

# Alternative Risk Transfer

## Structuring and Efficacy

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### Introduction

Catastrophe bonds were being talked about as far back as the early 1990s, but it was not until 1995 that they came into the limelight. In 1995, a series of devastating natural disasters in the United States pushed American insurers to reassess their hedging strategies against even greater catastrophes that could cripple them with claims. In November 1996, Morgan Stanley agreed to underwrite the first public issue of insurance related securities-catastrophe bonds, or CAT bonds for short. The client was the California Earthquake Authority (CEA), created by the state to insure California homeowners forsaken by insurance companies after the Northridge earthquake. The plan was to market bonds to big institutional investors with a novel feature: Bondholders would earn a huge 10%, but if any earthquake were to cause more than \$7 billion in losses to the CEA, bondholders could lose their principal. That the deal did not occur is another story altogether, but it did mark the launch of a new class of bonds on the street.

The first disaster-linked bonds to be actually issued in the US were then called "Act of God bonds." A landmark issue came in 1997 with Residential Reinsurance's US\$477 million hurricane-linked bond to fund catastrophe reinsurance. The issue managed by Goldman Sachs, Merrill Lynch and Lehman Brothers would be triggered by a hurricane happening within a year that will lead to claims exceeding US\$1 billion.

The success of this issue opened doors for similar securities from other insurance and reinsurance companies in the United States. In November 1997, Goldman Sachs and Swiss Re New Markets launched the first such securitisation in Asia with 10-year US\$120 million Japanese earthquake-linked bonds for Tokio Marine and Fire Insurance. The deal was the first to use a parametric structure to determine loss on the face value of the bonds. The emergence of catastrophe-linked securities heralded the convergence of insurance and capital markets. Later on, some issuers embedded derivatives like options in cat bonds.

CAT bonds are designed to protect insurance companies from events like massive hurricanes and earthquakes, which happen rarely but cause enormous damage. The bonds pay interest and return principal the way other debt securities do -- as long as a catastrophe that causes losses above an agreed-upon limit doesn't whack the issuer. For example, a San Antonio-based insurer floated a CAT bond issue with the loss threshold being \$1 billion. As long

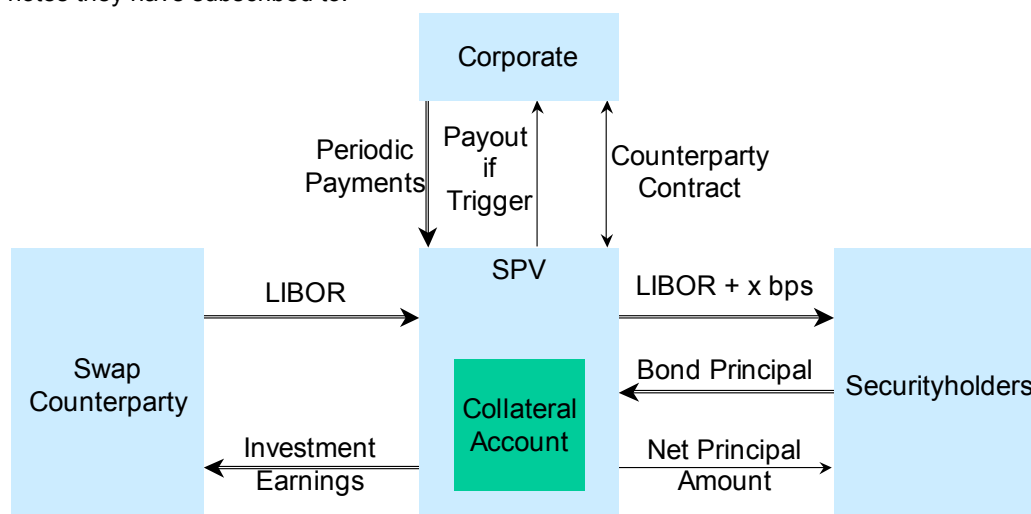
as a hurricane didn't hit their client for more, investors would enjoy their junk bond like yields of about 11%, and get their principal back. However, in the event of the losses exceeding \$1 billion, the bondholders would lose their principal as well as the interest.

CAT bonds are extremely high risk and high return, with not only insurance companies but also big corporates hedging catastrophe risk by issuing CAT bonds. CAT bonds have come as a reprieve for companies working in high-risk areas like Oriental Land, the owner of the Tokyo Disneyland and USAA. Faced with the prospect of insuring a potential fatality (Tokyo is an earthquake prone area) insurance companies, in trying to manage their risk and returns, prescribe massive premiums on such insurance policies. Reinsurers balk at the idea of reinsuring such high-risk insurance policies. However, with the presence of cat bonds, companies are resting easy.

## Structuring a Catastrophe Bond transaction

A Catastrophe Bond deal would be structured in a similar manner to a securitisation transaction; the major difference lying in the fact that in the case of the securitisation, there are certain receivables which are promised as collateral whereas in the case of cat bonds, there is no collateral, and the investors even stand to lose their principal should the losses exceed a certain threshold.

An SPV is formed, usually registered in a tax haven like Cayman Islands or Bahamas. The SPV usually issues certain notes or preference shares to investors with promised yields that are above the market. The money obtained from the investors is invested in high-grade paper or other such instruments. Usually a counter party guarantees the returns on these investments. The company insuring its risk provides additional funds to the SPV for payments to the investors. In the case of a natural disaster of the mentioned type occurring, the SPV transfers funds to the company, thus providing the repayment it had bought earlier on; the amount of funds transferred can vary from 10% to 100% of the kitty generated from the investors. In certain cases, the money transferred by the SPV is returnable to the investors, and acts merely as a sort of a loan, whereas in other cases, the investors stand to lose a part of their principle as well as the interest that they should be earning on the notes they have subscribed to.



**Structure of a Typical Catastrophe Bond Transaction**

## The Case of Oriental Land

Building a massive entertainment complex close to the sea, including hotels, shopping malls, entertainment complexes and a whole Disneyland is quite a daunting task, especially with the fear of earthquakes looming over all the time. The last major earthquake to strike Tokyo caused an estimated US\$ 145 billion of damage. For Oriental, aiming at building the best Disneyland in the world, insurance cover would not be sufficient to recoup losses if something like this happened, besides insurance being costly and coming for only one year at a time.

Since 1983, when the Tokyo Disneyland became operation, Oriental did not seek earthquake insurance of any kind, having had problems with insurance companies and faith in its construction of buildings. What Oriental was interested in was a cost-efficient, longer-term earthquake cover that extended beyond mere property damage to also cover the equally ruinous after effects of a disaster such as a decrease in Disneyland visitors. Till the advent of the CAT, such an option was unviable and needless to say, not available.

In May 1999, Oriental Land successfully raised a total of US\$200 million in the first-ever deal of earthquake risk securitisation by a corporate. Led by Goldman Sachs, the CAT is in two parts: US \$ 100-million, five-year notes issue for the earthquake cover and a further US\$ 100-million, standby post-earthquake fund facility. Both bonds have been issued through Cayman-registered special purpose vehicles.

Unlike the existing earthquake insurance policy, the cover is not pegged simply to physical damage. Rather, it is structured according to the magnitude, location and depth of the earthquake. The company had other objectives too. It wanted to make sure that the cost of rebuilding the facility is contained and it does not lose too many visitors to the after-effects. For example, it did not want to pay a hefty premium for the cover and preferred to pay only minimal interest on the post-earthquake contingent portion.

### *The Structuring*

For the structuring of the deal, Oriental entered into financial contracts with two SPVs both of them based in Cayman Islands. The first SPV called Concentric limited would pay Oriental as much as US\$ 100 million in case of an earthquake happening within five years, whether or not there would be any physical damages. Once the triggering earthquake happened, Oriental Land would be compensated with the appropriate amount, depending on the earthquake magnitude, depth and location as measured by the Japan Meteorological Agency.

In turn, Concentric would raise US\$ 100 million in five year floating notes at 310 basis points over 6M LIBOR. Concentric engaged Goldman Sachs Mitsui Marine Derivative Products to collateralise its obligation to Oriental. Goldman would invest the proceeds of the issue in US government securities, A-1 or triple A class paper. The aim of this agreement was an interest rate swap whereby GSMMDP would ensure that the interest yield on the portfolio would convert to LIBOR flat the interest being accrued on the papers and ensure that Concentric receives the full amount to pay to Oriental Land on the trigger date. The losses, if any were to be compensated by GSMMDP who would get a flat fee for the services. Note holders, on their part would lose entire or a part of the

principle depending on the magnitude and location of the earthquake's epicentre. (Oriental and Goldman sought the help of a US based firm called EgeCat for modelling the earthquake risk for creating the levels).

The second SPV, called Circle Maihama would extend Oriental a post earthquake reconstruction fund facility of US\$ 100 million to be raised through issue of 5-year notes at 75 bp over six month LIBOR (approximately 4.2%). Circle Maihama entered into a similar interest swap with GSMMDP. On the trigger date, GSMMDP would liquidate the portfolio and allow Circle to subscribe to US\$ 100 million worth of Oriental Land bonds at 25 bps over LIBOR, with Oriental enjoying an interest moratorium of three years. Once issued, the notes would also be extended for three years with the noteholders getting 5 bp over LIBOR in these three years.

## **Seismic Limited – Lehman Brothers**

Lehman Re is the reinsurance subsidiary of Lehman Brothers Holdings Ltd. Lehman Re had substantial exposure to the tune of US\$ 15 million) in the California area and they were looking at an efficient source of Reinsurance. Stuck between choosing to go to the capital markets and going along with a major reinsurance company, Lehman Re decided to create a security that would be tied to an index.

As a result of the decision to launch the bonds, a special purpose vehicle called Seismic Limited was formed in March 2000, and registered in the Cayman Islands. Seismic would issue securities in which the repayment of the principal and the interest would be linked to the PCS (Property Claim Services) reported cumulative insured losses in a period of 22 months. Seismic would issue notes at LIBOR + 450 bps and preference shares at LIBOR + 650 bps worth US\$ 150 million to investors. On its part, Seismic would put the money obtained from the investors in a collateral account from where it would be invested in high-grade securities and commercial papers. Seismic would also enter into a swap with another party to convert the earnings from the investments to LIBOR flat. Seismic would also enter into a contract with Lehman Re under which, if the trigger were reached, it would pay the amount, as allocated to Lehman Re, and Lehman Re would make periodic payments to cover the basis risk incurred by Seismic and assume the basis risk on its own self.

This deal, in which the catastrophe bond was linked to an index maintained by PCS, was among the first of its kind in the capital markets. With this deal, Lehman Re was able to fully secure a collateral against its exposure, as compared to reinsurance where it would have had to retain a subordinate tranche. On part of investors, they were provided with junk bond like yields with a positive but low probability of losing their entire investment. This product was totally uncorrelated to the other securities existing in the market, and provided for excellent diversification abilities.

## **USAA – Catastrophe Risk Financing**

United Service Automobile Association (USAA) was a unique insurance company, with a policyholder base limited solely to military personnel. As of March 1997, the company had approximately 2.6 million policyholders in lines of business that included automobiles, homeowner, dwelling, renter, condominium owner, pleasure boat and personal liability (umbrella). Following the demographic trends of the US as a whole, USAA's policyholder base had been growing in high-risk areas such as Florida and California. Faced with the necessity of serving its military personnel clientele wherever they resided, USAA had little control over the geographic pattern of its exposures. Like all insurance companies, especially given its market structure, natural catastrophes could potentially impair its ability to serve its policyholders, or wipe it out altogether.

The USAA management began thinking about risk mitigation and management after hurricane Andrew struck Florida, causing damage to USAA in excess of the industry levels. The management also realized that had the hurricane landed 50 miles north, it would have caused a damage to USAA of US\$50 billion compared to the US\$ 600 million right now. The management also realized that if such exposures could be mitigated and transferred or separately securitized, USAA could more efficiently deploy its capital resources.

The market offered USAA a whole portfolio of options and structured products which could be used to transfer and securitize the risk. Some of these included reinsurance, catastrophe bonds, surplus notes and contingent equity. However, there were several concerns based on which these instruments needed to be evaluated. All the instruments available had their positives and negatives. However, USAA sought something which would link the capital and reinsurance markets, and provide them with a secure structure at a low cost.

Based on the abovementioned considerations, USAA selected traditional reinsurance and Catastrophe Bonds to mitigate risk. USAA struck a deal with Residential Reinsurance obligating it to pay USAA for the claims in the layer between \$1.0 billion and \$1.5 billion resulting from a single Class 3, 4 or 5 hurricane in the Covered States during a 12 month claims period with USAA retaining not less than 10% of the risk. This transaction provided a buffer to the Catastrophe bond issue and helped the bonds floated to achieve a high enough rating for them to be subscribed to by investors. Further, USAA issued US\$400 million worth of catastrophe bonds, and renewed the same with a US\$ 450 million issue in 1998. This provided USAA with the requisite capacity to bear the claims and provide better service to its policyholders.

## **Key Issues in a Catastrophe Bond Transaction**

Catastrophe bond transactions are becoming more and more common with Corporates and Insurance companies alike seeking to hedge risks. The three examples above talk about a corporate (Tokyo Disneyland), a reinsurance company (Lehman Re) and an insurance company (USAA). However, for all these issuers there are some hurdles which are encountered, and it would be prudent

to treat them at this point. The following hurdles could be encountered at various stages in a Cat Bond issue:

1. *Taxation*: The issue of taxation is an old tale in the life of securitization. Most of the special purpose vehicles launched to securitize assets or liabilities usually find themselves being taxed doubly. First, they are taxed on the income generated (the fees etc. flowing in from the issuer) and secondly on the disbursement of interest or dividend (in the hands of investors). This diminishes returns, and to provide a return equivalent to the market on a post tax basis, the SPV has to generate astronomical pre tax returns. As such, it is usually seen that the SPV would be located in a tax haven like Mauritius, Cayman Islands, Bahamas or Bermuda. In such islands, the tax laws usually lead to a single point of taxation, at a much lower rate than say, having the SPV on the mainland in the USA. Similarly, taxation also governs the choice of the issue of securities to investors whether in the form of debt or equity. Equity dividends are usually taxed, whereas interest paid on debt is not taxed in certain jurisdictions. Therefore, it may be prudent to issue debt securities instead of equity, or vice versa, dependant on the taxation laws under which the SPV or the company would be operating
2. *Regulatory*: The SEC and several other watchdogs and regulators have often issued warnings to Cat bond issuers that their issues to retail investors are illegal as they are not in the business of insurance. However, with the extent of issues which have been conducted till date around the world in various markets, regulators have relented and have allowed the issue of these bonds
3. *Choice of Investors*: At the time of the issue, a choice needs to be made by the SPV whether it wants to target retail or institutional investors. This raises the issues of disclosure and targeted or general issues. Under US laws, the SEC allows a 144A targeted issue to institutional investors which needs much less disclosure compared to that for retail investors. Additionally, given the complexities of structures implemented for catastrophe bonds, it is usually preferred that institutional investors are targeted given their levels of sophistication and understanding of such issues.
4. *Bond Structure*: For the issue of debt securities, several issues and considerations can arise. Primary among these is the issue of the principal repayment. Debt issues can either be made in the form of a Principal Protected issue or a Principal At Risk issue. For a protected issue, the investor doesn't lose his principal if the issuer faces losses on the insured part of the Catastrophe bonds. However, in the principal at risk issue, the investor can lose part or all of the investment depending on the severity of losses inflicted by the catastrophe. Referring back to the example of Tokyo Disneyland, depending on the severity of the earthquake, the investor may lose part or whole of the principal. Another issue which crops up is whether to make the cat bond a single or a multi period issue. Furthermore, the issuer also carries the option of having a Single Occurrence or a Multi Occurrence structures. Under a single occurrence structure, the validity of the debt issued ceases as soon as any referred catastrophe occurs, over the limit. The principal is paid back in whole or part, as the case may be. However, a multi occurrence issue continues to exist, with the principal being written down on the occurrence of a catastrophe with a loss threshold higher than that prescribed in the issue.

5. *Disclosure Issues*: Since the bonds can cause a loss of money to the investors, the regulators demand more stringent disclosure norms compared to other forms of securities. The investors portfolio is linked to a specific insurer's portfolio, which creates the necessity of stringent disclosure and reset mechanisms for multi year transactions in order to reflect changes in the mix and quantum of exposure, while preserving the investor's loss profile.

## A Comparison with other forms of Catastrophe Risk Transfer

But, are catastrophe bonds the only way of transferring or hedging the risk? The answer is a strong NO. Over time, with complexity of technology and finance, and sophistication of investors, several products have been evolved which could be utilised for this purpose. Some of them are:

1. *Surplus Notes*: Insurer issued notes which are subordinate to all other forms of debt. The payment of interest and principal are to be approved periodically by state regulators. They increase the issuer's ordinary capital but not the GAAP capital
2. *Contingent Surplus Notes*: Similar to surplus notes, except that these are issued by a trust which extends to the company a put option giving it the right to sell to the trust surplus notes of its own in the case of a catastrophe
3. *PCS Catastrophe Insurance Options*: Similar to excess of loss insurance contract, provide a capped payout like a call spread. Linked to the Property Claims Services loss index.
4. *Contingent Equity*: Trust issued notes which get converted to equity in case the company is hit by a catastrophe
5. *Reinsurance*: Traditional insurance contract for an insurer. Usually limited to a percentage of losses upto a limit
6. *CBOT*
7. *Cat Bonds*

The table listed below compares the attributes of some of the securities mentioned above on some basic and important parameters.

Instrument	Financing	Hedging
	Surplus Notes Contingent Surplus Notes Contingent Equity	Reinsurance Cat Bonds CBOT
Risk Transfer	No	Yes
Impact On:		
PML	No	Yes
Balance Sheet	Yes	Yes
Surplus	Yes	Yes
Liquidity	Yes	Yes

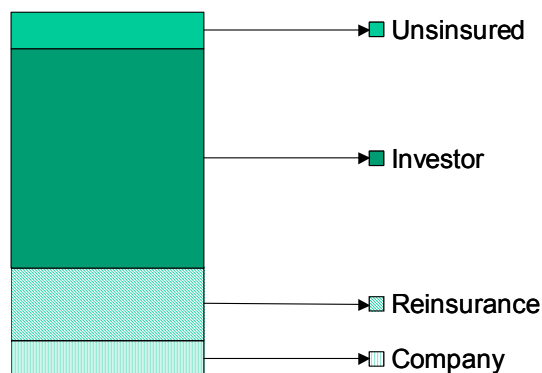
Index linked securities mitigate the disclosure and reset risk mentioned in the last chapter, however, they leave the cedant with a basis risk, not covered by compensation under the issued securities. However, the investors in ILS enjoy greater transparency, because the performance of their investment is linked to that of a publicly quoted index.

## The Efficacy of the Risk Transfer: A Corporate Viewpoint

As discussed earlier, several methodologies exist to attempt and hedge or transfer the risk from the issuer (the cedant) to the investor (the cesee). In the case of several of these securities, the risk transfer does not occur at all, and in some cases, the risk transfer is complete (principal at risk catastrophe bonds). Taking the case of Tokyo Disneyland, and the two companies Concentric and Circle Maihama. Through the brilliant structuring, what the management of Tokyo Disneyland succeeded in doing was to obtain insurance at a relatively low price. Thus, upto the issue limit of \$100 million, all the risk is effectively born by the investors. If an earthquake strikes the disneyland and causes damages of more than the trigger amount, the investors risk losing their principal almost altogether. Risk transfer is not merely limited to such cases. In the case of another device for hedging such a risk like surplus notes, the risk is not transferred to investors with such rigidity as the issuer has to pay the principal back to the investors sooner or later.

Getting back to our case in point of principal at risk catastrophe bonds, the issue structure usually consists of covenants where the investors lose part or whole of their principal depending on the amount of loss or the level of the natural catastrophe (like the richter level of an earthquake). The levels of losses are roughly correlated with the principal loss on the part of the investor. Therefore, in such a scenario, part or whole of the risk is transferred to the investor.

However, the efficacy of the risk transfer still remains. Is the risk totally off the balance sheet of the cedant or does he still retain a certain level of risk? The risk is never totally off the balance sheet of the cedant. Retention of the basis risk causes the cat bonds to be highly rated, and allows the issuance of these securities which investors might not subscribe to otherwise. The retention of risk for the cedant is a must, as it can never obtain a 100% protection. Therefore, a tranche of the risk would be retained with the cedant, and only a senior part of it transferred to the investor. The following diagram illustrates this point graphically.



Various risk tranches accommodated by the company