

Contract theory and Information Economics

Instructor's name: Mariya Teteryatnikova (lectures)

Class Times and Locations: TBA

Lectures: Mondays, starting from January 15, 18.10-21.00

Classes: by groups

Email: mteteryatnikova@hse.ru

Phone: (495) 772-95-90 *26033

Office Location: Shabolovka 26

Office Hours: TBA

Course type: elective

Section 1. General information about the course

How do managers create incentives for their employees? How, in turn, stockholders create incentives for the managers themselves? What is the difference between complete and incomplete contracts? How do relational contracts work? During the course we will address these and other questions. The course is relatively short, so we will not have time to cover all topics comprehensively. However, we will try to explore the core topics thoroughly, and briefly survey extensions, applications, and new directions in this fascinating subject.

We will start with a brief game theory refresher where we will review basic theoretical concepts. We will then spend some time on dynamic games with incomplete information, focusing on signaling games. The main part of the course focuses on contract theory. A general principal-agent framework is set up and all the applications are derived using (as much as possible) the same approach. We are going to start from the baseline models of adverse selection and moral hazard and then look at various modifications of these models: more general structure of outcomes/types, ex-ante contracting, limited liability, audit, etc.

Duration: 10 weeks, 2 classes per week.

Section 2. Course goals, learning objectives, expected learning outcomes

The objectives of the course are:

- to provide students with the knowledge of core concepts, methods and models in contract theory and information economics;
- to develop students' ability to apply the knowledge acquired in the analysis of specific methods and models to economic phenomena.

By the end of the course students are expected:

1. To be able to solve basic contract-theoretic models and their extensions.
2. Given the problem, to properly categorize its contract-theoretic features (adverse selection\moral hazard, how to model types in a particular situation, describe information structure, IC IR constraints)

Prerequisites: microeconomics, game theory, mathematics for economists.

Section 3. Course Outline

Nº	Topic	Week	Lecture	Readings
1	Introduction: Information economics. Moral hazard and adverse selection in principal-agent framework.	1	1	Salanie [1] or lecture slides.
2	Basic game theory refresher: ⊖ Static and dynamic games of complete information: Nash and Subgame perfect equilibrium ⊖ Static games of incomplete information: Bayesian equilibrium	1	1	Osborne [2-7, 9] or lecture slides.
3	Dynamic games of incomplete information: Perfect Bayesian equilibrium Signaling games: ⊖ Market for lemons. ⊖ Spence model. ⊖ Cheap-talk model. <i>PSI</i>	2-3	3	Osborne [10], Salanie [4] .

4	<p>Models of adverse selection:</p> <p>Baseline model of adverse selection:</p> <ul style="list-style-type: none"> ○ First-best and second-best. ○ Shutdown and pooling contracts. ○ Applications to financial contracts. 	3-4	2	Salanie [2]. Additional/alternative reading: Laffont-Martimort [2].
5	<p>Advanced topics in adverse selection:</p> <ul style="list-style-type: none"> ○ Ex ante contracting with limited liability. ○ Contracts with audit. ○ Contracts with different outside options. ○ Continuum of types. <p><i>PS2</i></p>	4-5	2	Salanie [3]. Additional/alternative reading: Laffont-Martimort [3].
6	<p>Moral hazard:</p> <ul style="list-style-type: none"> ○ Baseline model of moral hazard: observable and unobservable effort, risk-neutral and risk-averse agents. 	5-6	2	Salanie [5]. Additional/alternative reading: Laffont-Martimort [4].
7	<p>Advanced topics in moral hazard:</p> <ul style="list-style-type: none"> ○ Multiple outcomes. ○ Continuum of outcomes. ○ Linear contracts. ○ Multitasking. ○ Relational contracts. 	6-7	3	Salanie [5]. Additional/alternative reading: Laffont-Martimort [5], Bolton-Dewatripont [10], Abreu, Pearce, Stacchetti (1986), Levin (2003)

8	Incomplete contracts <i>PS3</i>	8	1	Salanie [7].
9	Dynamic aspects of contracting, renegotiation.	8-9	2	Salanie [6] . Additional/alternative reading: Laffont-Martimort [8], Bolton-Dewatripont [9-10], Aghion, Dewatripont, Rey (1994)
10	Tournaments (if time remains)	9	1	Lazear and Rosen (1981).
11	Students' presentations	10	2	

Description of course methodology and forms of assessment to be used

While teaching the course the following teaching methods and forms of study and control are used:

- ⇒ lectures (4 hours a week);
- ⇒ written home assignments;
- ⇒ presentation by students;
- ⇒ self-study;
- ⇒ teachers' consultations;
- ⇒ written test

Assessment and grade determination (see section 5 for more details):

- Three problem sets [15% each (45% total)]
- Presentation of a research article [20%]
- Final exam (written) [35%]

Section 4. Texts, readings and other informational resources

Literature:

1. **Salanie. The Economics of Contracts: A Primer. MIT Press 2005.**
2. Laffont and Martimort. The Theory of Incentives. Princeton University Press. 2002.
3. Bolton and Dewatripont. Contract Theory. MIT Press, 2005.
4. Lazear and Rosen. Rank-Order Tournaments as Optimum Labor Contracts. JPE. 1981
5. Osborne, M.J. An Introduction to Game Theory. Oxford University Press, 2004 or 2009.

Additional reading:

B.Holmstrom and P.Milgrom (1991) Multitask principal-agent analysis: Incentive contracts, asset ownership and job design. *Journal of Law, Economics and Organization* 7: 24-51.

B.Holmstrom (1982) *Moral hazard in teams. Bell Journal of Economics, Autumn 1982.*

George Baker, Robert Gibbons, and Kevin J. Murphy (1994). Subjective Performance Measures in Optimal Incentive Contracts. *Quarterly Journal of Economics* 109:1125-56.

P.Aghion, M.Dewatripont, P.Rey (1994) Renegotiation design with unverifiable information. *Econometrica* 62: 257-282.

P.Aghion and J. Tirole (1997) Formal and real authority in organizations. *Journal of Political Economy*, 105(1): 1-29.

O.Hart and J.Moore (2005) On the Design of Hierarchies: Coordination vs Specialization, *Journal of Political Economy* 113(4) (2005) 675-702.

B.Bernheim and M.Whinston (1986), Common Agency. *Econometrica*, 54(4): 923-942.

Gibbons, R. (1997), «Incentives and Careers in Organizations,» in *Advances in Economic Theory and Econometrics*, D.M. Kreps and K.F. Wallis eds., 7th World Congress, vol II, chap. 1, p. 1-37.

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

Levin, J., (2003). Relational incentive contracts. *The American Economic Review*, 93(3), pp.835-857.

Aghion, Philippe and Jean Tirole. (1997). "Formal and Real Authority in Organizations." *Journal of Political Economy* 105:1-29.

Baker, George, Robert Gibbons, and Kevin J. Murphy. (1999). "Informal Authority in Organizations." *Journal of Law, Economics, and Organization* 15: 56-73.

Section 5. Grading system and how both the course and final test will be graded

Presentation should be scheduled in advance.

Exam and problem sets are graded out of 100 points. The results for the exam and problem sets are used to calculate the final mark using the weights specified in section 3 and the resulting mark is converted into 10-points scale.

Make-up policies and form of the make-up

If the final course mark is below 4 out of 10 then the student can sit one written make-up test set in accordance with the HSE's [Internal Regulations](#). This test covers all the material studied in the course.

Policies on late work

Late home assignments are marked but are not counted for the average mark for home assignments.