

Eco211A: Contract Theory

M,W 9:30-10:50, BH 2249, Autumn 2007

<http://www.chass.utoronto.ca/sboard/teaching.html>

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This is a course in contract theory. It will cover many of the tools and techniques used in models of moral hazard, screening and incomplete contracting. Applications will be drawn from industrial organisation, corporate finance, public finance, personnel economics, and many other areas. In addition to the usual topics, I also plan to spend some time on recent innovations in the theory of relational contracts and dynamic signalling.

This course is also designed to compliment those of Jernej Copic (Mechanism Design, Winter) and Moritz Meyer-ter-Vehn (Auction Theory, Spring). There may be a little overlap when we cover mechanism design, but it's not such a bad thing to see this material a couple of times.

For those enrolled, there will be three problem sets (15% each) and a final (55%). The problem sets will be due on 22nd October (week 4), 12th November (week 7) and 3rd December (week 10). I encourage you to discuss the substance of the problems, but the final version should be your own. Later in the term, there may also be opportunities for students to present specific papers.

I will be away the following dates: Wed 3rd Oct, Mon 12th Nov, Wed 14th Nov.

Books and Manuscripts

Bolton and Dewatripont (2005), *Contract Theory*, MIT Press.

Laffont and Martimort (2002), *The Theory of Incentives*, PUP.

Mas-Colell, Whinston and Green (1995), *Microeconomic Theory*, OUP.

Salanie (1997), *The Economics of Contracts: A Primer*, MIT Press.

Segal and Tadelis (2002), *Lectures on Contract Theory*, Unpublished, Stanford University.

Stole (1993), *Lectures on Contracts and Organizations*, Unpublished, University of Chicago.

1. Useful Techniques

Topics: lattices, supermodularity, monotone comparative statics, comparing equilibria, envelope theorems, stochastic orders.

Topkis (1998), *Supermodularity and Complimentarity*, PUP.

Milgrom and Segal (2002), “Envelope Theorems for Arbitrary Choice Sets,” *Econometrica*.

Shaked and Shanthikumar (2007), *Stochastic Orders*, Springer.

Milgrom (1981), “Good News and Bad News: Representation Theorems and Applications,” *Bell Journal*.

Karlin and Rinott (1980), “Classes of Ordering of Measures and Related Correlation Inequalities I: Multivariate Totally Positive Distributions,” *Journal of Multivariate Analysis*.

Karlin and Rubin (1956), “The Theory of Decision Procedures for Distributions with Monotone Likelihood Ratio,” *Annals of Mathematical Statistics*.

2. Moral Hazard: One Agent

Topics: two action model, continuous action model, optimal linear contracts, comparative performance evaluation, multitasking, private evaluations, debt contracts.

Bolton and Dewatripont, *Chapters 4 and 6.2*.

Milgrom and Roberts (1992), *Economics, Organization and Management*, Prentice Hall.

Holmstrom (1979), “Moral Hazard and Observability,” *Bell Journal*.

Rogerson (1985), “The First-Order Approach to Principal-Agent Problems,” *Econometrica*.

Mirrlees (1999), “The Theory of Moral Hazard and Unobservable Behaviour: Part I,” *Review of Economic Studies*.

MacLeod (2003), “Optimal Contracting with Subjective Evaluation,” *American Economic Review*.

Innes (1990), “Limited Liability and Incentive Contracting with Ex-ante Action Choices,” *Journal of Economic Theory*.

Holmstrom and Milgrom (1991), “Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design,” *Journal of Law, Economics, & Organization*.

3. Moral Hazard: Many Agents

Topics: tournaments, partnerships, comparative performance evaluation.

Bolton and Dewatripont, *Chapter 8*.

Lazear and Rosen (1981), “Rank-Order Tournaments as Optimum Labor Contracts,” *Journal of Political Economy*.

Holmstrom (1982), “Moral Hazard in Teams,” *Bell Journal*.

4. Moral Hazard: Dynamics

Topics: repeated moral hazard, justifying simple contracts, renegotiation, career concerns, relational contracts.

Bolton and Dewatripont, *Chapter 10*.

Rogerson (1985), “Repeated Moral Hazard,” *Econometrica*.

Fudenberg, Holmstrom and Milgrom (1990), "Short-term Contracts and Long-term Agency Relationships," *Journal of Economic Theory*.

Holmstrom and Milgrom (1987), "Aggregation and Linearity in the Provision of Intertemporal Incentives," *Econometrica*.

Radner (1985), "Repeated Principal-Agent Games with Discounting," *Econometrica*.

Hermalin and Katz (1991), "Moral Hazard and Verifiability: The Effects of Renegotiation in Agency," *Econometrica*.

Fudenberg and Tirole (1990), "Moral Hazard and Renegotiation in Agency Contracts," *Econometrica*.

Holmstrom (1999), "Managerial Incentive Problems: A Dynamic Perspective," *Review of Economic Studies*.

5. Relational Contracts

Abreu, Pearce and Stacchetti (1986), "Optimal Cartel Equilibria with Imperfect Monitoring," *Journal of Economic Theory*.

Shapiro and Stiglitz (1984), "Equilibrium Unemployment as a Worker Discipline Device," *American Economic Review*.

Macleod and Malcomson (1989), "Implicit Contracts, Incentive Compatibility, and Involuntary Unemployment," *Econometrica*.

Macleod and Malcomson (1998), "Motivation and Markets," *American Economic Review*.

Levin (2003), "Relational Incentive Contracts," *American Economic Review*.

Levin (2002), "Multilateral Contracting and the Employment Relationship," *Quarterly Journal of Economics*.

Che and Yoo (2001), "Optimal Incentives for Teams," *American Economic Review*.

Rayo (2007), "Relational Incentives and Moral Hazard in Teams," *Review of Economic Studies*.

Board (2007), "Relational Contracts with On-the-Job Search," Working Paper, UCLA.

Holmstrom (1983), "Equilibrium Long-Term Labor Contracts," *Quarterly Journal of Economics*.

Harris and Holmstrom (1982), "A Theory of Wage Dynamics," *Review of Economic Studies*.

Thomas and Worrall (1988), "Self-Enforcing Wage Contracts," *Review of Economic Studies*.

Kocherlakota (1996), "Implications of Efficient Risk Sharing without Commitment," *Review of Economic Studies*.

Ligon, Thomas and Worrall (2002), "Informal Insurance Arrangements with Limited Commitment: Theory and Evidence from Village Economies," *Review of Economic Studies*.

Thomas and Worrall (1994), "Foreign Direct Investment and the Risk of Expropriation," *Review of Economic Studies*.

Albuquerque Hopenhayn (2004), "Optimal Lending Contracts and Firm Dynamics," *Review of Economic Studies*.

Board (2007), "Relational Contracts and the Value of Loyalty," Working Paper, UCLA.

6. Contracting with Externalities

Bolton and Dewatripont, *Chapter 13.3*.

Segal and Whinston (2003), "Robust Predictions for Bilateral Contracting with Externalities," *Econometrica*.

Segal (1999), "Contracting with Externalities," *Quarterly Journal of Economics*.

Bernheim and Whinston (1986), "Common Agency," *Econometrica*.

Bernheim and Whinston (1986), "Menu Auctions, Resource Allocation, and Economic Influence," *Quarterly Journal of Economics*.

7. Mechanism Design: One Agent

Topics: revelation principle, discrete type problems, continuous type problems, ironing, credit rationing, implicit labour contracts, regulation, insurance, labour contracts, contracts as barriers to entry, costly state verification.

Bolton and Dewatripont, *Chapter 2*.

Laffont and Martimort, *Chapters 2 and 3*.

Myerson (1982), “Optimal Coordination Mechanisms in Generalized PrincipalAgent Problems,” *Journal of Mathematical Economics*.

Maskin and Riley (1984), “Monopoly with Incomplete Information,” *RAND Journal of Economics*.

Mussa and Rosen (1978), “Monopoly and Product Quality,” *Journal of Economic Theory*.

Baron and Myerson (1982), “Regulating a Monopolist with Unknown Costs,” *Econometrica*.

8. Mechanism Design: Many Agents

Topics: optimal auctions, bilateral trading.

Mas–Collel, Whinston and Green, *Chapter 23*.

Bolton and Dewatripont, *Chapter 7*.

Myerson (1981), “Optimal Auction Design,” *Mathematics of Operations Research*.

Krishna (2002), *Auction Theory*, Academic Press.

Milgrom (2004), *Putting Auction Theory to Work*, CUP.

Myerson and Satterthwaite (1983), “Efficient Mechanisms for Bilateral Trading,” *Journal of Economic Theory*.

Cremer and McLean (1988), “Optimal Selling Strategies under Uncertainty for a Discriminating Monopolist when Demands are Interdependent,” *Econometrica*.

9. Mechanism Design: Multidimensional Types

Topics: incentive compatibility, 2×2 example, separable environments, efficiency in auctions.

Bolton and Dewatripont, *Chapter 6.1*.

Rochet and Stole (2003), “The Economics of Multidimensional Screening,” in *Advances in Economics and Econometrics: Theory and Applications, Eighth World Congress*, CUP.

Armstrong and Rochet (1999), “Multi-Dimensional Screening: A User’s Guide,” *European Economic Review*.

Krishna (2002), *Auction Theory*, Academic Press.

10. Mechanism Design: Dynamics

Topics: commitment solutions, no commitment, renegotiation, entry of new agents, durable goods monopoly, consumption smoothing, soft budget constraints.

Bolton and Dewatripont, *Chapter 9*.

Laffont and Martimort, *Chapter 8*.

Baron and Besanko (1984), “Regulation and Information in a Continuing Relationship,” *Information Economics and Policy*.

Courty and Li (2000), “Sequential Screening,” *Review of Economic Studies*.

Board (2007), “Durable-Goods Monopoly with Varying Demand,” *Review of Economic Studies*.

Segal (2003), “Optimal Pricing Mechanisms with Unknown Demand,” *American Economic Review*.

Thomas and Worrall (1990), “Income Fluctuation and Asymmetric Information: An Example of a Repeated Principal-Agent Problem,” *Journal of Economic Theory*.

Bulow (1982), “Durable-Goods Monopolists,” *Journal of Political Economy*.

Gul, Sonnenschein and Wilson (1986), “Foundations of Dynamic Monopoly and the Coase Conjecture,” *Journal of Economic Theory*.

Ausubel and Deneckere (1989), “Reputation in Bargaining and Durable Goods Monopoly,” *Econometrica*.

Fuchs and Skrzypacz (2007), “Bargaining with Arrival of New Traders or New Information,” Working Paper, Chicago and Stanford GSB.

Hart and Tirole (1988), “Contract Renegotiation and Coasian Dynamics,” *Review of Economic Studies*.

Laffont and Tirole (1988), “The Dynamics of Incentive Contracts,” *Econometrica*.

11. Mixed Models

Topics: false moral hazard (optimal taxation), adverse selection and moral hazard.

Bolton and Dewatripont, *Chapter 6.3*.

Laffont and Martimort, *Chapter 7*.

Laffont and Tirole (1986), “Using Cost Observation to Regulate Firms,” *Journal of Political Economy*.

McAfee and McMillan (1987), “Competition for Agency Contracts,” *RAND Journal of Economics*.

12. Signalling: Dynamics

Admati and Perry (1987), “Strategic delay in bargaining,” *Review of Economic Studies*.

Noldeke and van Damme (1990), “Signaling in a dynamic labor market,” *Review of Economic Studies*.

Swinkels (1999), “Education signaling with preemptive offers,” *Review of Economic Studies*.

Kaya (2006), "Repeated Signaling Games", Working Paper, University of Iowa.

13. Incomplete Contracts

Topics: holdup problem, ownership, message games, specific performance contracts, option contracts, strategic ambiguity, complexity, describability.

Bolton and Dewatripont, *Chapter 11 and 12*.

Hart (1995), *Firms, Contracts and Financial Structure*, OUP.

Grossman and Hart (1986), "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration," *Journal of Political Economy*.

Hart and Moore (1990), "Property Rights and the Nature of the Firm," *Journal of Political Economy*.

Edlin and Reichelstein (1996), "Holdups, Standard Breach Remedies, and Optimal Investment," *American Economic Review*.

Che and Hausch (1999), "Cooperative Investments and the Value of Contracting," *American Economic Review*.

Rogerson (1992), "Contractual Solutions to the Hold-Up Problem," *Review of Economic Studies*.

Noldeke and Schmidt (1995), "Option Contracts and Renegotiation: A Solution to the Hold-up Problem," *RAND Journal of Economics*.

Che and Sakovics (2004), "A Dynamic Theory of Holdup," *Econometrica*.

Bernheim and Whinston (1998), "Incomplete Contracts and Strategic Ambiguity," *American Economic Review*.

Segal (1999), "Complexity and Renegotiation: A Foundation for Incomplete Contracts," *Review of Economic Studies*.

Hart and Moore (1999), "Foundations of Incomplete Contracts," *Review of Economic Studies*.

Segal and Whinston (2002), “The Mirrlees Approach to Mechanism Design with Renegotiation (with Applications to Hold-up and Risk Sharing),” *Econometrica*.

Spier (1992), “Incomplete Contracts and Signalling,” *RAND Journal of Economics*.

Watson (2007), “Contract, Mechanism Design, and Technological Detail,” *Econometrica*.