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GIRO Convention

23-26 September 2008
Hilton Sorrento Palace

Insurance Linked Securities – Rating Agency Approach and Case Study.

Andrew Murray – Fitch Ratings

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Agenda

- Overview
- Catastrophe Bonds
- CDO Pools
- Motor Risks
- Criteria
- Impact on Ratings
- Conclusion: Looking Ahead …

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Overview

- First insurance securitisations in late 80s/early 90s
- Today, no single consistent market and includes:

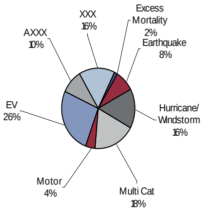
Non-Life
  - Cat Bonds (various)
  - Motor Frequency (e.g. AXA SPARC)
  - CDO pools (Dekania, Reinsurance Recoverables, Catastrophe Risk, Credit Risk)
  - Other (Technical Reserves, Sidecars etc.)

Life
  - EV/VIF securitisation (Friends Provident, Barclays, NPI)
  - Excess life reserves (eg XXX and AXXX)
  - Mortality (AXA, Swiss Re, Scottish Annuity and Life)

Overview

- Market has grown well above trend in 2005, 2006 and 2007 to ~EUR25bn …
- … 2008 weakening
- Estimate substantially understates reality (ie private placements, ILWs, sidecars)
- Also excludes weather and property risk futures traded on exchanges (NYMEX and CME)

Insurance Securitisation Issues Split 2007



Advantages and Disadvantages of Securitisations

FOR SPONSOR

Advantages
- Fully Collateralised form of protection for the Sponsor Company
- Often Multi-Year Protection
- Reduces Reliance on the Reinsurance / Retrocession market.

Disadvantages
- Can be Expensive, Time consuming
- Some forms of protection may have basis risk.
- Rarely Include Reinstatement Provision

FOR INVESTOR

Advantages
- Often Relatively high yield
- Often largely uncorrelated with other forms of Risk

Disadvantages
- Can be complex to understand
- Secondary market liquidity often fairly low
- Asymmetric Information / Moral Hazard can be a concern.

New Developments in Securitisation

- New Perils to Existing Risks
  - UK Flood Risk securitised for the first time in 2007 – "Blue Wings"
- New types of Risks being securitised or assessed for possible securitisation including
  - Frequency Risk (AXA "SPARC"), Reinsurance Recoverables (Hannover Re "Merlin")
  - Some Interest in the Securitisation of Reserve Risk, Liability Business
- New forms of Technology
  - Use of CDO Structures (Bay Haven / Fremantle)
  - Managed Portfolios (Gamut Re)
  - More Granular Parametric Triggers (e.g. WindX, Paradex)
  - Use of In-house Catastrophe Modelling
- New Structures
  - Regulatory Changes
  - Non-availability of monolines may affect market (esp. Life securitisation)
- New Investors

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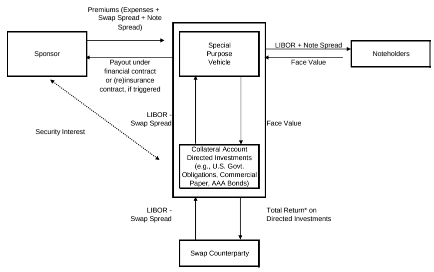
What is a Catastrophe Bond?

- A catastrophe-linked bond (a catastrophe bond or simply a cat bond) is a bond whose principal and interest payments depend upon the occurrence of a specified catastrophe event known as the named peril.
  - If the event does not occur, the bond pays principal and interest when due.
  - If the event does occur, bondholders lose some or all of their principal and interest.
  - Typically 3-5 Years, 3 years most common
  - Ratings usually B/BB reflecting transfer of risk to investors

Insurance Risk Structures

- Indemnity
  - Most Expensive, Moral Hazard, High disclosure Requirements, Time consuming to Issue, slow to settle. But Low Basis Risk
- Index
  - Some Basis Risk, Variable availability of Triggers
- Parametric
  - Often Higher Basis Risk, Simple, Fast to settle.
- Hybrid
  - E.g Ex-post Modelled Loss of Portfolio, Some basis risk, fast to settle.

The Catastrophe Bond Structure



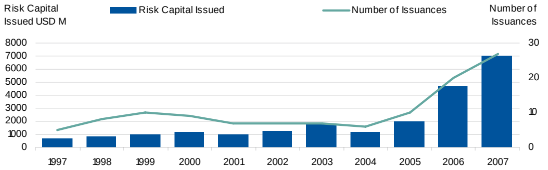
* Investment income, realized gains and losses.

Cat Bonds: Issuer Benefits

- Benefits
  - Cat risk is relatively simple and well established
  - Non-indemnity transactions can be quickly and accurately determined in terms of losses to investor
  - Limited moral hazard
  - Multi-year protection
  - Minimal credit risk for (re)insurer
- Issues
  - Basis risk: risk that the losses suffered by the (re)insurer directly will not be sufficiently covered through a non-indemnity protection
  - Can take much longer to implement compared to traditional reinsurance covers

A Small but Growing Market

Catastrophe Bonds - Annual Risk Capital Issuance and Number of Transactions



Source: GC Securities

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Recent Developments in Cat Bond Type

- Bonds are Increasingly Multi-Peril
- Transaction Size: Increasing average size, USD200-300m most common
- Triggers: Use of Indemnity Triggers has increased substantially since 2005
- Increasingly “Shelf” Offerings, allowing cheaper future issuance
- Rapid Development and Innovation
  - New Risks, better modelling
  - Enhanced Parametric and Modelled Loss Triggers (Windex / Paradex)
  - Cat Bond Futures.

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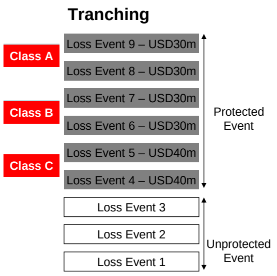
Cat Bond CDO: Example

- Fremantle provides USD200m in protection across three tranches
- The originator Brit Insurance provides credit enhancement for first three losses
- Three year tenor with call option
- Tranches were rated AAA, BBB+, BB-



Source: Transaction documents

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Cat Bond CDO: Example

- References 10 natural catastrophes, geographically diversified
- Mixture of parametric and loss severity triggers
  - Modelling from RMS and federal agencies

1.	UK	UK Windstorm
2.	Europe excluding UK	European Windstorm
3.	Japan	Japanese typhoon
4.	Japan	Japanese Earthquake
5.	USA – California	California Earthquake
6.	USA – New Madrid	New Madrid Earthquake
7.	USA – Florida only	Florida Hurricane
8.	USA – Gulf	Gulf Hurricane
9.	USA – East Coast	East Coast Hurricane
10	USA – Bypassing	Bypassing Hurricane

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Cat Bond CDO: Benefits and Issues

- Benefits
  - Access to non-insurance/structured credit investors that are comfortable with CDO structure
  - Compared to a normal Cat Bond the CDO provides:
    - Investment grade and non-investment grade tranches
    - No loss from first event
    - Non-binary; tranches can be liquidated if losses start accumulating
    - Diversified across risks (wind, earthquake, ocean temperature)
    - Geographically diversified (Europe, US, Japan)
- Issues
  - Time to market and structuring costs

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- **Motor Risks**
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Motor Risks: Example

- AXA's Dec-2005 transaction, FCC SPARC - up to EUR200m in protection in three tranches (notes)
- Structured as an 85% quota share via
  - Fonds Commun de Créances (FCC): French securitisation vehicle
  - Nexgen: a reinsurer (not needed under new legislation)
- 3 million policy reference portfolio from AXA's French motor book
- FCC supports losses above predefined yearly loss ratio trigger threshold and up to total amount of notes issued
- Trigger level reset annually by Fitch following analysis of AXA's budget
- Tranches were rated AAA, A and BBB- by Fitch
- AXA did a follow-up transaction in 2007, SPARC EUROPE – up to EUR450m in protection in four tranches (notes)

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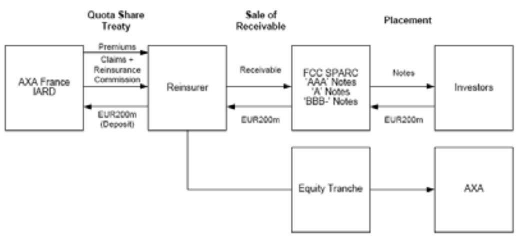
Motor Risks: Example

Structure Diagram



Source: Transaction documents

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Motor Risks: Issuer Benefits

- Benefits:
  - Alternative source of cover to traditional reinsurance
  - Multi-year protection (4 years, on 1-year rolling basis)
  - Indemnity protection
  - Minimal credit risk (fully collateralised)
  - Payment timing risk minimised
- Issues:
  - Excludes natural disasters, hail, snow and wind related losses
  - Only individual risks. Fleet business priced differently
  - Individual losses capped to avoid skewing loss distribution

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Motor Risks: Fitch's View

- Fitch views these as normal reinsurance protection with no credit or timing risk
- This type of transaction is likely to grow but slowly
  - Needs investor appetite for frequency rather than severity risks
  - Will it prove economically competitive?
  - Would capital markets accept smaller more volatile non-life portfolios?
- Significant requirements for successful structuring and execution
  - Sophisticated management reporting and budgeting; key driver of ratings of notes
  - High standards of risk management and processes: key components of quality ERM

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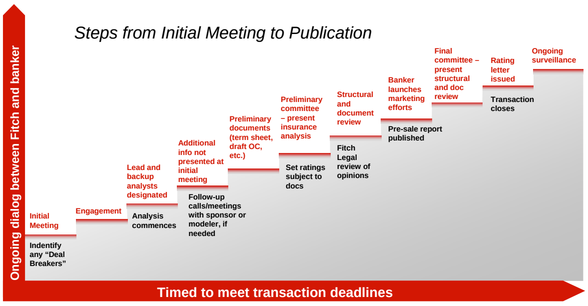
The Insurance Linked Securities Ratings Process



Overall Rating Process

- Structural Review
- Insurance Analysis
  - Analyse the Modelled probability of Loss and adjust if necessary.
  - Compare the Estimated Adjusted Probability of Loss to Fitch's Default Rate Grid to determine implied rating
  - Analyse the Risk of the Sponsor
- Key Factors Include:
  - Moral Hazard, Adverse Selection potential
  - Data Quality

Default Grid

- Annualized
  - Geometric average of the 5-year cumulative default statistic
  - Most cat bonds are 5 years or less
  - No ratings migration as bonds mature (if PL is constant)
  - Indifferent to call provisions

Annual Probability of Loss

Implied Rating	'AAA'	'AA+'	'AA'	'AA–'	'A+'	'A'	'A–'	'BBB+'
Probability of Loss	0.016%	0.026%	0.040%	0.057%	0.077%	0.090%	0.129%	0.316%

Implied Rating	'BBB'	'BBB–'	'BB+'	'BB'	'BB–'	'B+'	'B'	'B–'
Probability of Loss	0.471%	0.637%	0.836%	1.177%	2.651%	3.496%	5.574%	8.612%

Stress Factors

- Generally, not used
- Might consider in certain circumstances:
  - New or unusual perils (particularly man-made perils)
  - New geographies
  - New models or modelers
  - Atypical structures
  - If warranted by other unique circumstances

High Confidence Perils, Geographies & Structures

Perils & Regions

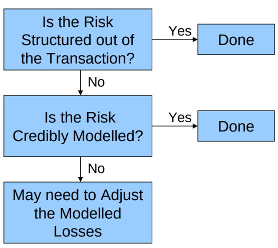
- US Hurricane
- US Earthquake
- Japanese Typhoon
- Japanese Earthquake
- European Wind Storm

Structures

- Parametric
- Index and Hybrid
- Indemnity
  - Reinsurance contract becomes very important
  - Potentially high exposure to:
    - Moral hazard
    - Unmodelled perils
    - Unmodelled geographies
    - Judicial or regulatory risk

Approach to Rating

- Consider additional relevant risks to investors



Exposure Growth

Data File Prepared — Start of Risk Period — End of Risk Period, Model Reset Date

- Insurance in force tends to grow over time
  - Inflation
  - Population growth
  - New construction
  - Demographic trends
  - Changes in sponsor's market share
- Not modeled
- Can be partially- or fully structured out of the transaction
- Risk varies based on cat bond structure

Currency Risk / Sponsor Analysis

Currency Risk

- Not typically an issue
- Comes up occasionally
- If present, Fitch adjusts for the risk
- Standard methodology for all structured finance transactions, not unique to catastrophe bonds

Sponsor Analysis

- Historically, this has not been a limiting factor in catastrophe bond ratings
- Recent trend in structures seeking ratings above the sponsor's rating
- Sponsor risk can be structured out
- Fitch rates most major insurance entities
- Most important in indemnity structures
- Repeat or "one-off" issuer?

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Rating Examples

	Example 1	Example 2	Example 3
Sponsor	Retrocessional Reinsurer	Primary Insurer	Primary Insurer
Sponsor's book of business	Reinsurance of Personal and Commercial	Commercial	Personal
Transaction Structure	1 Tranche	1 Tranche	1 Tranche
Transaction Size	$250 Mil	$250 Mil	$250 Mil
Currency	US$	US$	US$ / CAD
Perils	Earthquake	Hurricane	Hurricane / Earthquake / Wildfire
Regions	California	Eastern US	US, Canada
Insurance Risk Structure	Parametric	Index, Using PCS Data	Indemnity
Modelled Probability of Loss	1%	1%	1%
Contribution of Each Peril/Region to Loss	100%	100%	60% Hurricane, 30% Quake, 10% Wildfire
All Perils/Regions Modelled?	Yes	Yes	No, Eastern Wildfire not Modelled
Any Caps on the Contribution of Unmodelled Perils?	Not Applicable	Not Applicable	No
Portfolio Fixed?	Not Applicable	No	No
Any Caps on Portfolio Growth?	Not Applicable	Annual Modelled Reset	Annual Modelled Reset
Currency Risk	Not Applicable	No	Yes, 5% of Portfolio is in Canada
Any Caps pn Currency Risk?	Not Applicable	Not Applicable	No

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Example 1

- Fitch has high confidence in US earthquake models. Thus, Fitch would make no adjustments for modeling uncertainty.
- The insurance risk structure is parametric. Therefore, it does not matter whether the insurance portfolio grows.
- All perils and regions are modeled.
- Parametric transactions have no currency risk.
- Result — Fitch would make no adjustments to the 1% modeled probability of loss. The modeled probability of loss is greater than the 0.836% ‘BB+’ threshold, but lower than the 1.177% ‘BB’ threshold, so a ‘BB’ rating would be indicated (subject to structural considerations).

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Example 2

- Fitch has high confidence in US hurricane models. Thus, Fitch would make no adjustments for modeling uncertainty.
- The insurance risk structure is index. Therefore, the transaction is exposed to growth in the overall insurance industry’s exposure to hurricanes. However, the annual modeled reset limits the exposure growth to one year. Assume Fitch estimates that US coastal exposure will grow 8% next year, modestly more than expected growth in the US economy. Fitch might adjust the modeled loss statistics up by as much as 8%.
- All perils and regions are modeled.
- The PCS Index and the bond are both denominated in USD. Therefore, there is no currency risk.
- Result — Fitch would multiply the modelled probability of loss by a factor of up to 1.08% (to account for the growth in the portfolio). The 1.08% adjusted modelled probability of loss is greater than the 0.836% ‘BB+’ threshold, but lower than the 1.177% ‘BB’ threshold, so a ‘BB’ rating would be indicated (subject to structural considerations).

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Example 3

- Fitch has high confidence in US hurricane and earthquake models. Fitch has somewhat less confidence in US wildfire models. However, wildfire risk contributes only 10% of the modeled loss. Therefore, Fitch might make a minimal adjustment for modeling uncertainty of perhaps 1%.
- The insurance risk structure is indemnity. Therefore, the transaction is exposed to potential growth in the insurer’s book of business. However, the annual modeled reset limits the exposure growth to one year. Assume that Fitch expects the sponsor to be increasing its market share in addition to the normal growth of the US economy, and therefore, Fitch makes a 10% adjustment for portfolio growth.
- The wildfire peril is not modeled for the Eastern US. However, wildfire contributes only 10% of the modeled loss. Assume Fitch expects wildfire losses in the Eastern US to be roughly equal to the level that they are in the Western US. Therefore, Fitch would add 11% (10% plus the additional 1% for modeling uncertainty) to adjust for unmodelled perils.
- The risk structure is indemnity. The notes are denominated in USD. The sponsor has exposure in Canada and there are no structural features to protect against currency fluctuations. Assume 10% of the modeled risk is located in Canada, the ‘BB’ level currency stress is 12%. Fitch would add 1.2% (10% times 12%) for currency risk.

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Example 3 (continued)

- Result — Fitch would multiply the modeled loss probability by a factor of up to 1.232% (see table below).
- The 1.232% adjusted modeled probability of loss is greater than the 1.177% 'BB' threshold but lower than the 2.651% 'BB–' threshold, so a 'BB–' rating would be indicated (subject to structural considerations).

Base	1.000%
Modelling Uncertainty	0.010%
Portfolio Growth	0.100%
Unmodelled Perils	0.110%
Currency Risk	0.012%
Risk Adjustment	1.232%

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Impact on Ratings (Macro Level)

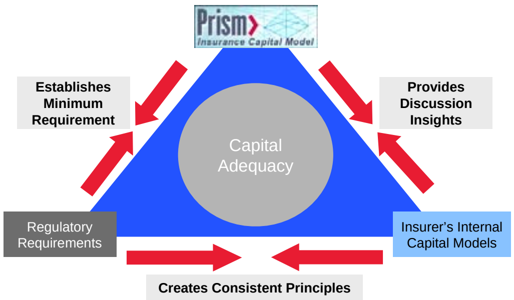
- Reduced Reliance on Reinsurance / Retrocession Market
- Widens **Opportunity** for risk mitigation or acquisition of insurance risk
- Competition for Insurance and Reinsurance Companies (Could be Competitive **Threat**)
- Capacity can be accessed quickly and easily in periods of good pricing (Hard market reduced in length)
- Opportunities for some players to enhance returns

Impact on Ratings (Company Level)

- **QUALITATIVE**
- Strategic Rationale
- Diversification of Risk Management Options
- Enhanced Financial Flexibility
- Use of Proceeds or Freed up Capital.
- Perceived Franchise Benefits?
- Future Intentions

- **QUANTITATIVE**
- Degree of Risk Transfer
- Impact on Capitalisation
  - Amount Recoverable
  - Credit Risk
- Basis Risk
  - Definition
  - Higher for some types of Instruments
- Profitability
- Others
  - Liquidity

Assessing the Capital Benefit



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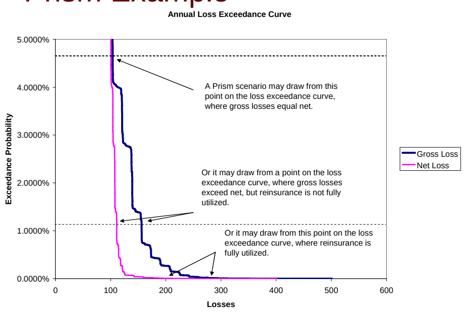
Prism Example



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Looking Ahead…

- Growth prospects are variable:
  - Cat Bonds: Very good long term, more modest short term
  - EV / VIF: Susceptible to Regulatory change
  - Mortality: Limited
  - Longevity: Plenty of Interest, challenges remain
  - Non-life: Reasonable
  - CDO pools: Reasonable

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Looking Ahead…

- Fitch welcomes the development of insurance securitisation as providing a significant opportunity for insurers and reinsurers.
- Over time, impact to the insurance sector could be as profound as it was for banking sector (Important to get the positives, avoid the negatives)
- Challenges remain in aligning interests of investors and sponsoring companies
- Other challenges include regulatory barriers and relatively nascent stage of market which impedes broadening of the market

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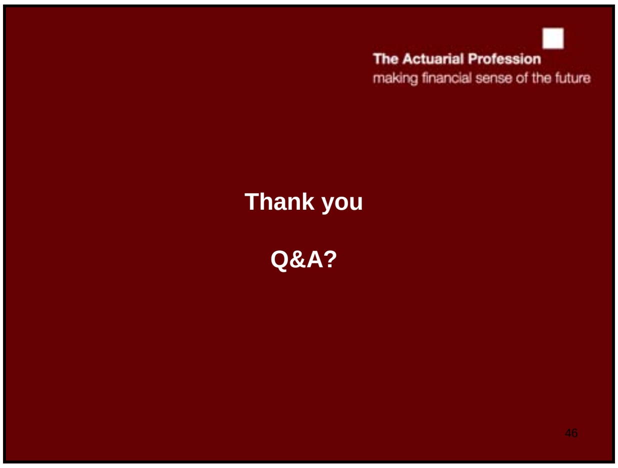
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Thank you
Q&A?
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