Doctoral Program in Economics

UNIVERSITÀ DEGLI STUDI FIRENZE | UNIVERSITÀ DI SIENA | UNIVERSITÀ DI PISA

Academic year 2025/26

Industrial Economics

Period:

Fourth term

Course hours:

20

Teachers:

Massimo De Francesco (6 hours), Nicola Doni (6 hours), Lapo Filistrucchi- Course Coordinator (4 hours), Domenico Menicucci (4 hours)

Exam methods:

written exam

Prerequisites:

Mathematics as taught in the first term (in particular: Static Optimization, with and without constraints), Standard Microeconomics a Taught in a First Year Bachelor in Economics (in particular: Production Theory, Monopoly Model, Basics of Game Theory such as concepts of Games, Simultaneous and Sequential, Strategies, Nash Equilibrium)

Educational objectives

The course aims at providing students with the ability to a) understand, predict and evaluate the outcome of firms strategies and strategic interactions among firms in markets; b) read papers in the field of industrial organization; c) understand the basic elements of economic modelling of markets

Module De Francesco

Program

<u>Competition and strategic interaction among sellers of a homogeneous product</u>

1. A STATIC GAME OF QUANTITY COMPETITION
   Cournot equilibrium under concave demand and identical and convex cost functions: existence, uniqueness and symmetry of Cournot equilibrium. Cournot equilibrium vs the competitive equilibrium.

2. DYNAMIC MODELS OF QUANTITY COMPETITION

(a) The leader-follower model by Stackelberg.
(b) The theory of limit pricing by Bain and Sylos-Labini as recounted by F. Modigliani.
(c) The role of sunk cost in Dixit's theory of entry deterrence.

3. PRICE COMPETITION WITH HOMOGENEOUS PRODUCT

(a) "Bertrand competition" – namely, price competition without capacity constraints: the Bertrand paradox.

(b) "Bertrand-Edgeworth competition" – namely, price competition with capacity constraints: competitive pricing as an equilibrium outcome of Bertrand-Edgeworth competition in a sufficiently large market.

Bibliographical references

1. *Lecture notes by the lecturer.*
2. *Reading list* (on the topics that have been covered or to learn more)

QUANTITY COMPETITION

J. Tirole, *The theory of industrial organization*, MIT Press, 1988, pp. 205-208 and pp. 218-228 (for Cournot models of quantity competition under product homogeneity, in the short run and, in the long run, under free entry).

W. Novshek, 1980, Cournot competition with free entry, *The Review of Economic Studies*, Vol. 47, No. 3, pp. 473-486.

A. Mas-Colell, M.D. Whinston, J. R.Green, *Microeconomic Theory*, Oxford University Press, 1995, pp. 389-394 (Quantity competition (The Cournot model)), pp. 405-40 and 411-413 (The competitive limit).

At a more elementary level and less comprehensively: H. Gravelle, R. Rees, *Microeconomics*, 2nd Edition, pp. 298-308 (for duopolistic Cournot and Stackelberg)

ENTRY DETERRENCE

F. Modigliani, 1958, New Developments on the Oligopoly Front, Journal of Political Economy, vol. 66, 215.

A. Dixit, 1980, The role of investment in entry deterrence, *The Economic Journal*, Vol.90, No. 357, pp. 95-106.

PRICE COMPETITION WITH HOMOGENEOUS PRODUCT

J. Tirole, *The theory of industrial organization*, cit.: pp. 209-215; pp. 245-247.

X. Vives, Rationing rules and Bertrand-Edgeworth equilibria in large markets, *Economics Letters*, 1986, 21, pp. 113-116.

[Vives' paper is recommended on several respects: it addresses the issue of the emergence of the competitive outcome of a price game in a large market; it also computes the mixed strategy equilibrium of the price game (when no pure strategy equilibrium of such a game exists). This task is performed for a symmetric oligopoly and under the efficient rationing rule.]

A. Mas-Colell, M.D. Whinston, J. R. Green, *Microeconomic Theory*, cit.: pp.387-390 ("The Bertrand model of price competition"), pp. 394-395 ("Capacity constraints and decreasing returns to scale"). You might also see H. Gravelle, R. Rees, *Microeconomics*, cit., for the computation (in a more friendly fashion) of mixed strategy equilibrium of the price game under duopoly.

You might also be interested in learning about mixed strategy equilibrium of the price game under asymmetric duopoly (i.e., different capacities at the two firms). In this connection, you can see: Tirole, *The theory of industrial organization*, cit., subsection 5.7.2.1 ("The price game"), R. Levitan and M. Shubik, 1972, Price duopoly and capacity constraints, *International Economic Review*, 13, pp. 111-122, and, of course, D. Kreps and J. Scheinkman, 1983, Quantity precommitment and Bertrand competition yield Cournot outcomes, *Bell Journal of Economics*, 14, pp. 326-337).

Module Doni

Program

<u>Competition and strategic interaction among sellers of differentiated products</u>

1. Oligopolistic Competition with Differentiated Products

2. Horizontal Product Differentiation

3. Vertical Product Differentiation

Bibliographical references
- Lecture notes by the lecturer.
- Reading list

1. Lecture reference:
(*) Belleflamme and Peitz, Industrial Organization: Markets and Strategies, Cambridge, 2010, Chapter 3 Sections 3.1.3, 3.1.4, 3.3.2, 3.4
Further references:
Levin, J., 2006. Supermodular games (mimeo).
Bulow, J.I., J.D. Geanakoplos, P.D. Klemperer, 1985. Multimarket Oligopoly: Strategic Substitutes and Complements, *Journal of Political Economy*, vol. 93(3), 488-511
Dowrick, S., 1986. Von Stackelberg and Cournot Duopoly: Choosing Roles, *Rand Journal of Economics*, vol. 17(2), 251-260.

2. Lecture reference:
Belleflamme and Peitz, Industrial Organization: Markets and Strategies, Cambridge, 2010, Chapter 5 Section 1-2
Further references:
Hotelling, H., 1929. Stability in Competition. *The Economic Journal*, vol. 39, 41-57.
D'Aspremont, C., J. Gabszewicz and J.-F. Thisse, 1979. On Hotelling's Stability in Competition. *Econometrica*, vol. 47, 1145–1150.
Salop, S.C., 1979. "Monopolistic Competition with Outside Goods," *Bell Journal of Economics*, vol. 10(1), 141-156.

3. Lecture reference:
(*) Belleflamme and Peitz, Industrial Organization: Markets and Strategies, Cambridge, 2010, Chapter 5 Section 5.3
Further references:
Mussa, M. and S. Rosen, 1978. "Monopoly and Product Quality," *Journal of Economic Theory*, vol. 18(2), 301-317.
Shaked, A. and J. Sutton, 1982. Relaxing Price Competition through Product Differentiation, *Review of Economic Studies*, vol. 49(1), 3-13.
Gabszewicz, J. and J.-F. Thisse, 1979. "Price Competition, Quality and Income Disparities" *Journal of Economic Theory*, vol. 20(3), 340-359.

Module Filistrucchi

Program
<u>Competition and strategic interaction in the presence of network effects</u>

1. Modelling network effects

2. Models of two-sided markets

Bibliographical references

- Lecture notes by the lecturer.
- Reading list

1.

Belleflamme, Paul & Peitz, Martin. (2015). Industrial Organization: Markets and Strategies (2nd Edition), Chapters 20,21,22

2.

Armstrong, M. 2006. Competition in Two-Sided Markets. Rand Journal of Economics,37(3):668-691.

Evans D.S., 2003, The Antitrust Economics of Multi-Sided Platform Markets. *Yale Journal of Regulation,* 20(2): 325-381

Gabszewicz JJ, Laussel D, Sonnac N. 2001, Press advertising and the ascent of the 'Pensée Unique". European Economic Review 45, 641-645.

Gabszewicz JJ, Laussel D, Sonnac N. 2002. Press Advertising and the Political Differentiation of Newspapers. Journal of Public Economic Theory 4(3): 317-34.

Filistrucchi L., Geradin D., van Damme E., and Affeldt P., 2014, Market Definition in Two-Sided Markets: Theory and Practice, Journal of Competition Law and Economics (2014), Volume 10 (2), pp. 293-339.

Parker G.G. and M.V. van Alstyne, 2005, Two-Sided Network Effects: A Theory of Information Product Design, *Management Science*, 51(10): 1494–1504.

Rochet J.C. and J. Tirole, 2003, Platform Competition in Two-Sided Markets, *Journal of the European Economic Association*, 1(4): 990-1029.

Rochet J.C. and J. Tirole, 2006, Two-Sided Markets: A Progress Report. *RAND Journal of Economics*, 37(3): 645-667.

Module Menicucci

Program

<u>Bundling in Monopoly</u>

1. Monopoly with zero costs and uniformly distributed values
2. Monopoly with positive costs and values distributed according to a symmetric and log-concave density
3. Mixed Bundling vs. Separate Sales
4. Bundling and Entry deterrence

Bibliographical references

1. Belleflamme Paul, Peitz Martin**,** 2010. Industrial Organization; Markets and Strategies, Cambridge University Press. Sections 11.1, 11.2

2. Fang Hanming, Norman Peter, 2006. To Bundle or Not to Bundle. RAND Journal of Economics, 37(4): 946–963.
3. McAfee R. Preston, McMillan John, Whinston Michael D., 1989. Multiproduct Monopoly, Commodity Bundling, and Correlation of Values. Quarterly Journal of Economics 104(2): 371–83.
4. Whinston Michael D., 1990. Tying, Foreclosure, and Exclusion. American Economic Review 80(4): 837–59.