The Dynamic Financial Analysis of

Property-Liability Insurance Companies

by

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ABSTRACT

Recent interest expressed by the property-liability insurance industry in risk-based capital standards and dynamic financial analysis recognizes that insurers operate within a dynamic environment, and that company, economic, and regulatory variables all affect companies in an integrated and complicated framework. In this research, both assets and liabilities, as well as a number of economic and financial processes, are recognized as stochastic, and their effects on insurance company value are examined. In particular, this research focuses on two areas:

1. A single-period property-liability dynamic financial analysis model is developed, and applied to a hypothetical (but representative) set of insurance company and economic parameters. Testing several corporate and economic situations provides an understanding of which types of companies are most sensitive to which factors, and an indication of relative financial solidity.

2. The dynamic financial analysis model is then re-worked into a multiperiod model which utilizes contingent claim techniques -- in particular, Monte Carlo simulation under equivalent martingale measures. Company assets, liabilities, and (in some versions of the model) interest rates are assumed to follow diffusion processes, and are aggregated across the industry. The model thereby becomes a multiperiod model of insurance guaranty funds that incorporates company and regulatory behavior considerations. In particular, alternative regulatory policies regarding the closure or forbearance of financially impaired companies are evaluated.

The results will have meaning for actuarial pricing techniques, corporate decision-making, and insurance solvency regulation, and will provide insight into the true inherent value of a company from a market perspective.