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Virginia Commonwealth University

### RISK PERCEPTION AND ECONOMIC BEHAVIOR

***Arrow's Theorem on the Optimality of Deductibles: A Stochastic Dominance Approach***, by Christian Gollier (University of Toulouse, France) and Harris Schlesinger (University of Alabama)

We provide a new proof for the optimality of deductible insurance that does not depend on the expected-utility hypothesis. Our model uses first- and second-degree stochastic dominance arguments. *Economic Theory*, Spring 1996, 7: 359–363. (Reprinted with permission of *Economic Theory*.)

***Risk Compensation: Implications for Safety Interventions***, by Adam Stetzer (Purdue University) and David A. Hoffman (Purdue University)

Several theories of driving behavior have suggested that individuals will react to environmental changes in a compensatory fashion such that riskier behaviors result from perceptions that the environment has become safer. Specifically, both Peltzman (1975) and Wilde (1982) have proposed such compensation mechanisms, although Wilde takes a more stringent approach. Unfortunately, the majority of studies on the topic have attempted to test the compensation mechanism using aggregate accident data. Studies that have investigated risk compensation at the level of the individual have failed to assess subjective risk, a critical variable for the interpretation of the risk associated with specific behaviors. It is argued that risk compensation can only operate at the individual level and that previous studies testing the validity of risk compensation are difficult to interpret due to levels of analysis issues or unmeasured variables. In the current investigation, two judgment decision making studies were designed to test risk compensation. Individual level analyses indicated that there was modest support for Peltzman's mild interpretation of the risk compensation mechanism, but that individuals do not compensate for changes in the environment enough to return to their original levels

of risk as Wilde has predicted. *Organizational Behavior & Human Decision Processes*, April 1996, 66(1): 73–88. (Reprinted with permission of Academic Press, Inc.)

***Changes in Background Risk and Risk Taking Behavior***, by Louis Eeckhoudt (Facultés Universitaires Catholiques de Mons et de Lille), Christian Gollier (University of Toulouse, France), and Harris Schlesinger (University of Alabama)

We consider the effects of changes in the distribution of a background risk on the optional risk taking behavior of a risk-averse decision maker. In particular, we suppose that the background risk deteriorates via a first- or second-degree stochastic dominance shift. Our contention is that such a change in background wealth should lead the individual to behave in a more risk-averse manner. We identify necessary and sufficient conditions for a deterioration in background wealth to increase the index of absolute risk aversion, either for FSD or SSD shifts in distribution. These conditions place restrictions on the stronger measure of risk aversion defined by Ross (1981). *Econometrica*, May 1996, 64(3): 683–689. (Reprinted with permission of *Econometrica*.)

***Learning To Be Risk Averse***, by James G. March (Stanford University)

Experimental learning that conforms to standard learning models is shown to lead learners to favor less risky alternatives when possible outcomes are positive. This learning disadvantage for risky alternatives is likely to be quite substantial and persistent, particularly among relatively fast learners. Learning to choose among alternatives whose outcome lies in the negative domain, on the other hand, leads to favoring more risky alternatives in the short run but tends to become risk neutral in the long run. Thus, the fact that human beings exhibit greater risk aversion for gains than for losses in a wide variety of situations may reflect accumulated learning rather than inexplicable human traits or utility functions. Some implications of an experiential learning interpretation of risk preferences are discussed. *Psychological Review*, April 1996, 103(2): 309–319. (Reprinted with permission of *Psychological Review*.)

***The Influence of Positive Affect on the Decision Rule in Risk Situations: Focus on Outcome (and Especially Avoidance of Loss) Rather than Probability***, by Thomas E. Nygren (Ohio State University), Alice M. Isen (Cornell University), Pamela J. Taylor, and Jessica Dulin (Ohio State University)

Two experiments examined the influence of positive affect on probability estimation and choice. Participants in whom positive affect had been induced, as well as no-manipulation controls, were asked to make both numerical evaluations of ver-

bal probabilities in three-outcome gambles and actual betting decisions about similar gambles. Results from Experiment 1 showed the phenomenon labeled *cautious optimism*: Positive affect participants significantly overestimated the probabilities associated with phrases for winning relative to their estimates of probability of losing for the same phrases (*optimism*), while participants in a control condition did not; yet, in actual gambling situations, affect condition participants were much less likely to gamble than were controls when a real loss was possible (*caution*). Results of the betting task from the second experiment further indicated that affect participants used a betting-decision rule that was different from that of controls: They bet less than controls in gambles where potential losses were large, even though probability of loss was small, and they bet more than controls in gambles where the amount of the potential loss was small, even though the probability of loss was moderate or large. These findings suggest that positive affect can promote an overt shift from a decision rule focusing primarily on probabilities to one focusing on utilities or outcome values, especially for losses. Taken together, the results are compatible with an interpretation of the influence of positive affect in terms of an elaboration of positive cognitive material, and purposive behavior in decisions, rather than in terms of mere response bias. *Organizational Behavior & Human Decision Processes*, April 1996, 66(1): 59-72. (Reprinted with permission of Academic Press, Inc.)

#### STATISTICAL AND MATHEMATICAL MODELS

***On Smoothness Terms in Multidimensional Whittaker Graduation***, by James D. Broffitt (University of Iowa)

Multidimensional Whittaker graduations are obtained by minimizing a linear combination of a measure of lack-of-fit between the graduated and ungraduated values, and measures of lack-of-smoothness of the graduated values across each dimension. For convenience we shall use the terminology "smoothness," rather than lack-of-smoothness when referring to the terms included in the objective function. Standard smoothness terms are sums of squares of differences, with respect to a single variable, of the graduated values. Consequently, such terms may be thought of as measuring lack-of-smoothness in directions that are parallel to the various axes. Additional smoothness of the graduated values may be obtained by obtaining smoothness terms that are based on mixed differences. In this paper a method is developed for determining which smoothness terms to include in the objective function. This analysis assumes the graduator has pre-specified a polynomial model which represents the graduated values under ideal or ultimate smoothness.

A second problem of determining formulas for these smoothness terms is also solved. Whittaker graduation is most efficiently done when the objective function is expressed in terms of matrices. Smoothness terms may then be written as quadratic forms in the graduated values. Lowrie (1993) explains how to construct

the matrices of these quadratic forms; however, a basic formula for these matrices has not been found. In this paper formulas for these matrices are developed in terms of Kronecker products. An extension to nonstandard smoothness terms is also discussed. *Insurance Mathematics and Economics*, May 1996, 18(1): 13–27. (Reprinted with permission of North-Holland Publishing Company.)

***Statistical Tests of Stochastic Process Models Used in the Financial Theory of Insurance Companies***, by Patrick L. Brockett (University of Texas), Robert C. Witt (University of Texas), Boaz Golany (Israel Institute of Technology), Naim Sippra (University of Latrobe, Pakistan), and Xiaohua Xia (University of Texas)

This paper presents a statistical test allowing the analyst to determine if a given time series is statistically incompatible with being modeled as a linear or log-linear process. Since the commonly used models for financial series of interest to insurance professionals are linear or log-linear, this paper allows the analyst to verify the linearity of the model under investigation, or else points to the necessity of nonlinear modeling. We also show how to test for time series Gaussianity using the same type of statistical test. These results are applied to several financial data sets relevant to the financial operations of insurance companies. *Insurance Mathematics and Economics*, May 1996, 18(1): 73–79. (Reprinted with permission of North-Holland Publishing Company.)

#### PROBABILITY THEORY

***Extraction of Surplus Under Adverse Selection: The Case of Insurance Markets***, by Michael Lansberger (Haifa University, Israel) and Isaac Meilijson (Tel-Aviv University, Israel)

We consider a principal-agent setting with two types of risk-averse agents with different abilities to avoid losses. Abilities (types) are characterized by two distributions  $F$  and  $G$  which are agents' private information. All agents have the same increasing and strictly concave utility function  $U$ , under which  $G$  has a higher certainty equivalent. In this environment we derive a characterization of pairs of distributions under which a first best outcome can be achieved or approximated. It is proven that a first best outcome can be achieved if and only if the distribution  $F$  is not absolutely continuous with respect to the distribution  $G$ . If this condition is not satisfied, the first best outcome can be approximated if and only if the likelihood ratio  $dF/dG$  is unbounded. *Journal of Economic Theory*, April 1996, 69(1): 234–239. (Reprinted with permission of the Academic Press, Inc.)

## RISK THEORY

***Orderings of Risks: A Comparative Study Via Stop-Loss Transforms***, by Alfred Miller (Universität Karlsruhe, Germany)

The relations between the following concepts for ordering risks are investigated: stochastic dominance, stop-loss order, convex order, and being more dangerous. Using characterizations via stop-loss transforms, we give an elementary proof of the separation theorem for stop-loss order, and we correct a mistake in a result of van Heerwaarden (1991) about the connection of stop-loss order and being more dangerous. This is done by introducing a new notion of convergence for distributions. Moreover, we consider lattice properties of these orders. *Insurance Mathematics and Economics*, May 1996, 18(1): 215–222. (Reprinted with permission of North-Holland Publishing Company.)

## LOSS RESERVING

***UMVUE of the IBNR Reserve in a Lognormal Linear Regression Model***, by Louis G. Doray (Université de Montréal)

In this paper, we first find an expression for the mean and the variance of the IBNR claims in a lognormal linear regression model, of which the chain ladder model is considered as a special case. We then derive the unique uniformly minimum variance unbiased estimator (UMVUE) and the maximum likelihood estimator (MLE) of those quantities and calculate the variance of the UMVUE of the mean of the IBNR claims; we also find an estimator not involving an infinite series, which provides an excellent approximation to the UMVUE of the mean of the IBNR claims. Finally, the claims experience of an insurance company is used to compare the various estimators of the IBNR reserve developed in the paper. Several tests and graphs are used to verify model assumption. *Insurance Mathematics and Economics*, May 1996, 18(1): 43–57. (Reprinted with permission of North-Holland Publishing Company.)

## HEALTH CARE ISSUES

***Insurance Rationing Versus Public Political Rationing: The Case of the Oregon Health Plan***, by Michael N. Baur, Julie B. Wang, and John F. Fitzgerald

The development and evolution of the Oregon experiment with public political rationing in health care is discussed. As dissatisfaction with current health care rationing has mounted, the search has accelerated for alternatives to replace the de facto rationing generated by the private health insurance marketplace. As the foremost example of public rationing, the closely watched Oregon Health Plan is

widely offered as an alternative to traditional private health insurance. Other health care rationing alternatives include HMOs and proposals that encourage self-rationing by individual consumers. *Public Budgeting and Finance*, Spring 1996, 16(1): 60–74. (Reprinted with permission of ABI/Inform, copyright UMI.)

***The Effects of Benefit Design and Managed Care on Health Care Costs***, by D. P. Goldman, Susan D. Hosek, Lloyd S. Dixon, and Elizabeth M. Sloss

Recently, the Department of Defense replaced its traditional fee-for-service insurance plan for military health care beneficiaries with an HMO/PPO hybrid. Using survey and claims data, the authors compare changes in costs over two years at sites that implemented this initiative (CRI) with changes at matched control sites. The results indicate that CRI substantially raised per beneficiary government costs for providing benefits as compared to predicted costs in the absence of CRI. The authors attribute this difference to the higher overhead of managed care and the increased expenditures by HMO participants. *Journal of Health Economics*, October 1995, 14(4): 401–418. (Reprinted with permission of the *Journal of Economic Literature*.)

***Physicians' Personal Malpractice Experiences Are Not Related to Defensive Clinical Practices***, by Peter A. Glassman, John E. Rolph, and Laura P. Peterson

Whether personal malpractice experience is part of a tort signal prompting physicians to practice defensively is unclear. To determine how physicians' malpractice experiences may affect clinical decision making, a number of physicians from four specialty groups are surveyed. Physicians evaluated clinical scenarios that were designed to maximize potential for finding positive defensive practices. Physicians with greater malpractice experience showed no systematic difference in initial management choice or subsequent test recommendations. *Journal of Health Politics, Policy and Law*, Summer 1996, 21(2): 219–241. (Reprinted with permission of ABI/Inform, copyright UMI.)

***Do Doctors Practice Defensive Medicine?*** by Daniel Kessler (Stanford University) and Mark McClellan (National Bureau of Economic Research)

"Defensive medicine" is a potentially serious social problem: if fear of liability drives health care providers to administer treatments that do not have worthwhile medical benefits, then the current liability system may generate inefficiencies much larger than the costs of compensating malpractice claimants. To obtain direct empirical evidence on this question, we analyze the effects of malpractice liability reforms using data on all elderly Medicare beneficiaries treated for serious heart disease in 1984, 1987, and 1990. We find that malpractice reforms that di-

rectly reduce provider liability pressure led to reductions of 5 to 9 percent in medical expenditures without substantial effects on mortality or medical complications. We conclude that liability reforms can reduce defensive medical practices. *The Quarterly Journal of Economics*, May 1996, 109(2). (Reprinted with permission of *The Quarterly Journal of Economics*.)

#### GOVERNMENT INSURANCE PROGRAMS

***Assessing the FDIC's Premium and Examination Policies Using "Soviet" Put Options***, by T. W. Epps (University of Virginia), Lawrence B. Pulley (College of William and Mary), and David B. Humphrey (Florida State University)

The FDIC's total liability for insuring a bank's deposits during a fixed period diminishes as the frequency of examinations increases, since a marginally solvent bank can be closed while losses are small. This paper develops a technique for pricing the insurance liability over a fixed period during which there are multiple examinations. Under current policy, most banks are examined annually and reviewed every six months, at which time the fees for insurance may be adjusted. Since the current schedule of fees allows only a narrow range and a few discrete levels, the FDIC typically retains some positive or negative residual liability in each six-month period and for the entire year. We show how to estimate this net liability. The calculations of total and net liability are illustrated for a sample of large banks. *Journal of Banking & Finance*, May 1996, 20(4): 699-721. (Reprinted with permission of North-Holland Publishing Company.)

#### SOCIAL INSURANCE

***The Role of Social Security in an Economy with Asymmetric Information and Financial Intermediaries***, by Pietro Reichlin (Universita di Chieti, Italy) and Paolo Siconolfi (Columbia University)

We study an overlapping generations model with production, asymmetric information, and competitive financial intermediaries. Social security may be beneficial even when it should not be used under full information, unless credit rationing emerges with polling contracts. In this case, social security could be welfare reducing even when the safe rate of return falls short of population growth. We provide a full characterization of "constrained Pareto efficient" allocations and prove that, when the expected marginal product exceeds population growth and high-risk firms have a low probability of default, no tax-transfer policy can support these allocations as competitive equilibria. When equilibria are constrained inefficient, optimal contracts are pooling and the optimal stock market value is zero. *Journal of Public Economics*, May 1996, 60(2): 153-175. (Reprinted with permission of North-Holland Publishing Company.)

***Social Security in a Non-Altruistic Model with Uncertainty and Endogenous Fertility***, by Camillo Furio Rosati (Università di Roma, Italy)

The effect of social security on fertility and saving is analyzed within a non-altruistic model of intergenerational transfers, both in the absence and in the presence of a perfect capital market. Fertility is reduced by a budget balanced increase in social security if the individuals have a high degree of risk aversion. Savings are unambiguously increased by an expansion of social security, while the effect of a deficit-financed expansion of the social security system on saving and fertility depends on the characteristics of the policy package considered. *Journal of Public Economics*, May 1996, 60(2): 283–294. (Reprinted with permission of North-Holland Publishing Company.)

***Responses to Social Security by Men and Women: Myopic and Far-Sighted Behavior***, by Cordelia Reimers and Marjorie Honig (City University of New York)

The labor supply response to critical aspects of the Social Security program depends on whether behavior is “myopic” (conditioned by current benefits only) or “far-sighted” (conditioned by the entire future benefit stream). This behavior reflects attitudes toward risk and ability to borrow, as well as underlying time preferences. The individual’s effective time horizon is treated as an empirical question. In this paper, responses to the Social Security’s earnings test and the delayed retirement credit are examined, as well as the question of whether older men and women are able to work while keeping their earnings below the exempt earnings limit; in other words, whether the earnings test affects participation as well as hours of work. Hazard functions for labor market reentry after retirement are estimated using the Longitudinal Retirement History Study. We find striking gender differences, in that women respond to Social Security wealth and are not deterred from working by the earnings test, while men respond to current benefits and their labor force participation is impeded by the test. Increases in the delayed retirement credit, as provided by the 1983 amendments to the Social Security Act, should therefore increase the supply of older women but not of men, though its intention was to increase the supply of both; however, increasing or abolishing the earnings limit, as proposed by Congress, would increase older men’s participation but not that of older women. *Journal of Human Resources*, Spring 1996, 31(2): 359–382. (Reprinted with permission of *Journal of Human Resources*.)

***Work Disincentives of Workers’ Compensation Permanent Partial Disability Benefits: Evidence for Canada***, by Douglas E. Hyatt (University of Wisconsin–Milwaukee and University of Toronto)

This paper examines the impact of workers’ compensation benefits and expected labor market earnings on the post-injury employment status of permanently injured

workers. Permanent partial disability benefits in Ontario at the time the data were collected were not related to post-injury labor market earnings and can therefore be characterized as having a pure income effect on post-injury employment behavior. The estimation results indicate an elasticity of post-injury employment to workers' compensation permanent disability benefits of  $-0.15$ , evaluated for the mean worker. The elasticity of post-injury employment to expected post-injury labor market earnings is about 0.94 percent. *Canadian Journal of Economics*, May 1996, 29(2): 289–308. (Reprinted with permission of the *Canadian Journal of Economics*.)

#### PENSION FUNDING

***Stability of Pension Systems When Gains/Losses Are Amortized and Rates of Return Are Autoregressive***, by Gerald S. Haberman (City University, London)

Methods of funding pension funds which amortize intervaluation over a fixed number of years have been considered by Dufresne (1988, 1989) and Haberman (1990, 1991, 1994). We consider the effects of such a method in the case where the rate of return on investments behaves as a first-order autoregressive process. This means that the actuarial loss process has the structure of a nonlinear time series, where an autoregressive component is multiplied by the autoregressive rate of return. We obtain a recursive formula for the expected actuarial loss in a given year and for the expectation of the square of this quantity and prove that, for suitable values of the parameters, these expectations converge in time to limits which, though not explicitly obtainable, can nevertheless be found by a simple numerical procedure in any given case. *Insurance Mathematics and Economics*, May 1996, 18(1): 59–71. (Reprinted with permission of North-Holland Publishing Company.)

***Transition from a Pay-As-You-Go to a Fully Funded Pension System: The Case of Differing Individuals and Intragenerational Fairness***, by Johann K. Brunner (University of Linz, Austria)

In recent contributions to the theory of public pension systems it was argued that a Pareto-improving transition from an established unfunded pension system to a funded one is possible. This result is derived in an overlapping-generations model with identical individuals. In the present study, an extended model, with differing individuals, of an intragenerationally fair unfunded pension scheme is introduced. Within this more realistic framework, it is shown that, in general, a Pareto-improving transition to a funded system is not possible because any instrument applied to the financing of pension in the transition phase involves intragenerational redistribution. *Journal of Public Economics*, April 1996, 60(1): 131–146. (Reprinted with permission of North-Holland Publishing Company.)

## INSURER MANAGEMENT

***The Structure of the Property/Casualty Insurance Industry***, by Gerald A. Hanweck and Arthur M. B. Hogan (George Mason University)

The proposition of market power abuse by insurers is predicated on the existence of economies of scale and/or scope. Economies of scale and scope for the property/casualty insurance industry are estimated for the first time using the generalized Box-Cox multiproduct cost function model. The results will be compared with the findings from other financial service industries where economies of scale for smaller specialized firms and diseconomies of scale for larger more diversified firms have been found. As has been found in other financial service industries, economies of scope do not appear to be important in the property/casualty industry, and economies of scale appear for small firms and become diseconomies for the largest firms in the industry. *Journal of Economics & Business*, May 1996, 48(2): 141–155. (Reprinted with permission of North-Holland Publishing Company.)

## LIABILITY RULES

***The Timing of Out-of-Court Settlements***, by Gary M. Fournier and Thomas W. Zuehlke (Florida State University)

Parties to a lawsuit will frequently delay litigation, even in circumstances where a voluntary agreement is eventually reached. This article is concerned with what causes legal disputes to be prolonged over time. We discuss dynamic models of litigation to illustrate how changes in the bargaining environment might generate empirical hazard functions. Comparative statics results are then corroborated with empirical estimates of a hazard function adjusted to account for both the heterogeneity of lawsuits and the nonproportional time dependence suggested by theory. *Rand Journal of Economics*, Summer 1996, 27(2): 310–321. (Reprinted with permission of the *Rand Journal of Economics*.)

***Plaintiff Injury and Defendant Responsibility: Implications for Compensatory and Punitive Damage Awards***, by Corinne Cather (University of Pennsylvania), Edith Greene (University of Colorado), and Robert Durham (University of Colorado)

A criticism of the civil jury is that jurors' decisions about damages are capricious and arbitrary. In particular, critics point to the skyrocketing nature of punitive damage assessments as evidence of a system run amok. The purpose of this study was to examine the factors that influence jurors' decisions about compensatory and punitive awards. We assess whether, as the law intends, jurors' decisions about

compensation are influenced by the severity of the plaintiff's injury but not by the reprehensibility of the defendant's conduct, and whether assessments of punitive damages are related to the defendants' conduct, but not to the plaintiffs' injury. Across three cases, mock jurors generally utilized relevant information and ignored irrelevant factors in their decisions about damages. Results are discussed in terms of the extent to which juror decision making comports with legal doctrine. *Law and Human Behavior*, April 1996, 20(2): 189–205. (Reprinted with permission of *Law and Human Behavior*.)

***Differential Treatment of Corporate Defendants by Juries: An Examination of the "Deep-Pockets" Hypothesis***, by Robert J. MacCoun (University of California, Berkeley)

Evidence that juries treat corporate defendants less favorably than individual defendants is often cited in support of the widely-held view that juries are biased against wealthy "deep-pocket" defendants. Such evidence confounds defendant wealth and defendant identity. In two juror simulation experiments involving citizens on jury duty, these factors were separated by manipulating whether the defendant was described as a poor individual, a wealthy individual, or a corporation; the defendants' assets were described identically in the latter two conditions. In Experiment 1, liability was significantly more likely, and awards were significantly greater, for corporate defendants rather than wealthy individual defendants, but verdicts against poor versus wealthy individuals did not differ. In Experiment 2, awards were larger against wealthy individuals who engaged in commercial rather than personal activities, and awards in the personal activity condition were larger against corporations than wealthy individuals. There was little evidence for a defendant wealth effect on juror judgments. While jurors do appear to treat corporations differently, the explanation may have more to do with citizens' views about special risks and responsibilities of commercial activity. *Law and Society Review*, 1996, 30(1): 121–161. (Reprinted with permission of *Law and Society Review*.)

***Medical Practice Guidelines in Malpractice Litigation: An Early Retrospective***, by Andrew L. Hyams, David W. Shapiro, and Troyan A. Brennan

The role of practice guidelines in medical malpractice litigation has been discussed in some theoretical detail. Little information is available, however, on how courts use guidelines or on the effort of state legislatures to explicitly link guideline compliance with malpractice defense. All relevant case law and legislation is reviewed to shed light on the influence of medical malpractice on guidelines. Although guidelines are being used for both inculpatory and exculpatory purposes in common-law litigation, legislatures are interested in applying them only for ex-

culpatory purposes. *Journal of Health Politics, Policy and Law*, Summer 1996, 21(2): 289-313. (Reprinted with permission of ABI/Inform, copyright UMI.)

#### SAFETY AND LOSS CONTROL

***Theoretical Models of Health Behavior and Workplace Self-Protective Behavior,***  
David M. Dejoy (University of Georgia)

This paper provides a critical review of the applicability of theoretical models of health behavior to workplace self-protective behavior. Value expectancy, environmental/contextual, and behavior change models are reviewed. On this basis, an integrative framework is proposed that conceptualizes self-protective behavior as consisting of four stages or phases: hazard appraisal, decision making, initiation, and adherence. In addition, five general constructs are identified as being of either primary or secondary importance at each stage: threat-related beliefs, response efficacy, self-efficacy, facilitating conditions, and safety climate. The proposed framework highlights the need to target interventions to each of the four stages. Particular emphasis is also assigned to environmental or situational factors in enabling and reinforcing self-protective behavior in the workplace. *Journal of Safety Research*, Summer 1996, 27(2): 61-72. (Reprinted with permission of the *Journal of Safety Research*.)

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