September 2011

CASUALTY ADVISORY UPDATE

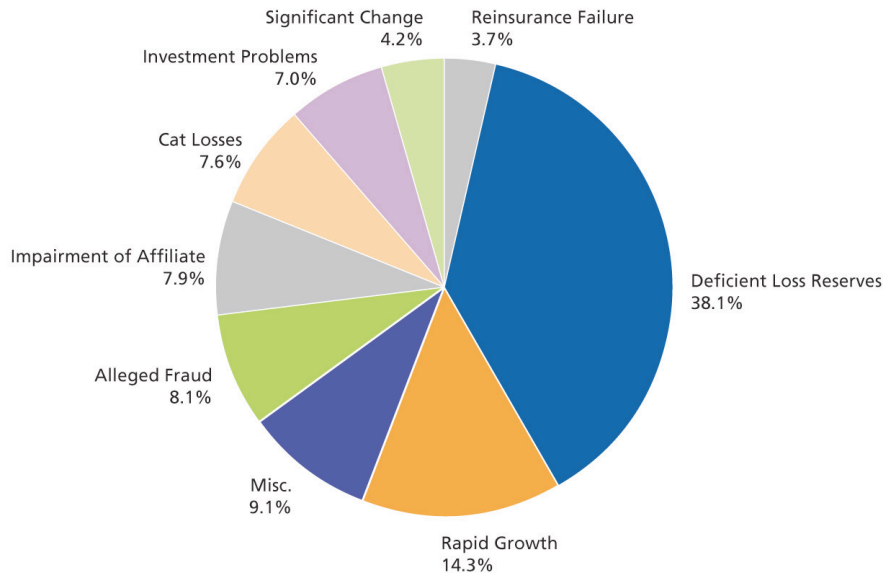
Managing Liability Catastrophe Exposures in the Context of Solvency II

The uncertainty regarding the ultimate loss cost of long-tail liability exposures has led insurance regulators to insist on a very high capital allocation requirement for liability classes within the Solvency II guidelines. These will apply to all insurance and reinsurance companies with operations, subsidiaries and affiliates in the European Union (EU) that are licensed to write (re)insurance business within the EU. There are two aspects to the perceived catastrophe exposure in casualty insurance: 1) reserving risk and 2) man-made catastrophe risk.

Reserving Risk

The regulators' concerns are primarily focused on the reserving risk. Historically, under-reserving has been the main factor behind insurance company failures (see Chart 1).

CHART 1: PRIMARY CAUSES OF US P&C INSURER IMPAIRMENTS 1969-2008



Source: A.M. Best & Co

Solvency II regulations are designed to ensure that casualty insurers have sufficient capital to handle the volatility exposure that hides within existing reserves. In the future, technical provisions must include a risk margin in excess of the best estimate (probability weighted value of cash flows, discounted). This risk margin is intended to be the amount in excess of the best estimate that would need to change hands if the business were sold to a willing buyer, representing the cost of the capital the buyer would need to establish at the time of transfer. The question is: how much should the risk margin be? The standard formula will apply a loading factor that will increase the ultimate discounted value of the loss reserves across all open accident years to the 99.5 percentile value at risk (VaR) (1-in-200-year) safety level. Under Solvency II the insurer must allocate capital to cover the risk margin. This can result in a substantial additional capital charge, especially at the current low point in the underwriting cycle, where many EU-domiciled insurers have used up past reserve redundancy to support current calendar year underwriting results.

With liability reserves, it can be difficult to determine how much is too much. Unlike property reserves, which are largely for specific known events, casualty reserves have to be sufficient to cover exposures that may unfold well into the future, stemming from policy coverage given in past years. A lot can happen in 15 or 20 years, which only serves to compound the uncertainty that casualty insurers face.

A unique characteristic of casualty risks is that they accumulate over time. This exposes the insurer to the systemic risk associated with paradigm shifts. Some examples are:

- Legislative: the impact of a new EU Directive, which may have a retroactive effect
- Judicial: a court decision that influences indemnity levels or the extent of liability
- Economic: monetary inflation, which can be especially acute for medical care costs
- Demographic: increases in life expectancy, vastly increasing pension/annuity costs
- Technological: latent side-effects of new products for example, nanotechnology

Right now, for the first time, monetary inflation is a serious factor for the Eurozone. If asset performance does not keep pace with this inflation, the concern is that we may see a real depletion in the value of loss reserves. If these economic factors combine with other systemic exposures at the same time, the adjustment effect on multiple open accident year loss reserves in one single financial year could be catastrophic.

Insurers need to demonstrate – not only to Solvency II regulators but also to rating agencies and analysts – that they have a suitable mitigation strategy in place. Many insurers, however, do not yet even have the ability to measure the accumulated exposure on a financial year basis. They are only able to trend individual accident years to ultimate using factors related to past experience. This is why leading reinsurance risk management consultants, such as Guy Carpenter & Company, are building models that stochastically project the diagonal “3-D” impact of a systemic event across an entire loss portfolio on a financial year basis (see Chart 2).

CHART 2: STOCHASTIC PROJECTION OF THE DIAGONAL "3-D" IMPACT OF A SYSTEMIC EVENT ACROSS AN ENTIRE LOSS PORTFOLIO ON A FINANCIAL YEAR BASIS

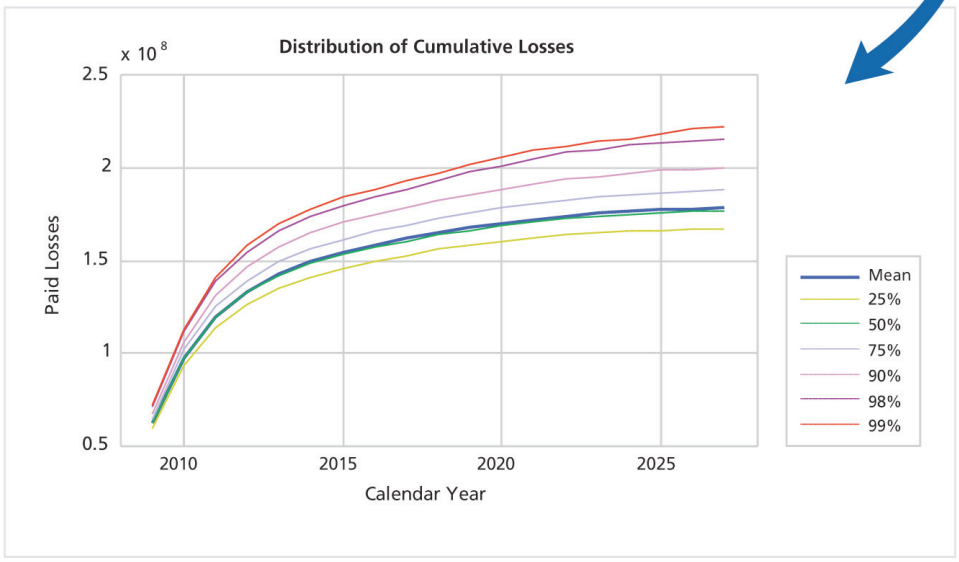
	0	1	2	3	4	5	6	7	8	9
1998	4,645	4,927	3,016	1,485	1,172	806	594	438	316	316
1999	4,205	5,412	3,114	1,865	1,018	584	532	447	356	
2000	4,543	5,800	3,335	1,867	1,145	641	596	471		
2001	4,546	5,773	3,414	1,858	738	443	488			
2002	4,253	5,258	3,002	1,650	1,106	614				
2003	4,273	5,177	2,938	1,748	1,145					
2004	4,624	5,174	2,675	1,661						
2005	4,865	5,082	2,843							
2006	5,130	5,594								
2007	5,212									

Accident Year (AY) 2002

Calendar Year of Payment (CY) 2007 (CY = AY + DY)

Development Year (DY) 1

The calendar year movements are key. These measure the year-on-year financial impact that is critical for solvency.



GUY CARPENTER

Source: Guy Carpenter & Company, LLC

Once the insurer can model the projected calendar year loss reserve volatility, it has the means to measure the cumulative impact of risk transfer mechanisms over time. The mechanisms may include:

- Quota share treaties
- Coverages designed to protect specifically against adverse growth of past loss reserves for example, adverse development covers or loss portfolio transfers
- Coverage that protects against both prospective loss occurrences and retrospective adverse development for example, calendar year aggregate protections
- Reserve index securitizations

Man-Made Catastrophe Risk

Over the past few years, several incidents, seemingly isolated, have ballooned into cross-border, cross-industry and cross-business line catastrophes. Chain reactions of liability, such as the Deepwater Horizon oil spill, the collapse of Lehman Brothers, the Chinese Drywall product recall and E-Coli food poisoning – have led insurers to ask: how do I assess the impact of a major legal liability catastrophe on my portfolio?

Increasingly, insurers are expected by regulators, rating agencies and analysts to demonstrate enterprise risk management (ERM) strategies that encompass worst-case casualty catastrophe event scenarios set at the 99.5 percent VaR. At this stage, Solvency II does not prescribe the specific scenarios that must be tested, but Quantitative Impact Study (QIS) 5 set a capital allocation requirement based on the following factors of annual premium income:

- Errors and omissions (including physicians medical malpractice): 125 percent
- Directors and officers liability: 200 percent
- General liability (including products, recall, employment practices liability and nursing home medical malpractice): 225 percent
- Employers liability: 200 percent
- Motor liability: a market-share based calculation based on a EUR275 million loss event

These minimum capital allocation levels are currently being reviewed by a European Insurance and Occupational Pensions Authority (EIOPA) working committee, following the QIS 5 exercise. There could be some changes to the final Solvency II standard formula, perhaps even reductions in capital levels. But for insurers with a large liability book of business these punitive capital allocation levels underline the value of developing a full or partial internal model and Own Risk and Solvency Assessment (ORSA) to allow a fairer, portfolio-specific capital allocation.

To address this need for portfolio-specific modeling of catastrophe event exposure, Guy Carpenter & Company is working in conjunction with risk modeling consultants Arium. Using Arium's proprietary software, Guy Carpenter has developed CasCat®, the insurance industry's first casualty catastrophe modeling platform. CasCat enables, for the first time, the evaluation of the catastrophe exposure of a casualty portfolio and estimates the financial impact of a given scenario on that portfolio.

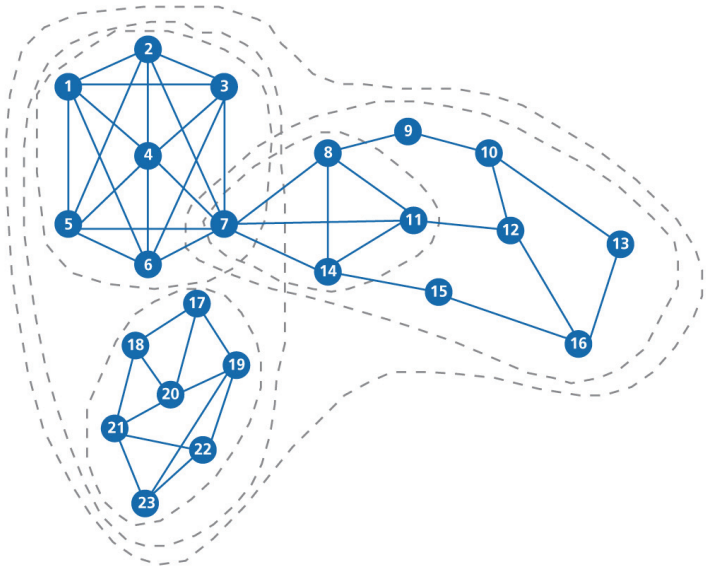
CasCat maps out hidden links between different insureds using complex connectivity data based on industry and trading partner relationships. Built on network theory and using trended historic data, CasCat is able to stochastically model the potential quantum and spread of liability through an insurance portfolio. It allocates the assumed insured loss from a specified man-made catastrophe scenario across different policies and jurisdictions.

The outputs from the model can be used for:

- Risk selection and pricing according to accumulation propensity
- Portfolio catastrophe risk management.
- Solvency II-driven disaster scenario capital allocation

Using a consistent methodology, the insurer can then make an independent projection of the level of loss to which its portfolio is exposed from specified man-made catastrophe scenarios at specified return periods. This enables insurers to make more informed decisions on the level and type of reinsurance required to keep the catastrophe exposure at a manageable level.

CHART 3: CASCAT® LIABILITY CONNECTIVITY DIAGRAM



Source: Guy Carpenter & Company, LLC

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