

Satellite Risk & Insurance

An Underwriter's Perspective

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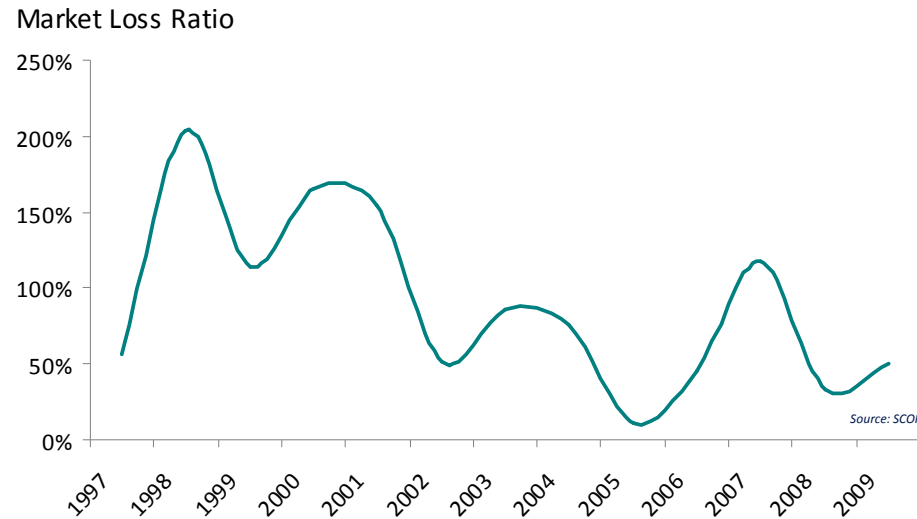
SCOR Global P&C



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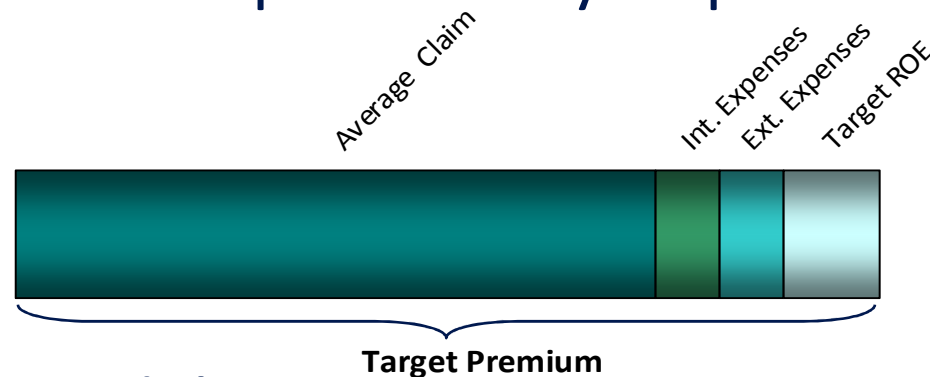
Space Insurance: A Volatile Market



- Volatility due to:
 - Small population of risks
 - High claim severity
 - Cyclical market volume and price
- Capital is the measure of volatility

Introducing Capital Allocation

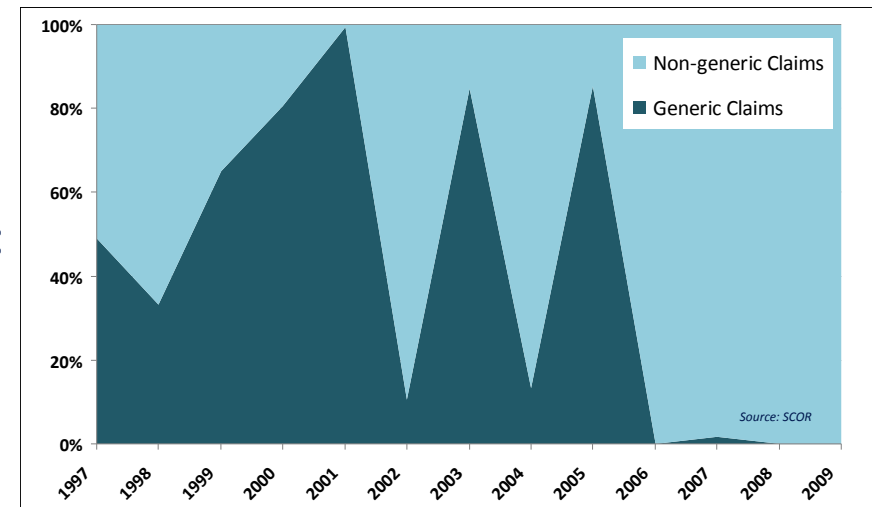
- Capital requirement under Solvency II rules:
 - To cover all risks an insurer faces (insurance, market, credit and operational risk)
 - Calculated as Insurer's expected loss with a 99.5% confidence level over a one year time horizon
- Target ROE drives profitability requirement



- A need to model extreme events

Extreme Events for Satellites

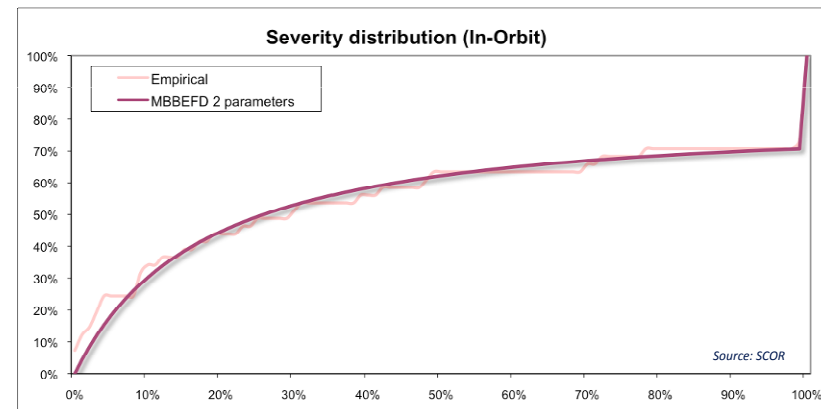
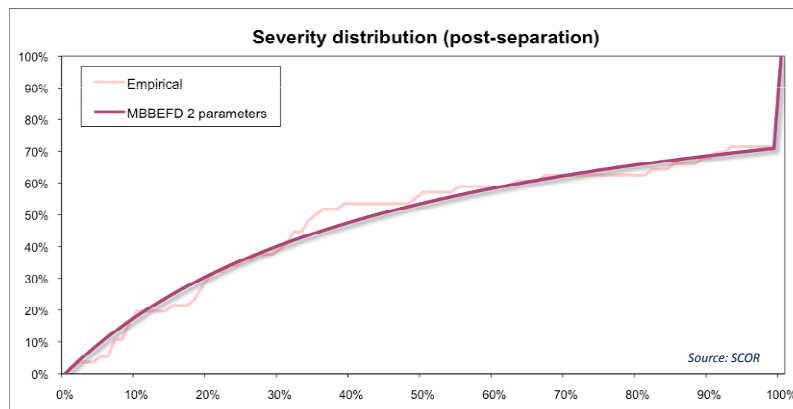
- Correlation of risks in time and space
 - Solar flares, In-orbit collisions, Leonids, Generic Defects...
- Focus on generic defects
 - A substantial part of market claims
 - Design/Manufacturing/Testing:
From minor deviations to major technological steps



- How to build a model capturing both individual & serial risks ?

Satellite Risk Model (individual risks)

- Severity model
 - Based on observed loss quantum
 - Fitting MBBEFD curves (Post-separation & In-orbit risks)



- Frequency model
 - Poisson distribution fit to observed numbers

Satellite Risk Model

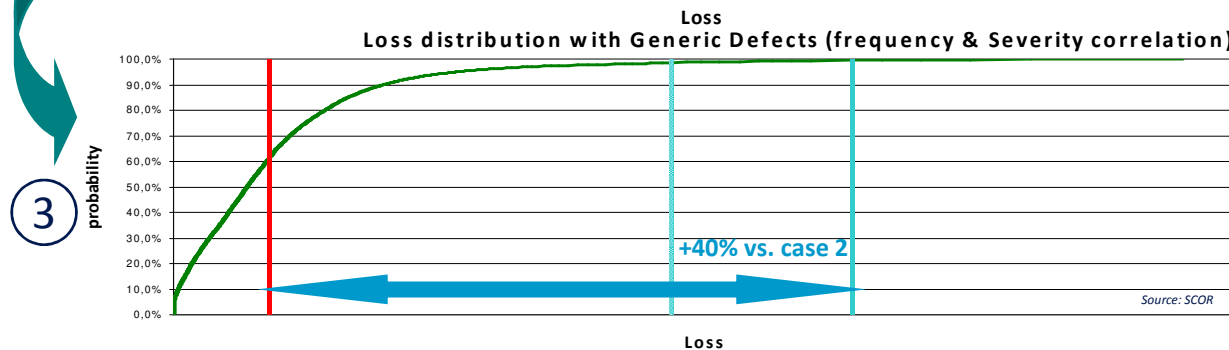
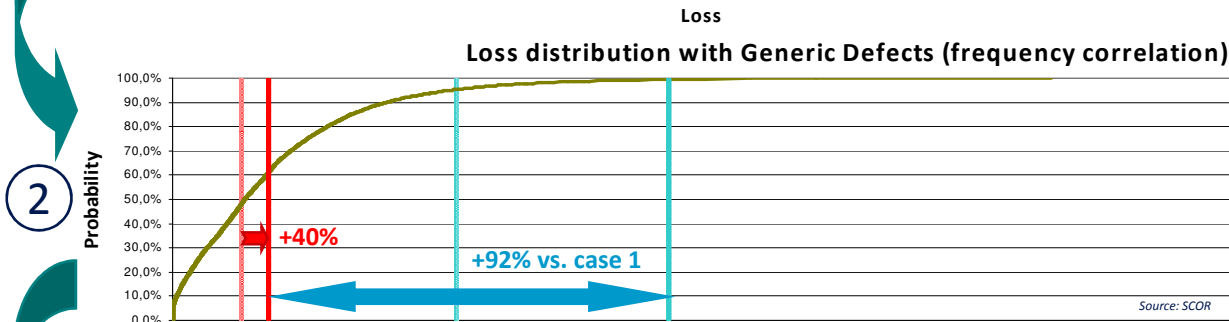
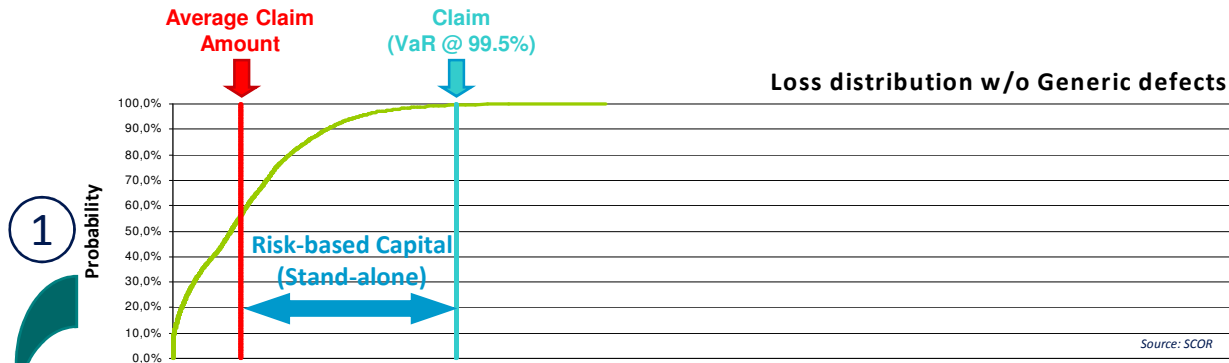
(Generic Defects)

- Based on Event scenarios
- Several Event types considered
 - Gradual loss (e.g. solar cell or TWTA failures)
 - Severe loss (e.g. SADA or certain propulsion failures)
 - Total loss (e.g. computer or power bus total failures)
 - The “Big One” (e.g. ... a big one)
- For each type, scenario is based on Return period, Number of affected satellites, Severity

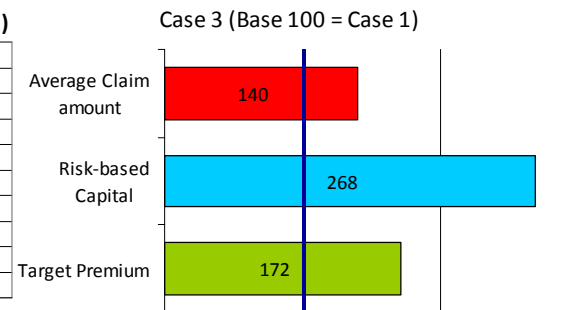
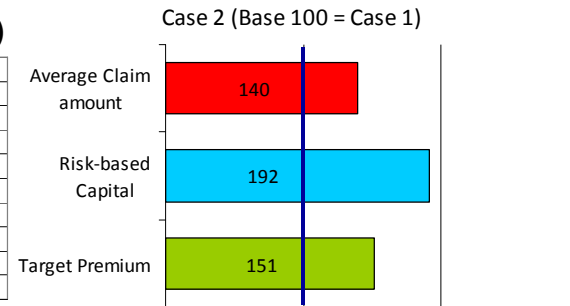
Portfolio Loss Distribution

- Set a reference portfolio
 - Number of satellites per phase of risk (Post-sep., In-orbit)
 - Distribution of values
 - Type of coverage (proportional / non-proportional)
 - Average premium rate per phase
- Generate losses according to stochastic model (per risk and per event)

Results: Claims, Capital & Premium



High sensitivity to Frequency & Severity Correlation



Summary

- Solvency rules & strong ERM call for adequate capital allocation among various insurance lines, which in turn drives profitability
- Allocating capital to Space Insurance requires strong knowledge of the past and a prospective view on risk
- Working with Satellite manufacturers and Satellite operators is key to refine/update Satellite risk model
- Proper capital assessment is also a concern for our clients who are retaining a substantial part of the risk

Thank you.



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Didier Parsoire CV

Work Experience

- 2007 to present
SCOR Global P&C Chief Underwriting Officer, Space specialty line & Alternative Risk Financing
- 2000 – 2007
SCOR Senior Vice President – Head of Space department. Head of Technology, Finance & Service Corporate Risks underwriting
- 1992 – 2000
SCOR Space Underwriter & Head of Space department
- 1986 – 1992
MATRA (now Astrium) Space Engineer - Satellite Design & Ground system integration

Education

- 1982 – 1985 Graduated Engineer from « Ecole Nationale Supérieure de l'Aéronautique et de l'Espace » (**Supaero**) in Toulouse, France
- 2001 Young Managers Programme - **INSEAD** business school

SCOR Introduction

Global P&C

SCOR is the 5th largest Reinsurer in the world. The group benefits from a strong global franchise with 51 offices across 5 continents and over 3500 clients. As a multi-line risk carrier, SCOR business strategy is based on a twin-engine approach :

SCOR Global Life is dedicated to life reinsurance for individual and group life insurance, long-term care, substandard risks, critical illness (in United Kingdom and Asia) and financing products.

SCOR Global P&C is committed to reinsurance as its core business and worldwide presence, based on two strong balanced business areas: **Treaty P&C** and **Specialty Lines**

Space is one of our core specialty lines. SCOR was among the pioneers who responded to the dedicated needs of the Space industry. Through its continuous presence over the past 25 years, SCOR has built a leading position in the Space market.



In 2010, SCOR celebrates its 40th birthday

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