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Return to Main Page

How DFA Can Help the Property/Casualty Industry, Part 4

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Editor's Note: This is the fourth in a series of articles on Dynamic Financial Analysis (DFA). Click here to view Part 1. Click here to view Part 2. Click here to view Part 3.

Reinsurance

One of the things we find when we talk to people about DFA is that while DFA is considered a "new concept" for primary insurers, DFA is already considered an established part of how business is done in the reinsurance industry. This is largely because reinsurers frequently deal with events that are low frequency but high severity. Therefore modeling a number of scenarios is the best way to illustrate the value of any given coverage to potential purchasers, and to compare and contrast the economic effects of possible reinsurance "solutions" for a potential client. Reinsurers are in the lead in terms of using DFA for pricing studies, marketing studies, and reserving studies.

Many reinsurers and brokers have become increasingly sophisticated and now use DFA-type modeling to actively evaluate the effect of proposed cessions from primary companies. DFA is also particularly useful in evaluating various finite risk reinsurance transactions.

If you are a primary insurer, how can you use DFA? Primary insurers can use DFA modeling to help develop an appropriate cession strategy that will maximize achievement of their reinsurance goals. This may involve modeling a variety of mixes of reinsurance coverages at various limits and retentions and with various loss-sensitive features in order to achieve an optimal program.

A second example of DFA use by primary companies is perhaps the best known—catastrophe modeling. When Hurricanes Hugo and Andrew hit and the Northridge Earthquake occurred, the industry realized that simulation, modeling and multiple stress test scenarios were the only reasonable approach to get a handle on their true potential exposure. In fact, reinsurers who specialize in writing catastrophe covers rely on these types of DFA models for their very existence!

It's generally conceded that the industry is far more sophisticated today about managing its exposure to natural disasters than just five years ago. Much of the credit for this improvement has to go to the knowledge derived from this special subset of DFA models.

A third use of DFA models is to help primary companies deal realistically with the risk of uncollectible reinsurance. At the same time DFA can help reinsurers deal realistically with the potential financial stresses of failures occurring among primary company cedants.

Modeling reinsurance recoveries under mass torts is yet another important use of DFA. DFA is well-known to primary insurers as an accepted method for estimating various mass tort liabilities. It can be used to model potential reinsurance recoveries under a variety of scenarios.

Other specialized uses of DFA may involve modeling non-reinsurance alternatives such as CBOT Catastrophe Futures, lines of credit, catastrophe bonds and other derivative products.

Table 1 shows a simplified example of one traditional type of DFA analysis. An insurer considers the purchase of quota share (QS) or excess of loss (XOL) for a small low frequency, high severity book of business. This insurer has decided that its key measure is profit-center underwriting gain.

The insurer can then see not only how often each reinsurance alternative is best, but when and why.

DFA modelers frequently need to do significant original research and development. Some areas requiring such research include:

- Catastrophe models for workers compensation.
- Tying together workers compensation and property loss occurrences.
- Tying together the effects of major natural catastrophes with significant movements in financial markets (e.g., stock market plunges and exchange rate declines related to the 1906 San Francisco earthquake and recent Kobe, Japan earthquake).
- Specialized reinsurance product features such as reinstatement provisions, sunrise and sunset provisions, ECO coverage, corridor deductibles, loss ratio caps, or MAOLs.

DFA model building is likely to spur a host of econometric-related insurance research that will prove beneficial in numerous areas.

As you can see, reinsurance provides a particularly rich area for DFA studies whether you are a primary carrier or reinsurer.

Paul J. Kneuer, FCAS of the Holborn Agency contributed to this article.