

ECON 2060

Fall 2019

Part I Instructor: Daniel Barron (d-barron@kellogg.northwestern.edu)

Office Hours: W 1:30-3:00 or by appointment.

This part of the course covers the fundamentals of contract theory

Part II Instructor: Oliver Hart (ohart@harvard.edu)

Office Hours: W 1:30-3:00 or by appointment.

This part of the course covers work on incomplete contracts and organizations

TF: Jiacheng Feng: fengj@g.harvard.edu

Office Hours by appointment.

Lectures: M,W 10:30-11:45 (Littauer M-17)

Prerequisites

Economics 2010a,b or equivalent. Comfort with formal models is essential.

Grading

This class has letter grades. Graduate students with a serious interest in the topics are expected to take the field exam either in Organizational Economics (in combination with corporate finance), or in Economic Theory.

Assignments

There will be a final exam in December and four graded problem sets (two in each part of the course). The total weight of the problem sets in the grade is 20%.

Part I: Reading List

This reading list is *long*. We will not cover all, or even most, of the papers listed here, though most of them are mentioned at least briefly in the lecture notes. Papers with * or ** in front of them will be discussed.

Potentially Useful Books

Bolton, Patrick, and Mathias Dewatripont. 2005. Contract Theory. MIT Press: Cambridge, MA.
Milgrom, Paul. 2001. Putting Auction Theory to Work. Cambridge University Press: New York, NY.

Stole, Lars A. 2001. "Lectures on the Theory of Contracts and Organizations." Available Online: at many places, including <https://bit.ly/2ZfqRPj>, or just type the author and title into Google scholar.

Static Moral Hazard

Chapter 1: Insurance versus Incentives

- ** Holmstrom, Bengt. 1979. "Moral Hazard and Observability." *The Bell Journal of Economics* 10 (1), 74-91.
- * Mirrlees, J. A.. 1999 (written 1975). "The Theory of Moral Hazard and Unobservable Behavior: Part 1." *Review of Economic Studies* 66, 3-21.
- * Rogerson, William P. 1985. "The First-Order Approach to Principal-Agent Problems." *Econometrica* 53 (6), 1357-1367.
- * Grossman, Sanford J., and Oliver D. Hart. 1983. "An Analysis of the Principal-Agent Problem." *Econometrica* 51 (1), 7-46.
- Chade, Hector, and Jeroen Swinkels. 2019. "Screening in Vertical Oligopolies." Working Paper.
- Che, Yeon-Koo, and Seung-Weon Yoo. 2001. "Optimal Incentives for Teams." *American Economic Review* 91 (3), 525-541.
- Georgiadis, George, and Michael Powell. 2019. "Optimal Incentives under Moral Hazard: From Theory to Practice." Working Paper.
- Green, Jerry R., and Nancy L. Stokey. 1983. "A Comparison of Tournaments and Contracts." *Journal of Political Economy* 91 (3), 349-364.
- Jewitt, Ian. 1988. "Justifying the First-Order Approach to Principal-Agent Problems." *Econometrica* 56 (5), 1177-1190.
- Lazear, Edward P., and Sherwin Rosen. 1981. "Rank-Order Tournaments as Optimal Labor Contracts." *Journal of Political Economy* 89 (5), 841-864.

Chapter 2: Other Contracting Frictions

- ** Holmstrom, Bengt, and Paul Milgrom. 1991. "Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design." *Journal of Law, Economics, and Organizations* 7, 24-52.
- ** Holmstrom, Bengt. 1982. "Moral Hazard in Teams." *The Bell Journal of Economics* 13 (2), 324-340.
- * Holmstrom, Bengt, and Paul Milgrom. 1994. "The Firm as an Incentive System." *The American Economic Review* 84 (4), 972-991.
- * Innes, Robert D. 1990. "Limited Liability and Incentive Contracting with Ex-ante Action Choices." *Journal of Economic Theory* 52, 45-67.
- * MacLeod, W. Bentley. 2003. "Optimal Contracting with Subjective Evaluation." *American Economic Review* 93 (1), 216-240.
- Fuchs, William. 2007. "Contracting with Repeated Moral Hazard and Private Evaluations." *The American Economic Review* 97 (4), 1432-1448.
- Fudenberg, Drew, David Levine, and Eric Maskin. 1994. "The Folk Theorem with Imperfect Public Information." *Econometrica* 62 (5), 997-1039.

Radner, Roy, Roger Myerson, and Eric Maskin. 1986. "An Example of a Repeated Partnership Game with Discounting and with Uniformly Inefficient Equilibria." *Review of Economic Studies* 53 (1), 59-70.

Zhu, John Y. 2019. "Better Monitoring...Worse Productivity?" Working Paper.

Dynamic Moral Hazard

Chapter 3: Dynamic Moral Hazard Problems

* Harris, Milton, and Bengt Holmstrom. 1982. "A Theory of Wage Dynamics." *Review of Economic Studies* 49 (3), 315-333.

* Rogerson, William P. 1985. "Repeated Moral Hazard." *Econometrica* 53 (1), 69-76.

* Fudenberg, Drew, Bengt Holmstrom, and Paul Milgrom. 1990. "Short-term Contracts and Long-term Agency Relationships." *Journal of Economic Theory* 51 (1), 1-31.

* Fudenberg, Drew, and Jean Tirole. 1990. "Moral Hazard and Renegotiation in Agency Contracts." *Econometrica* 58 (6), 1279-1319.

Albuquerque, Rui, and Hugo A. Hopenhayn. 2004. "Optimal Lending Contracts and Firm Dynamics." *Review of Economic Studies* 71 (2), 285-315.

Board, Simon. 2011. "Relational Contracts and the Value of Loyalty." *American Economic Review* 101 (7), 3349-3367.

Di Tella, Sebastian, and Yuliy Sannikov. 2016. "Optimal Asset Management Contracts with Hidden Savings." Working Paper.

Sannikov, Yuliy. 2008. "A Continuous-Time Version of the Principal-Agent Problem." *The Review of Economic Studies* 75 (3), 957-984.

Thomas, Jonathan, and Tim Worrall. 1994. "Foreign Direct Investment and the Risk of Appropriation." *Review of Economic Studies* 61 (1), 81-108.

Chapter 4: Commitment Problems

** Holmstrom, Bengt. 1999 (written 1982). "Managerial Incentive Problems: A Dynamic Perspective." *Review of Economic Studies* 66, 169-182.

** Levin, Jonathan. 2003. "Relational Incentive Contracts." *American Economic Review* 93 (3), 835-857.

* Levin, Jonathan. 2002. "Multilateral Contracting and the Employment Relationship." *The Quarterly Journal of Economics* 117 (3), 1075-1103.

Abreu, Dilip. 1988. "On the theory of infinitely repeated games with discounting." *Econometrica*, 383-396.

Andrews, Isaiah, and Daniel Barron. "The allocation of future business: dynamic relational contracts with multiple agents." *American Economic Review* 106 (9), 2742-59.

Baker, George, Robert Gibbons, and Kevin J. Murphy. 1994. "Subjective Performance Measures in Optimal Incentive Contracts." *The Quarterly Journal of Economics* 109 (4), 1125-1156.

Barron, Daniel, and Michael Powell. 2019. "Policies in relational contracts." *American Economic Journal: Microeconomics* 11 (2), 228-249.

Bull, Clive. 1987. "The Existence of Self-Enforcing Implicit Contracts." *The Quarterly Journal of Economics* 102 (1), 147-159.

- Dewatripont, Mathias, Ian Jewitt, and Jean Tirole. 1999. "The Economics of Career Concerns, Part I: Comparing Information Structures." *The Review of Economic Studies* 66 (1), 183-198.
- Dewatripont, Mathias, Ian Jewitt, and Jean Tirole. 1999. "The Economics of Career Concerns, Part II: Application to Missions and Accountability of Government Agencies." *The Review of Economic Studies* 66 (1), 199-217.
- Halac, Marina. 2012. "Relational contracts and the value of relationships." *American Economic Review* 102 (2), 750-779.
- Klein, Benjamin, and Keith B. Leffler. "The role of market forces in assuring contractual performance." *Journal of Political Economy* 89 (4), 615-641.
- Macaulay, Stewart. 1963. "Non-contractual relations in business: A preliminary study." *American Sociological Review*, 55-67.
- MacLeod, W. Bentley, and James M. Malcomson. 1989. "Implicit Contracts, Incentive Compatibility, and Involuntary Unemployment." *Econometrica* 57 (2), 447-480.
- Williamson, Oliver E. 1983. "Credible commitments: Using hostages to support exchange." *The American Economic Review* 73 (4), 519-540.

Chapter 5: Gaming and "Simple" Contracts

- ** Holmstrom, Bengt, and Paul Milgrom. 1987. "Aggregation and Linearity in the Provision of Intertemporal Incentives." *Econometrica* 55 (2), 303-328.
- ** Carroll, Gabriel. 2015. "Robustness and Linear Contracts." *The American Economic Review* 105 (2), 536-563.
- * Diamond, Peter. 1998. "Managerial Incentives: on the Near Linearity of Optimal Compensation." *Journal of Political Economy* 106 (5), 931-957.
- Antic, Nemanja. 2018. "Contracting with Unknown Technologies." Working Paper.
- Barron, Daniel, George Georgiadis, and Jeroen Swinkels. 2019. "Optimal Contracts with a Risk-Taking Agent." Working Paper.
- Bandiera, Oriana, Iwan Barankay, and Imran Rasul. 2005. "Social Preferences and Response to Incentives: Evidence from Personnel Data." *Quarterly Journal*
- Chevalier, Judith, and Glenn Ellison. 1997. "Risk Taking by Mutual Funds as a Response to Incentives." *Journal of Political Economy* 105 (6), 1167-1200.
- Dai, Tianjiao, and Juuso Toikka. 2019. "Robust Incentives for Teams." Working Paper.
- Larkin, Ian. 2014. "The Cost of High-Powered Incentives: Employee Gaming in Enterprise Software Sales." *Journal of Labor Economics* 32 (2), 1-29.
- Oyer, Paul. 1998. "Fiscal Year Ends and Nonlinear Incentive Contracts: The Effect on Business Seasonality." *The Quarterly Journal of Economics* 113 (1), 149-185.

Asymmetric Information

Chapter 6: Mechanism Design

- ** Myerson, Roger B., and Mark A. Satterthwaite. 1983. "Efficient Mechanisms for Bilateral Trading." *Journal of Economic Theory* 29 (2), 265-281.
- * d'Aspremont, Claude, and Louis-Andre Gerard-Varet. 1979. "Incentives and Incomplete Information." *Journal of Public Economics* 11 (1), 25-45.

- * Green, Jerry, and Jean-Jacques Laffont. 1977. "Characterization of Satisfactory Mechanisms for the Revelation of Preferences for Public Goods." *Econometrica* 45 (2), 427-438.
- * Milgrom, Paul. 2001. Putting Auction Theory to Work. Cambridge University Press: New York, NY.
- Athey, Susan, and Ilya Segal. 2013. "An Efficient Dynamic Mechanism." *Econometrica* 81 (6), 2463-2485.
- Benoit, Jean-Pierre. 2000. "The Gibbard-Satterthwaite Theorem: A Simple Proof." *Economics Letters* 69 (3), 319-322.
- Clarke, Edward H. 1971. "Multipart Pricing of Public Goods." *Public Choice* 11 (1), 17-33.
- Gibbard, Allan. 1977. "Manipulation of Voting Schemes: A General Result." *Econometrica* 41 (4), 587-601.
- Groves, Theodore. 1973. "Incentives in Teams." *Econometrica* 41 (4), 617-631.
- Pavan, Alessandro, Ilya Segal, and Juuso Toikka. 2014. "Dynamic Mechanism Design: A Myersonian Approach." *Econometrica* 82 (2), 601-653.
- Satterthwaite, Mark. 1975. "Strategy-proofness and Arrow's conditions: Existence and Correspondence Theorems for Voting Procedures and Social Welfare Functions." *Journal of Economic Theory* 10 (1975), 187-217.
- Vickrey, William. 1961. "Counterspeculation, Auctions, and Competitive Sealed Tenders." *The Journal of Finance* 16 (1), 8-37.

Chapter 7: Adverse Selection

- * Akerlof, George A. 1970. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *Quarterly Journal of Economics* 84 (3), 488-500.
- * Courty, Pascal, and Hao Li. 2000. "Sequential Screening." *Review of Economic Studies* 67, 697-717.
- Baron, David P., and Roger B. Myerson. 1982. "Regulating a Monopolist with Unknown Costs." *Econometrica* 50 (4), 911-930.
- Laffont, Jean-Jacques, and Jean Tirole. 1986. "Using Cost Observation to Regulate Firms." *Journal of Political Economy* 94 (3), 614-641.
- Mirrlees, James A. 1971. "An Exploration in the Theory of Optimum Income Taxation." *The Review of Economic Studies* 38 (2), 175-208.
- Stokey, Nancy L. 1981. "Rational Expectations and Durable Goods Pricing." *The Bell Journal of Economics* 12 (1), 112-128.

Part II: Reading List

Topics and Readings

A recommended text that covers some of the course topics is Patrick Bolton and Mathias Dewatripont, *Contract Theory* (MIT Press).

A useful overview is Hart, O. (2017), "Incomplete Contracts and Control," *American Economic Review*, July 2017.

Many of the readings are journal articles (or hoped-to-be journal articles), and some course topics are closer to the research frontier than others.

A. Firm Boundaries

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

Hart, O. and J. Moore (1990), "Property Rights and the Nature of the Firm," *Journal of Political Economy*, 98: 1119-1158.

Hart, O. (1995), *Firms, Contracts, and Financial Structure*, Oxford University Press, Chapters 2-4.

Baker, George P., and Thomas N. Hubbard. 2003. "Make Versus Buy in Trucking: Asset Ownership, Job Design, and Information." *American Economic Review*, 93(3): 551– 572.

Baker, George P, and Thomas N. Hubbard. 2004. "Contractibility and asset ownership: On-board computers and governance in US trucking." *The Quarterly Journal of Economics*, 119(4): 1443–1479.

Hortaçsu, Ali, and Chad Syverson (2007), "Cementing Relationships: Vertical Integration, Foreclosure, Productivity and Prices," *Journal of Political Economy*, 113: 250-301.

Atalay, Engin, Ali Hortacsu, and Chad Syverson. 2014. "Vertical integration and input flows." *The American Economic Review*, 104(4): 1120–1148.

B. Finance

Aghion, P. and P. Bolton (1992), "An 'Incomplete Contracts' Approach to Financial Contracting," *Review of Economic Studies* 59:473-494.

Dewatripont, M. and J. Tirole (1994), "A Theory of Debt and Equity: Diversity of Securities and Manager-Shareholder Congruence," *Quarterly Journal of Economics* 109(4): 1027-1054.

Kaplan, Steven N, and Per Stromberg. 2003. "Financial contracting theory meets the real world: An empirical analysis of venture capital contracts." *The Review of Economic Studies*, 70(2): 281–315.

C. Public vs. Private Provision

Hart, O., A Shleifer, and R. Vishny (1997), "The Proper Scope of Government: Theory and an Application to Prisons," *Quarterly Journal of Economics* 112: 1127–1161.

D. Delegation

Aghion, P., and J. Tirole (1997), "Formal and Real Authority in Organizations," *Journal of Political Economy* 105(1): 1-29. [see also Hart and Homström (2010) below]

Dessein, W. (2002), "Authority and Communication in Organizations" *Review of Economic Studies*, 69: 811-838.

Newman, D, and Kirill E Novoselov. 2009. "Delegation to encourage communication of problems." *Journal of Accounting research*, 47(4): 911–942.

E. Relational Contracting and Property Rights

Levin, J. (2003), "Relational Incentive Contracts," *American Economic Review* 93(3): 835-857.

Chassang, S. (2010), "Building Routines: Learning, Cooperation and the Dynamics of Incomplete Relational Contracts," *American Economic Review*, 100(1): 448-465.

Baker, G., R. Gibbons, and K. Murphy (2002), "Relational Contracts and the Theory of the Firm," *Quarterly Journal of Economics*, 117(1): 39-84.

Baker, G. R. Gibbons and K. Murphy (1999). "Informal Authority in Organizations," *Journal of Law, Economics, and Organization* 15, 56-73.

F. Foundational Issues

Hart, Oliver, and John Moore. 1988. "Incomplete contracts and Renegotiation." *Econometrica*, 755–785.

Nöldeke, G. and K. Schmidt (1995), "Option Contracts and Renegotiation: A Solution to the Hold-Up Problem." *Rand Journal of Economics* 26(2): 163-79.

Che, Y.-K. and D.B. Hausch (1999), "Cooperative Investments and the Value of Contracting," *American Economic Review*, 89(1): 125-147.

Maskin, E., and J. Tirole (1999), "Unforeseen Contingencies and Incomplete Contracts," *Review of Economic Studies* , 66: 83-114.

_____ (1999), "Two Remarks on the Property Rights Literature," *Review of Economic Studies* , 66: 139-149

Aghion, P. D. Fudenberg, R. Holden, T. Kunimoto, and O. Tercieux (2012), "Subgame Perfect Implementation under Information Perturbations," *Quarterly Journal of Economics*, 127(4): 1843-1881.

G. "Behavioral" Approaches

Hart, O. and J. Moore (2008), "Contracts as Reference Points," *Quarterly Journal of Economics* 123(1): 1-48.

Fehr, Ernst, Oliver Hart, and Christian Zehnder. 2011. "Contracts as Reference Points—Experimental Evidence." *The American Economic Review*, 493–525.

Fehr, Ernst, Oliver Hart, and Christian Zehnder. 2015. "How do informal agreements and revision shape contractual reference points?" *Journal of the European Economic Association*, 13(1): 120–1.

Brandts, Jordi, Matthew Ellman, and Gary Charness. 2016. Let's Talk: How Communication Affects Contract Design. *Journal of the European Economics Association* 14(4): 943-974.

Fehr, Ernst, Oliver Hart, and Christian Zehnder. 2017. Contracts, Conflicts and Communication. Harvard working paper.

Herweg, Fabian, and Klaus M Schmidt. 2014. "Loss aversion and inefficient renegotiation." *The Review of Economic Studies*, 82(1): 297–332.

Hart, Oliver. 2009. Hold-Up, Asset Ownership, and Reference Points. *Quarterly Journal of Economics* 124(1): 267-300.

Frydlinger and Hart (2019), "Overcoming Contractual Incompleteness: The Role of Guiding Principles". [See my Harvard website.]

Frydlinger, David, Oliver Hart and Kate Vitasek. 2019. A New Approach to Contracts. *Harvard Business Review*, September-October. [See my Harvard website.]

E. Fehr, H. Herz, and T. Wilkening (2013), "The Lure of Authority: Motivation and Incentive Effects of Power," *American Economic Review*, 103(4):1325-1359.

Bartling, B., E. Fehr, and H. Herz (2014), "The Intrinsic Value of Decision Rights," *Econometrica*, 82(6): 2005-2039.

H. Firm Scope

Hart, O. and B. Holmstrom (2010), "A Theory of Firm Scope," *Quarterly Journal of Economics* 125(2): 483-513.

Legros, P., and A.F. Newman (2013), "A Price Theory of Vertical and Lateral Integration," *Quarterly Journal of Economics*, 128(2): 725-770.

Legros, P., and A.F. Newman (2015), "Demand-Driven Integration and Divorcement Policy," *International Journal of Industrial Organization*, 53: 306-325.

L. Alfaro, P. Conconi, H. Fadinger, and A.F. Newman (2016), "Do Prices Determine Vertical Integration?" *Review of Economic Studies*, 83(3): 855-872.