaries, it enlarges the menu of banking products they can offer their clients.

By helping mitigate the devastating impact of natural disasters through the appropriate use of this product in conjunction with other catastrophe risk management instruments, the entities involved promote a more effective and enduring framework for development and growth in emerging economies.

Notes:

1. This work is a product of the staff of the World Bank (International Bank for Reconstruction and Development). The findings, interpretations, and conclusions expressed in this work are those of the authors and do not necessarily reflect the views of the Executive Directors of the World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work.
2. There are a variety of arrangements with regard to the types of assets in which the proceeds of the cat bond issue are invested. The market has changed recently as a result of, inter alia, the Lehman Brothers bankruptcy.

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