

14.281 Contract Economics

R. Gibbons and B. Holmstrom

MW 10:30-12

E51-361

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<http://web.mit.edu/14.281/www/>

This course describes several prominent theories of contracting, but this is not a standard course in contract theory. Instead, the theories are chosen because of their existing and potential applications – as applied theory in fields such as IO, labor, macro, corporate finance, and organizations, and also as empirical work in such fields. In short, this course is an attempt to define and develop “contract economics,” rather than a conventional exposition of contract theory.

The prerequisite for this course is 14.124. That is, we presume a solid background in the basics of uncertainty, statistical decision theory, risk aversion, moral hazard, adverse selection, signaling and auctions, at the level of Mas Colell, Whinston, and Green (Chapters 6, 13, 14, and 23).

The structure of the course is as follows:

- I. Incentives
 - A. Formal Contracts
 - B. Relational Contracts
 - C. No Contracts: Career Concerns and Reputation
- II. Decision Rights
 - A. Classics
 - B. Ex Ante Incentives
 - C. Ex Post Control
- III. Dynamic Contracting
 - A. Renegotiation and Incomplete Contracting
 - B. Dynamic Risk-Sharing and Moral Hazard
 - C. Dynamic Financial Contracting
- IV. Multi-Agent Contracting

Many of the readings are available on the web and can be accessed from the course web page. Readings marked with an asterisk are required: Those marked *W are available on the web; those marked *P are available in the course packet from Copy Tech (E52, basement).

There will be several problem sets, which will be corrected but not counted. The grade will depend solely on the final exam. Completing the problem sets is virtually a necessary condition for doing well on the exam.

This course is a prerequisite for two courses in Spring '04: Organizational Economics (14.282, R. Gibbons) and Advanced Contract Theory (14.129, P. Legros and H. Ergin). There are two minor fields that involve these courses: (1) 14.281 and 14.282 can be taken as a minor field in Contracts and Organizations; (2) 14.129 can be taken as one of the two courses constituting a minor field in Advanced Economic Theory (but 14.281 cannot count as one of these courses). Finally, there will be three questions on the Theory General Exam from 14.281 and 14.129: one from 14.281, one from H1 of 14.129, and one from H2 of 14.129.

I. Incentives

A. Formal Contracts (Sept. 3, 8, 10, 15)

1. Basic Theory

- Kerr, Steven. 1975. "On the Folly of Rewarding A, While Hoping for B." *Academy of Management Journal* 18:769-83.
- *P Holmstrom, Bengt, and Paul Milgrom. 1991. "Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design." *Journal of Law, Economics, and Organization* 7:24-52.
- Baker, George. 1992. "Incentive Contracts and Performance Measurement." *Journal of Political Economy* 100:598-614.
- Feltham, Gerald and Jim Xie. 1994. "Performance Measure Congruity and Diverstiy in Multi-Task Principal/Agent Relations." *The Accounting Review* 69: 429-53.
- Datar, Srikant, Susan Kulp, and Richard Lambert. 2001. "Balancing Performance Measures." *Journal of Accounting Research* 39: 75-92
- *W Baker, George. 2002. "Distortion and Risk in Optimal Incentive Contracts." *Journal of Human Resources* 37: 728-51.
- *W Prendergast, C. 2002. "The Tenuous Trade-off between Risk and Incentives." *Journal of Political Economy* 110: 1071-1102.
- Baker, George and Bjorn Jorgensen. 2003. "Volatility, Noise, and Incentives." Unpublished manuscript, HBS. http://www.people.hbs.edu/gbaker/oes/papers/Baker_Jorgensen.pdf
- Fehr, Ernst and Klaus Schmidt. 2003. "Fairness and Incentives in a Multi-Task Principal-Agent Model." mimeo, University of Zurich.
- Baker, G. and B. Hall. 2002. "CEO Incentives and Firm Size." working paper, Harvard Business School.

2. Evidence and Applications

- *W Brickley, James and Jerold Zimmerman. 2001. "Changing Incentives in a Multitask Environment: Evidence from a Top-tier Business School." *Journal of Corporate Finance* 7: 367-396.
- Lazear, Edward. 2000. "Performance Pay and Productivity." *American Economic Review* 90: 1346-61.
- Oyer, Paul. 1998. "Fiscal Year Ends and Nonlinear Incentive Contracts: The Effect on Business Seasonality." *Quarterly Journal of Economics* 113:149-85.
- Chevalier, Judith, and Glen Ellison. 1997. "Risk Taking by Mutual Funds as a Response to Incentives." *Journal of Political Economy* 105:1167-1200.
- Cragg, Michael. 1997. "Performance Incentives in the Public Sector: Evidence from the Job Training Partnership Act." *Journal of Law, Economics, and Organization* 13:147-68.
- *W Cockburn, Ian, Rebecca Henderson, and Scott Stern. 2002. "Balancing Incentives: The Tension Between Basic and Applied Research." Unpublished manuscript, MIT.
- *W D. Akerberg and M. Botticini. "Endogenous Matching and the Empirical Determinants of Contract Form." *Journal of Political Economy* Vol 110, No 3, June 2002.
- M. Roomkin and B. Weisbrod. 1999. "Managerial Compensation and Incentives in For-Profit and Non-Profit Hospitals." *Journal of Law, Economics and Organization* Vol 15, No 3, 750-781.

3. Multiple Agents

- *P Bolton, P. and M. Dewatripont (2001), Introduction to Contract Theory (manuscript), Chapter 9 (Multiagent Moral Hazard and Collusion)
- Holmstrom, Bengt. 1982. "Moral Hazard in Teams." *Bell Journal of Economics* 13:324-40.
- Itoh, H. (1991), "Incentives to Help in Multi-Agent Situations." *Econometrica* 59(3): 611-636.
- Kandel, Eugene, and Edward Lazear. 1992. "Peer Pressure and Partnership." *Journal of Political Economy* 100:801-17.
- *W Barron, John, and Kathy Paulson Gjerde. 1997. "Peer Pressure in an Agency Relationship." *Journal of Labor Economics* 15:234-54.
- Knez, Marc, and Duncan Simester. 2001. "Firm-Wide Incentives and Mutual Monitoring at Continental Airlines." *Journal of Labor Economics* 19: 743-72.
- *W Lazear, Edward, and Sherwin Rosen. 1981. "Rank-Order Tournaments as Optimum Labor Contracts." *Journal of Political Economy* 89: 841-864.
- Lazear, Edward. 1989. "Pay Equality and Industrial Politics." *Journal of Political Economy* 97:561-80.
- Murphy, Kevin J. 1985. "Corporate Performance and Managerial Remuneration: An Empirical Analysis." *Journal of Accounting and Economics* 7:11-42.
- *W Eriksson, Tor. 1999. "Executive Compensation and Tournament Theory: Empirical Tests on Danish Data." *Journal of Labor Economics* 17: 262-80.

B. Relational Contracts (Sept. 17, 24, 29)

- Macaulay, Stewart. 1963. "Non Contractual Relations in Business: A Preliminary Study." *American Sociological Review* 28: 55-67.
- Macneil, Ian. 1978. "Contracts: Adjustments of long-term economic relations under classical, neoclassical, and relational contract law." *Northwestern University Law Review*. 192: 854-906.
- Goldberg, Victor. 1980. "Relational Exchange." *American Behavioral Scientist* 23: 337-52.
- Macneil, Ian. 1995. "Relational Contract: What We Do and Do Not Know." *Wisconsin Law Review* 3: 483-526.
- Hayes, Rachel and Scott Schaefer. 2000. "Implicit contracts and the Explanatory Power of Top Executive Compensation for Future Performance." *RAND Journal of Economics* 31: 273-93.
- Bull, Clive. 1987. "The Existence of Self-Enforcing Implicit Contracts." *Quarterly Journal of Economics* 102:147-59.
- MacLeod, Bentley and James Malcomson. 1998. "Motivation and Markets." *American Economic Review* 88:388-411.
- *W Levin, Jonathan. 2003. "Relational Incentive Contracts." *American Economic Review* 93: 835-57.
- Levin, Jonathan. 2002. "Multilateral Contracting and the Employment Relationship." *Quarterly Journal of Economics* 117: 1075-1103.
- Ramey, Garey, and Joel Watson. 1997. "Contractual Fragility, Job Destruction, and Business Cycles." *Quarterly Journal of Economics* 112:873-911.
- Watson, Joel. 1999. "Starting Small and Renegotiation." *Journal of Economic Theory* 85: 52-90.
- Watson, Joel. 2002. "Starting Small and Commitment." *Games and Economic Behavior* 38: 176-99.
- Rauch, James and Joel Watson. 2003. "Starting small in an unfamiliar environment." *International Journal of Industrial Organization* 21: 1021-42.
- Brown, Martin, Armin Falk, and Ernst Fehr. 2003. "Relational Contracts and the Nature of Market Interactions." Forthcoming in *Econometrica*.
- *W Baker, George, Robert Gibbons, and Kevin J. Murphy. 1994. "Subjective Performance Measures in Optimal Incentive Contracts." *Quarterly Journal of Economics* 109:1125-56.
- Pearce, David and Ennio Stacchetti. 1998. "The Interaction of Implicit and Explicit Contracts in Repeated Agency." *Games and Economic Behavior* 23: 75-96.
- *P Che, Yeon-Koo, and Seung-Weon Yoo. 2001. "Optimal Incentives for Teams." *American Economic Review* 91: 525-41.
- Rayo, Luis. 2003. "Relational Team Incentives and Ownership." Unpublished manuscript, University of Chicago.
- Kandori, Michihiro. 2002. "Introduction to Repeated Games with Private Monitoring." *Journal of Economic Theory* 102: 1-15.

C. No Contracts: Career Concerns and Reputation (Oct. 1, 6, 8)

- *W Holmstrom, Bengt. 1982. "Managerial Incentive Problems—A Dynamic Perspective." Republished in *Review of Economic Studies* 66 (1999): 169-82.
- Dewatripont, Mathias, Ian Jewitt, and Jean Tirole. 1999. "The Economics of Career Concerns, Part I: Comparing Information Structures." *Review of Economic Studies* 66: 183-98.
- Meyer, Margaret and John Vickers. 1997. "Performance Comparisons and Dynamic Incentives." *Journal of Political Economy* 105: 547-81.
- Gibbons, Robert, and Kevin J. Murphy. 1992. "Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence." *Journal of Political Economy* 100:468-505.
- Gompers, Paul, and Josh Lerner. 1999. "An Analysis of Compensation in the U.S. Venture Capital Partnership." *Journal of Financial Economics* 51: 3-44.
- Chevalier, Judith and Glenn Ellison. 1999. "Career Concerns of Mutual Fund Managers." *Quarterly Journal of Economics* 114: 389-432.
- Auriol, Emmanuelle, Guido Friebel, and Lambros Pechlivanos. 2002. "Career Concerns in Teams." *Journal of Labor Economics* 20: 289-307.
- Holmstrom, Bengt and Joan Ricart I Costa. 1986. "Managerial Incentives and Capital Management." *Quarterly Journal of Economics* 101: 835-60.
- Milbourn, Todd, Richard Shockley, and Anjan Thakor. 2001. "Managerial career concerns and investments in information." *RAND Journal of Economics* 32: 334-51.
- *W Milgrom, Paul and John Roberts. 1988. "An Economic Approach to Influence Activities in Organizations." *American Journal of Sociology* 94:S154-S179.
- Stein, Jeremy. 1989. "Efficient Capital Markets, Inefficient Firms: A Model of Myopic Corporate Behavior." *Quarterly Journal of Economics* 104: 655-69.
- Boot, Arnoud, Stuart Greenbaum, and Anjan Thakor. 1993. "Reputation and Discretion in Financial Contracting." *American Economic Review* 83: 1165-83.
- Diamond, Douglas. 1989. "Reputation Acquisition in Debt Markets." *Journal of Political Economy* 97: 828-62.
- Tirole, Jean. 1996. "A Theory of Collective Reputations (with applications to the persistence of corruption and to firm quality)." *Review of Economic Studies* 63:1-22.
- *W Banerjee, Abhijit and Esther Duflo. 2000. "Reputation Effects and the Limits of Contracting: A Study of the Indian Software Industry." *Quarterly Journal of Economics* 115: 989-1017.
- Tadelis, Steven. 2002. "The Market for Reputations as an Incentive Mechanism." *Journal of Political Economy* 110: 854-82.

II. Decision Rights

A. Classics (Oct. 15)

Williamson, Oliver. 1971. "The Vertical Integration of Production: Market Failure Considerations." *American Economic Review* 61: 112-23.

Klein, Benjamin, Robert Crawford, and Armen Alchian. 1978. "Vertical Integration, Appropriable Rents and the Competitive Contracting Process." *Journal of Law and Economics* XXI: 297-326.

Williamson, Oliver. 1979. "Transaction Cost Economics: The Governance of Contractual Relations." *Journal of Law and Economics* 22: 233-61.

Monteverde, Kirk and David Teece. 1982. "Supplier Switching Costs and Vertical Integration in the Automobile Industry." *Bell Journal of Economics* 13:206-13.

Anderson, Erin and David Schmittlein. 1984. "Integration of the Sales Force: An Empirical Examination." *Rand Journal of Economics* 15: 385-95.

Masten, Scott. 1984. "The Organization of Production: Evidence from the Aerospace Industry." *Journal of Law and Economics* 27: 403-17.

Joskow, Paul. 1985. "Vertical Integration and Long-Term Contracts: The Case of Coal-Burning Electric Generation Plants." *Journal of Law, Economics, and Organization* 1: 33-80.

Joskow, Paul. 1987. "Contract Duration and Relationship-Specific Investment: Empirical Evidence from Coal Markets." *American Economic Review* 77:168-85.

Masten, Scott, James Meehan, and Edward Snyder. 1991. "The Costs of Organization." *Journal of Law, Economics, and Organization*. 7: 1-25.

Williamson, Oliver. 2002. "The Theory of the Firm as Governance Structure: From Choice to Contract." *Journal of Economic Perspectives* 16: 171-95.

Gibbons, Robert. 2003. "Four Formal(izable) Theories of the Firm." Unpublished manuscript, MIT.

B. Ex Ante Incentives (Oct. 20, 22, 27)

*W Grossman, S. and O. Hart (1986), "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy* 94(4): 691-719.

Hart, O. and J. Moore (1990), "Property Rights and the Nature of the Firm." *Journal of Political Economy*, 98 (6): 1119-1158.

Hart, Oliver. 1995. "The Property Rights Approach," and "Further Issues Arising from the Property Rights Approach." Chapters 2-3 in *Firms, Contracts, and Financial Structure*. Oxford University Press.

*W Whinston, Michael. 2003. "On the Transaction Cost Determinants of Vertical Integration." *Journal of Law, Economics, and Organization* 19: 1-23.

Holmstrom, Bengt and Paul Milgrom. 1994. "The Firm as an Incentive System." *American Economic Review* 84: 972-91.

- *W Holmstrom, Bengt. 1999. "The Firm as a Subeconomy." *Journal of Law, Economics, and Organization*. 15: 74-102.
- *W Baker, George and Thomas Hubbard. 2003. "Make Versus Buy in Trucking: Asset Ownership, Job Design, and Information." *American Economic Review* 93: 551-572.
- Maskin, Eric, and Jean Tirole. 1999. "Two Remarks on the Property-Rights Literature." *Review of Economic Studies* 66: 139-49.
- Lerner, Josh and Robert Merges. 1998. "The Control of Technology Alliances: An Empirical Analysis of the Biotechnology Industry." *Journal of Industrial Economics* 46: 125-56.
- Baker, George, Robert Gibbons, and Kevin J. Murphy. 2002. "Relational Contracts and the Theory of the Firm." *Quarterly Journal of Economics* 117: 39-83.

C. Ex Post Control (Oct. 29, Nov. 3)

- *W Hart, Oliver, and Bengt Holmstrom. 2002. "A Theory of Firm Scope." Unpublished manuscript, Harvard University.
- Klein, Benjamin. 1996. "Why Hold-ups Occur: The Self-Enforcing Range of Contractual Relationships." *Economic Inquiry* 34: 444-63.
- *W Klein, Benjamin and Kevin M. Murphy. 1997. "Vertical Integration as a Self-Enforcing Contractual Arrangement." *American Economic Review* 87: 415-20.
- Klein, Benjamin. 2000. "The Role of Incomplete Contracts in Self-Enforcing Relationships." *Revue D'Économie Industrielle* 92: 67-80.
- Arruñada, Benito, Luis Garicano, and Luis Vázquez. 2001. "Contractual Allocation of Decision Rights and Incentives: The Case of Automobile Distribution." *Journal of Law, Economics, and Organization* 17: 257-84.
- *W Baker, George, Robert Gibbons, and Kevin J. Murphy. 2003. "Governing Adaptation: Decision Rights, Payoff Rights, and Relational Contracts in Firms, Contracts, and Other Governance Structures." <http://www.courses.fas.harvard.edu/~ec2665/Papers/>
- Bajari, Patrick and Steven Tadelis. 2001. "Incentive versus Transaction Costs: A Theory of Procurement Contracts." *RAND Journal of Economics* 32: 387-407.
- Elfenbein, Daniel, and Josh Lerner. 2003. "Ownership and control rights in Internet portal alliances, 1995-1999." *RAND Journal of Economics* 34: 356-69.
- Robinson, David, and Toby Stuart. 2002. "Just How Incomplete Are Incomplete Contracts? Evidence from Biotech Strategic Alliances." Unpublished manuscript, Columbia University.

III. Dynamic Contracting

A. Renegotiation and Incomplete Contracting (Nov. 5, 12)

- *W Hart, Oliver, and John Moore. 1988. "Incomplete Contracts and Renegotiation." *Econometrica* 56: 755-85.
- Aghion, Philippe, Mathias Dewatripont and Patrick Rey. 1994. "Renegotiation Design with Unverifiable Information." *Econometrica* 62: 257-282.
- Noldeke, Georg and Klaus M. Schmidt. 1995. "Option Contracts and Renegotiation: A Solution to the Hold-up Problem." *RAND Journal of Economics* 26(2): 163-179.
- Che, Yeon-Koo and Donald Hausch. 1999. "Cooperative Investments and the Value of Contracting." *American Economic Review* 89: 125-47.
- Edlin, Aaron and Benjamin Hermalin. 2000. "Contract Renegotiation and Options in Agency Problems." *Journal of Law, Economics, and Organization* 16: 395-423.
- Hermalin, Benjamin and Michael Katz. 1991. "Moral Hazard and Verifiability: The Effects of Renegotiation in Agency." *Econometrica* 59(6): 1735-1753.
- *W Bernheim, Douglas, and Michael Whinston. 1998. "Incomplete Contracts and Strategic Ambiguity." *American Economic Review* 88: 902-32.

B. Dynamic Risk-Sharing and Moral Hazard (Nov. 17, 19, 24)

- Harris, M. and B. Holmstrom. 1982. "A Theory of Wage Dynamics." *Review of Economic Studies* 49: 315-333.
- *W J. Thomas and T. Worrall, "Self-Enforcing Wage Contracts." *Review of Economic Studies* Vol 55, Issue 4, Oct 1988: 541-553.
- E. Ligon, J. Thomas and T. Worrall, "Informed Insurance Arrangements with Limited Commitment: Theory and Evidence from Village Economies." *Review of Economic Studies* Vol 69, Issue 1, Jan 2002.
- *W Hendel, I. and A. Lizzeri. 2003. "The Role of Commitment in Dynamic Contracting: Evidence from Life Insurance." *Quarterly Journal of Economics* 118: 299-328.
- *P Bolton, P. and M. Dewatripont (2001), Introduction to Contract Theory (manuscript), Chapter 13 (Dynamic Moral Hazard).
- *W Rogerson, W. 1985. "Repeated Moral Hazard." *Econometrica* 53: 69-76.
- Dewatripont, M. and E. Maskin. 1990. "Contract renegotiation in models of asymmetric information." *European Economic Review* 34: 311-321.

C. Dynamic Financial Contracts (Nov. 26, Dec. 1)

Bolton, P and M. Dewatripont, Introduction to Contract Theory. Chapter 13.

- *P Hart, O. (1995), *Firms, Contracts, and Financial Structure*, Ch 5, Oxford University Press.
- Aghion, P., and P. Bolton (1992), "An 'Incomplete Contracts' Approach to Financial Contracting." *Review of Economic Studies* 59:473-94.
- Townsend, P. (1979), "Optimal Contracts and Competitive Markets with Costly State Verification." *Journal of Economic Theory* 21:265-93.
- *W Hart, O., and J. Moore (1994), "A Theory of Debt Based on the Inalienability of Human Capital." *Quarterly Journal of Economics* 109:841-79.
- Hart, O., and J. Moore (1998), "Default and Renegotiation: A Dynamic Model of Debt." *Quarterly Journal of Economics* 113:1-41.
- Diamond, D. (1991), "Debt Maturity Structure and Liquidity Risk." *Quarterly Journal of Economics* 106:709-37.
- *P Hart, O. (2001), "Financial Contracting." *Journal of Economic Literature* 34 (4), 1079-1100.
- Berglöf, E., and E.L. von Thadden (1994), "Short-term versus Long-Term Interests: Capital Structure with Multiple Investors." *Quarterly Journal of Economics* 109:1055-84.
- *W Kaplan, S., and P. Stromberg (2002), "Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts." *Review of Economic Studies* 70: 281-315.
- Kaplan, S., and P. Stromberg (2002), "Characterics, Contracts, and Actions: Evidence from Venture Capitalist Analyses." Mimeo.
- *W Holmstrom, B and J. Tirole (1998), "Private and Public Supply of Liquidity." (with Jean Tirole), *Journal of Political Economy* 106:1, February.
- Caballero R and A Krishnamurthy (2001), "International and Domestic Collateral Constraints in a Model of Emerging Market Crises." forthcoming in *Journal of Monetary Economics*.
- Inderst, R. and H. Muller (2002), "Internal vs External Financing: An Optimal Contracting Approach." working paper, Stern School, New York University (should be on Muller's web page).
- Newman, A. (2002), "Risk Bearing, Entrepreneurship and the Theory of Moral Hazard." mimeo, University College London (should be available on his site ther – else available on Stanfords SITE conference page).

IV. Multi-Agent Contracting (Dec. 3, 8, 10)

- Bolton, P. and M. Dewatripont (2001), *Introduction to Contract Theory* (manuscript), Chapter 9 (Multiagent Moral Hazard and Collusion)
- *P Holmstrom, B. and P. Milgrom (1990), "Regulating Trade Among Agents." *Journal of Institutional and Theoretical Economics* 146(1): 85-105.
- Tirole, Jean. 1986. "Hierarchies and Bureaucracies: On the Role of Collusion in Organizations." *Journal of Law, Economics, and Organization* 2:181-214.

- Kofman, A. and J. Lawarree (1993), "Collusion in Hierarchical Agency." *Econometrica* 61, 629-56.
- *W Bernheim, B. D. and M. Whinston (1986), "Common Agency." *Econometrica* 54(4): 923-42.
- Dixit, A., G. Grossman and E. Helpman (1997), "Common agency and coordination: General theory and application to government policymaking." *Journal of Political Economy* 105(4), August, 752-769.
- *W Aghion, Philippe. and Patrick Bolton. 1987. "Contracts as a Barrier to Entry." *American Economic Review* 77: 388-401.
- *W Segal, Ilya. 1999. "Contracting with Externalities." *Quarterly Journal of Economics* 114: 337-88.
- Gemicot, G. and D. Rey (2003), "Contract and Externalities: How Things Fall Apart" University of California Irvine. (Available on SITE page mentioned above, but probably also on UCI's page).
- d'Aspremont, C. and L. Gerard-Varet (1979), "Incentives and Incomplete Information." *Journal of Public Economics* 11: 24-45.
- Holmstrom, B. and R. Myerson (1983), "Efficient and Durable Decision Rules with Incomplete Information." *Econometrica* 51(6): 1799-1820.
- *P Myerson, Roger and M. Satterthwaite (1983), "Efficient Mechanisms for Bilateral Trading." *Journal of Economic Theory* 29: 265-281.
- Aghion, P. and P. Bolton (2003), "Incomplete Social Contracts." *Journal of the European Economic Association* Vol 1 (1).
- *W Milgrom P. and J. Roberts (1986), "Relying on the Information of Interested Parties." *Rand Journal of Economics* 17(1): 18-32.