

Topics in Microeconomics: Modern Contract Theory

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Content:

Contracts are part of our everyday lives. Contracts cover both formal and informal agreements between people on various subjects. Although the baseline idea of a written (and complete) agreement is powerful and a core idea at the roots of economics, the real-world has taught us that contracts are inherently incomplete.

At least since the 1970ies, that incompleteness has inspired both theorists and applied researchers to work on both normative and positive aspects of incomplete contracts. Based on these foundations, modern contract theory mainly focuses on the dynamic aspects of formal and informal contractual relationships. It is still one of the most active and innovative fields of Microeconomics.

In this course, we aim to bring students to the frontier of modern contract theory. We start by a (largely lecture based) review of classical concepts and how they translate to solution techniques that allow us to model and understand among other how agents build and diminish reputation, how career concerns interfere with contractual obligations, or how institutions shape the form of contracts we expect to observe.

In the second part, we “put these theories to work” and study the applications of contract theory to questions in industrial organizations, environmental economics, political economy, and innovation. We will look at how contracts can be set up to foster collaboration, exploit or meet certain behavioral traits and help to shape organizations and culture.

We will use a combination of lectures and short input sessions with student led activities such as paper presentations, the discussion of open questions and the combination of the students’ research interests with the ideas in contract theory.

Detailed Program

Part A: Techniques

This part will take a lecture+discussion format to ensure everyone is technically up to speed.

1. **The Basics** (Dynamic Optimizations, Hamilton-Jacobi-Bellman Equations, Optimal Control, Monotone Comparative Statics, Solving Dynamic Games)

Textbook References: Mailath, George J., and Larry Samuelson. Repeated games and reputations: long-run relationships. Oxford university press, 2006.

Seierstad, Atle, and Knut Sydsaeter. *Optimal control theory with economic applications*. Elsevier North-Holland, Inc., 1986.

Acemoglu, Daron. *Introduction to modern economic growth*. Princeton university press, 2008. (Chapter 7)

2. **A Refresher on Moral Hazard** (First-Order-Approach, Duality, Relational Issues)

Textbook References: Bolton, Patrick, and Mathias Dewatripont. *Contract theory*. MIT press, 2004.

3. **Basic Experimentation Models** (Career Concerns, the Bandit Model, Collective Experimentation)

References:

Stopping Problems:

Bergemann, D., and U. Hege, 2005, "The financing of innovation: Learning and stopping," RAND Journal of Economics, pp. 719–752.

Manso, Gustavo. "Motivating innovation." *The journal of finance* 66.5 (2011): 1823-1860.

Callander, Steven. "Searching and learning by trial and error." *American Economic Review* 101.6 (2011): 2277-2308.

Collective experimentation

Bolton, Patrick, and Christopher Harris. "Strategic experimentation." *Econometrica* 67.2 (1999): 349-374.

Keller, Godfrey, Sven Rady, and Martin Cripps. "Strategic experimentation with exponential bandits." *Econometrica* 73.1 (2005): 39-68.

Strulovici, Bruno. "Learning while voting: Determinants of collective experimentation." *Econometrica* 78.3 (2010): 933-971.

Part B: Applications

In this part we will use the techniques to study recent applications of contract theory to various fields of economics. If we are bold, we will also venture into the advancements of the theory we observe.

1. Innovation

Boleslavsky, Raphael, and Curtis R. Taylor. "Make it'til you fake it." *Journal of Economic Theory* 217 (2024): 105812.

Deb, Rahul, Matthew Mitchell, and Mallesh M. Pai. "(Bad) reputation in relational contracting." *Theoretical Economics* 17.2 (2022): 763-800.

Hopenhayn, Hugo, and Francesco Squintani. "On the direction of innovation." *Journal of Political Economy* 129.7 (2021): 1991-2022.

Ederer, Florian, and Gustavo Manso. "Is pay for performance detrimental to innovation?." *Management Science* 59.7 (2013): 1496-1513.

Guo, Yingni. "Dynamic delegation of experimentation." *American Economic Review* 106.8 (2016): 1969-2008.

Georgiadis, George, and Michael Powell. 2022. "A/B Contracts." *American Economic Review*, 112(1): 267–303.

2. Collaboration

Cetemen, Doruk, Can Urgan, and Leeat Yariv. "Collective progress: Dynamics of exit waves." *Journal of Political Economy* 131.9 (2023): 2402-2450.

Deb, Joyee, Aditya Kuvalekar, and Elliot Lipnowski. "Fostering Collaboration." (2023).

Moroni, Sofia. "Experimentation in organizations." *Theoretical Economics* 17.3 (2022): 1403-1450.

Dai, Tianjiao, and Juuso Toikka. 2022. "Robust incentives for teams." *Econometrica*, 90(4): 1583–1613.

3. Industrial Organization

Pei, Harry. "Reputation building under observational learning." *The Review of Economic Studies* 90.3 (2023): 1441-1469.

Hörner, Johannes, and Larry Samuelson. "Managing strategic buyers." *Journal of Political Economy* 119.3 (2011): 379-425.

Board, Simon. "Relational contracts and the value of loyalty." *American Economic Review* 101.7 (2011): 3349-3367.

4. Organizational Economics

Barron, Daniel, Yingni Guo, and Bryony Reich. "Wealth dynamics in communities." *The Review of Economic Studies* 90.4 (2023): 1642-1668.

Ely, Jeffrey C., George Georgiadis, and Luis Rayo. *Feedback Design in Dynamic Moral Hazard*. Centre for Economic Policy Research, 2023.

Halac, Marina, Elliot Lipnowski, and Daniel Rappoport. 2021. "Rank uncertainty in organizations." *American Economic Review*, 111(3): 757–86

Foarta, Dana, and Takuo Sugaya. 2021. "The management of talent: Optimal contracting for selection and incentives." *The RAND Journal of Economics*, 52(1): 49–77.

Halac, Marina, and Pierre Yared. 2018. "Fiscal Rules and Discretion in a World Economy." *American Economic Review*, 108 (8): 2305-34.

5. Political Economy

Harstad, Bård (2022): Pledge-and-Review Bargaining: from Kyoto to Paris. *The Economic Journal*, vol. 133, pp. 1181-1216.

Harstad, Bård, and Marco Battaglini (2020): The Political Economy of Weak Treaties. *Journal of Political Economy*.

Myerson, Roger (2015): Moral Hazard in High Office and the Dynamics of Aristocracy. *Econometrica*.

Acemoglu, Daron, and Matt Jackson (2015): History, expectations, and leadership in the evolution of social norms. *Review of Economic Studies*.

Delgado-Vega, Alvaro and Johannes Schneider (2024): Embracing the Enemy, mimeo.

6. Behavioral Economics

Koszegi, Botond (2014): Behavioral Contract Theory. *Journal of Economic Literature*, vol. 52, pp. 1075-1118.

Heidhues, Paul and Botond Kőszegi (2015): Behavioral Industrial Organization in *Handbook of Behavioral Economics - Foundations and Applications* 1

Carroll, Gabriel. 2019. "Robustness in mechanism design and contracting." *Annual Review of Economics*, 11(1): 139–166.

7. Recent Theoretical Advances

Georgiadis, George, Doron Ravid, and Balázs Szentes. "Flexible moral hazard problems." *Econometrica* 92.2 (2024): 387-409.

Gottlieb, Daniel, and Humberto Moreira. 2022. "Simple contracts with adverse selection and moral hazard." *Theoretical Economics*, 17(3): 1357–1401.

Strulovici, Bruno. "Renegotiation-Proof Contracts with Persistent States." *preprint* (2022).

Strulovici, Bruno, and Martin Szydlowski. "On the smoothness of value functions and the existence of optimal strategies in diffusion models." *Journal of Economic Theory* 159 (2015): 1016-1055.

Dumav, Martin and Urme Khan (2024): A Theory of Robust Contracts under Uncertainty, Working Paper.

Assessment: Students will be assessed by a combination of class participation, presentation and a written report/research proposal about one of the work discussed in class. Topics are chosen in discussion with the lecturers.