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FROM THE LIBRARY SHELF

Edited by Phyllis Schiller Myers
Virginia Commonwealth University

Bargaining Theory

Open- Versus Closed-Door Negotiations, by Motty Perry (Hebrew University, Jerusalem, and University of Western Ontario) and Larry Samuelson (University of Wisconsin)

We examine noncooperative bargaining between two agents, one of whom (agent 1) represents a constituency. Under "closed-door" bargaining, constituents must approve the final bargaining agreement. In the "open-door" case, constituents may also terminate bargaining after intermediate offers have been made and rejected. A "learning effect" and a "termination effect" arise in open-door bargaining. The former increases and the latter decreases the payoff to agent 2 from rejecting offers. The termination effect dominates, making agent 2 less likely to reject offers and hence making agent 1 more aggressive in the open-door case. *Rand Journal of Economics,* Summer 1994, 25(2): 348-359. (Reprinted with permission of the *Rand Journal of Economics.*)

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Economics of Information and Signaling

When Words Speak Louder Than Actions: Another's Evaluations Can Appear More Diagnostic Than Their Decisions, by Richard Gonzalez (University of Washington)

When making decisions we often infer the value of the alternatives from the behavior of others. In some domains, however, we fail to make such inferences. Stock trading is a case in point—investors appear to undervalue the significance of the behavior of those who are willing to trade. A simulated market was developed to test this claim. Subjects made a series of portfolio reallocations on the basis of reports they read. Subjects in the experimental conditions also saw the responses of another person who based their responses either on the same information as the subject (high redundant information) or on different but equally predictive information (low redundant information.) In fact, the

responses subjects observed were identical in both conditions. A normative argument suggests that another's decisions is more diagnostic when it is based on information having low redundancy rather than high redundancy. The dependent measure was index of the degree of conformity to the other's decision. Results show that people become more sensitive to the diagnosticity of another's responses when observing how the person evaluated their information rather than how the person acted on their information. A salience hypothesis is involved to account for the pattern of results. Additional studies were conducted to test various alternative explanations. Implications for the measurement of conformity and influence are discussed. *Organizational Behavior and Human Decision Processes,* May 1994, 58(2): 214-145. (Reprinted with permission of *Organizational Behavior and Human Decision Processes.*)

Risk Perception and Economic Behavior

Supply Response to Agricultural Insurance: Risk Reduction and Moral Hazard Effects, by B. Ramaswami

This paper examines the consequences of agricultural insurance for expected supply. The effect of insurance is shown to decompose into a "risk reduction" effect as well as a "moral hazard" effect. The direction and magnitude of these effects depend on the parameters of the insurance contract, producer's risk preferences, and the underlying technology. Two models are considered for this purpose. In the first model, widely employed in the literature, a producer controls only one input. The second model uses a dual approach to extend the results to the case where a producer controls multiple inputs. *American Journal of Agricultural Economics,* November 1993, 75(4): 914-925. (Reprinted with permission of the *Journal of Economic Literature.*)

Insurance, Moral Hazard, and Chemical Use in Agriculture, by J. K Horowitz and E. Lichtenberg

This paper examines how crop insurance affects corn farmers' fertilizer and pesticide use in the U.S. Midwest. Crop insurance might be expected to affect chemical use because of moral hazard; insured farmers may undertake riskier production than uninsured farmers. Results suggest that insurance exerts considerable influence on corn farmers' chemical use decision. Those purchasing insurance applied significantly more nitrogen per acre (19 percent), spent more on pesticides (21 percent), and treated more acreage with both herbicides (7 percent and 63 percent) than did those not purchasing insurance. These results suggest that both fertilizer and pesticides may be risk-increasing inputs. *American Journal of Agricultural Economics,* November 1993, 75(4): 926-935. (Reprinted with permission of the *Journal of Economic Literature.*)

A Hint of Risk: Tradeoffs Between Quantitative and Qualitative Risk Factors, by Robin Gregory and Sarah Lichtenstein (Decision Research, Eugene, Oregon)

Risk-perception research plays an active role in discussions of risk-management alternatives. However, little guidance is provided regarding how public concerns should be weighed against other sources of cost and benefits. This paper reports the results of two experiments that measure tradeoffs among cost (in dollars), a quantitative risk measure (number of deaths or injuries), and several qualitative characteristics associated with perceived risk. Most subjects were willing to make the requested trade. However, the perceived risk information led others to reject the proposed technology. *Risk Analysis,* April 1994, 14(2): 199-206. (Reprinted with permission of *Risk Analysis.*)

Exposure Assessment: Then, Now, and Quantum Leaps in the Future, by Russell E. Keenan, Brent L. Finley, and Paul S. Price (McLaren/Hart Environmental Engineering Corporation, Portland, Maine)

Health risk assessments have become so widely accepted in the United States that their conclusions are a major factor in many environmental decisions. Although the risk assessment paradigm is ten years old, the basic risk assessment process has been used by certain regulatory agencies for nearly 40 years. Each of the four components of the paradigm has undergone significant refinements, particularly during the last five years. A recent step in the development of the exposure assessment component can be found in the 1992 EPA *Guidelines for Exposure Assessment.* Rather than assuming worst-case or hypothetical maximum exposures, these guidelines are designed to lead to an accurate characterization, making use of a number of scientific advances. Many exposure parameters have become better defined, and more sensitive techniques now exist for measuring concentrations of contaminants in the environment. Statistical procedures for characterizing variability, using Monte Carlo or similar approaches, eliminate the need to select point estimates for all individual exposure parameters. These probabilistic models can more accurately characterize the full range of exposures that may potentially be encountered by a given population at a particular site, reducing the need to select highly conservative values to account for this form of uncertainty in the exposure estimate. Lastly, our awareness of the uncertainties in the exposure assessment as well as our knowledge as to how best to characterize them will almost certainly provide evaluations that will be more credible and, therein, more useful to risk managers. If these refinements are incorporated into future exposure assessments, it is likely that our resources will be devoted to problems that, when resolved, will yield the largest improvement in public health. *Risk Analysis,* June 1994, 14(3): 225-230. (Reprinted with permission of *Risk Analysis.*)

The Welfare Implications of Moral Hazard and Adverse Selection in Competitive Insurance Markets, by Jay Stewart (U.S. Department of Labor)

I model a competitive insurance market with both moral hazard and adverse selection, and analyze the effect on welfare when both problems are present simultaneously. An examination of the interaction between the two problems leads to two hypotheses. First, the nature of the equilibrium contracts is such that each problem partially offsets the welfare loss associated with the other. And second, the degree to which this occurs increases as agents become more heterogeneous. Simulation results overwhelmingly support both hypotheses. *Economic Inquiry,* April 1994, 32(2): 193-208. (Reprinted with permission of *Economic Inquiry.*)

Risk and Insurance in Village India, by Robert M. Townsend

The full insurance model is tested using data from three poor, high-risk villages in the semi-arid tropics of southern India. The model presented here incorporates a number of salient features of the actual village economics. Although the model is rejected statistically, it does provide a surprisingly good benchmark. Household consumptions comove with village average consumption. More clearly, household consumptions are not much influenced by contemporaneous own income, sickness, unemployment, or other idiosyncratic shocks, controlling for village consumption (i.e., for village-level risk). There is evidence that the landless are less insured than their village neighbors in one of the three villages. *Econometrica,* May 1994, 62(3): 539-591. (Reprinted with permission of *Econometrica.*)

Adverse Selection, Commitment, and Renegotiation: Extension to and Evidence from Insurance Markets, by Georges Dionne (University of Montreal) and Neil A. Doherty (University of Pennsylvania)

With asymmetric information, full commitment to long-term contracts may permit markets to approach first-best allocations. However, commitment can be undermined by opportunistic behavior, notably renegotiation. We reexamine commitment in insurance markets. We present an alternative model (which extends Laffont and Tirole's procurement model to address uncertainty and competition), which involves semipooling in the first period followed by separation. This and competing models (e.g., single-period models and no-commitment models) have different predictions concerning temporal patterns of insurer profitability. A test using California data suggests that some automobile insurers use commitment to attract selective portfolios comprising disproportionate numbers of low risks. *Journal of Political Economy,* April 1994, 102(2): 209-257. (Reprinted with permission of the *Journal of Political Economy.*)

Evidence on Adverse Selection: Equilibrium Signaling and Cross-Subsidization in the Insurance Market, by Robert Puelz (Southern Methodist University) and Arthur Snow (University of Georgia)

The configuration of equilibrium in the market for automobile collision insurance is examined empirically by representing the premium-deductible menu and the demand function as a standard hedonic system. Using contractual data from a representative insurer, we estimate a reduced-form hedonic premium equation and the inverse of the marginal bid equation for insurance coverage. The data reveal an equilibrium with adverse selection and market signaling but lead us to reject the hypothesis that high risks receive contracts subsidized by low risks. *Journal of Political Economy,* April 1994, 102(2): 236-257. (Reprinted with permission of the *Journal of Political Economy.*)

Utility Theory

What Common Ground Exists for Descriptive, Prescriptive, and Normative Utility Theories? by R. Duncan Luce (University of California, Irvine) and Detlof von Winterfeldt (University of Southern California)

Descriptive and normative modeling of decision making under risk and uncertainty have grown apart over the past decade. Psychological models attempt to accommodate the numerous violations of rationality axioms, including independence and transitivity. Meanwhile, normatively-oriented decision analysts continue to insist on the applied usefulness of the subjective expected utility (SEU) model. As this gap has widened, two facts have remained largely unobserved. First, most people in real situations attempt to behave in accord with the most basic rationality principles, even though they are likely to fail in more complex situations. Second, the SEU model is likely to provide consistent and rational answers to decision problems within a given problem structure, but may not be invariant across structures. Thus, people may be more rational than the psychological literature gives them credit for, and applications of the SEU model may be susceptible to some violations of invariance principles.

This paper attempts to search out the common ground between the normative, descriptive, and prescriptive modeling by exploring three types of axioms concerning structural rationality, preference rationality, and quasi-rationality. Normatively the first two are mandatory and the last, suspect. Descriptively, all have been questioned, but often the inference involved have confounded preference and structural rationality. We propose a prescriptive view that entails full compliance with preference rationality, modifications of structural rationality, and acceptance of quasi-rationality to the extent of granting a primary role to the status quo and the decomposition of decision problems into gains and losses. *Management Sciences,* February 1994, 40(2): 263-279. (Reprinted with permission of *Management Sciences.*)

Rational Choice Under an Imperfect Ability to Choose, by André de Palma (Université Genève), Gordon M. Myers (University of Waterloo), and Yorgos Y. Papageorgiou (McMaster University)

We consider an individual who lacks the information-processing capacity required for a direct comparison of all feasible allocations. Instead of finding at once a best allocation, the individual myopically adjusts his current allocation toward higher utility. The individual makes adjustment errors inversely proportional to his ability to choose. We compare the stationary state of this process with a standard model. We see how an imperfect ability to choose modifies both positive and normative predictions of the standard model and how the standard model can be obtained from our more general one as the special case corresponding to perfect ability. *The American Economic Review,* June 1994, 84(3): 622-641. (Reprinted with permission of *The American Economic Review.*)

Expo-Power Utility: A "Flexible" Form for Absolute and Relative Risk Aversion, by A. Saha

A new utility function, which the author calls expo-power, is proposed that exhibits decreasing, constant, or increasing absolute risk aversion and decreasing or increasing relative risk aversion, depending on parameter values. Numerical analysis suggests that the expo-power function performs well in incorporating these risk preference structures and that arbitrary risk preference specifications may lead to biased risk response estimates. *American Journal of Agricultural Economics,* November 1993, 75(4): 905-913. (Reprinted with permission of the *Journal of Economic Literature.*)

Probability Theory

On the Stability of Recursive Formulas, by Harry H. Panjer and Shaun Wang (University of Waterloo)

Based on recurrence equation theory and relative error (rather than absolute error) analysis, the concept and criterion for the stability of a recurrence equation are clarified. A family of recursions, called congruent recursions, is proved to be strongly stable in evaluating its non-negative solutions. A type of wrongly unstable recursion is identified. The recursive formula discussed by Panjer (1981) is proven to be strongly stable in evaluating the compound Poisson and the compound negative binomial (including geometric) distributions. For the compound binomial distribution, the recursion is shown to be unstable. A simple method to cope with this instability is proposed. Many other recursions are reviewed. Illustrative numerical examples are given. *Astin Bulletin,* November 1993, 23(2): 227-258. (Reprinted with permission of *Astin Bulletin.*)

Distribution-Free Calculation of the Standard Error of Chain Ladder Reserve Estimates, by Thomas Mack (Munich Re)

A distribution-free formula for the standard error of chain ladder reserve estimates is derived and compared to the results of some parametric methods using a numerical example. *Astin Bulletin,* November 1993, 23(2): 213-225. (Reprinted with permission of *Astin Bulletin.*)

Trend Analysis and Prediction Procedures for Time Nonhomogeneous Claim Processes, by Menachem P. Berg (University of Haifa) and Steven Haberman (City University, London)

The paper focuses on time nonhomogeneous claim occurrence processes. Such processes arise either in a natural way, as a result of modeling (often qualitative-type) assumptions, or when a trend may exist and needs to be allowed for in the model construction.

For trend analysis, we use trend representations which are formulated on the basis of an appropriate process characteristic in conjunction with a probabilistic ordering notion. Such trend representations are verified for a given process with respect to assumptions on its stochastic behaviour.

Making predictions with regard to quantities of interest such as the time to the next claim or the expected total number of claims in the next year is the other major goal of this work. The predictions are obtained by employing Bayesian revision procedures for different inference models on the claim occurrence process. *Insurance: Mathematics and Economics,* April 1994, 14(1): 19-32. (Reprinted with permission of North-Holland Publishing Company.)

Critical Starting Points for Stable Evaluation of Mixed Poisson Probabilities, by Shaun Wang (Concordia University) and Harry Panjer (University of Waterloo)

For the recursions derived by Willmot (1993) for mixed Poisson probabilities, some critical starting points are identified; only starting from these critical points can a stable evaluation be achieved. Simple algorithms are given to produce the starting values which involve special functions. *Insurance: Mathematics and Economics,* December, 1993, 13(3): 287-297. (Reprinted with permission of North-Holland Publishing Company.)

Risk Theory

Proportional Convergence and Tail-Cutting Techniques in Evaluating Aggregate Claim Distributions, by Shaun Wang and Harry Panjer (University of Waterloo)

Some tail-cutting techniques are developed for an efficient usage of Panjer-type recursions in evaluating aggregate claim distributions for large insurance

portfolios. Generally, for a linear recurrence equation, given arbitrary initial values, the computed solutions tend to be proportional to each other. By cutting the left tail of the aggregate claim distribution and using arbitrary initial values, a good approximation of the aggregate claim distribution can be achieved through a simple rescaling. This method can reduce the computing time and avoid underflow/overflow problems. *Insurance: Mathematics and Economics,* May 1994, 14(2): 129-138. (Reprinted with permission of North-Holland Publishing Company.)

On a Class of Approximative Computation Methods in the Individual Risk Model, by Jan Dhaene (Katholieke Universiteit Leuven) and Nelson De Pril (Leuven, Belgium)

Exact calculations in the individual risk model are possible, but are very time consuming. Therefore, a number of recursive methods for approximate computation of the aggregate claims distribution and stop-loss premiums have been developed. In the present paper a general class of such approximation methods is considered, containing the higher order approximations suggested by Kornya, Hipp, and De Pril. In this way, the treatment of the different methods is unified and extended to a more general setting. Some new theoretical error bounds are derived, giving a quantitative measure of the accuracy of the approximations. *Insurance: Mathematics and Economics,* May 1994, 14(2): 181-196. (Reprinted with permission of North-Holland Publishing Company.)

On the First Crossing of the Surplus Process with a Given Upper Barrier, by Philippe Picard (Université Lyon Villeurbanne Cedex, France) and Claude Lefèvre (Université Libre de Bruxelles)

In the classical model of risk theory with the claim sizes arithmetically distributed, we consider the time T of the first crossing between the surplus process and a given (non-necessarily linear) upper barrier. The distribution of T is recognized to be discrete, and the related probabilities can be expressed explicitly using a family of Abel-Gontcharoff polynomials when all claims have unit value, or a natural extension of these polynomials in the general case. *Insurance: Mathematics and Economics,* May 1994, 14(2): 163-179. (Reprinted with permission of North-Holland Publishing Company.)

Insurance Rating Models

Equilibrium in a Reinsurance Syndicate: Existence, Uniqueness and Characterization, by Knut K. Aase (Norwegian School of Economics and Business Administration)

This paper attempts to give an overview of the pricing of risks in a pure exchange economy, where trade takes place at time zero and where uncertainty is formulated, where conditions characterizing a Pareto optimal exchange equi-

librium are derived. We present two sets of sufficient conditions for the existence of an equilibrium, and demonstrate how equilibria can be characterized through several examples. Uniqueness of equilibrium is also discussed. Special attention is given to the principal components that the premiums in a reinsurance market must depend upon. We also apply the general theory to the risk exchange problem between a policyholder and an insurer, and in particular we compute market premiums of the resulting optimal contracts.

It is emphasized throughout how the formulation of a competitive equilibrium, rather than merely a general risk exchange formulation, is of particular interest in deriving a well-defined and unique set of equilibrium premiums in an insurance market. The theory is put into a framework which is fruitful for extensions beyond the one-period case. *Astin Bulletin,* November 1993, 23(2): 185-211. (Reprinted with permission of *Astin Bulletin.*)

Pricing Long Term Care Insurance Contracts, by B. Levikson and G. Mizrahi (University of Haifa)

Insurance companies are faced with the problem of pricing long term care (LTC) insurance contracts. An LTC contract provides the insured benefits should he become in need of care. We consider several models describing the changes in the needs of the insured for care over time. Some models are more conservative than others, some are based on ADLs, and one model assumes alternating periods of activity and disability. A quite general Markovian multistate model is also analyzed. A basic concept needed for pricing LTC contracts is the r.v. discounted value of future benefits (DVFB). Using the expected DVFB, termed elsewhere net single premium, we find the annual premiums for all the models. The methods used to price the contracts include Markov chain analysis, potential theoretic approach, backward induction, and Bellman's equation of dynamic programming. *Insurance: Mathematics and Economics,* April 1994, 14(1): 1-18. (Reprinted with permission of North-Holland Publishing Company.)

Ruin Theory

Gamma Processes and Finite Time Survival Probabilities, by David C. M. Dickson (University of Melbourne) and Howard R. Waters (Heriot-Watt University, Edinburgh)

In this paper, we derive formulae for finite time survival probabilities when the aggregate claims process is a gamma process. We illustrate how a compound Poisson process can be approximated by a gamma process and by a process termed as a translated gamma process. We also show how survival probabilities for a compound Poisson process can be approximated by those for a gamma process or a translated gamma process. *Astin Bulletin,* November 1993, 23(2): 259-272. (Reprinted with permission of *Astin Bulletin.*)

Ruin Problems and Dual Events, by David C. M. Dickson (University of Melbourne) and Alfredo Egídio dos Reis (Heriot-Watt University, Edinburgh)

Dickson (1992) uses dual events to explain results relating to the distribution of the surplus immediately prior to ruin in the classical surplus process. In this paper we show that dual events can be used to explain other results in ruin theory. In particular we prove and explain the relationship between the density of the surplus immediately prior to ruin, and the joint density of the surplus immediately prior to ruin and the severity of ruin. *Insurance: Mathematics and Economics,* April 1994, 14(1): 51-60. (Reprinted with permission of North-Holland Publishing Company.)

Health Care and Insurance

Should Physicians Be Permitted to "Balance Bill" Patients? by J. Glazer and T. G. McGuire

This paper studies the efficiency effects of physician fees when the insurer (possibly the government) pays a fee for each procedure and the doctor may supplement the fee by an extra charge to the patient, a practice known as "balance billing." Monopolistically competitive physicians can discriminate among patients on the basis of both price and quality. Equilibria with and without balance billing are compared. The paper analyzes and recommends a new fee policy, a form of payer "fee discrimination." *Journal of Health Economics,* October 1993, 12(3): 239-258. (Reprinted with permission of the *Journal of Economic Literature.*)

Improving Economic Incentives in Hospital Prospective Payment Systems Through Equilibrium Pricing, by Michael Shwartz and Melanie L. Lenard (Boston University)

Under the Prospective Payment System (PPS) implemented by Medicare in 1983, hospitals are paid a set price for each Medicare patient treated, rather than being reimbursed for the patient's costs as had been done previously. An increasing number of other insurers have adopted a similar method of hospital payment. In these systems, the price, which depends on the patient's Diagnosis Related Group (DRG), is derived from the average cost over all hospitals of all patients in that DRG. We propose an alternative method for setting prices in hospital prospective payment systems, called equilibrium pricing, in which prices are derived from a linear programming model of competitive equilibrium. To evaluate the improvement in incentives associated with equilibrium pricing, we define a measure, called the disincentive index, of the extent to which a set of prices creates economic disincentives to efficient behavior. In the situation in which all hospitals compete in a single market area, we show that equilibrium pricing creates the best possible economic incentives, i.e., by reducing the disincentive index to zero. The analysis is then extended to the

more realistic situation where hospitals compete in limited geographical market areas, whereas prices must be uniformly set for a number of such market areas. We prove that, with an appropriate generalization of the disincentive index, equilibrium prices for a single market area are also optimal for multiple market areas. Finally, actual cost and utilization data from hospitals that compete in eastern Massachusetts are used to determine prices and to evaluate the associated disincentive index for a simulated prospective payment system. This empirical study shows a dramatic improvement in the incentives created by equilibrium pricing compared to average-cost pricing. *Management Sciences,* June 1994, 40(6): 774-787. (Reprinted with permission of *Management Sciences.*)

Health Economics

QALYs versus HYEs, by A. J. Culyer and A. Wagstaff

This paper explores the claim that quality adjusted life years (QALYs) may misrepresent consumer preferences and, hence, lead to decision-makers choosing options that are not those preferred by the public. It also considers the claim that healthy years equivalent (HYEs) do not suffer from this defect. The authors argue that none of the examples offered to date demonstrate that alleged tendency of QALYs to misrepresent preferences. They also show that HYEs are identical to QALY scores obtained from a time trade-off experiment and, therefore, that the assumptions about preferences underlying HYEs are just as restrictive as those underlying time trade-off based QALYs. *Journal of Health Economics,* October 1993, 12(3): 311-323. (Reprinted with permission of the *Journal of Economic Literature.*)

A Note on HYE (Healthy Years Equivalent), by K. Buckingham

This note presents a simplified description of the healthy years equivalent (HYE) health outcome measure. The author examines the claims made for the HYE and discusses their theoretical validity. The HYE is shown to be conceptually flawed because of confusions between the measures of value and the things being valued. Under close inspection, the unnecessarily complicated multiple stage valuation used to determine the HYE is seen to be no more than an indirect way of asking the time trade-off. For this reason, the claimed superiority of the method over the quality adjusted life year is rejected. *Journal of Health Economics,* October 1993, 12(3): 301-309. (Reprinted with permission of the *Journal of Economic Literature.*)

Government Insurance Programs

The Value of Pension Benefit Guaranty Corporation Insurance, by George G. Pennacchi (University of Illinois) and Christopher M. Lewis (Office of Management and Budget)

This paper considers the cost of Pension Benefit Guaranty Corporation (PBGC) insurance for singe-employer defined-benefit pension plans. It derives a formula for the PBGC's liability that explicitly recognizes that two necessary conditions must arise for the PBGC to sustain a loss. First, the corporation sponsoring the pension fund must undergo bankruptcy, and, second, this pension plan must be underfunded. The PBGC's liability is valued as a contingent put option and expressed as infinite series of modified Bessel functions. The comparative statics of the model are examined and are quite consistent with economic intuition. *Journal of Money, Credit and Banking,* August 1994, 26(3): 735-753. (Reprinted with permission of the *Journal of Money, Credit and Banking.*)

Social Insurance

An Empirical Analysis of Married Women's Retirement Decisions, by Jessica Primoff Vistnes (Agency for Health Care Policy and Research, Rockville, Maryland)

This paper estimates a transitional probability model to analyze the retirement decisions of married women in the Retirement History Study. The results show that an increase in the marginal change in Social Security wealth from additional work increases the probability that married women continue to work. This result implies that married women who receive a Social Security spouse benefit based on their husbands' earnings records, retire earlier than otherwise similar married women. The study also suggests that pension coverage of the wife encourages work at younger ages but discourages work at older ages. *National Tax Journal,* March 1994, 47(1): 135-155. (Reprinted with permission of the *National Tax Journal.*)

Social Security and Household Wealth Accumulation: Refined Microeconometric Evidence, by Edward T. Gullason, Bharat R. Kolluri, and Michael J. Panik (University of Hartford)

This study examines the relationship between social security wealth and fungible wealth using relatively recent micro data. We find that a ceteris paribus increase in social security wealth has no effect on fungible wealth, suggesting that Ricardian equivalence holds. Of the individual wealth categories comprising fungible wealth, only pension wealth is negatively and significantly affected by an increase in social security wealth and, if some of this pension wealth is not fully funded, Ricardian equivalence will not hold. We conclude therefore that the social security system might adversely affect capital accumulation, but not necessarily to the degree suggested by others. *The Review of Economics and Statistics,* August 1993, 75(3): 548-551. (Reprinted with permission of *The Review of Economics and Statistics.*)

Employee Benefits

The Incidence of Mandated Maternity Benefits, by Jonathan Gruber (Massachusetts Institute of Technology)

I consider the labor-market effects of mandates which raise the costs of employing a demographically identifiable group. The efficiency of these policies will be largely dependent on the extent to which their costs are shifted to group-specific wages. I study several state and federal mandates which stipulated that childbirth be covered comprehensively in health insurance plans, raising the relative cost of insuring women of childbearing age. I find substantial shifting of the costs of these mandates to the wages of the targeted group. Correspondingly, I find little effect on total labor input for that group. *The American Economic Review,* June 1994, 84(3): 622-641. (Reprinted with permission of *The American Economic Review.*)

Pensions and Retirement

Taxes, Retirement Transfers, and Annuities, by H. Bateman, G. Kingston, and J. Piggott

In most countries, retirement benefits from pension saving must be taken as an annuity. By contrast, Australia allows benefits to be taken as a lump sum and instead has recently introduced various tax incentives to encourage annuity purchase. This paper investigates the effectiveness of these tax concessions and concludes that they do little to achieve this objective. This is because they are nullified by the provisions of the broader tax and social security framework within which Australian private pension policy is set. *Economic Record,* September 1993, 69(206): 274-284. (Reprinted with permission of the *Journal of Economic Literature.*)

Pension Funding

Public Policies and Private Pension Contributions, by William G. Gale (Brookings Institution)

Changes in pension regulation since 1974 have coincided with changes in pension coverage, plan choice, funding status, and pension contribution. This paper examines the effects of regulation and other factors on these items. The main contribution is a new set of estimates of the determinants of pension contributions. Regressions using a new, comprehensive measure of private pension contributions indicate that ERISA raised contributions, and the 1987 full funding limitations reduced contributions. In each case, the regulatory change accounts for a sizable share of the actual change in contributions. *Jour-*

nal of Money, Credit and Banking, August 1994, 26(3): 710-732. (Reprinted with permission of the *Journal of Money, Credit and Banking.*)

Delay, Feedback and Variability of Pension Contributions and Fund Levels, by Alexandros Zimbidis and Steven Haberman (City University, London)

In this paper, we construct a general model for studying the variability of contribution rates and fund levels, when there are time delays and feedback into a pension fund. Time delays are introduced into the model using a parameter q, which takes the values 1, 2, 3, ... The time delay of q years is introduced at each time t, when the contribution rate is fixed by considering the information or the data we have for the pension fund at time $t - q$ (e.g., the fund level at time $t - q$, $F(t-q)$). Real rates of return on the fund are assumed to be represented by independent, identically distributed random variables. Other assumptions are made but these assumptions are not essential and we use them in order to simplify our mathematical formulae. We obtain expressions for the expectations and the variances of fund and contribution levels for finite t and in the limit as t goes to infinity (for all values of q). Then we investigate their behaviour and how they change as the parameter q takes the values 0, 1, 2, 3, ... up to infinity. *Insurance: Mathematics and Economics,* December 1993, 13(3): 271-285. (Reprinted with permission of North-Holland Publishing Company.)

Pension Funding, by Steven Haberman (City University, London)

We consider a mathematical model of the financial structure of a defined benefit occupational pension scheme and investigate the variability of pension contributions and fund levels in the presence of independent and identically distributed investment returns. In particular, we consider the specific cases of annual and triennial valuations and compare the optimal spread periods (for amortizing valuation surpluses and deficiencies) and the relative limiting variances of the pension contributions and fund levels. For non-negative expected real rates of investment return, it is found that the optimal spread period is marginally increased when we move from annual valuations to triennial valuations (from M^* to M_1^*). For values of M *less than* $M_2^* = M_1^*$, it is found that the relative limiting variances of both contributions and fund levels are increased in the triennial valuation case relative to the annual case. The results are then generalized to the case where valuations are every n years (where n is an integer). *Insurance: Mathematics and Economics,* December 1993, 13(3): 263-270. (Reprinted with permission of North-Holland Publishing Company.)

Estate Planning and Distribution

The Non-Equalization of True Gift and Estate Tax Rates, by Michael Kuehlwein (Pomona College)

Before 1976, the affluent transferred most of their wealth to their heirs through bequests, not gifts, even though gifts faced lower statutory tax rates.

This suggests the affluent were not acting altruistically. However, bequests had the advantage that unrealized capital gains were forgiven at the moment of transfer. Taking this into account, I derive true marginal gift and estate tax rates. Contrary to previous research, I find that the affluent failed to equalize these true rates, both before and after 1976. This represents stronger evidence that the large transfers made by the affluent were not motivated by altruism. *Journal of Public Economics,* February 1994, 53(2): 319-323. (Reprinted with permission of North-Holland Publishing Company.)

Insurer Management and Regulation

Evaluation of the GIC Rollover Option, by Hal W. Pedersen (Washington University) and Elias S. W. Shiu (University of Iowa)

In order to persuade its customer with a maturing guaranteed investment contract (GIC) to roll it over for another term, an insurer may have to provide him with an incentive in the form of a call option. That is, if the customer commits himself now to reinvest the proceeds from his current GIC in a new GIC, the interest rate for the new GIC will be the maximum of today's interest rate and the interest rate on the day when the current GIC matures. This paper shows that there is a very simple formula for determining the interest-rate spread throughout the term of the new contract to pay for the option. The formula for the interest rate is: Multiply by 0.4 the standard deviation of the yield rate of the underlying zero-coupon bond at the reinvestment date as estimated at the contract commitment date. *Insurance: Mathematics and Economics,* May 1994, 14(2): 117-127. (Reprinted with permission of North-Holland Publishing Company.)

Junk Bonds, Life Insurer Insolvency, and Stock Market Reactions: The Case of First Executive Corporation, by Joseph A. Fields (University of Connecticut), James B. Ross (Radford University), Chinmoy Ghosh (University of Connecticut), and Keith B. Johnson (University of Connecticut)

The First Executive Corporation was the largest failure in the history of the life insurance industry. The company was one of the most aggressive purchasers of junk bonds through the 1980s and was the first of several large failures in the staid life insurance industry. We find that the price of other life insurer stock is negatively affected by the earnings announcement that preceded First Executive's failure. The magnitude of an individual company's reaction to First Executive's loss varies according to the proportion of the company's assets invested in junk bonds, the proportion of the company's assets invested in real estate, and the financial strength of the company as measured by A. M. Best's rating. *Journal of Financial Services Research,* April 1994, 8(2): 95-111. (Reprinted with permission of the *Journal of Financial Services Research.*)

Prices, Distribution Channels and Regulatory Intervention in European Insurance Markets, by J. Finsinger and F. A. Schmid (University of Vienna)

The "Cost of Non-Europe" reports suggest that the opening of European national financial services markets will benefit consumers by increasing competition. But these gains are only some of the potential consumer benefits that may result from European market integration. The EC-member countries have developed quite different schemes of insurance market regulations. Except for an agreement on some basic aspects such as solvency regulations, a harmonisation of the national rules of insurance market regulations was not achieved. For the time being, some markets continue to be highly regulated while others remain relatively unregulated. When freedom of service will be finally realised in Europe, insurance contracts written under different regulatory rules will compete with each other. Ultimately, as the volume of exports grows, the national regulatory rules will be put to the market test. This paper provides an empirical analysis of how regulatory schemes affect key market characteristics and thus contribute to an understanding of the forces unleashed by the freedom of service program.

Numerous studies which deal with the influence of regulation on insurance premiums have been carried out for the United States (see Harrington, 1984). A price level index is chosen; typically the inverse of the loss ratio, premium divided by the benefits paid to consumers, is analysed. The larger the proportion of premiums paid out as benefits to policyholders, the lower the price of the insurance is considered to be. A drawback of this approach is that price differences that are due to quality differences cannot be controlled for if no suitable measure of product quality is available (a study that takes variations into account is that by Pauly, Kunreuther, and Kleindorfer, 1986). In this paper, the problem of product differentiation was avoided by considering a single and well-defined homogeneous product which is pure risk life insurance. The premiums of this product in highly regulated countries can be shown to exceed the premiums in less regulated countries by 117 percent.

The distribution channels that are used for the marketing of insurance products "carry" different kinds of information and are therefore crucial for the consumer's purchase decisions. Since the national supervisory systems are meant to protect the imperfectly informed customers, the merits of these systems can be assessed by looking at the market shares of the various distribution channels. The market shares of various types of distribution channels such as brokers, multiple agents, exclusive firm agents, direct marketing and banks are presented for ten EC-member countries. The analysis shows that, in highly regulated environments, distribution channels which provide less information to consumers tend to dominate. Moreover, it will be shown that regulation fosters concentration and leads to more stable market shares. *The Geneva Papers on Risk and Insurance*, January 1994, 19(70): 22-36. (Reprinted with permission of *The Geneva Papers on Risk and Insurance*.)

Ex Post Control of Insurance in Belgium, by Herman Cousy and Hubert Claassens (University of Leuven)

This paper focuses on some aspects of an important modification which recently has been or shortly will be introduced into the supervisory legislation of most of the EEC-member states and which is commonly referred to as the change from "ex ante supervision" (in French, *contrôle a priori*) to "ex post supervision" (in French, *contrôl a postériori*), a change which was set in motion by the so-called "third generation" EC insurance directives.

After some introductory remarks concerning terminology and classification of the different types or models of insurance supervision, this paper will first very briefly describe the way in which the ex ante/ex post discussion was introduced by the EC directives, and then concentrate upon the case study of the rather remarkable way in which Belgian legislation has recently interpreted and implemented the new principle of "a posteriori control" by its regime of *contrôle de la rentabilité*. While intending to remain mainly descriptive, the paper will also raise some questions both as to the substantive merits of the described system and as to compatibility of this system with the EC (third generation) directives. The study of the Belgian case will also lead to some more general considerations about supervisory policies and methods. *The Geneva Papers on Risk and Insurance,* January 1994, 19(70): 46-59. (Reprinted with permission of *The Geneva Papers on Risk and Insurance.*)

Information Technology

Determinants of Electronic Integration in the Insurance Industry: An Empirical Test, by Akbar Zaheer (University of Minnesota) and N. Venkatraman (Boston University)

Electronic integration—a form of vertical quasi-integration achieved through the deployment of dedicated computers and communication systems between relevant actors in the adjacent stages of the value chain—is an important concept to researchers in the information systems field since it focuses on the role of information technology in restructuring vertical relationships. Drawing on theoretical and empirical research on transaction cost, we develop and test a model of the determinants of the degree of electronic integration in the commercial segment of the property and casualty insurance industry. Based on a sample of 120 independent agencies operating under dedicated information technology-mediated conditions, we provide empirical support for three hypotheses on the determinants of electronic integration. Implications and research extensions are identified to guide further research in this important area. *Management Science,* May 1994, 40(5): 549-566. (Reprinted with permission of *Management Science.*)

Liability Rules

Pretrial Bargaining and the Design of Fee-Shifting Rules, by Kathryn E. Spier (Northwestern University)

Legal rules for allocating the private costs of civil litigation, of "fee-shifting" rules, provide powerful incentives for settlement. Within the context of a direct-revelation mechanism, the fee-shifting rule that generates the highest probability of settlement bases the allocation of costs upon the proximity of the court's award to the pretrial announcements. This mechanism resembles Rule 68 of the Federal Rules of Civic Procedure and other offer-based rules. In a simple extensive-form game, if the litigants have asymmetric information about the level of damages (probability of prevailing), the Rule 68 increases (decreases) the settlement rate. *Rand Journal of Economics,* Summer 1994, 25(2): 197-214. (Reprinted with permission of the *Rand Journal of Economics.*)

The Burden of Proof and the Liability Rule for Suppliers of Services in the EEC, by Christopher Curran (Emory University)

On November 9, 1990, the Commission submitted to the Council of the European Communities a proposal to shift the burden of proof in cases involving services. Scholars of law and economics have tended to ignore the implications of which party to a legal dispute bears the burden of proof. American tort courts normally expect the plaintiff to prove that the negligence of the defendant caused him injury. However, analyses show that there is no reason *a priori* that plaintiffs should bear the burden of proof on anything other than proving that there are actual damages. For instance, in situations where little evidence about a defendant's actions exists after an accident, it may be less costly for the defendant to prove that he took due care than it is for the plaintiff to attempt to prove that the defendant did not take due care. In these cases, Coase's Theorem would seem to suggest that, since transaction costs are minimized when the defendant bears the burden of proof, the defendant should bear the burden of proving that he did not cause the damages.

It is this very argument, in fact, that seems to be the basis of the Commission's proposal. Unfortunately, the Commission offers no empirical support for this claim. Moreover, as discussed later, shifting the burden of proof to the service suppliers will have the detrimental effects of amount of insurance bundled in service prices and of decreasing the quantity of services demanded. Cost savings, though, are not the only potential benefit from changing the burden of proof to service suppliers. There may be additional benefits if the new rule gives service suppliers more incentives to take due care. It is this last issue that is the focus of this paper. In particular, we use models developed in the law and economics literature to analyze the impact of the proposed change on the caretaking decisions of service providers. Moreover, since the main conclusion of this paper is that shifting the burden will have little effect on the caretaking decisions of service suppliers, justification of the

Commission's recommendation awaits further empirical research. *The Geneva Papers on Risk and Insurance,* January 1994, 19(70): 85-98. (Reprinted with permission of *The Geneva Papers on Risk and Insurance.*)

Injury Compensation

Compensation for Personal Injuries: A Review of Recent Legal and Insurance Developments in the UK, by Roger Bowles (University of Bath)

The purpose of the first part of this paper is to explore the principles which govern the award of damages for personal injury under English law. We show here that the traditional judicial approach to damages has a natural interpretation as a means of computing the present value of expected loss. The purpose of the second part is to apply the model to the debate going on in England at present as to how best the law in this area may be reformed in the light of the development of "structured settlements." The rapid growth of structuring is explained by reference to the advantages current arrangements (most notably the agreement struck between the Inland Revenue and the Association of British Insurers as to the tax treatment of annuities) offer to insurers, although we do not offer a full public choice treatment of the development of policy in this area.

The economic model of accident law familiar from the literature is usually based on the assumption that judges make awards of damages which reflect accurately the plaintiff's losses (see for example Shavell, 1987.) Claims about the efficiency of negligence rules rely on such assumptions, and yet much of the literature concerns itself with matters of detail about the structure of the liability rules and ignores the question of whether courts, in practice, are making reliable estimates of losses.

The present paper has narrower ambitions than much of the efficiency-based literature. It is concerned more with valuation procedures than with the efficiency properties of the amounts of damages which result. It seems relatively clear that English judges are seeking to make awards which reflect as closely as possible the present value of losses. Thus we do not follow the lead of Rea (1990) in seeking to explore the role of taxation and its influence on the capacity of a negligence rule to meet various objectives in a welfare maximization setting. We are concerned with the rather different task of characterising the way English judges quantify awards of damages and identifying circumstances in which these procedures may fail to approximate the present value of plaintiffs' losses. *The Geneva Papers on Risk and Insurance,* January 1994, 19(70): 60-69. (Reprinted with permission of *The Geneva Papers on Risk and Insurance.*)