Alternative Risk Transfer and Government-Sponsored Risk Pools

Presentation to:
CASUALTY ACTUARIAL SOCIETY
Boston, Massachusetts
October 4, 2010

TOWERS WATSON
Capital Markets

Speaker bios

Beat Holliger, Managing Director -- Munich Re Capital Markets

Beat Holliger is the Head of Munich Re Capital Markets, the New York-based division of Munich Re's Risk Trading Unit. His main responsibilities include the transfer of insurance risks to and from capital markets and the origination of related transactions here in the Americas.

Mr. Holliger has been part of Munich Re's capital markets initiatives since its inception and has been involved in all of Munich Re's catastrophe bonds since he joined the firm in Munich, Germany, in early 2000 and was transferred to New York in the fall of 2002.

Mr. Holliger, a citizen of Switzerland, started his career in banking and consultancy after he graduated from the University of St. Gallen in Switzerland with a Masters Degree in International Relations (lic rer publ HSG).

Speaker bios

David A. Lalonde, FCAS, FCIA, MAAA, Senior Vice President -- AIR Worldwide

Mr. David Lalonde is Senior Vice President responsible for the Consulting and Client Services group, the members of which work one-on-one with clients to help them understand their risk profile and identify where and how catastrophe loss information can best be used in decision-making. Mr. Lalonde has a wealth of experience in the securitization of insurance risk and the use of dynamic financial analysis models for pricing, reserving, and corporate planning. He is responsible for ensuring AIR models meet all regulatory standards and he regularly assists clients in responding to Department of Insurance requests for information relating to the use of catastrophe models in ratemaking. He has appeared as an expert witness in rate arbitration hearings and has provided catastrophe modeling expertise on due diligence teams.

Prior to joining AIR, Mr. Lalonde was a Director of Coopers & Lybrand. His team of actuaries provided a wide variety of consulting services to help insurance companies and self-insured organizations assess and manage their risk. He signed loss reserve opinions, performed classification studies, and provided ratemaking support. Prior to that, Mr. Lalonde was Chief Actuary at the Insurance Corporation of British Columbia, where he reported to the company's Board of Directors on a wide range of strategic and operational issues, including recommending appropriate levels of surplus based on stochastic planning models. He was responsible for both pricing and reserving functions.

Mr. Lalonde is a Fellow of the Casualty Actuarial Society, a Fellow of the Canadian Institute of Actuaries, and a Member of the American Academy of Actuaries. He received his B.Math. (Honors) in Actuarial Science with Statistics from the University of Waterloo.

Speaker bios

Ivan Zelenko, Head of the Derivatives and Structured Finance Team -- The World Bank

Ivan Zelenko has been with the World Bank Treasury since 2000, where he is currently Head of the Derivatives and Structured Finance team. In this capacity, he was in charge of the development and launching of the new MultiCat bond that was issued in October 2009 to provide the government of Mexico with financial coverage against potential natural disasters of large magnitude—the second government bond ever issued.

Prior to joining the World Bank, he was Head of Asset-Liability Management (ALM) for the Credit Agricole group. Most of his professional life has been with the French state-owned financial institution Caisse des Depots, where he has held various positions related to risk management, financial management and ALM. Ivan started his career in 1990 at the Strategy Department of the Banque Nationale de Paris (BNP), where he set up the ALM function within the group.

Ivan Zelenko wrote a textbook on financial economics (4th edition to be published in 2010) and coauthored a book on credit risk modeling (3rd edition in 2006) published in French by Dunod editions. He also the author of several articles, including the World Bank Working Paper: "What Determines US Swap Spreads" (2005).

Ivan graduated from Ecole des Ponts et Chaussees and from Sciences-Po (Institute for Political Studies) in Paris. He holds a post graduate degree in Finance from the University of Paris Dauphine and a PhD in Financial Economics from the University of Paris Sorbonne.

Speaker bios

James M. Doona, Managing Director -- Towers Watson Capital Markets

James Doona is the founding Head of ILS Structuring & Origination at Towers Watson Capital Markets ("TWCM"), a licensed broker-dealer of the reinsurance brokerage arm of global actuarial consultant Towers Watson.

Prior to joining TWCM, Mr. Doona was an investment banker at Banc of America Securities LLC, responsible for insurance securitization and structural M&A advisory. Prior to that, Mr. Doona originated the insurance securitization practice at Standard & Poor's, the global credit-rating agency.

Originally a derivatives trader at Bankers Trust, then Barclays de Zoete Wedd (subsequently rebranded as Barclays Capital), Mr. Doona conducted Ph.D-level research on the connectivity of Julia Sets (which arise in Chaos Theory) by recourse to a still-unsolved problem in algebraic topology, attempting to measure the effect of topological torsion on the algebraic invariant "cat(X)," for X any denumerable product of CW-complexes. He earned an M.Sc. in algebraic topology at Cornell University.

Fifty pounds earlier, Mr. Doona rowed a starboard oar on the Varsity Lightweight Crew at Columbia University, where he earned an A.B. in Mathematics and in Philosophy.

Introduction to catastrophe bonds

James M. Doona Managing Director james.doona@towerswatson.com 212-309-3477

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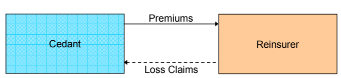
Cat bond basics

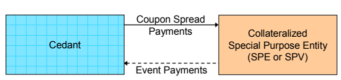
- **The hedge for insurance is a product called "reinsurance"**
  - Hedger (cedant) wants to achieve "reinsurance credit" in its regulatory filings
  - Off-shore reinsurers are "non-admitted" (not recognized by cedant's domicile)
  - To get credit, therefore, cedant must have high-credit collateral in a trust account (under NY Reg. 114, for example)
- **The cat bond market has been around since early 1990's (post Hurricane Andrew)**
  - About $13 billion outstanding
- **Cat bonds are issued to provide collateral to an off-shore SPE**
  - Collateral typically invested in one of several liquid asset classes:
    1) a bank deposit;
    2) a commercial paper investment
    3) a US Treasury money market fund; or
    4) (before the Lehman bankruptcy) a longer-term high-grade investment stabilized with a total return swap
- **Growth of the cat bond market has been materially reliant on:**
  - Development of third-party models (such as AIR's models) for pricing and risk-assessment
  - Growth in the brokered synthetic reinsurance market (ILWs)
  - More capital sophistication among issuers
  - Greater clarity on rating agency methodology for capital and risk valuation

Cat bonds act like (synthetic) reinsurance

REINSURANCE



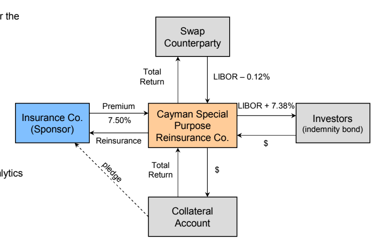
CAT BOND (illustrated with non-indemnity trigger)



We have illustrated the case where the agreement is a derivative (ISDA swap) but, in fact, the SPE can be an SPR - a Special Purpose Reinsurer - and the agreement with the cedant would then be an honest-to-God reinsurance agreement

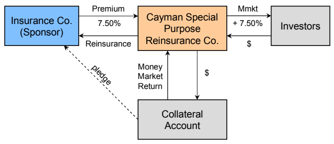
Cat bonds – basic structure (prior to credit crisis)

- Notes issued by SPE, usually domiciled in the Cayman Islands
- Bond proceeds at risk as collateral for the reinsurance
  - "BB" range ≈ 1% annual exp loss
  - "B" range ≈ 3.5% annual exp loss
- Bullet repayment (3-5 years)
- Typical perils insured include:
  - Southeast U.S. Hurricane
  - European Windstorm
  - California Quake
  - Japanese Quake
  - Midwest U.S. Earthquake
- Three firms provide the modeling analytics for all rated cat bonds
  - AIR (Applied Insurance Research)
  - RMS (Risk Management Solutions)
  - EQECAT



Cat bonds – basic structure (following collapse of Lehman)

- Following the credit crisis and the collapse of Lehman, who had been TRS provider on a handful of bonds, transparency and credit quality became major concerns
- The simplest response has been to remove the derivates structure from the collateral trust, to replace the TRS with a U.S. Treasury money market fund
  - There have been a few with longer-term, puttable GSE or governmental debt
  - The absence of a TRS had been pioneered by the sidecars that followed Katrina
    - these sidecars incorporated (structured) equity layers below the debt layers
    - equity absorbs the overall losses of the vehicle – underwriting and credit – in exchange for high expected returns
- This addressed the “we can’t buy credit” mantra of the dedicated ILS funds



Benefits of cat bonds

- **Issuer Benefits**
  - Complement to traditional reinsurance program
  - Expands risk transfer capacity
  - Provides for longer-term coverage (most reinsurance is renewable annually)
  - Mitigates or eliminates counterparty credit risk
  - Diversification of traditional reinsurance program on a permanent basis is viewed favorably by rating agencies as part of enterprise risk management analysis
- **Investor Benefits**
  - Uncorrelated with other investments
  - Yield pick-up vs. other similarly-rated investments
  - Tradeable security

Cat bonds provide collateralized, multi-year reinsurance protection and rating agency capital relief

Cat bond trigger structures

- Most cat bonds have had “synthetic” triggers – not triggered by company losses
  - **Parametric** – tied to quake readings or wind speeds – quick resolution, no extension risk
  - **Indexed** – percentage of industry losses – avoid company performance, but have extension risk
- **Indemnity** bonds make payments based on company’s actual losses
  - A significant volume of cat bonds are now written on an indemnity basis
    - 56% in 2010 vs 20% five years ago
  - Residential Re (for USAA) is the primary example: USAA is rated “AAA” with 14 years history of “BB+” indemnity cat bonds
- Only two cat bonds have lost principal due to peril occurrences (KAMP 2005 Re and Avalon Re)
  - Four cat bonds suffered losses due to the Lehman bankruptcy (Ajax, Newton, Carillon, and Willow), due to a reliance on Lehman to stabilize collateral values via “total return swap”
- Rating agencies look at probability of “attachment” and loss severity
  - Most cat bonds are rated in “BB+” range
    - Probability of loss of 1% per annum and an annual expected loss of 0.75%
  - Hedge fund appetite tends to extend downward to “B+” range
    - Probability of loss of 5% per annum and an annual expected loss of 3.00%

Recent trends in the cat bond market

- **There are now almost 30 dedicated cat bond and ILS funds**
  - Continued diversification away from reinsurers and multi-strategy hedge funds as the main investor base
  - These funds tend to dominate issuance selection, although many of them are small
  - In some cases, multi-strategy funds and pensions are investing by way of the dedicated cat funds
- **Increased focus on trust account stabilization and quality of collateral**
  - Rejection of the “total return swap” approach that exposed buyers to Lehman bankruptcy
  - Inclusion of collateral provisions requiring “top-ups” upon a decrease in the market value of the assets
  - Improved disclosure of assets held in the trust portfolios
- **Increasing investor willingness to invest in UNL triggers**
  - Investors are digging deeper into the third-party models
  - Also, PCS and PERILS licensing fees are rising
  - Partly as a result of the growth and contraction of the “sidecar” market
- **Secondary trading has seen vigorous growth**
  - Market absorbed several large BWICs these past two years
  - Volumes for US wind bonds most active
  - By some measures, trading volume has exceeded issuance volume

Cat bond issuance 2010 YTD

2010 Cat Bond Transactions (through 3Q)

Transaction		Sponsor	($ MM)	Trigger type	Risk
Green Valley II Ltd	30-Sep-10	Groupama	$ 134	Parametric	Euro Wind
Shore Re Ltd	08-Jul-10	Mass Prop Ins U/W Assn (via Munich Re)	$ 96	Indemnity	US hurricane
Merna Re III Ltd	30-Jun-10	State Farm	$ 250	Indemnity	US hurricane and earthquake
Res Re 2010	28-May-10	USAA	$ 405	Indemnity	US hurricane and earthquake
Blue Fin Ltd	25-May-10	Allianz Argos 14 GmbH	$ 150	Parametric	US hurricane
Caelus Re II Ltd	21-May-10	Nationwide Mutual	$ 185	Indemnity	Earthquake
Eos Wind Ltd	19-May-10	Munich Re	$ 80	PCS Index	US hurricane
Lodestone Re	12-May-10	National Union Fire (Chartis)	$ 425	PCS Index	US hurricane and earthquake
Johnston Re Ltd	06-May-10	NCJUA/IUA (via Munich Re)	$ 305	Indemnity	NC hurricane
Ibis Re Ltd	27-Apr-10	Assurant	$ 150	PCS Index	US hurricane
Merna Re II Ltd	01-Apr-10	State Farm	$ 350	Indemnity	New Madrid Quake
Successor X Ltd	26-Mar-10	Swiss Re	$ 120	PERILS / PCS	US hurricane + European Windstorm
Foundation Re III Ltd	27-Jan-10	Hartford Fire Ins Co	$ 180	PCS Index	US hurricane
			$ 2,830		

Most cedants are strategically committed to placing a portion of their programs into the cat bond market every year

Who issues (sponsors) cat bonds?

Some Sponsors of Cat Bonds
ACE
Allianz
Allstate
Aspen
BRIT
Catlin
Chubb
Endurance Specialty
Factory Mutual
Flagstone Re
Groupama
Hannover Re
Harbor Point
The Hartford
Hiscox
Lexington (AIG)
Liberty Mutual
Mass. FAIR Plan
Mexican government
Montpelier Re
Munich Re
Nephila Asset Mgmt
Renaissance Re
SCOR
State Farm
Swiss Re
Travelers
USAA
XL Capital
Zürich Insurance