Economics 890-002: Contract Theory

CONTACTS

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COURSE

Meetings
Tuesday/Thursday, 11:00am–12:15pm
Gardner [TBD]

Office hours
[TBD]
Gardner 305A

GOALS

Contract theory studies the interactions of small numbers of agents, how they interpret each others' actions, and how they can incentivize one another to engage in proper behavior. We will begin this course with static models in which agents interact once, then extend our analyses to dynamic models in which agents interact over time; in the course of these analyses we will develop a toolkit for analyzing standard (and not-so-standard) contracting problems. These tools will permit the analysis of mechanism design problems, formal contracts, and informal contracts. These models will be motivated with examples from industrial organization, finance, and public economics.

PREREQUISITES

Successful completion of Economics 711, or permission of the instructor.

RESOURCES

There is no textbook for this course. If you are interested in further references, the following texts may prove useful:

- ⊞ P. Bolton and M. Dewatripont, *Contract Theory*, MIT Press, 2005.
- ⊞ J. Laffont and D. Martimort, *The Theory of Incentives: The Principal-Agent Model*, Princeton University Press, 2002.
- ⊞ B. Salanie, *The Economics of Contracts: A Primer*, MIT Press, 2005.

This course is heavily based on Simon Board's course on Contract Theory at UCLA. Simon maintains a list of resources which may be helpful.

GRADING

Participation

You are expected to prepare for class and participate in discussions.

Problem sets

There will be four problem sets, approximately uniformly distributed across the semester. Problem sets will be graded on a $\checkmark + | \checkmark | \checkmark -$ basis.

Exams

There will be no exams for this course.

Paper

You will write a term paper on contracts. Your paper must demonstrate independent research (i.e., no survey papers) but does not need to be at the theoretical frontier. A successful paper will likely address at least one of the following points:

- ⊞ A modification of an existing model, including theoretical implications of this modification
- ⊞ Applying an existing model to a policy problem, including practical prescriptions for implementation
- ⊞ Taking an existing model to the data and refining its predictions on the basis of observations

You will present your preliminary findings to the class in a short (30-minute) presentation before your paper is due.

Grades

Your final grade will be one of $\{\mathrm{H}, \mathrm{P}, \mathrm{L}, \mathrm{F}\}$. Points will be apportioned as follows:

- ⊞ Participation: 20%
- ⊞ Problem sets: 40%
- ⊞ Paper: 40% (30% paper, 10% presentation)

Agenda

The following is a rough agenda for the topics and papers covered in this course. Note that there are more topics to be covered than weeks in the semester. Coverage of each topic will therefore vary in depth and time.

Topic 1. Moral hazard (one agent)

Hölmstrom, B. (1979). Moral hazard and observability. *The Bell journal of economics*, pages 74–91

Rogerson, W. P. (1985a). The first-order approach to principal-agent problems. *Econometrica*, 53(6):1357–1367

Innes, R. D. (1990). Limited liability and incentive contracting with ex-ante action choices. *Journal of economic theory*, 52(1):45–67

Holmstrom, B. and Milgrom, P. (1991). Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design. *Journal of Law, Economics, & Organization*, 7:24–52

Mirrlees, J. A. (1999). The theory of moral hazard and unobservable behaviour: Part i. *The Review of Economic Studies*, 66(1):3–21

MacLeod, W. B. (2003). Optimal contracting with subjective evaluation. *American Economic Review*, 93(1):216–240

Topic 2. Moral hazard (multiple agents)

Lazear, E. P. and Rosen, S. (1981). Rank-order tournaments as optimum labor contracts. *Journal of political Economy*, 89(5):841–864

Holmstrom, B. (1982). Moral hazard in teams. *The Bell Journal of Economics*, pages 324–340

Winter, E. (2004). Incentives and discrimination. *American Economic Review*, 94(3):764–773

Winter, E. (2006). Optimal incentives for sequential production processes. *The RAND Journal of Economics*, 37(2):376–390

Topic 3. Moral hazard (dynamics)

Rogerson, W. P. (1985b). Repeated moral hazard. *Econometrica: Journal of the Econometric Society*, pages 69–76

Radner, R. (1985). Repeated principal-agent games with discounting. *Econometrica: Journal of the Econometric Society*, pages 1173–1198

Holmstrom, B. and Milgrom, P. (1987). Aggregation and linearity in the provision of intertemporal incentives. *Econometrica: Journal of the Econometric Society*, pages 303–328

Fudenberg, D., Holmstrom, B., and Milgrom, P. (1990). Short-term contracts and long-term agency relationships. *Journal of economic theory*, 51(1):1–31

Fudenberg, D. and Tirole, J. (1990). Moral hazard and renegotiation in agency contracts. *Econometrica: Journal of the Econometric Society*, pages 1279–1319

DeMarzo, P. M. and Sannikov, Y. (2006). Optimal security design and dynamic capital structure in a continuous-time agency model. *The Journal of Finance*, 61(6):2681–2724

Sannikov, Y. (2008). A continuous-time version of the principal-agent problem. *The Review of Economic Studies*, 75(3):957–984

Biais, B., Mariotti, T., Rochet, J.-C., and Villeneuve, S. (2010). Large risks, limited liability, and dynamic moral hazard. *Econometrica*, 78(1):73–118

Topic 4. Reputation

Holmström, B. (1999). Managerial incentive problems: A dynamic perspective. *The review of Economic studies*, 66(1):169–182

Mailath, G. J. and Samuelson, L. (2001). Who wants a good reputation? *The Review of Economic Studies*, 68(2):415–441

Bar-Isaac, H. (2003). Reputation and survival: learning in a dynamic signalling model. *The Review of Economic Studies*, 70(2):231–251

Board, S. and Meyer-ter-Vehn, M. (2013). Reputation for quality. *Econometrica*, 81(6):2381–2462

Topic 5. Relational contracts

Harris, M. and Holmstrom, B. (1982). A theory of wage dynamics. *The Review of Economic Studies*, 49(3):315–333

Shapiro, C. and Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. *The American Economic Review*, 74(3):433–444

Abreu, D., Pearce, D., and Stacchetti, E. (1986). Optimal cartel equilibria with imperfect monitoring. *Journal of Economic Theory*, 39(1):251–269

Thomas, J. and Worrall, T. (1988). Self-enforcing wage contracts. *The Review of Economic Studies*, 55(4):541–554

MacLeod, W. B. and Malcomson, J. M. (1989). Implicit contracts, incentive compatibility, and involuntary unemployment. *Econometrica: Journal of the Econometric Society*, pages 447–480

Thomas, J. and Worrall, T. (1994). Foreign direct investment and the risk of expropriation. *The Review of Economic Studies*, 61(1):81–108

Che, Y.-K. and Yoo, S.-W. (2001). Optimal incentives for teams. *American Economic Review*, 91(3):525–541

Levin, J. (2003). Relational incentive contracts. *American Economic Review*, 93(3):835–857

Fuchs, W. (2007). Contracting with repeated moral hazard and private evaluations. *American Economic Review*, 97(4):1432–1448

Board, S. (2011). Relational contracts and the value of loyalty. *American Economic Review*, 101(7):3349–67

Topic 6. Mechanism design (one agent)

Myerson, R. B. (1982). Optimal coordination mechanisms in generalized principal–agent problems. *Journal of mathematical economics*, 10(1):67–81

Baron, D. P. and Myerson, R. B. (1982). Regulating a monopolist with unknown costs. *Econometrica: Journal of the Econometric Society*, pages 911–930

Topic 7. Mechanism design (multiple agents)

Myerson, R. B. (1981). Optimal auction design. *Mathematics of operations research*, 6(1):58–73

Myerson, R. B. and Satterthwaite, M. A. (1983). Efficient mechanisms for bilateral trading. *Journal of economic theory*, 29(2):265–281

Crémer, J. and McLean, R. P. (1985). Optimal selling strategies under uncertainty for a discriminating monopolist when demands are interdependent. *Econometrica*, 53(2):345–361

McAfee, R. P. and McMillan, J. (1987). Competition for agency contracts. *The Rand Journal of Economics*, pages 296–307

Neeman, Z. (2004). The relevance of private information in mechanism design. *Journal of Economic Theory*, 117(1):55–77

Topic 8. Mechanism design (no transfers)

Melumad, N. D. and Shibano, T. (1991). Communication in settings with no transfers. *The RAND Journal of Economics*, pages 173–198

Hopenhayn, H., Llobet, G., and Mitchell, M. (2006). Rewarding sequential innovators: Prizes, patents, and buyouts. *Journal of Political Economy*, 114(6):1041–1068

Goltsman, M., Hörner, J., Pavlov, G., and Squintani, F. (2009). Mediation, arbitration and negotiation. *Journal of Economic Theory*, 144(4):1397–1420

Armstrong, M. and Vickers, J. (2010). A model of delegated project choice. *Econometrica*, 78(1):213–244

Ben-Porath, E., Dekel, E., and Lipman, B. L. (2014). Optimal allocation with costly verification. *American Economic Review*, 104(12):3779–3813

Topic 9. Mechanism design (dynamics)

Stokey, N. L. (1979). Intertemporal price discrimination. *The Quarterly Journal of Economics*, pages 355–371

Baron, D. P. and Besanko, D. (1984). Regulation and information in a continuing relationship. *Information Economics and policy*, 1(3):267–302

Bolton, P. and Scharfstein, D. S. (1990). A theory of predation based on agency problems in financial contracting. *The American economic review*, pages 93–106

Thomas, J. and Worrall, T. (1990). Income fluctuation and asymmetric information: An example of a repeated principal-agent problem. *Journal of Economic Theory*, 51(2):367–390

Courty, P. and Li, H. (2000). Sequential screening. *The Review of Economic Studies*, 67(4):697–717

Board, S. (2008). Durable-goods monopoly with varying demand. *The Review of Economic Studies*, 75(2):391–413

Bergemann, D. and Välimäki, J. (2010). The dynamic pivot mechanism. *Econometrica*, 78(2):771–789

Pavan, A., Segal, I., and Toikka, J. (2014). Dynamic mechanism design: A myersonian approach. *Econometrica*, 82(2):601–653

Board, S. and Skrzypacz, A. (2016). Revenue management with forward-looking buyers. *Journal of Political Economy*, 124(4):1046–1087

Topic 10. Mechanism design (no commitment)

Bulow, J. I. (1982). Durable-goods monopolists. *Journal of political Economy*, 90(2):314–332

Gul, F., Sonnenschein, H., and Wilson, R. (1986). Foundations of dynamic monopoly and the coase conjecture. *Journal of Economic Theory*, 39(1):155–190

Hart, O. D. and Tirole, J. (1988). Contract renegotiation and coasian dynamics. *The Review of Economic Studies*, 55(4):509–540

Laffont, J.-J. and Tirole, J. (1988). The dynamics of incentive contracts. *Econometrica: Journal of the Econometric Society*, pages 1153–1175

Ausubel, L. M. and Deneckere, R. J. (1989). Reputation in bargaining and durable goods monopoly. *Econometrica: Journal of the Econometric Society*, pages 511–531

Fuchs, W. and Skrzypacz, A. (2010). Bargaining with arrival of new traders. *American Economic Review*, 100(3):802–36

Topic 11. Mechanism design (competition)

Rothschild, M. and Stiglitz, J. (1976). Equilibrium in competitive insurance markets: An essay on the economics of imperfect information. *The Quarterly Journal of Economics*, 90(4):629–649

Stole, L. A. (2007). Price discrimination and competition. *Handbook of industrial organization*, 3:2221–2299

Calzolari, G. and Denicolò, V. (2013). Competition with exclusive contracts and market-share discounts. *American Economic Review*, 103(6):2384–2411

Topic 12. Incomplete contracts

Grossman, S. J. and Hart, O. D. (1986). The costs and benefits of ownership: A theory of vertical and lateral integration. *Journal of political economy*, 94(4):691–719

Edlin, A. S. and Reichelstein, S. (1996). Holdups, standard breach remedies, and optimal investment. *The American Economic Review*, 86(3):478–501

Che, Y.-K. and Hausch, D. B. (1999). Cooperative investments and the value of contracting. *American Economic Review*, 89(1):125–147

Hart, O. and Moore, J. (1999). Foundations of incomplete contracts. *The Review of Economic Studies*, 66(1):115–138

Topic 13. Contracting with externalities

Bernheim, B. D. and Whinston, M. D. (1986a). Common agency. *Econometrica: Journal of the Econometric Society*, pages 923–942

Bernheim, B. D. and Whinston, M. D. (1986b). Menu auctions, resource allocation, and economic influence. *The quarterly journal of economics*, 101(1):1–31

Segal, I. (1999). Contracting with externalities. *The Quarterly Journal of Economics*, 114(2):337–388

Topic 14. Dynamic signaling

Admati, A. R. and Perry, M. (1987). Strategic delay in bargaining. *The Review of Economic Studies*, 54(3):345–364

Noldeke, G. and Van Damme, E. (1990). Signalling in a dynamic labour market. *The Review of Economic Studies*, 57(1):1–23

Swinkels, J. M. (1999). Education signalling with preemptive offers. *The Review of Economic Studies*, 66(4):949–970

Hörner, J. and Vieille, N. (2009). Public vs. private offers in the market for lemons. *Econometrica*, 77(1):29–69

Daley, B. and Green, B. (2012). Waiting for news in the market for lemons. *Econometrica*, 80(4):1433–1504

Topic 15. Mechanism design (multidimensional types)

Armstrong, M. and Rochet, J.-C. (1999). Multi-dimensional screening: A user's guide. *European Economic Review*, 43(4-6):959–979

Rochet, J.-C. and Stole, L. A. (2003). The economics of multidimensional screening. *Econometric Society Monographs*, 35:150–197

Topic 16. Robustness

Bergemann, D. and Morris, S. (2005). Robust mechanism design. *Econometrica*, 73(6):1771–1813

Lopomo, G., Rigotti, L., and Shannon, C. (2011). Knightian uncertainty and moral hazard. *Journal of Economic Theory*, 146(3):1148–1172

Garrett, D. F. (2014). Robustness of simple menus of contracts in cost-based procurement. *Games and Economic Behavior*, 87:631–641

Carroll, G. (2015). Robustness and linear contracts. *American Economic Review*, 105(2):536–63