

19th ASTIN COLLOQUIUM  
TEL AVIV ISRAEL 20th–24th SEPTEMBER 1986

The 19th ASTIN Colloquium, which was held at the Hilton Hotel in Tel Aviv, was attended by some 175 participants, together with some 75 accompanying persons, from 23 countries. It began in the customary fashion with a welcoming cocktail party on the Saturday evening.

The opening ceremony the following morning was presided over by the Chairman of ASTIN, Jean LEMAIRE. After the ceremony, Professor Eitan BERGLAS of Tel Aviv University gave a lecture on inflation, stabilization, the government budget and the capital market. Professor Berglas, besides being the Chairman of the Bank Hapoalim, was also one of the chief architects of the economic policy which had recently been introduced in Israel and which had led to a reduction in the year-on-year rate of inflation, in the space of a year, from several hundred per cent to less than 20 per cent. As a professor of economics who had been tackling a severely practical problem, so far with apparent success, he was listened to with great interest.

Those colloquium papers which had been sent in sufficiently early had been assembled by the organizing committee in a single volume and distributed to the participants in advance of the colloquium. Following the lecture by Professor Berglas, the whole of the remainder of that day was devoted to Subject 1: The company environment of the non-life actuary. The papers were divided into three groups, as set out in the list at the end of this note, corresponding to the three working sessions.

The first four papers considered ratemaking and related issues.

HARWAYNE's paper refers to ratemaking in the United States, in the sense of determining the overall level of the rates to be charged for a class of insurance business rather than determining the premium relativities for the various rating cells. Using an example based on worker's compensation insurance, he illustrates an approach based on projecting paid losses, as an alternative to using figures of incurred losses which include a large element of subjective estimating.

DE PRIL's paper, in which he postulated a portfolio of independent life assurance policies for which the distribution by amount at risk is known and which is subject to known mortality rates, developed recursive expressions for computing the distribution of aggregate claims. The relevance of this paper to non-life insurance was not explained.

The first of SUNDT's papers describes experimental work carried out in the use of credibility regression models to derive results intended as an aid to the persons who have the task of classifying car models into groups for the purpose of insurance rating. Although the paper contains a formidable array of mathematics, the method was nevertheless over-simplified in that whilst it took account of such factors as cubic capacity of the engine, price, weight, etc., it did not incorporate any specific allowance for the interactions with other risk factors

such as age of the car and the characteristics of the policyholder or driver. In his second paper he discusses, in the context of a credibility model, the extent to which data derived from the experience of earlier years may be used to yield improved estimators.

Among the papers on reserving techniques, the one by GATH and LUBITCH relates to dental expenses insurance as practised in Israel. Reserving for claims for the basic forms of dental treatment does not present any problems since the claims arise quickly and are settled quickly. The paper describes the authors' approach to reserving for claims for prosthetic treatment, where, although the period from reporting to settlement is quite short, it is necessary to allow not only for claims incurred but not reported, but also for claims for which the treatment has been authorized but not yet carried out.

STANARD, in his paper, describes the use of simulated figures of claim costs by year of accident and year of development, with the aim of estimating the variance of the errors in the estimates of ultimate losses. The paper by FALLQUIST and JONES set out ways in which the data typically available in the form of a loss development triangle can be used to obtain derived figures which may be used in various methods of estimating reserves for outstanding claims and the expenses associated with them.

The remaining two papers on Subject 1 related to profitability management and planning. BOHMAN and LEVY criticize the preoccupation, in insurance company accounting, with the single figure representing the purported profit or loss in the latest completed year, and advocate a form of presentation, at least for the information of management, which acknowledges the stochastic nature of the business. They illustrate their ideas by means of a much over-simplified model in which they separate the underwriting and investment aspects of the insurance business. In TAPIERO's paper, he describes a project to develop a computer expert system for insurance and reinsurance. Much of the paper is occupied with the author's comments on different forms of reinsurance treaty.

On the Monday the working session was confined to the morning, for discussion of the papers on Subject 2: Financial aspects of general insurance. Again, these came under three main headings.

In the first of the papers on solvency, COUTTS and DEVITT advocate the use of cash flow models for reporting on the financial strength of an insurance enterprise, the models embodying probability distributions and sets of decision rules defining future strategy. These two authors are also among those responsible for the paper by DAYKIN *et al.*, which presents the approach developed by a working party which was set up to extend, in the context of the solvency regime in the UK, the work carried out by the Finnish group of actuaries led by PENTIKAINEN and RANTALA. They recommend the simultaneous consideration of assets and liabilities, and put forward a case for a system of actuarial reporting on the financial strength of insurance companies, so that the supervisory authority can have available, within a solvency regime based on crude minimum solvency margins, an assessment which reflects the level of risk for the individual company.

There were two papers dealing with mathematical aspects of reinsurance. The short paper by KASS, GOOVAERTS and BAUWELINCKX derives upper and lower bounds for stop-loss premiums in terms of the claim number distribution, the mean claim, the mean claim less than the retention, and the probability of a claim less than the retention. LEMAIRE and QUAIRIERE generalize earlier work by Gerber on chains of reinsurance, using a theorem of Borch.

The miscellaneous group of papers on other financial aspects of general insurance includes two highly theoretical papers, one by BRIYS and the other by BRIYS, KAHANE and KROLL, on optimal insurance demand by individuals. The paper by EDEN and KAHANE presents a model of an insurance market with three players: an insured population, a local insurer and an international reinsurer, and discusses the allocation of risk among the three parties. MASTERSON presented the latest sets of figures in his customary review of price indices in various countries and indices of the costs of different types of non-life insurance claims in the US.

After lunch Mr. Gideon PATT, the Minister of Science and Development, gave an address in which he vigorously supported current policies of the Israeli government.

The final working day was the Tuesday, starting with Subject 3: The actuarial treatment of catastrophe — target risks and special lines.

ARIAV, KAHANE and TAPIERO discuss the possible advantages to a group of companies of establishing a back-up computer centre, which might, for example, be owned by a separate company which would sell the services when required to the members participating in the pool.

AJNE and WIDE discuss the question of defining catastrophe claims and assessing their expected cost. For their purpose, catastrophe claims are large individual claims, rather than large groups of claims arising out of a single catastrophic incident. The Pareto family of curves was found to give the best fit to the claim distributions for the four classes of business which were treated, and the paper includes comparisons between actual and expected numbers and amounts of catastrophe claims over a four-year period.

KAHANE's paper gives a wide-ranging survey of the problems of insurance against earthquake risks, with particular reference to Israel, and sets out a number of proposals as to how these problems should be tackled.

Subject 3 was followed by the customary Speakers' Corner session. Besides the presentations for which papers were submitted — these are listed at the end of this note — there were presentations by S. BENJAMIN on the reserving methods used at Lloyd's, by E. KREMER on premium calculation for largest claims reinsurance covers and on robust premium principles, and by R. NORBERG on life insurance rating.

The business proceedings ended with the General Assembly of ASTIN, at which the plans were announced for the 20th Colloquium, to be held in Scheveningen, Netherlands, 30th August–3rd September 1987.

The Colloquium dinner was held on the Tuesday evening at the Hilton Hotel. An important feature of any colloquium is the opportunity it gives for the par-

ticipants to discuss matters of mutual interest before and after the business meetings. The social arrangements provided by our Israeli hosts included a piano recital by David Levy, a talented young musician from the Royal Northern College of Music in Manchester; a visit to the Diaspora Museum, followed by a tour of the old city of Jaffa; and a full-day guided tour of Jerusalem and Bethlehem. For those able to stay for a further day, there was a tour of Galilee.

The excellent arrangements for both the business meetings and the social events were a tribute to the organizing committee led by Yitzchak GOLDSTEIN and Eddy LEVY and the scientific committee led by Yehuda KAHANE.

PETER JOHNSON

#### LIST OF PAPERS

##### **Opening Lecture**

Prof. E. BERGLAS

Inflation, stabilization, government budget and capital market.

##### **Subject 1: The Company Environment of the Non-Life Actuary**

###### *Ratemaking and Related Issues*

F. HARWAYNE

A comparison of practical ratemaking models: paid vs. incurred claims and claims adjustment expense experience.

N. DE PRIL

On the exact computation of the aggregate claims distribution in the individual life model.

B. SUNDT

Some credibility regression models for the classification of individual passenger car models.

B. SUNDT

Credibility and old estimates.

###### *Reserving techniques*

Y. GATH and A. LUBITCH

Reserving in dental insurance.

J. N. STANARD

Bootstrap estimation of the variance of prediction errors of loss reserving methods.

R. J. FALLQUIST and B. A. JONES

Loss reserving in the microcomputer environment.

###### *Profitability management and planning*

H. BOHMAN and E. J. LEVY

Diagnostic tools for profitability.

C. S. TAPIERO

Executive insurance system: the computer insurance expert.

**Subject 2: Financial Aspects of General Insurance***Solvency*

S. M. COUTTS and E. R. F. DEVITT

The assessment of the financial strength of insurance companies: a generalized cash flow model.

C. D. DAYKIN, G. D. BERNSTEIN, S. M. COUTTS, E. R. F. DEVITT, G. B. HEY,  
D. I. W. REYNOLDS and P. D. SMITH

The solvency of a general insurance company in terms of emerging costs.

*Reinsurance*

R. KAAS, M. J. GOOVAERTS and T. BAUWELINCKX

Some elementary stop-loss inequalities.

J. LEMAIRE and J. P. QUAIRIERE

Chains of reinsurance revisited.

*Other financial aspects*

E. BRIYS

On the theory of rational insurance purchasing in a continuous-time model.

E. BRIYS, Y. KAHANE and Y. KROLL

The demand for voluntary insurance coverage in the presence of compulsory insurance, speculative risk and risky–riskless portfolio opportunities.

Y. EDEN and Y. KAHANE

Moral hazard and insurance market structure.

N. E. MASTERSON

Inflation: an economic factor in non-life insurance.

**Subject 3: The Actuarial Treatment of Catastrophes: Target Risks and Special Lines**

A. ARIAV, Y. KAHANE and C. S. TAPIERO

A pooled computer center as a risk management tool.

B. AJNE and H. WIDE

On the definition and the expected cost of catastrophe claims: an application to the business insurance portfolio of a direct insurance company.

Y. KAHANE

Earthquake risk and insurance in Israel: policy considerations.

**Speakers' Corner**

E. P. PEREZ

Structure de la prime et rendements financiers des provisions techniques des assurances privées.

B. ZEHNWIRTH and G. BARNETT

Fundamental principles of forecasting and chain ladder model.

G. BENKTANDER

Claim size distributions: Pareto as an approximation to other continuous distributions in the tail areas.

- Y. KAHANE, C. S. TAPIERO and L. JACQUE  
Concepts and trends in the study of insurers' solvency.
- G. SZPIRO  
Risk aversion in the not-so-small: beyond mean and variance.
- Y. EDEN and Y. KAHANE  
Optimal reinsurance contracts and the insurance capacity problem.
- R. KAAS and M. J. GOOVAERTS  
On the use of Quadpack for the calculation of risk theoretical quantities.
- H. BOHMAN  
ELCED (A program which performs an algorithm representing a hypothetical arrangement between a ceding company and a reinsurer).
- H. BOHMAN, A. NETTERMAN and E. LEVY  
Non-life insurance premium using factorial method.