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Edited by Phyllis Schiller Myers
Virginia Commonwealth University

THEORY OF CONTRACTS

Noisy Observation in Adverse Selection Models, by B. Caillaud (CEPREMAP, Paris), R. Guesnerie (DELTA, Paris) and P. Rey (ENSAE, Paris)

We consider a principal-agent contracting problem under incomplete information where some of the agent's actions are imperfectly observable. Contracts take the form of reward schedules based on the noisy observation of the agent's action. We first review situations where the principal can reach the same utility as in the absence of noise. We exhibit sufficient conditions under which linear reward schedules implement a given mechanism. Finally, we characterize necessary conditions for a mechanism to be implementable under noisy observation by a linear schedule, and by quadratic schedules. We give the geometric intuition behind all results. *Review of Economic Studies*, Vol. 59 (3), No. 200 (July 1992), pp. 595-615. (Reprinted with permission of the *Review of Economic Studies*.)

RISK PERCEPTION AND ECONOMIC THEORY

Increases in Risk and Deductible Insurance, by L. Eeckhoudt (Catholic Facilities of Mons, Belgium and Lille, France), C. Gollier (Groupe HEC, France) and H. Schlesinger (University of Alabama)

This paper examines how mean-preserving transformations in the loss distribution affect the optimal level of deductibility in an insurance contract. If marginal utility is convex, increases in risk affecting losses only below the deductible are shown to lead to a reduction in coverage (higher deductible), which can be viewed as an increase in precautionary savings. On the other hand, a transformation that spreads losses more toward the tails of the distribution leads to an increase in coverage (lower deductible)

whenever preferences exhibit nonincreasing absolute risk aversion. *Journal of Economic Theory*, Vol. 55, No. 2 (December 1991), pp. 435-40. (Reprinted with permission of Academic Press, Inc.)

Status, The Distribution of Wealth, Private and Social Attitudes to Risk, by Arthur J. Robson (University of Western Ontario)

This paper supposes an individual cares about his/her own wealth not only directly but also via the relative standing that this wealth induces. The implications for risk-taking are investigated in particular. Such a model provides a natural explanation of the "concave-convex-concave" utility described by Friedman and Savage. However, there are a number of key differences between the present model and any model based on own wealth alone. For example, an equilibrium wealth distribution here may have a middle class. Further, the status interaction involves an externality and an equilibrium wealth distribution may be Pareto inefficient. *Econometrica*, Vol. 60, No. 4 (July 1992), pp. 837-57. (Reprinted with permission of *Econometrica*.)

GAME THEORY

Existence and Dynamic Consistency of Nash Equilibrium with Non-Expected Utility Preferences, by E. Dekel (University of California, Berkeley), Z. Safra (University of Pennsylvania and Tel Aviv University) and U. Segal (University of Toronto)

Sufficient conditions for the existence of a Nash equilibrium are given when preferences may violate the reduction of compound lotteries assumption. Without the reduction of compound lotteries assumption, decision-makers may not be indifferent between compound lotteries that have the same probabilities of final outcomes. Therefore, the conditions depend on how players perceive the game—whether they view themselves as moving first or second. The authors also review conditions under which the equilibria will be dynamically consistent. *Journal of Economic Theory*, Vol. 55, No. 2 (December 1991), pp. 229-46. (Reprinted with permission of Academic Press, Inc.)

UTILITY THEORY

Repeated Gambles, Learning, and Risk Aversion, by Kevin F. McCardle and Robert T. Winkler (Duke University)

We analyze a decision problem with repeated gambles and find that under some seemingly reasonable risk-averse utility functions, recommended behavior for the initial decision can be highly risk-taking and counterintuitive. Further analysis reveals that the derived utility function for the

return on the first gamble is discontinuous because gains or losses carry with them positive or negative signals regarding future prospects. A variant of the basic model without a discontinuity in derived utility has essentially the same implications. The issues raised in this paper present no conceptual difficulties for the standard expected utility theory; in principle, we can model the grand world and understand fully all implications of grand-world utility functions. In practice, however, this ideal may not always be attainable and as a result we may be faced with serious modeling and assessment problems. *Management Science*, Vol. 38, No. 6 (June 1992), pp. 807-18. (Reprinted with permission of *Management Science*.)

Risk, Return, Skewness and Preference, by Patrick L. Brockett (University of Texas) and Yehuda Kahane (Tel Aviv University)

This paper considers choice between individual projects and shows that when the choice set includes arbitrary distributions, then *any* assumed relationship between expected utility theory and general moment preferences for individual decision-makers is theoretically unsound. In particular, a risk averse investor with *any* common utility function may, when choosing between two positive return opportunities, prefer the project simultaneously having a lower mean, higher variance, and lower positive skewness. Moreover, the decision-maker can prefer opportunities with higher variance even when the opportunities are continuous, unimodal, and arbitrarily visually and statistically close to the normal distribution in shape. Our conclusions hold for any decision-maker with a utility function whose derivatives alternate in sign being strictly positive or negative (i.e., we exclude the uninteresting cases of quadratic and cubic utilities).

The method of analysis is based upon the theory of Tchebychev systems of functions which deals with the expected value of [utility] functions of stochastic variables with known moments. Although we focus on the first three moments, the results, as presented here, apply to all higher moments as well. It is also shown that there can be extremely large deviations between the certainty equivalents of distributions having the same moments, so this result is also pertinent to practical decision analysts as well. The paper demonstrates that the properties of utility functions have implications which are much more subtle than previously recognized for evaluating distributions in terms of their moments. *Management Science*, Vol. 38, No. 6 (June 1992), pp. 851-66. (Reprinted with permission of *Management Science*.)

A More Robust Definition of Subjective Probability, by Mark J. Machina (University of California, San Diego) and David Schmeidler (Tel-Aviv University)

The goal of choice-theoretic derivations of subjective probability is to separate a decision-maker's underlying *beliefs* (subjective probabilities of events) from their *preferences* (attitudes toward risk). Classical derivations

have all relied upon some form of the Marschak-Samuelson "Independence Axiom" or the Savage "Sure-Thing Principle," which imply that preferences over lotteries conform to the expected utility hypothesis. This paper presents a choice-theoretic derivation of subjective probability, in a Savage-type setting of purely subjective uncertainty, which neither assumes nor implies that the decision maker's preferences over lotteries necessarily conform to the expected utility hypothesis. *Econometrica*, Vol. 60, No. 4 (July 1992), pp. 745-80. (Reprinted with permission of *Econometrica*.)

The Influence of Probability on Risky Choice—A Parametric Examination, by Pamela K. Lattimore (National Institute of Justice, Washington, D.C.), Joanna R. Baker (Virginia Polytechnic Institute and State University) and Ann D. Witte (Wellesley College, National Bureau of Economic Research)

The appeal of expected utility theory as a basis for a descriptive model of risky decision making has diminished as a result of empirical evidence which suggests that individuals do not behave in a manner consistent with the prescriptive tenets of EUT. In this paper, we explore the influence of probability on risky choice, by proposing and estimating a parametric model of risky decision making. Our results suggest that models which provide for probability transformations are most appropriate for the majority of subjects. Further, we find that the transformation differs for most subjects depending upon whether the risky outcomes are gains or losses. Most subjects are considerably less sensitive to changes in mid-range probability than is proposed by the expected utility model and risk-seeking behavior over "long-shot" odds is common. *Journal of Economic Behavior and Organization*, Vol. 17, No. 3 (May 1992), pp. 377-400. (Reprinted with permission of North-Holland Publishing Company.)

RISK THEORY

Ordering of Risks Through Loss Ratios, by Werner Hürlimann (Winterthur-Leben, Winterthur, Switzerland)

Using a model of financial insurance a *stable retention ratio* is associated to the underwriting return ratio of an insurable risk. It is the most stable retention ratio needed to cover the risk of an over-loss by self-finance. A recursive algorithm to evaluate it is derived. Two new total ordering relations are defined. The first, *return order* shows the relation between the stable retention ratios for different risk. It preserves stop-loss order between loss ratios. The mean-variance approximation of the stable retention ratio defines a *stability return index*, which is shown to induce a total *stable return order* on risks which preserves stop-loss order between loss ratios with equal mean. The actuarial use of the new concepts is illustrated by some examples. *Insurance: Mathematics and Economics*, Vol. 11, No. 1

(April 1992), pp. 49-54. (Reprinted with permission of North-Holland Publishing Company.)

HEALTH ECONOMICS

The Journal of Economic Perspectives, Vol. 6, No. 3 (Summer 1992) contains a symposium on health economics which may be of interest to some of *JRI*'s readers. The following papers are included:

Medical Care Costs: How Much Welfare Loss?, by Joseph P. Newhouse (Harvard University), pp. 3-21.

Diffusion of Information in Medical Care, by Charles E. Phelps (University of Rochester), pp. 23-42.

Possible Reforms for Financing Long-Term Care, by William J. Scanlon (Georgetown University), pp. 43-58.

SOCIAL INSURANCE

Pay-As-You-Go Public Pensions with Endogenous Fertility, by Kazuo Nishimura (Kyoto University, Japan) and Junsen Zhang (Australian National University and University of Western Ontario)

Veall's (1986) model of public pensions is generalized to allow for endogenous fertility. We show that gifts to the old, which can be viewed as social security contributions, are always positive in the steady state. An optimal stationary allocation is sustainable. In particular, if a government enforces a social security plan setting the pension level at the optimal gifts and individuals optimize under the pension constraint, the resulting sustainable outcome is in general different from either the optimal or Nash outcome. *Journal of Public Economics*, Vol. 48, No. 2 (July 1992), pp. 239-58. (Reprinted with permission of North-Holland Publishing Company.)

EMPLOYEE BENEFITS

Taxes, Fringe Benefits and Faculty, by Stephen A. Woodbury (Michigan State University and W. E. Upjohn) and Daniel S. Hamermesh (Michigan State University and National Bureau of Economic Research)

The growth of employee benefits in academe has closely paralleled their economy-wide growth. This study estimates a complete system describing the demand for benefits and wages using panel data on 1477 institutions of higher learning. The demand for benefits is very responsive to changes in real income and the tax price of benefits. These conclusions are robust with respect to varying definitions of the tax price, treating it as endogenous, and accounting for unmeasured individual effects on demand. Simulations

suggest that the Tax Reform Act of 1986 sharply reduced the demand for benefits. Extrapolating the impact to the entire economy, the annual flow of compensation shifted away from benefits by at least \$15 billion. *The Review of Economics and Statistics*, Vol. LXXIV, No. 2 (May 1992), pp. 287-96. (Reprinted with permission of North-Holland Publishing Company.)

PENSIONS

The Market Valuation Implications of Net Periodic Pension Cost Components, by Mary E. Barth (Harvard University), William H. Beaver (Stanford University) and Wayne R. Landsman (University of North Carolina)

This paper examines whether market participants implicitly assign different coefficients to pension cost components when determining security prices. The major findings are: (1) The pension cost components' coefficients generally differ from one another. As predicted, the transition asset amortization coefficient is lower than other pension coefficients, and is insignificantly different from zero. (2) Consistent with the market viewing pension-related income streams as less risky, the pension coefficients are generally larger than the nonpension coefficients. Additional specification tests permitting nonpension coefficients to vary with risk, taxpayer status, and industry membership, generally support the basic findings, although the significance levels are generally higher. *Journal of Accounting and Economics*, Vol. 15, No. 1 (March 1992), pp. 27-62. (Reprinted with permission of North-Holland Publishing Company.)

A Simulation Comparison of Actuarial and Contingent Claims Models for Unfunded Pension Liabilities, by G. Lee Willinger (University of Oklahoma)

Corporate financial statements must include pension plan disclosures. The disclosures include information that allows users to compute the unfunded pension liability. Willinger (1985) discusses an alternative contingent claims model for the valuation of unfunded pension liabilities. This alternative model may be preferred to the actuarial present value model, as the model reduces the opportunities to manipulate the pension liability. This paper develops simulations that compare the actuarial model to the contingent claims model. The results provide evidence that the contingent claims model reduces variation in the possible pension liability and therefore reduces the possible manipulative qualities of the actuarial model. *Quarterly Journal of Business and Economics*, Vol. 31, No. 2 (Spring 1992), pp. 72-97. (Reprinted with permission of the *Quarterly Journal of Business and Economics*.)

INSURER MANAGEMENT AND REGULATION

Modeling Large Claims in Non-life Insurance, by Jan Beirlant and Jozef L. Teugels (Katholieke Universiteit Leuven, Louvain, Belgium)

This paper gives an overview of relevant distributional models and diagnostics to model large claims or outliers in an insurance setting. The specific behavior of portfolio items such as total claim amount and ruin probabilities, and the problem of reinsurance in the presence of large claims, are elucidated. The existing practical tools are outlined and illustrated with some practical examples. *Insurance: Mathematics and Economics*, Vol. 11, No. 1 (April 1992), pp. 17-29. (Reprinted with permission of the North-Holland Publishing Company.)

A Dynamic Reinsurance Theory, by A. DeWaegenaere (Universiteit Antwerpen, U.I.A., Antwerp, Belgium) and F. Delbaen (Vrije Universiteit Brussel, Brussels, Belgium)

In this paper we present a technique that can be used by the insurer, who reinsured part of his risk by means of a proportional stop-loss contract, to evaluate his residual risk position. Part of this technique consists of the calculation of the optimal reinsurance strategy. We also show how this same technique can be used by the reinsurer to evaluate his risk position. *Insurance: Mathematics and Economics*, Vol. 11, No. 1 (April 1992), pp. 31-48. (Reprinted with permission of the North-Holland Publishing Company.)

Robust Methods for Credibility, by Hans R. Künsch (ETH-Zentrum, Zürich, Switzerland)

Excess claims lead to an unsatisfactory behavior of standard linear credibility estimators. We suggest in this paper to use robust methods in order to obtain better estimators. Our first proposal is the linear credibility estimator with the claims replaced by a robust M-estimator of scale calculated from the claims. This corresponds to a truncation of the claims with a truncation point depending on the data and different for each contract. We discuss the properties of the robust M-estimator and present several examples. In order to improve the performance for a very small number of years, we propose a second estimator, which incorporates information from other claims into the M-estimator. *Astin Bulletin*, Vol. 22, No. 1 (May 1992), pp. 33-49. (Reprinted with permission of *Astin Bulletin*.)

Controlling Automobile Insurance Costs, by J. David Cummins and Sharon Tennyson (University of Pennsylvania)

Automobile insurance prices rose rapidly throughout the 1980s, even as the general rate of inflation slowed and automobile accident rates declined.... The populist view is that high insurance costs are primarily

attributable to inefficient and excessively profitable insurance companies. Insurers are accused of paying claims without adequate controls, padding their expenses, and passing the costs along to the consumer, all while being shielded by a federal antitrust exemption. Insurers counter that insurance markets are competitive and efficient. They attribute rising costs to the excesses of the tort liability system, which is largely beyond their control. Insurers argue that profits are declining, in part because rate regulation has prevented prices from fully adjusting to recognized claim cost inflation.

Informed discussion of the auto insurance issue has been impeded by the complexity of the issue and the difficulty of obtaining objective information. Publicly available statistics generally are highly aggregated and presented in a form accessible only to the specialist. As a result of these limitations, much of the auto insurance debate has been emotional and uninformed and has focused on the wrong issues. The primary objective of this paper is to remedy this situation. We begin by providing an overview of the auto insurance system and the structure of the auto insurance market. We then turn to an analysis of the factors underlying the auto insurance price increases experienced in recent years. The paper concludes with recommendations for bringing costs under control. *Journal of Economic Perspectives*, Vol. 6, No. 2 (Spring 1992), pp. 95-115. (Reprinted with permission of the *Journal of Economic Perspectives*.)

Corporate Demand for Insurance: Some Empirical and Theoretical Results, by Wallace N. Davidson, III (Southern Illinois University), Mark L. Cross (Louisiana Tech) and John H. Thornton (University of North Texas)

Although risk aversion explains individual consumer demand for insurance, it does not explain the corporate demand for insurance. Studies have suggested a variety of incentives that motivate corporations to purchase insurance. We find that the primary motivation for corporate insurance purchases can be explained by the bondholder's me-first rule. In return for insurance, bondholders will charge stockholders a lower cost of debt, thereby increasing firm value. *Journal of Financial Services Research*, Vol. 6, No. 1 (May 1992), pp. 61-72. (Reprinted with permission of Kluwer Academic Publishers.)

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