

Tentative Syllabus **INSR 934 “Insurance Economics”** Spring 2005

**Course Description**

In this course, we will develop the basic microeconomic models for settings in which economic agents are faced with uncertainty. A particular emphasis is given to insurance markets as means of transferring risk and wealth. The models we discuss, however, are adaptable to many other situations in finance and economics. The main concepts include decision making under uncertainty, Pareto-optimal allocation of risk, equilibrium analysis of risk exchange, and informational asymmetries.

**Grades**

There will be ungraded homework exercises. You are asked to present a concept included in one of the additional topics listed below. You will have to write a short paper on the topic and present it in one class. The paper's deadline is the time of your presentation. Paper and presentation will account for 50% of your grade. There will be a final exam which is worth the remaining 50% of your grade.

**Main Concepts**

1. Choice under Uncertainty
  - Expected Utility Theory
  - Risk Aversion (comparison of utility functions)
  - Change in Risk (comparison of distributions)
2. Insurance Demand (fixed contractual structure)
  - Single Risk
  - Multiple Risks (default, independent and dependent background risk)
3. The Calculus of Variations and Optimal Control Theory
4. Optimal Risk Sharing
  - Pareto Optimal Allocations
  - Equilibrium Analysis
5. Asymmetric Information
  - Moral Hazard
  - Adverse Selection
6. Recently Published/Working Papers

### **Additional Topics**

7. The Theory of Risk Classification
8. Economic Analysis of Insurance Fraud
9. Organizational Forms within the Insurance Industry
10. Insurance Capacity and Cycles
11. Corporate Risk Management

### **Reading List** (to be complemented)

#### Books

Chiang, A.C. (2000) *Elements of Dynamic Optimization*, Waveland Press

Dionne, G. ed. (2000) *Handbook of Insurance*, Kluwer Academic Publishers

Gollier, Ch. (2001) *The Economics of Risk and Time*, MIT Press

Mas-Colell, A. et al. (1995) *Microeconomic Theory*, Oxford University Press

Articles (mostly accessible through UPenn library - additional readings and lecture notes will be made available through web café)

### **Main Concepts**

#### **1. Choice under Uncertainty**

Mas-Colell, A. et al. Chapter 6

Gollier, Ch. Chapters 1-3

Bernoulli, D. (1954) "Exposition of a New Theory on the Measurement of Risk", *Econometrica* 22:1, p. 23-36

Kihlstrom, R., D. Romer, and S. Williams (1981) "Risk Aversion with Random Initial Wealth", *Econometrica* 49, p. 911-920

Machina, M.J. (1987) "Choice under Uncertainty: Problems Solved and Unsolved", *Journal of Economic Perspectives* 1:1, p. 121-154

Pratt, J.W. (1964) "Risk Aversion in the Small and in the Large", *Econometrica* 32:1/2, p. 122-136

Schoemaker, P.J.H. (1982) "The Expected Utility Model: Its Variants, Purposes, Evidence and Limitations", *Journal of Economic Literature* 20:2, p. 529-563

## **2. Insurance Demand**

Dionne, G. ed. Chapter 5: Schlesinger, H. "The Theory of Insurance Demand"

Gollier, Ch. Chapter 8

Braun, M. and A. Muermann (2004) "The Impact of Regret on the Demand for Insurance", *Journal of Risk and Insurance* 71:4, p. 737-767

Doherty, N.A., and H. Schlesinger (1983) "Optimal Insurance in Incomplete Markets", *Journal of Political Economy* 91:6, p. 1045-1054

Doherty, N.A. and H. Schlesinger (1990) "Rational Insurance Purchasing: Consideration of Contract Nonperformance", *Quarterly Journal of Economics* 105, p. 243-253

Meyer, J. and M.B. Ormiston (1999) "Analyzing the Demand for Deductible Insurance", *Journal of Risk and Uncertainty* 18, p. 223-230

Mossin, J. (1968) "Aspects of Rational Insurance Purchasing", *Journal of Political Economy* 76:4, p. 553-568

Schlesinger, H. (1981) "The Optimal Level of Deductibility in Insurance Contracts", *Journal of Risk and Insurance* 48:3, p. 465-481

## **3. The Calculus of Variations and Optimal Control Theory**

Chiang, A.C. Chapters 2, 3, and 7

## **4. Optimal Risk Sharing**

Dionne, G. ed. Chapter 3: Gollier, Ch. "Optimal Insurance Design: What can we do with and without Expected Utility"

Aase, K.K. (1993) "Equilibrium in a Reinsurance Syndicate: Existence, Uniqueness and Characterization", *ASTIN Bulletin* 23, p. 185-211

Arrow, K.J. (1963) "Uncertainty and the Welfare Economics of Medical Care", *American Economic Review* 53, p. 941-969

Blazenko, G. (1985) "The Design of an Optimal Insurance Policy: Note", *American Economic Review* 75, p. 253-255

Borch, K. (1962) "Equilibrium in a Reinsurance Market", *Econometrica* 30, p. 424-444

Doherty, N.A. and A. Muermann (2004) "Brokers and the Insurance for Non-Verifiable Losses", *Brookings-Wharton Papers on Financial Services*, ed. Robert E. Litan and Richard Herring, Brookings Institution Press, Washington, D.C., p. 193-211.

Raviv, A. (1979) "The Design of an Optimal Insurance Policy", *American Economic Review* 69, p. 84-96

Gollier, Ch. and H. Schlesinger (1996) "Arrow's Theorem on the Optimality of Deductibles: A Stochastic Dominance Approach", *Economic Theory* 7, p. 359-363

Schlesinger, H. (1997) "Insurance Demand without the Expected-Utility Paradigm", *Journal of Risk and Insurance* 64, p. 19-39

## 5. Asymmetric Information

Dionne, G. ed. Chapter 6: Winter, R.A. "Optimal Insurance under Moral Hazard"

Dionne, G. ed. Chapter 7: Dionne, G, Doherty, N.A., and N. Fombaron "Adverse Selection in Insurance Markets"

Dionne, G. and N.A. Doherty (1994) "Adverse Selection, Commitment, and Renegotiation: Extension to and Evidence from Insurance Markets", *Journal of Political Economy* 102, p. 209-235

Doherty, N.A. and H. Schlesinger (1995) "Severity Risk and the Adverse Selection of Frequency Risk", *Journal of Risk and Insurance* 62, p. 649-665

Holmstrom, B. (1979) "Moral Hazard and Observability", *Bell Journal of Economics* 10, p. 74-92

Muermann, A. and S.H. Shore (2004) "Spot Market Power and Futures Market Trading", *working paper*

Rothschild, M. and J. Stiglitz (1976) "Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information", *Quarterly Journal of Economics* 90, p. 629-650

Shavell, S. (1979) "On Moral Hazard and Insurance", *Quarterly Journal of Economics* 93, p. 541-562

Spence, M. and R. Zeckhauser (1971) "Insurance, Information and Individual Action", *American Economic Review* 61, p. 380-387

## **6. Recently Published/Working Papers**

Kim, B.J. and H. Schlesinger (2005) "Adverse Selection in an Insurance Market with Government-Guaranteed Subsistence Levels", *Journal of Risk and Insurance* 72, p. 61-75

Janssen, M.C. and V.A. Karamychev (2005) "Dynamic Insurance Contracts and Adverse Selection", *Journal of Risk and Insurance* 72, p. 45-59

Eeckhoudt, L. and H. Schlesinger "Putting Risk in its Proper Place", *working paper*

## **Additional Topics**

### **7. The Theory of Risk Classification**

Crocker, K.J. and A. Snow "The Theory of Risk Classification" Chapter 8 in *Handbook of Insurance* ed. Dionne, G.

Finkelstein, A., J. Porteba, and C. Rothschild (2005) "Redistribution by Insurance Market Regulation: the Effect of Banning Gender-Based Retirement Annuities", *working paper*.

### **8. Economic Analysis of Insurance Fraud**

Picard, P. "Economic Analysis of Insurance Fraud" Chapter 10 in *Handbook of Insurance* ed. Dionne, G.

Boyer, M.M. (2004) "Overcompensation as a Partial Solution to Commitment and Renegotiation Problems: The Case of Ex Post Moral Hazard", *Journal of Risk and Insurance* 71(4), p. 559-582

### **9. Organizational Forms within the Insurance Industry**

Mayers, D. and C.W. Smith "Organizational Forms within the Insurance Industry" Chapter 21 in *Handbook of Insurance* ed. Dionne, G.

Viswanathan, K.S. and J.D. Cummins (2003) "Ownership Structure Changes in the Insurance Industry: An Analysis of Demutualization", *Journal of Risk and Insurance* 70(3), p. 401-437

## **10. Insurance Capacity and Cycles**

Harrington, S. and G. Niehaus "Volatility and Underwriting Cycles" Chapter 20 in *Handbook of Insurance* ed. Dionne, G.

Weiss, M.A. and Chung, J. "U.S. Reinsurance Prices, Financial Quality, and Global Capacity", *Journal of Risk and Insurance* 71(3), p. 437-467

## **11. Corporate Risk Management**

MacMinn, R. and J. Garven "On Corporate Insurance" Chapter 16 in *Handbook of Insurance* ed. Dionne, G.

Gurenko, E. and O. Mahul "Combining Insurance, Contingent Debt, and Self-Retention in an Optimal Corporate Risk Financing Strategy", World Bank Policy Research Working Paper Series, No. 3167