

THE UNIVERSITY OF MARYLAND  
COLLEGE PARK MARYLAND  
(DRAFT)

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**ECONOMICS 662**

September 1, 2009

Office Hours: Tuesday 11-12:30.

**COURSE OUTLINE AND READING LIST**

**REQUIRED TEXT:**

J. Tirole, *The Theory of Industrial Organization*, Cambridge: MIT Press, 1988.

**OTHER USEFUL SOURCES:**

Vives, Xavier. *Oligopoly Pricing: Old Ideas and New Tools*. MIT Press. 1999.

Fudenberg, D. and J. Tirole. *Game Theory*. MIT Press. 1991.

F.M. Scherer, *Industrial Market Structure and Economic Performance*, 3rd Edition, Houghton Mifflin, 1990.

R. Schmalensee and R.D. Willig (eds.), *Handbook of Industrial Organization*, Amsterdam: North-Holland, 1989.

Gellhorn, E. and W. Kovacic. *Antitrust Law and Economics in a Nutshell*. Fourth Edition, West Group. 1994.

**COURSE ARTICLES AND MATERIAL:**

Many (though not all) of the articles listed below are available in a course packet that you may borrow from me to photocopy if you wish. It is probably worth your while to do so since finding these articles in libraries can be difficult. Other material will be available at my website, [www.wam.umd.edu/~dvincent](http://www.wam.umd.edu/~dvincent).

**EVALUATION:**

A number of non-graded problem sets will be distributed for the students to try for themselves. The questions on the exam will be closely based on these problems, so I urge you to understand them as fully as possible. Grades will be based on one final exam (70%) which will be a take home exam given out on the final day of classes and due approximately three days later.

The remaining 30% will be assigned through an "antitrust consultant" project. I would like you to select a current or recent antitrust case, analyse the economic issues that relate to it and develop a *model* that either supports or defends a side in the case. Here are some recent cases that you might consider:

Fresh Fields/Wild Oats  
Google/DoubleClick  
Oracle/PeopleSoft merger  
Lepages v. 3M  
UPM/MacTac merger  
GE/Honeywell

You may also choose cases from recent news developments. The recent merger between XM and Sirius or that between Live Nation and TicketMaster are examples. There is also a current antitrust concern connected to Google and its Kindle project. The emphasis is on model building. I want simple theoretical models that support an economic argument. You are responsible for finding any evidence you need to create a case though I am happy to help to extent possible. Given that information on various case may be limited, I also am willing to allow some selective evidence creation. I will expand on this as the course proceeds (note: consultant creation of evidence is not a generally recognized best practice).

Alternatively, students may choose to write a *referee report project*. Each student will select a paper from the syllabus (to be selected with my consent). They will read it carefully and write a referee report on the paper as if it were presented to a journal for publication for the first time. The report should be at least three and no more than five pages. A referee report should

- i) describe the issue and model addressed in the paper;
- ii) explain why the issue is interesting and important;
- iii) provide a critique of the weaknesses and strengths of the paper.

The student should also prepare a brief (20 minute) in-class presentation that describes the problem, the solution and the context in which the paper is written. The report is to be typed up and submitted to me electronically. In addition, the student will construct a problem set question along with a solution to the problem that is based on the model in the paper.

## 1. TOOLS (Not covered in lectures)

\*Vives, *Oligopoly Pricing*, Chapter 2.

\*Fudenberg, D. and J. Tirole. *Game Theory*. Chapters 1,3,8.

**Fudenberg, D. and J. Tirole, "Perfect Bayesian Equilibrium and Sequential Equilibrium," *Journal of Economic Theory* 53 (1991), 236-260.**

Tirole: Chapter 11

Fudenberg and Tirole, in HIO, Chapter 5.

Kreps and Wilson, "Sequential Equilibrium", *Econometrica*, 50. Pp. 854-894.

Kreps, D., *A Course in Microeconomic Theory*, Princeton U.P., 1990. Chapters 11-13.

Debreu, G. *Theory of Value*, Yale University Press, 1959.

Varian, H. *Microeconomic Analysis*, Third Edition, W.W. Norton, 1992.

Dixit, A. *Optimization in Economic Theory*, Second Edition, Oxford University Press, 1990.

## 2 MONOPOLY

### 2.1 Monopoly: Introduction

\*Tirole: Chapter 1.

Nalebuff, Barry. "Competing Against Bundles", Working Paper Series H, WP#7 Yale University, November, 2000.

### 2.2 Monopoly: Price Discrimination

#### 2.2a) General Discussions:

\*Tirole: Chapters 2.1, 2.2, 3.

Varian, H., "Price Discrimination", in *HIO*.

Mussa, M., and S.Rosen."Monopoly and Product Quality", *JET* 18,2 (1978): 301-317.

Salop, S., "The Noisy Monopolist: Imperfect Information, Price Dispersion and Price Discrimination", *REStud.* 44,3 (1977): 393-406.

Katz, M. "The Welfare Effects of Third-Degree Price Discrimination in Intermediate Goods Markets", *AER* 77, 1, (1987): 154-167.

Nahata, B., K. Ostaszewski and P. Sahoo (1990) "Direction of price changes in third-degree price discrimination," *AER* 80:1254-1258.

Varian, H. " Price Discrimination and Social Welfare", *AER*, 75,4,(1985): 870-875.

\*Schmalensee, R. " Output and Welfare Implications of Monopolistic Third Degree Price Discrimination" *American Economic Review* 71 1, (1981): 242-247.

Marius Schwartz, "The perverse effects of the Robinson-Patman Act", *Antitrust Bulletin*, Fall. 1986.

Stole, Lars. "Price Discrimination and Imperfect competition." Draft (2003)

<http://faculty.chicagogsb.edu/lars.stole/papers/pdce.pdf>

#### 2.2b) Specific Examples:

Ausubel, L., and R. Deneckere. "Durable Goods Monopoly with Incomplete Information", *REStud.* 59,4 (1992) 795-812.

Bulow, J., "Durable-Goods Monopolists", *JPE* 90,2 (1982): 314-332.

Conlisk, Gerstner and Sobel, *QJE* 99: 489-505. 1984.

Fudenberg, D. Levine, and J. Tirole, "Infinite Horizon Models of Bargaining with Incomplete Information", in *Game Theoretic Models of Bargaining*, (A.Roth ed.) pp. 73-98. Cambridge University Press, Cambridge, 1986.

Gul, F. "Noncooperative Collusion in Durable Goods Oligopoly" *Rand Journal of Economics* 18 (1987): 248-254.

\*\*Gul, F., H. Sonnenschein, and R. Wilson. "Foundations of Dynamic Monopoly and the Coase Conjecture", *JET* 39,1 (1986): 155-190.

Kolay, S. G. Shaffer and J. Ordovery. "All-Units Discounts in Retail Contracts" *Journal of Economics and Management Strategy*, 13,3. 2004.

\*Oi, W., "A Disneyland Dilemma: Two-Part Tariffs for a Mickey Mouse Monopoly", *QJE* 85,1 (1971): 77-96.

Stokey, N., "Rational Expectations and Durable Goods Pricing", *BJE* 12,1 (1981): 112-28.

Vincent, Daniel. "Bargaining with common values", *JET* 48, 1 (1989): 47-62.

## 2.3 Monopoly: Product Choice and Product Differentiation

### 2.3a) Product Differentiation:

\*Tirole: Chapters 2.1, 2.2, 3.

\* Caplin, A. and B. Nalebuff, "Aggregation and Imperfect Competition: On the Existence of Equilibrium", *Econometrica*, 59, 1, January, 1991, 25-59.

Spence, M. "Product Selection, Fixed Costs, and Monopolistic Competition", *ReStud.* 43, (1976): 217-235.

Dixit, A. and J. Stiglitz. "Monopolistic Competition and Optimum Product Diversity", *AER* 67,3. (1977):297-308.

### 2.3b) Bundling:

Adams, W.J. and J. Yellen, "Commodity Bundling and the Burden of Monopoly", *QJE*, 90 (1976): 475-98.

Bakos, Yannis and Brynjolfsson, E. "Bundling Information Goods: Pricing, profits and Efficiency." *Management Science*. Forthcoming.

\*anelli, A. and Daniel R. Vincent. "Optimal Bundling by A Multiproduct Monopolist", mimeo, 2002.

\*athewson, F. and R. Winter. "Tying as a Response to Demand Uncertainty", *Rand Journal*, (1997): 566-582.

\*cAfee, R.P., J. McMillan, and M. Whinston. "Multi-product Monopoly, Commodity Bundling and Correlation of Values", *QJE* 104,2 (1989): 371-383.

Stigler, G. J. "A Note on Block Booking", In G.J. Stigler (ed.) *The Organization of Industries*. Homewood, Ill.: Irwin.

## 3. OLIGOPOLY

### 3.1 Classical Oligopoly Theory

\*Tirole: Chapter 5

\* Vives, *Oligopoly Pricing*, Chapters 4 and 5.

Shapiro, C., "Theories of Oligopoly Behavior", in *HIO*, Section 2.

Novshek, W., "On The Existence of Cournot Equilibrium", *REStud.* 52,1 (1985): 85-98.

Novshek, W., "Cournot Equilibrium with Free Entry", *REStud.* 47 (1980): 473-486.

Kreps, D., and J. Scheinkman. "Quantity Precommitment and Bertrand Competition Yield Cournot Outcomes", *BJE* 14,2 (1983): 326-337.

Davidson, C., and R. Deneckere. "Long-run Competition in Capacity, Short-run Competition in Price, and the Cournot Model", *RJE* 17,3 (1986): 404-415.

Klemperer, P.D., and M. Meyer. "Supply Function Equilibria in Oligopoly Under Uncertainty", *Econometrica* 57,6 (1989): 1243-1277.

Scherer: Chapters 6-7.

Vives, X., "On the Efficiency of Bertrand and Cournot Equilibria with Product Differentiation", *JET* 36,1 (1985): 166-175.

### 3.2 Oligopoly --Horizontal Mergers

- \*<http://www.usdoj.gov/atr/public/guidelines/hmg.htm>
- \*<http://www.usdoj.gov/atr/foia/divisionmanual/ch2.htm>
- \*Salant, S., Switzer, S. and R.Reynolds. "Losses from Horizontal Merger: The Effects of an Exogenous Change in Industry Structure on Cournot-Nash Equilibrium", *QJE*, *XCVII*, 2 (1983): 185-199.
- \*Porter, R. and M. Perry, Oligopoly and the incentive for horizontal merger. *AER* 75 (1985): 219- 227.
- \*McAfee, RP and M. Williams. Horizontal mergers and antitrust policy. *Journal of Industrial Economics*. June 1992.
- \*\*Farrell, J. and C. Shapiro;. "Horizontal mergers: An equilibrium analysis. *AER* 80, no. 1.(1990.): 107-126. (Plus comment and reply by Werden and Farrell and Shapiro, *AER* 81,4 (1991).)
- Farrell, J. and C. Shapiro;. "Asset Ownership and Market Structure in Oligopoly." *Rand Journal* 21 (1990.).
- Salinger, M. "The Meaning of "Upstream" and "Downstream" and the implications for Modeling Vertical Mergers." *Journal of Industrial Economics XXXVII*, 4 (1989): 373-387.
- Reynolds, R. and B. Snapp, "The Economic Effects of Partial Equity Interests and Joint Ventures", *Economic Policy Office Discussion Paper, EPO 82-3*, August, 1982.

### 3.3 Oligopoly: Price Discrimination and Imperfect Competition

- \*Armstrong, M. and J. Vickers. "Competitive Price Discrimination" *Rand Journal* 32 4, (2001): 579-605.
- Stole, Lars. "Price Discrimination and Imperfect competition." Draft (2003)  
<http://faculty.chicagogsb.edu/lars.stole/papers/pdce.pdf> Thisse, J-F. and X. Vives (1988) "On the strategic choice of spatial price policy," *AER*, 78: 122-137.

## 4. DYNAMIC OLIGOPOLY

### 4.1 Dynamic Oligopoly -- Theory and Framework

- \*Tirole: Chapters 8,9.
- Bulow, J., J. Geanakoplos, and Klemperer, P., "Multimarket Oligopoly: Strategic Substitutes and Complements", *JPE* 93,3 (1985): 488-511.
- Fudenberg, D., and J. Tirole. "The Fat-cat Effect, the Puppy-dog Ploy, and the Lean and Hungry Look", *AER* 74,2 (1984): 361-366.
- Riordan, M. "Imperfect Information and Dynamic Conjectural Variations", *RJE* 16,1 (1985): 41-50.
- Shapiro, C. "Theories of Oligopoly Behaviour". *HIO*, Section 4.

### 4.2 Dynamic Oligopoly -- Examples

#### 4.2a) General Applications:

- \*Tirole: Chapters 8,9
- Fershtman, C., and K. Judd. "Equilibrium Incentives in Oligopoly", *AER* 77,5 (1987): 927-940.
- Brander, J., and B. Spencer. "Export Subsidies and International Market Share Rivalry",

*JIE* 18, 1/2 (1985): 83-100.

Krugman, P., "Import Protection as Export Promotion", in Kierzkowski, H. *Monopolistic Competition and International Trade*, Oxford: Clarendon Press, 1984. pp. 180-193.

Fudenberg, D., and J. Tirole. "Capital as a Commitment: Strategic Investment to Deter Mobility", *JET* 31,2 (1983): 227-250.

Matutes, C., and P. Regibeau. " 'Mix and Match': Product Compatibility Without Network Externalities", *RJE* 19,2 (1988): 221-234.

#### 4.2b) Bundling as Entry Deterrence:

(% denotes can be found at <http://www.econ.umd.edu/~vincent/foreclosure/>)

Carbajo, J. De Meza, D. and D. Seidman.. "A Strategic Motivation for Commodity Bundling. *Journal of Industrial Economics*, 38. (1990): 283-98.%

Director, Aaron and . Levi.. Law and the Furture: Trade regulation, *Northwestern University Law Review*, 51 (1956.): 281-96.

Farrell, Joseph. "A Simple Price-Theory Model of Anti-competitive Exclusive Dealing." Mimeo. 2004%

Greenlee, P. D. Reitman and D. Sibley. "An Antitrust Analysis of Bundled Loyalty Discounts". USDOJ, EAG 04-13 Discussion Paper. 2004.%

Kolay, S. G. Shaffer and J. Ordovery.. "All-Units Discounts in Retail Contracts" *Journal of Economics and Management Strategy*, 13,3. 2004.

Mathewson, F. and R. Winter. "Tying as a Response to Demand Uncertainty", *Rand Journal*, (1997): 566-582.

Mills, David E. "Market Share Discounts", University of Virginia, mimeo, 2004.%

Nalebuff, Barry. "Bundling as an Entry Barrier", *Quarterly Journal of Economics*, CXIX, No. 1. (2004): 159-188.

Nalebuff, Barry. "Bundling as a way to leverage Monopoly", Yale School of Management, WP #36. 2004.%

Nalebuff, Barry. "Exclusionary Bundling". Mimeo. 2004?%

Rasmusen, E. J. Ramseyer, and J Wiley. "Naked Exclusion", *AER*, 81, no. 5, (1991): 1137-1145.

Segal, I and M. Whinston, "Naked Exclusion: A Comment". Mimeo, 2000.

Westport Taxi V. Westport Transit District, 664 A.2d (Conn 1995).

\*Whinston, M. "Tying, Foreclosure and Exclusion", *American Economic Review*, 80, no. 4, (1990): 838-859.

### 4.3 Dynamic Oligopoly -- An Application to Google-Yahoo!

Krishna, K. "", *Journal of International Economics*, 1989.

### 4.4 Dynamic Oligopoly -- Entry, Exit and Predation

#### 4.3a) Theory:

Cho, I-K., and D. Kreps. "Signaling Games and Stable Equilibria", *QJE* 102,2 (1987): 179-221.

Dixit, A., "A Model of Duopoly Suggesting a Theory of Entry Barriers", *BJE* 10,1

(1979): 20-32.

Gilbert, R., "Mobility Barriers and the Value of Incumbency", in *HIO*.

Ghemawat, P., and B. Nalebuff. "Exit", *RJE* 16,2 (1985): 184-194.

Gilbert, R., and X. Vives. "Entry Deterrence and the Free Rider Problem", *REStud.* 53,1 (1986): 71-83.

Harrington, J., "Limit Pricing when the Potential Entrant is Uncertain of its Cost Function", *Econometrica* 54,2 (1986): 429-437.

\*Milgrom, P., and J. Roberts. "Limit Pricing and Entry Under Incomplete Information: An Equilibrium Analysis", *Econometrica* 50,2 (1982): 443-459.

Selten, R., "The Chain-store Paradox", *Theory and Decision* 9 (1978): 127-159.

#### 4.3b) Legal Issues:

Bolton, Patrick, Joseph Brodley and M. Riordan. "Predatory Pricing: Strategic Theory and legal Policy." Mimeo, July, 1999.

Klevorick, A. "The Current State of the Law and Economics of Predatory Pricing". *American Economic Review, Papers and Proceedings*, 83, 2. (1993).

Milgrom, P. and John Roberts. New Theories of Predatory Pricing." In Bonanno, G. and D. Brandolini, *Industrial Structure in the New Industrial Economics*. Oxford, 1990.

## 5. REPEATED OLIGOPOLY: COLLUSION

\*Tirole: Chapter 6.

Shapiro, C., "Theories of Oligopoly Behaviour", in *HIO*, Section 3.

Friedman, J., "A Non-cooperative Equilibrium for Supergames", *REStud.* 38,1 (1971): 1-12.

Abreu, D., "On the Theory of Infinitely Repeated Games With Discounting", *Econometrica* 56,2 (1988): 383-396.

Fudenberg, D., and E. Maskin. "The Folk Theorem in Repeated Games with Discounting or with Incomplete Information", *Econometrica* 54,3 (1986): 533-554.

Green, E. J. , and R. Porter. "Noncooperative Collusion Under Imperfect Price Information", *Econometrica* 52,1 (1984): 87-100.

Porter, R., "Optimal Cartel Trigger Price Strategies", *JET* 29,2 (1983): 313-338.

\*Porter, R., "A Study of Cartel Stability: The Joint Executive Committee 1880-1886", *BJE* 14,2 (1983): 301-314.

Abreu, D., D. Pearce, and E. Stacchetti. "Optimal Cartel Equilibria with Imperfect Monitoring", *JET* 39,1 (1986): 251-269.

Rotemberg, J., and G. Saloner. "A Supergame-Theoretic Model of Price Wars During Booms", *AER* 76,3 (1986): 390-407.

## 6. INDUSTRIAL ORGANIZATION IN COMPETITIVE ECONOMIES

\*Tirole: Introduction

\*Schmalensee, R. "Interindustry Studies of Structure and Performance", in R.

- Schmalensee and R.D. Willig (eds.), *Handbook of Industrial Organization*, Amsterdam: North-Holland, 1989.
- Scherer. Chapter 1, Chapter 3.
- Stigler, G. *The Organization of Industry*, Irwin, 1968.
- Berry, S. "Estimation of a Model of Entry in the Airline Industry", *Econometrica* 60,4(1992): 889-917.
- \*Dunne, T., M. Roberts and L. Samuelson. "Pattern of Firm Entry and Exit in U.S. Manufacturing Industries", *Rand Journal of Economics* 19,4 (Winter,1988): 495-515.
- \_\_\_\_\_, "The Growth and Failure of U.S. Manufacturing Plants", *Quarterly Journal of Economics* 104,4 (November 1989): 671-698.
- \*\*Jovanovic, B., "Selection and the Evolution of Industry", *Econometrica* 50,3 (May 1982): 649-670.
- \*Hopenhayn, H., "Entry, Exit and Firm Dynamics in Long run Equilibrium", *Econometrica* 60,5 (September 1992): 1127-50.
- \*Lucas, R., "On the Size Distribution of Firms", *Bell Journal of Economics* 9, (1978): 508-523.

## 7. VERTICAL RESTRAINTS: RAISING RIVAL'S COSTS

- Katz, M. Vertical Contractual Relations. In *Handbook of Industrial Economics*, Vol. 1, Edited by R. Schmalensee and R.D. Willig. Elsevier Science Publishers, 1989. Pp. 655-721.
- McAfee, R.P. and M. Schwartz. "Opportunism in Multilateral Vertical Contracting: Nondiscrimination, Exclusivity and Uniformity." *AER* 84 (1994).
- Krattenmaker, T. and S.Salop. "Raising Rivals' Costs to Achieve Power over Price", *The Yale Law Journal*, Vol. 96, No. 2 (1986): 209-293.
- Riordan, M. "Anticompetitive Vertical Integration by a Dominant Firm", *AER*, 88, no.5, (1998): 1232-1248.
- Rasmusen, E. J.Ramseyer, and J Wiley. "Naked Exclusion", *AER*, 81, no. 5, (1991): 1137-1145.
- Segal,I and M. Whinston, "Naked Exclusion: A Comment". Mimeo, 2000.
- Aghion, P. and P. Bolton. "Contracts as Barriers to Entry", *AER* 77, 3 (1987): 388-401.
- \*Olover, J., Saloner, G. and S. Salop. "Equilibrium Vertical Foreclosure", *AER*, 80, 1, (1990): 127-142.
- \*Reiffen, D. "Equilibrium Vertical Foreclosure: Comment", *AER* 82, no. 3,(1992): 694-697.
- Mathewson,F and R. Winter. "The Competitive Effects of Vertical Agreements: Comment", *AER* 77 5, (1987): 1057-1062.

## 8. RESEARCH AND DEVELOPMENT

- Reingenaum, J., "Dynamic Games of Innovation", in *JET* 25, (1981): 21-41.

\*Tirole: Chapter 10.

Katz, M., and C. Shapiro. "On the Licensing of Innovations", *RJE* 16,4 (1985): 504-520.

\_\_\_\_\_, "R&D Rivalry with Licensing or Imitation", *AER* 77,3 (1987): 403-420.

\*Fudenberg, D., R. Gilbert, J. Stiglitz, and J. Tirole. "Preemption, Leapfrogging and Competition in Patent Races", *European Economic Review* 22 (1983): 3-31.

Harris, C., and J. Vickers. "Perfect Equilibrium in a Model of a Race", *REStud.*, 52,2 (1985): 193-209.

Choi, J.P.. "Tying and Innovation: A Dynamic Analysis of Tying Arrangements", Mimeo May, 1998.

## 9. NETWORK EFFECTS AND COMPATIBILITY

Farrell, J., and G. Saloner. "Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation", *AER* 76,5 (1986): 940-955.

Farrell, J., H. Monroe and G. Saloner. "The Vertical Organization of Industry; Systems Competition versus Component Competition.", *JEMS* Vol. 7, no. 2, Summer 1998.

Farrell, J., and C. Shapiro. "Dynamic Competition with Switching Costs", *RJE* 19,1 (1988): 123-137.

Katz, M., and C. Shapiro. "Network Externalities, Competition, and Compatibility", *AER* 75,3 (1985): 424-440.

Klemperer, P., "Markets with Consumer Switching Costs", *QJE* 102,2 (1987): 375-394.

Klemperer, P., "The Competitiveness of Markets with Switching Costs", *Rand JE* 18, no. 1 (Spring, 1987): 138-150.

\_\_\_\_\_, "Price Wars Caused By Switching Costs", *REStud.* 56,3 (1989): 405-420.