

Introduction

***Journal of Risk and Insurance* Symposium Issue Fourth International Conference on Insurance Solvency and Finance**

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The feature articles for this issue of the *Journal of Risk and Insurance* are culled from presentations to the Fourth International Conference on Insurance Solvency and Finance, held at the Wharton School of the University of Pennsylvania, April 25–27, 1994.¹ In attendance were 57 representatives from 13 countries around the world.

The International Conference on Insurance Solvency and Finance is a loosely-structured organization of actuaries and economists whose aim is to facilitate the merger of the economic and actuarial approaches to insurance solvency and finance. The formation of the Conference in 1986 was motivated by the recognition that actuaries and economists were pursuing parallel research on insurance solvency and related financial matters. For the most part, the parallel tracks utilized different methodologies and did not communicate with one another. The purpose of the Conference series is to promote communications and effectuate the eventual merger of the two tracks of insurance financial research.

The Fourth Conference participants honored Willem DeWit of Erasmus University, Rotterdam, The Netherlands, with the presentation of the Teivo Pentikäinen award for his life-long contributions to insurance management and research. The award was created by the organizers of the International Conference on Insurance Solvency and Finance in honor of the well-known Finnish actuarial risk theorist, Teivo Pentikäinen, who was one of the organizers of the first conference. The award was presented to Professor DeWit by Professor Pentikäinen at the Conference.

In the eight years between the first and fourth conferences (both held at the Wharton School),² much progress has been made in bringing the actuarial and economic approaches to a common view of modeling the essence of the insurance firm. Sophisticated cash flow models have been fully developed for sol-

¹ Papers from earlier conferences were published in Cummins and Derrig (1988, 1989, and 1991).

² The second conference was held in 1988 in Brighton, England, and the third conference was held in 1991 in Rotterdam, The Netherlands.

vency testing and financial management (see, for example, Daykin, Pentikäinen, and Pesonen, 1994; Cummins, Phillips, and Grace, 1995). Risk-based capital requirements have been adopted in the United States, while refinements are under development (see, e.g., Butsic, 1994; Cummins, Harrington, and Klein, 1995; Cummins, Harrington, and Niehaus, 1994). Equilibrium and option pricing models continue to be discussed and refined (see, e.g., Taylor, 1994, 1995). The International Actuarial Society has created a specialized Actuarial Approach for Financial Risks (AFIR) Conference devoted to financial risk, holding five conferences between 1990 (Paris) and 1995 (Brussels). New technologies, such as fuzzy set theory and neural networks, have been added to enrich the mix of analytical methods (see Derrig and Ostaszewski, 1995; Ostaszewski, 1993; Brockett, et al., 1994).

The participants in the 1994 Conference reached agreement on several principles that should guide future research.

- Interactions are the key to realistic modeling of the insurance firm, the primary example being integrated models of assets and liabilities.
- Economic values, rather than book or accounting values, should form the basis for empirical methods and testing.
- The financial structure of the firm remains the key focal point for analysis, rather than the traditional focus on life insurance vs. non-life insurance.
- Sophisticated techniques such as option pricing theory are needed to model the decision making and risk management problem confronting insurers.
- The demand side of the insurance market should be fully integrated into financial decision making.

The participants also formulated a research agenda for the future. Extensive discussion led to identification of the following high-priority topics:

- Multiperiod/dynamic modeling of the firm. Gregory Taylor's paper on the value of the firm (published in this issue) sets the stage for integrating firm-level risk into the valuation and pricing process.
- Capital structure and project pricing. The persistent problems associated with the attempt to allocate capital for purposes of pricing, project valuation, and financial management need further work. At issue is the pricing of projects with different risk characteristics in the multiproduct firm.
- Risk-based capital requirements. The risk-based capital requirements that have been adopted in the United States reflect simplistic and ad hoc approximations to financial theoretic concepts. Solvency modeling is now being conducted using sophisticated methods such as options pricing and neural networks. The development and testing of more appropriate and accurate models are important objectives.
- Options and derivatives. The impact of catastrophe exposures and losses, and the hedging of such losses through derivative financial instruments and reinsurance, constitute a serious problem in the wake of hurricanes Hugo, Andrew, and Iniki and the Northridge earthquake. Exchange-traded options and futures such as the catastrophe insurance derivatives traded on the Chi-

cago Board of Trade have the potential to revolutionize the hedging of these and other types of risks traditionally handled through insurance. Because the parties to derivative contracts are anonymous, derivatives have the potential to substantially reduce the deadweight losses to society caused by adverse selection and moral hazard in insurance markets. The principal barrier to the wider use of these instruments is the need for accurate and timely indices to which their values can be linked.

- Regulation. The structure of insurance markets in most countries is heavily influenced by regulation. Additional theoretical and empirical research on the effects of regulation is needed, particularly in view of the trends toward deregulation of financial markets in Europe and the changing regulatory and political climate in the United States. The breaking down of traditional barriers among financial institutions poses significant opportunities as well as challenges for actuaries, financial risk managers, and regulators.
- Information. The role and value of information and the technology needed to transfer the information is a vital topic with little preceding study. Information, or the lack thereof, creates significant problems such as adverse selection and moral hazard in insurance markets and is the primary barrier to the more widespread use of insurance derivatives.
- New products and delivery systems. Improvements in technology should provide ways to create new or hybrid products that can be delivered through technologically intensive channels, such as the WorldWideWeb, rather than through current agency or direct marketing channels.

Readers of the *Journal of Risk and Insurance* are encouraged to explore the problems outlined in the Conference Research Agenda. Progress toward solutions of those problems will be discussed at the Fifth International Conference on Insurance Solvency and Finance to be held in Europe during Spring 1997.

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