

## Reinsurance vs. Catastrophe Bonds

### Comparing and Contrasting Features across the Convergence Spectrum

February 2012

Rick Miller  
Co-head, Insurance-Linked Securities  
Towers Watson Capital Markets  
(212) 309-3861  
rick.miller@towerswatson.com

Michael Popkin  
Co-head, Insurance-Linked Securities  
Towers Watson Capital Markets  
(212) 309-3475  
michael.popkin@towerswatson.com

#### **BACKGROUND**

The convergence market is alive and well. The property catastrophe reinsurance and insurance-linked securities (ILS) markets are witnessing this convergence along a spectrum and across a range of differing attributes. This paper will review this continuum across key characteristics in the catastrophe risk transfer arena. To provide a specific example, we will conclude with a brief case study of OakLeaf Re 2011 and describe where it fits across the various attributes.

Though there are many ways to divide the market, we have chosen to break it into three main categories: reinsurance; collateralized reinsurance (CRE); and catastrophe bonds. We will cover the similarities and differences for the following topics: (1) type of collateral; (2) payment flow; (3) reinstatement; (4) collateral release & commutation; (5) premium adjustment; (6) fees & expenses; (7) risk analysis; (7A) tradability; and (8) trigger type. Multi-year vs. single-year contracts are not explored in depth in this paper because this is a feature that can be utilized in all three forms of execution.

#### **1. Type of Collateral**

The nature of the collateral for the cedant varies depending on the type of protection they purchase. A cedant following the traditional reinsurance route takes the reinsurer's "paper." Though somewhat of an over-generalization, the value of the paper is a binary assessment from a credit perspective. Is the provider of that reinsurance paper a reliable enough counterparty that their paper will have value when called upon? While there is slight variation in value attribution depending on whether the paper comes from a bulge bracket reinsurer, second tier reinsurer, or the rest, it remains largely a binary consideration. Assuming the answer to the binary question is "yes" the focus shifts to other key components of the decision. Specifically, the question then becomes one of long-standing relationships versus Rate-on-Line (ROL). Certain dedicated insurance funds will utilize transformer vehicles and borrow the "paper" from rated and recognized counterparties in order to offer the cedant a traditional reinsurance market.

At the opposite end of the spectrum reside 144A bonds. In these, the cedant is fully covered irrespective of counterparty risk (Lehman TRS<sup>1</sup> and the like excluded). Once the bond buyer purchases the bond, the cash remains in a collateral account. Even if the bond buyer became insolvent, the cash would remain in the collateral account and would inure to the benefit of the cedant if an underlying trigger event occurred.

<sup>1</sup> The problems that transpired with the Lehman Brothers' TRS facilities embedded in an earlier generation of cat bonds are described in detail in the Towers Watson July 2009 thought piece entitled "Catastrophe Bonds Evolve to Address Credit Risk Issues."

The connection or ongoing relationship between the bond buyer and the cedant is weaker. Nonetheless, it is not uncommon to see the same investors buying every issuance of certain cedants.

In this attribute, CRE is more similar to bonds in terms of the collateral rather than paper supporting the protection. While there are many collateral variations within both bonds and CRE (U.S. Treasuries, IBRD notes, tri-party repo structures, etc.), both methodologies of execution rely on collateral to support the transaction vs. the unsecured promise of the market. With respect to documentation, CRE rests more in the middle between reinsurance and bonds. In CRE, as in reinsurance, an insurance slip is used rather than security documentation used for a bond. Because of the collateral involved, the reinsurance slip and associated documentation more closely mirror the collateral and collateral release mechanism sections of a catastrophe bond offering.

## **2. Payment Flow**

The payment flow mechanism among the three categories also varies. At one end of the spectrum lies reinsurance. The reinsurer provides paper cover for the full limit and, in exchange, receives premium payments that are paid per the terms of the slip. Typically, these are paid throughout the contract period on a quarterly or semi-annual basis. They are rarely paid up-front when the market is concerned about the creditworthiness of the cedant to make these premium payments.

For cat bonds, like corporate bonds, payment is done in the form of a coupon payment. The bonds are purchased providing collateral, which is returned at the end of the transaction, assuming no loss from a cat event. The coupon payment that occurs quarterly is actually made up from two separate flows. First, the collateral or principal provided by the bond buyer goes into a collateral account. The collateral is invested into permitted securities under a variety of different structures. The yield from the collateral makes up part of the coupon payment. The second part of the coupon payment comes from what the cedant pays the (special-purpose vehicle or SPV) issuer for the protection (i.e. the premium). In most circumstances, the limit of cover is fully collateralized and the premium flows to the investors as an ongoing coupon.

CRE is a hybrid of traditional reinsurance and cat bonds. The insurer and the CRE party agree a premium, which reflects the amount the insurer is willing to pay for collateralized cover rather than paper cover. Typically, the collateral posted represents the limit minus the net premium, providing the collateralized market a degree of leverage. The premium flows can occur on a quarterly, semi-annual or up-front basis to top-up the collateral account to the full limit. Whereas in most 144A bonds the entire principal face is paid up-front (and received back at maturity if no event is triggered) and the premium is paid throughout the deal as coupon payments. In CRE, the premium reduces the amount of principal the collateralized market must contribute up-front (i.e. they contribute limit minus net premium).

A simple example, ignoring time value of money, should illustrate the differences. For the example, assume cover of \$10MM and premium of \$2MM (or four coupons of \$500K). For reinsurance, paper cover of \$10MM is provided and the reinsurer receives \$2MM. For a one-year bond, \$10MM of principal is provided as collateral. The bond buyer receives four quarterly coupons of \$500K each. At maturity, the principal is returned to the investor (assuming no event). For CRE, the same \$10MM of cover is provided; however, only \$8MM of cash for collateral comes from the CRE market and the premium payments are made into the structure.

## **3. Reinstatements**

Traditional reinsurance generally allows for reinstatements. Namely, if the reinsurance contract is penetrated and the limit is paid out, both the cedant and the market may have to reinstate the contract. The cedant pays another premium to the market and the market provides the cedant similar cover until the end of the risk period. From a cash flow perspective, this is dealt with as an offset; the market pays the cedant the loss minus the appropriate reinstatement premium.

Catastrophe bonds by their very fungible nature struggle to provide a reinstatement and are single-shot in nature. They can provide second-event cover, but the premium on that particular cover is paid on the outset of the contract and is not contingent upon the occurrence of an event.

Most CRE provides only single-shot cover. CRE can provide reinstatable cover, but the premium needs to be sizeable enough to provide an adequate return on collateral posted on effectively two limits. Furthermore, the cover is more likely described as “one free,” meaning that the original premium pays for both the first occurrence and a reinstatement. Economically, this feels more akin to a single-shot cover plus a second event cover.

#### **4. Collateral Release and Commutation**

Since traditional reinsurance does not require collateral to be held, contracts do not need to provide for a collateral release mechanism. Furthermore, traditional markets can remain obligated to pay claims once the full loss development period has run its course. However, some long-tailed lines of cover may have a commutation mechanism included in the slip wording to close out the obligations of the market so risk capital is not tied-up into perpetuity.

Catastrophe bonds require a collateral release mechanism. From a regulatory perspective, the special purpose insurance vehicle's obligations are limited by the collateral available to pay claims. Therefore, collateral release effectively (and most likely legally) results in commutation. The collateral release mechanism is described as an extension event past the risk period. Extension events can occur for a variety of reasons including a discretionary decision on the part of the cedant or significant losses currently evident through the loss development period. Extending a bond is not a free option for the cedant. If a bond is extended, the cedant no longer pays a risk premium/coupon into the structure but pays the noteholders a smaller extension spread. If the decision is at the cedant's discretion, the extension spread is higher (circa 3%) than if the extension is driven by proven losses arising to a level triggered by the documentation (0.10% to 0.30%).

CRE also requires a collateral release mechanism. However, the cedant typically does not have discretion to hold the collateral beyond the risk period. Collateral is retained and/or released based on predefined loss triggers. The triggers adjust and become more favorable to the market as more time passes beyond the loss occurrence date and more loss development should have occurred. Accordingly, additional premium or spread is typically not included within these structures. Furthermore, the collateral release mechanism allows for a partial release of collateral and should be designed to provide the cedant with appropriate but not excessive collateral to accommodate loss development.

#### **5. Premium Adjustment**

For traditional reinsurance, the premium, attachment points and exhaustion points are set at the beginning of the period expressed as a hard dollar amount. For most cedants who have a stable book of business during the risk period, the risk of the layer should not change. However, for certain cedants such as Florida homeowner specialty insurance companies, the portfolio migrates and the risk of the reinsured layer migrates. Due to regulatory and rating agency reasons, the attachment points and exhaustion points cannot change during a single year risk period. Accordingly, if the risk increases, then the market should be compensated with more premium dollars. Conversely, if the risk of the portfolio decreases, the market should return some of that premium. Therefore, the premium remains a function of risk as measured by a variety of methodologies calculated at different intervals of the risk period and at different risk / return periods. Some of these methodologies include probable maximum loss (PML), total insured value (TIV), or other measurements of risk aggregation.

Multi-year contracts in any of the three forms can be dealt with through “reset” mechanisms, where the attachment points and exhaustion points can be recalibrated to PML probabilities as opposed to premium adjustments. Catastrophe bonds are typically bought at par and mature at par with a predetermined coupon spread. Premium adjustments are not commonly seen. However, almost all multi-year cat bonds provide for a reset mechanism to adjust the layer of risk transferred once a single risk period ends. From a cedant's perspective, they can enable purchasing more or less complementary traditional cover in future years to manage the shifting nature of the reset bonds, assuming cat bonds form a controlled allocation of their overall reinsurance program.

CRE has features from both bonds and reinsurance. With CRE, the value of the collateral posted can be viewed as having a par value at inception and accreting to some level above par at the end of the risk period (assuming no loss events). The expected return is, in essence, embedded in that accretion. By comparison, a typical zero coupon bond's initial purchase is at a discount, and accretes to a par value at maturity. The apparent growth in principal is really just derived from the coupon payments that aren't paid because the discounted bond matures at par. CRE is like that zero-coupon bond except it can be viewed as starting at par and maturing above par. The rationale for the mathematical shift in value perception is because CRE can experience a premium adjustment. Transactions should have a value above par in a no loss scenario. In the event where a premium adjustment lowers the amount of premium provided, the impact should be on the expected level above par.

## **6. Fees & Expenses**

The fee structure represents another area of differentiation. Since reinsurance is a paper trade without collateral, it has a more straight-forward fee structure. Brokers are paid to place the risk via the reinsurance or retro markets as a function of premium. Documentation is familiar and light, so it can generally be done in-house for both the cedant and the protection provider. However, markets have internal costs associated with maintaining their credibility and the value of their unsecured promise to cedants through reserve requirements and constraints on how reserves are invested, fees paid to rating agencies, and expenses related to enterprise risk management.

At the other end of the spectrum are 144A bonds. Catastrophe bonds involve collateral, include broad distribution to both reinsurance and non-reinsurance professionals, operate under both securities and insurance law, and require varied degrees of external expertise and due diligence. Accordingly, there are many more parties and agreements involved, thereby creating other significant fee arrangements. Service providers include but are not limited to: rating agencies, insurance managers of the SPV/SPI, indenture trustees, reinsurance trust trustees, catastrophe modeling agencies, capital market teams to structure and place the bonds, and distinct counsel for most (if not all) of these parties including the investors. The documentation for a bond issuance is considerably larger and more detailed than for reinsurance, encompassing numerous agreements.

CRE documentation is somewhere in the middle, but leans closer to traditional reinsurance. Since it involves collateral, it is more extensive than reinsurance. CRE is typically a bilateral agreement not subject to secondary trading and document requirements are well shy of what is required for a full 144A bond.

## **7. Risk Analysis**

For each of the three categories, it is important to think about the risk from both the cedant's perspective and from the market's / investor's perspective.

The risk on traditional reinsurance is a well-trodden path. Since it is a pure paper transaction, the cedant takes the risk that the protection provider is there when called upon. The cedant has no collateral and remains exposed to not only the simple credit risk of its counterparty but also indirectly to the other risks within the protection provider portfolio. From the market's perspective, the contract is based on the ultimate net loss of the cedant. Accordingly, the reinsurer is exposed to the underwriting and the claims management of the insurer, in addition to the risk of a catastrophic loss.

With a bond, the cedant is fully collateralized and so the counterparty risk (ignoring the old Lehman-style TRS problems, which the markets have generally addressed) is negligible. Since many of the bonds are not pure indemnity, the bond purchaser has less exposure to the specific underwriter. Furthermore, most catastrophe bonds pay fees to service providers in an attempt to quantify the risk. Investors need not have dedicated reinsurance knowledge if they rely upon these experts when assessing probability of loss. Conversely, a lot of information is not provided to the broad investor base because it is distilled by these experts. From an investor's perspective, there is less to analyze and from a cedant's perspective, disclosure of proprietary information can be better controlled.

CRE offers the cedant the protection of collateral, which addresses the counterparty risks inherent in reinsurance. Investors / collateralized markets still face those associated with indemnity but are paid accordingly. Furthermore, information is not distilled, but is provided in a manner similar to other traditional markets. In this instance, CRE feels more like traditional placement.

One other risk is worth mentioning. If cedants rely solely on certain segments of capacity, they are running the risk that capacity in another segment won't necessarily be there when they need it. Specifically, it takes time to develop a capital markets following as well as to build the institutional capability to bring a bond to market. If cedants wait to do this until they definitely need it, they will likely be at a competitive disadvantage to those who have already established capital markets programs.

#### **7A). Tradability**

When undertaking a risk analysis, it is important to consider potential liquidity. Traditional reinsurance is not tradable. Liquidity can be achieved via novation, while the risk can be shifted via retrocession. Conversely, a 144A bond is freely tradable to qualified buyers, thereby providing significantly greater liquidity. In this sub-category of Risk Analysis, CRE is similar to reinsurance, with limited liquidity. One alternative that can make CRE liquid, which we discuss in our case study about OakLeaf Re 2011, is to structure the CRE as a bond. In creating a bond, the security becomes more liquid and can trade in the secondary market (as OakLeaf Re 2011 has done).

#### **8. Triggers**

In many ways, the topic of synthetic vs. indemnity / ultimate net loss (UNL) triggers comes down to basis risk and customization. Synthetic triggers can include parametric triggers based on physical parameters, industry loss triggers reported by various reporting agencies, modeled loss triggers based on bootstrapping a storm path into an escrowed catastrophe model, and combinations / permutations on the above methods. For example, a county-weighted trigger utilizes both an industry loss index and a modeled loss bootstrap.

With traditional reinsurance, the cedant normally operates under an indemnity (UNL) arrangement. The reinsurer receives a very detailed submission package that describes in great detail the insurer's book of business. The underwriting decision is based upon the cedant and its book. The structure is fairly simple. If the insurer loses money, then the reinsurer loses money either on a quota share (QS) or excess of loss (XOL) basis. In other words, the reinsurer follows the fortunes of the cedant.

When approaching the broader market on a bond, it is easier to market synthetic triggers to reach the largest potential investor group. Bond investors, though taking into consideration the cedant somewhat, can focus primarily on the triggers and other structural features. When a cedant employs synthetic triggers, the bond buyer's underwriting on the cedant's book of business does not have to go to the same depth. Further, the bond buyers don't require the same level of information disclosure required as part of a reinsurance submission package. However, this access to a broader market is not a free lunch. To capture the broader appeal, cedants have to accept more basis risk, namely that the triggers don't perfectly match the cedant's book of business. Synthetic triggers rather than indemnity are the easiest way to achieve the broader appeal with the bond market and are its mainstay.

Since CRE is generally more bilateral than a bond distribution, it is often done on an indemnity basis. However, increasingly in order to expand the universe of capacity, synthetic triggers, such as county-weighted triggers (like Towers Watson's DIAL – "Dynamic Industry Allocation of Losses"), are being employed. Because CRE is a customized hybrid, the use of trigger depends on many other variables, such as the investor(s) involved and the cedant's overall objective.

#### **CASE STUDY: OakLeaf Re 2011**

As described above, there exists a spectrum ranging from traditional reinsurance to catastrophe (144A) bonds. Collateralized reinsurance (CRE) falls somewhere in the middle and its location along that spectrum varies depending on the feature. In fact, there are other variations on these three categories that

help fill-out the continuum. The OakLeaf Re 2011 bond that Towers Watson brought to market is one such hybrid example. The OakLeaf Re 2011 is, at its heart, collateralized reinsurance in a bond structure. However, since OakLeaf Re 2011 is clearly a security, it can be purchased by investors who are not in the business of writing reinsurance. We will now review the OakLeaf Re 2011 bond across the various attributes described earlier.

### **1) Type of Collateral**

OakLeaf Re 2011 is like other forms of CRE, namely supporting its protection via collateral. Collateral is invested in a Treasury Money Market fund, which is now the most common way to hold collateral for US deals.

### **2) Payment Flow**

Though a bond, the payment flow for OakLeaf Re 2011 mirrored the traditional CRE route. Investors paid in the limit less the net premium amount, and receive an adjusted limit at maturity.

### **3) Reinstatement**

For the reasons highlighted earlier in the discussion regarding the added complexity and/or difficulty for CRE and 144A bonds to incorporate reinstatement, OakLeaf Re 2011 did not have a reinstatement feature.

### **4) Collateral Release and Commutation**

In this respect, OakLeaf Re 2011 stayed closer to typical CRE. It built in features to address extension issues. In essence, it made use of release based upon the event level and development curve, and did not allow for unilateral optionality on the part of the cedant to keep collateral longer than the risk period. However, it did not utilize the structural mechanism of various extension periods and associated payments normally seen in 144A catastrophe bonds. Furthermore, collateral release resulted in commutation on an incremental basis, which is more similar to 144A bonds and some CRE structures.

### **5) Premium Adjustment**

Akin to other CRE and traditional reinsurance transactions, OakLeaf Re 2011 utilized the premium adjustment mechanisms described earlier. It employs accretion from par up to a level that reflected the rate-on-line. In other words, there was no quarterly coupon like many bonds; rather, the entire compensation came via the terminal price on the notes. The expected final level was set in the original documents, but the calculation of the final level is driven by actual performance, with a pre-specified adjustment mechanism.

### **6) Fees & Expenses**

To address the high fee structure associated with other 144A bonds, a number of critical steps were taken. By receiving the full reinsurance submission package, investors were able to perform their own analyses, thereby eliminating the deal costs associated with external modeling. Similarly, the bonds were unrated, saving both time and cost. Moreover, the documentation utilized was a scaled-back version of typical bond documents, which allowed for considerably lower legal costs. Overall, because the costs for the transaction were well below typical 144A bond costs, the cedant was able to issue a much smaller bond (approx. \$12MM) than one normally sees in the cat bond market. This enabled a new cedant to come to market and capture the benefits of forming a relationship with the capital markets.

### **7) Risk Analysis**

Like other forms of CRE and traditional reinsurance, OakLeaf Re 2011 provides indemnity coverage, so the basis risk of typical 144A bonds was addressed from the cedant's perspective. The investors had much greater access to information (e.g. the reinsurance submission package) and they were less dependent on other parties to assess the risks for them. Furthermore, sophisticated investors were better able to manage the correlation impact of this transaction because they had access to all of the underlying data. Investors were also able to employ a greater degree of traditional underwriting and to better weigh the factors they considered important.

**7A) Tradability**

Since OakLeaf Re 2011 is structured as a bond (with an ISIN), it can trade in the secondary market among qualified buyers. Given that the OakLeaf Re 2011 bonds have in fact traded offers fundamental support for the argument that the bond structure provides enhanced liquidity relative to collateralized reinsurance.

By issuing OakLeaf Re 2011 in a bond format rather than pure collateralized reinsurance, the cedant was able to tap new capacity because it allowed other markets to participate. For those markets who participated, the increased liquidity associated with a bond structure gave them greater flexibility around optimizing the buckets within their mandates.

**8) Triggers**

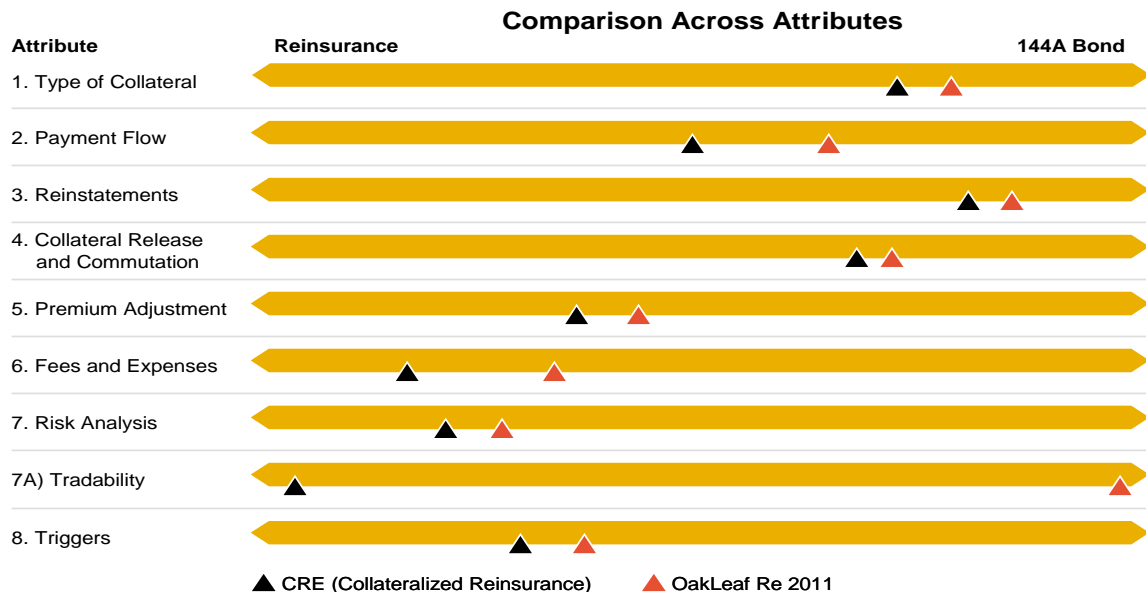
Though a bond, OakLeaf Re 2011 employed an indemnity trigger. Other trigger mechanisms may still be explored, depending on the objectives of the cedant and the requirements of the investors. One such mechanism could be Towers Watson’s county-weighted index structure (DIAL).

Overall, OakLeaf Re 2011’s collateralized reinsurance in a bond structure accomplished many things. It gave the cedant an indemnity deal but allowed it to enter the capital markets for the first time and access markets that previously didn’t exist for the cedant. However, the deal also brought opportunities for investors. Since it was a full-fledged bond rather than straight CRE, it allowed the investors to source a new cedant and obtain more customized risk. Importantly, because of the hybrid structure on the convergence spectrum, the costs in the structure compared to 144A bonds were driven way down, which allowed more of the economics to remain in the deal for both sides. Without the lower costs, it would not be feasible to bring a \$12 million bond to market.

**CONCLUSIONS**

Increasingly, we are seeing cedants and investors / markets play across the entire spectrum, allowing the capital markets and its investors to participate in various layers and structures. Similarly, it enables cedants to expand their placement beyond standard reinsurance. Those cedants and investors who are able to participate across the whole continuum will capture the most value as they optimize. To achieve that optimization, particularly for smaller cedants, structures such as OakLeaf Re 2011 may play a valuable role in expanding the capital universe by drawing on a mix of attributes from across the reinsurance-bond spectrum.

We expect other cedants will follow suit to achieve these benefits.



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