



**BE 887: Fall B 2015**

**IMPERFECT COMPETITION AND MARKET OUTCOMES**

**Professor Margaret C. Levenstein**

**CONTACT INFORMATION:**

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**CLASS DATES AND LOCATIONS:**

| <b>Date</b>        | <b>Room</b>      |
|--------------------|------------------|
| <b>November 2</b>  | <b>Ross 6325</b> |
| <b>November 9</b>  | <b>ISR 3443</b>  |
| <b>November 16</b> | <b>Ross 6325</b> |
| <b>November 23</b> | <b>Ross 2248</b> |
| <b>November 30</b> | <b>Ross 2236</b> |
| <b>December 7</b>  | <b>Ross 2228</b> |

**COURSE REQUIREMENTS AND EVALUATION:**

|                     |                 |
|---------------------|-----------------|
| Class participation | 10%             |
| Presentations (5)   | 50% (10% each)  |
| Final Exam          | 40% (take home) |

**COURSE MATERIALS:**

Recommended Texts:

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

Stephen Martin, *Advanced Industrial Economics*, Oxford: Blackwell Publishers, 2002 (2<sup>nd</sup> ed.).

## **Student Presentations**

**Week 1:** Prepare a brief presentation on a cartel case. This presentation will not be graded, but will count toward your overall class participation grade. It is intended to give you an opportunity to think about the economics of collusion in a specific industry setting.

- First read a basic guide to U.S. antitrust law with regard to price-fixing and bid-rigging from the U.S. Department of Justice, Antitrust Division:  
<http://www.justice.gov/atr/public/guidelines/211578.htm>.
- Next go to the Antitrust Division homepage: <http://www.justice.gov/atr/> and click on Public Documents on the left bar; scroll down and click on Press Releases. You will see that many of the press releases concern price-fixing and bid-rigging cases.
- Choose a press release related to price-fixing or bid-rigging for your presentation. It could be domestic or international and in any year. Prepare a 10 minute presentation, addressing the following:
  1. Brief outline of the facts of the case
  2. Brief description of the market
  3. Assessment of the ease or difficulty of collusion in this industry and why

Question 3 will require a bit of background research on the industry. I do not expect you to spend hours doing this. Take an hour to learn what you can about the product and market structure, and form your opinion based on that research. Please prepare an outline of the key points for your presentation and upload your Word document to the CTools assignment site by 9:00 am, Monday, November 2.

**Weeks 2 through 6:** Each week has articles designated “student presentation” on the topic for the week. You will be assigned an article for each class and have 20 minutes to present. You should prepare an outline of the key points for your presentation and upload your outline to the CTools drop box by Monday at 9:00 am.

**Presenters:** Address each of the following questions (which will be used as the rubric for grading your presentation):

1. What is the research question?
  - Why is this question important?
    - According to the author
    - According to you (Is it? Why?)
2. What are the data?
  - What are the key variables and how are they measured?
3. What is the most important empirical relationship tested in the paper?
4. What is the author’s interpretation of the key empirical results?
  - Are you convinced? Why or why not?
5. What improvements or changes would you make, in interpretation or empirical strategy?
6. Given what you know about the literature on this topic, what further interesting research questions come to your mind after reading this paper?

## SCHEDULE OF TOPICS WITH READINGS

### Session#1: Market Structure and Game Theoretic Models of Collusion (November 2)

#### Required Reading

Tirole, Jean, *Theory of Industrial Organization*, Ch. 6 (“Dynamic Price Competition & Tacit Collusion”).  
Levenstein, Margaret C. and Valerie Y. Suslow, “What Determines Cartel Success?” *Journal of Economic Literature*, 54 (March 2006), 43-95.

#### Student Presentations

Student-selected Department of Justice price-fixing or bid-rigging case.

#### Further Reading

- Abreu, Dilip, David Pearce and Ennio Stachetti, “Optimal Cartel Equilibria with Imperfect Monitoring,” *Journal of Economic Theory*, 39:1 (1985), 251-69.
- Asch, Peter and Joseph J. Seneca, “Characteristics of Collusive Firms,” *Journal of Industrial Economics*, 23:3 (1975), 223-237.
- Athey, Susan and Kyle Bagwell, “Optimal Collusion with Private Information,” *RAND Journal of Economics* 32:3 (2001), 428-465.
- Bernheim, B. Douglas and Michael Whinston, “Multimarket Contact and Collusive Behavior,” *RAND Journal of Economics*, 21:1 (1990), 1-26.
- Bos, Iwan and Joseph E. Harrington, Jr. “Endogenous Cartel Formation with Heterogeneous Firms” *The RAND Journal of Economics* 41:1 (Spring 2010), 92-117.
- Brock, William and Jose Scheinkman, “Price Setting Supergames with Capacity Constraints,” *Review of Economic Studies*, 52 (1985), 371-82.
- Friedman, James, “A Non-cooperative Equilibrium for Supergames.” *Review of Economic Studies*, 38: 113 (1971), 1-12.
- Martin, Stephen, *Advanced Industrial Economics*, Ch. 2 (“Foundations of Oligopoly Theory I”) and Ch. 10 (“Collusion and Noncooperative Collusion”)
- Porter, Robert, “Optimal Cartel Trigger Price Strategies,” *Journal of Economic Theory*, 29 (1983), 313-38.
- Shapiro, Carl, “Theories of Oligopoly Behavior,” in *Handbook of Industrial Organization*, Vol. I, Ch. 6.
- Stigler, George, “A Theory of Oligopoly,” *Journal of Political Economy*, 72:1 (1964), 44-61.
- Sutton, John “Explaining Everything, Explaining Nothing? Game Theoretic Models in Industrial Economics,” *European Economic Review*, 34 (1990), 505-512.

**Session#2: Endogenous Market Structure (November 9)**

Required Reading

Sutton, John, *Sunk Costs and Market Structure* (MIT Press 1991), Ch. 2 “The Analytic Framework I: Exogenous Sunk Costs”

Student Presentations

Dunne, Timothy, Shawn D. Klimek, Mark J. Roberts, and Daniel Yi Xu, “Entry, Exit, and the Determinants of Market Structure,” *RAND Journal of Economics* 44:3 Fall 2013, 462-487.

Symeonidis, George, “Price Competition and Market Structure: The Impact of Cartel Policy on Concentration in the UK,” *Journal of Industrial Economics*, 48 (2000), 1-26.

Takahashi, Yuya, “Estimating a War of Attrition: The Case of the US Movie Theater Industry” *American Economic Review* 2015 105:7 , 2204-2241.

Further Reading

Bresnahan, Timothy, “Sutton's Sunk Costs and Market Structure: Price Competition, Advertising, and the Evolution of Concentration: Review Article,” *RAND Journal of Economics*, 23:1 (Spring 1992), 137-52.

Bresnahan, Timothy and Peter Reiss, “Entry and Competition in Concentrated Markets,” *Journal of Political Economy*, Vol. 99 (Oct. 1991), 977-1009.

Dixit, Avinash, “The Role of Investment in Entry Deterrence,” *Economic Journal*, 90 (1980), 95-106.

Dunne, Timothy, Mark J. Roberts, and Larry Samuelson, “Patterns of Entry and Exit in U.S. Manufacturing Industries,” *RAND Journal of Economics*, 19 (Winter 1988), 495-515.

Dunne, Timothy, Mark J. Roberts, and Larry Samuelson, “The Growth and Failure of U.S. Manufacturing Plants,” *Quarterly Journal of Economics*, 104:4 (1989), 671-698.

Geroski, Paul A., “Innovation, Technological Opportunity and Market Structure,” *Oxford Economic Papers*, 42:3 (1990), 586-602.

Jovanovic, Boyan and Glenn M. MacDonald, “The Life Cycle of a Competitive Industry,” *Journal of Political Economy*, 102 (1994), 322-347.

Jovanovic, Boyan, “Selection and the Evolution of Industry,” *Econometrica* 50:3 (1982), 649-670.

Klepper, Steven and Elizabeth Graddy, “The Evolution of New Industries and the Determinants of Market Structure,” *RAND Journal of Economics*, 21 (1990), 27-44.

Klepper, Steven and Kenneth L. Simons, “The Making of an Oligopoly: Firm Survival and Technological Change in the Evolution of the U.S. Tire Industry,” *Journal of Political Economy*, 108:4 (2000), 728-760.

Pakes, Ariel, Michael Ostrovsky and Steven Berry, “Simple Estimators for Parameters of Discrete Dynamic Games (with Entry/Exit Examples),” *RAND Journal of Economics*, 38:2, (Summer 2007), 373-399.

Schmitt, Nicolas and Rolf Weder, “Sunk Costs and Cartel Formation: Theory and Application to the Dyestuffs Industry,” *Journal of Economic Behavior and Organization*, 36 (1998), 197-220.

Sutton, John, “Endogenous Sunk Costs and the Structure of Advertising Intensive Industries,” *European Economic Review*, 33 (1989), 335-344.

**Session #3: Imperfect Competition: Testing models of collusion (November 16)**

Required Reading

Porter, Robert, "On the Incidence and Duration of Price Wars," *Journal of Industrial Economics*, 33:4 (1985), 415-26.

Student Presentations

Asker, John, "A Study of the Internal Organization of a Bidding Cartel," *American Economic Review*, 100 (June 2010), 724-762.

Kawai, Kei and Jun Nakabayashi "Detecting Large-Scale Collusion in Procurement Auctions" working paper, August 5, 2015.

Madhavan, Ananth N., Robert T. Masson and William H. Lesser, "Cooperation for Monopolization? An Empirical Analysis of Cartelization" *The Review of Economics and Statistics*, 76:1 (Feb. 1994) 161-175.

Further Reading

Bajari, Patrick, C. Lanier Benkard and Jonathan Levin "Estimating Dynamic Models of Imperfect Competition" *Econometrica*, 75:5 (Sep., 2007), 1331-1370 .

Borenstein, Severin and Andrea Shepard, "Dynamic Pricing in Retail Gasoline Markets," *RAND Journal of Economics*, 27:3 (1996), 429-51.

de Roos, Nicolas, "Examining Models of Collusion: The Market for Lysine," *International Journal of Industrial Organization*, 24 (2006), 1083-1107.

Ellison, Glenn, "Theories of Cartel Stability and the Joint Executive Committee," *RAND Journal of Economics*, 25:1 (Spring 1994), 37-57.

Fershtman, Chaim and Ariel Pakes, "A Dynamic Oligopoly with Collusion and Price Wars," *RAND Journal of Economics*, 31:2 (2000), 207-36.

Green, Edward J., and Robert H. Porter, "Noncooperative Collusion under Imperfect Price Information," *Econometrica*, 52:1 (1984), 87-100.

Harrington, Joseph E., Jr. and Andrzej Skrzypacz, "Private Monitoring and Communication in Cartels: Explaining Recent Collusive Practices," *American Economic Review*, 101 (2011), 1-25.

Jacquemin, Alexis, Tsuruhiko Nambo and Isabelle Dewez, "A Dynamic Analysis of Export Cartels: The Japanese Case," *Economic Journal*, 91:363 (1981), 685-96.

Levenstein, Margaret, "Price Wars and the Stability of Collusion: A Study of the Pre-World War I Bromine Industry," *Journal of Industrial Economics*, 45:2 (1997), 117-138.

Porter, Robert, "A Study of Cartel Stability: The Joint Economic Committee, 1880-1886," *Bell Journal of Economics*, 14 (Autumn 1983), 301-314.

Rojas, Christian "The Role of Demand Information and Monitoring in Tacit Collusion," *RAND Journal of Economics*, 43:1 (Spring 2012), 78-109.

Rotemberg, Julio and Garth Saloner, "A Supergame-Theoretic Model of Price Wars during Booms," *American Economic Review*, 76:3 (1986), 390-407.

Slade, Margaret E., "Vancouver's Gasoline-Price Wars: An Empirical Exercise in Uncovering Supergame Strategies," *Review of Economic Studies*, 59:2 (1992), 257-76.

Suslow, Valerie, "Cartel Contract Duration: Empirical Evidence from Inter-war International Cartels," *Industrial and Corporate Change*, 14:5 (2005), 705-744.

**Session #4: Strategic Enforcement and Leniency (November 23)**

Required Reading

Marvão, Catarina and Giancarlo Spagnolo. “What do we know about the Effectiveness of Leniency Policies? A Survey of the Empirical and Experimental Evidence” chapter 4 of *The Leniency Religion: Anti-Cartel Enforcement in a Contemporary Age*, Eds. Caron Beaton-Wells and Christopher Tran. Hart Publishing 2015.

Student Presentations

Asker, John, “Leniency and Post-Cartel Market Conduct: Preliminary Evidence from Parcel Tanker Shipping,” *International Journal of Industrial Organization*, 28 (2010), 407–414.

Miller, Nathan, “Strategic Leniency and Cartel Enforcement,” *American Economic Review*, 99 (2009), 750-768.

Stephan, Andreas and Ali Nikpay, “Leniency Theory and Complex Realities” Centre for Competition Policy Working Paper 14-8.

Further Reading

Aubert, Cecile, Patrick Rey, and William E. Kovacic, “The impact of leniency and whistle-blowing programs on cartels” *International Journal of Industrial Organization* 24 (2006): 1241-1266.

Baker, Jonathan, “Identifying Cartel Policing Under Uncertainty: The U.S. Steel Industry, 1933-1939,” *Journal of Law and Economics*, 32 (October 1989), S47-S76.

Brenner, Steffen, “An Empirical Study of the European Corporate Leniency Program,” *International Journal of Industrial Organization*, 27 (2009), 639-645.

Bresnahan, Timothy, “Competition and Collusion in the American Automobile Market: The 1955 Price War,” *Journal of Industrial Economics*, 35:4 (1987), 457-82.

Dick, Andrew R. 1996. “When Are Cartels Stable Contracts?” *Journal of Law and Economics*, 39:1 (1996), 241-83.

Fershtman, Chaim and Neil Gandal, “Disadvantageous Semicollusion,” *International Journal of Industrial Organization*, 12 (1994), 141-54.

Genesove, David and Wallace Mullin, “Rules, Communication and Collusion: Narrative Evidence from the Sugar Institute Case,” *American Economic Review*, 91:3 (2001), 379-98.

Harrington, Joseph, “Collusion among Asymmetric Firms: The Case of Different Discount Factors” *International Journal of Industrial Organization*, 7:2 (1989), 289-307.

Hay, George and Daniel Kelley, “An Empirical Survey of Price-Fixing Conspiracies,” *Journal of Law and Economics*, 17:1 (1974), 13-38.

Röller, Lars-Hendrik and Frode Steen “On the Workings of a Cartel: Evidence from the Norwegian Cement Industry,” *American Economic Review*, 96:1 (2006), 321-338.

Scott Morton, Fiona, “Entry and Predation: British Shipping Cartels 1879-1929,” *Journal of Economics and Management Strategy*, 6:1 (1997), 679-724.

Spagnolo, Giancarlo, “Leniency and Whistleblowers in Antitrust,” 259-304 in *Handbook of Antitrust Economics*, Paolo Buccirossi, ed. (2007) Cambridge, Mass.: MIT Press.

Steen, Frode and Lars Sjørgard, “Semicollusion in the Norwegian Cement Market,” *European Economic Review*, 43:9 (1999), 1775-96.

**Session #5: Cartel breakup and post-cartel competition (November 30)**

Required Reading

- Levenstein, Margaret and Valerie Suslow, "Breaking Up Is Hard to Do: Determinants of Cartel Duration," *Journal of Law and Economics*, 54:2 (May 2011), 455-492.
- Levenstein, Margaret, Catarina Marvão, and Valerie Suslow, "Serial Collusion in Context: Repeat Offenses by Firm or by Industry" note for OECD Global Forum on Competition (October 2015).

Student Presentations

- Chowdhury, Subhasish M. and Carsten J. Crede, "Post-Cartel Tacit Collusion: Determinants, Consequences, and Prevention" Centre for Competition Policy working paper 15-1.
- Stephen Davies, Peter L. Ormosi, and Martin Graffenberger, "Mergers after cartels: How markets react to cartel breakdown" Centre for Competition Policy working paper 14-1.
- Hüschelrath, K., and Smuda, F., 2012. "Do cartel breakdowns induce mergers? Evidence from EC cartel cases." *European Competition Journal* 9, 407-429.

Further Reading

- Alexander, Barbara, "The Impact of the National Industrial Recovery Act on Cartel Formation and Maintenance Costs," *Review of Economics & Statistics*, 76:2 (1994), 245-54.
- Bagwell, Kyle and Robert Staiger, "Collusion over the Business Cycle," *RAND Journal of Economics*, 28:1 (Spring 1997), 82-106.
- Bittlingmayer, George, "Output and Stock Prices When Antitrust is Suspended: the Effects of the NIRA," in *The Causes and Consequences of Antitrust: The Public Choice Perspective*. F. S. McChesney and W. F. Shughart II, eds. Chicago: U. of Chicago Press (1995), 287-318.
- Davidson, Carl and Raymond Deneckere, "Excess Capacity and Collusion," *International Economic Review*, 31:3 (1990), 521-41.
- Baumol, William J., "Horizontal Collusion and Innovation," *The Economic Journal*, 102:410 (1992), 129-137.
- Broadberry, Stephen and Nicholas Crafts, "Competition and Innovation in 1950s Britain," *Business History*, 43:1 (2001), 97-118.
- Chicu, Mark; Vickers, Chris; and Ziebarth, Nicolas L, "Cementing the Case for Collusion Under the National Recovery Administration," *Explorations in Economic History*, 50:4 (Oct. 2013), 487-507.
- Gupta, Bishnupriya, "Collusion in the Indian Tea Industry in the Great Depression: An Analysis of Panel Data," *Explorations in Economic History*, 34:2 (1997), 155-73.
- Haltiwanger, John and Joseph Harrington, "The Impact of Cyclical Demand Movements on Collusive Behavior," *RAND Journal of Economics*, 22 (Spring 1991), 89-106.
- Levenstein, Margaret and Valerie Suslow, "The Economic Impact of the U.S. Export Trading Company Act," *Antitrust Law Journal*, 74:2 (2007), 343-386.
- Rotemberg, Julio and Garth Saloner, "A Supergame-Theoretic Model of Price Wars during Booms," *American Economic Review*, 76:3 (1986), 390-407.
- Taylor, Jason, "The Output Effects of Government Sponsored Cartels During the New Deal," *Journal of Industrial Economics*, 50:1 (2002), 1-10.
- Taylor, Jason, "Cartel Code Attributes and Cartel Performance: An Industry-Level Analysis of the National Industrial Recovery Act," *Journal of Law and Economics*, 50 (2007), 597-624.

**Session #6: Vertical relationships and collusion (December 7)**

Required Reading

Levenstein, Margaret C. and Valerie Y. Suslow, “How do Cartels use Vertical Restraints? Reflections on Bork’s *Antitrust Paradox* and Twenty-first Century Cartels,” *Journal of Law and Economics* special issue on the legacy of Robert Bork.

Student Presentations

Asker, John and Heski Bar-Isaac, “Raising Retailers’ Profits: On Vertical Practices and the Exclusion of Rivals” *American Economic Review* 104(2)672:686.

Bonnet, Celine and Pierre Dubois, “Inference on vertical contracts between manufacturers and retailers for nonlinear pricing and resale price maintenance,” *Rand Journal of Economics* 41:1 (Spring 2010), 139-164.

Levenstein, Margaret. “Vertical Restraints in the Bromine Cartel: The Role of Wholesalers in Facilitating Collusion” working paper 1992.

Further Reading

Aubert, Cécile, Patrick Rey, and William E. Kovacic, “The Impact of Leniency and Whistle-Blowing Programs on Cartels,” *International Journal of Industrial Organization*, 24 (2006), 1241-66.

Bernheim, Douglas and Michael Whinston, “Common Marketing Agency as a Device for Facilitating Collusion,” *RAND Journal of Economics*, 16:2 (1985), 269-281.

Bernheim, Douglas and Michael Whinston, “Common Agency,” *Econometrica*, 54:4 (1986), 923-942.

Borenstein, Severin, “Rapid Price Communication and Coordination: The Airline Tariff Publishing Case (1994),” in Kwoka and White, *The Antitrust Revolution*, 4th ed. (2004).

Timothy J. Brennan, “Vertical Excuses for Horizontal Practices: Should There Be a Per Se Antitrust Rule?” *Antitrust Bulletin*, 5 (2000), 467-468.

Gallo, Joseph C., Kenneth Dau-Schmidt, Joseph L. Craycraft, and Charles J. Parker, “Department of Justice Antitrust Enforcement, 1955-1997: An Empirical Study,” *Review of Industrial Organization*, 17 (2000), 75-133.

Harrington, Joseph E., Jr., and Myong-Hun Chang, “Modeling the Birth and Death of Cartels with an Application to Evaluating Competition Policy,” *Journal of the European Economic Association*, 7 (2009), 1400–35.

Jullien, Bruno and Patrick Rey, “Resale Price Maintenance and Collusion,” *RAND Journal of Economics*, 38 (Winter 2007), 983-1001.

Lafontaine, Francine and Margaret Slade, “Exclusive Contracts and Vertical Restraints: Empirical Evidence and Public Policy,” in *Handbook of Antitrust Economics*, (Paolo Buccirossi ed., 2008).

Posner, Richard, “A Statistical Study of Antitrust Enforcement,” *Journal of Law and Economics*, 13:2 (1970), 365-419.

Rey, Patrick and Joseph Stiglitz, “The Role of Exclusive Territories in Producers’ Competition,” *RAND Journal of Economics*, 26 (1995), 431.

Rey, Patrick and Jean Tirole, “The Logic of Vertical Restraints,” *American Economic Review*, 76 (1986), 921.

Rey, Patrick and Thibaud Verge, “Resale Price Maintenance and Interlocking Relationships,” *Journal of Industrial Economics*, 58:4 (2010), 928-961.

Vincent Verouden, Vertical Agreements: Motivation and Impact, *Issues in Competition Law and Policy* (ABA Section of Antitrust Law), 3 (2008), Ch. 72, 1813-1840.