

# Spring 2015 Ph.D. Seminar

## The Economics of Entrepreneurship and Young Firms

**Peter Thompson**

**Office Hours: Any time**

### **Objectives**

In this course we will study the recent theoretical and empirical literature on entrepreneurship, firm formation, and the performance of young firms. The principal objectives of the course are as follows:

1. To develop among participants a thorough familiarity with, and understanding of, a particularly active area of current research.
2. To learn how to read papers critically, with a view to identifying researchable topics.
3. To initiate a transformation among students from consumers of research to producers of research.

### **Class organization**

The class meets once a week. Each class will follow more or less the same format:

**Part A.** A discussion of the two main readings. Each reading will have a designated primary presenter, who will give a short critical presentation, raise questions for discussion, and chair the group discussion.

**Part B.** A presentation of one additional paper on the same topic, chosen by the designated student. The chosen paper should be a quality recent contribution to the topic.

**Part C.** A mini-lecture by the instructor, covering (a) some additional papers in the supplementary reading, and (b) providing an overview of the following week's topic.

The discussions should focus on questions that might generate new research ideas (e.g. is the theory robust to alternative, plausible assumptions? how might one test the theory? can the empirical work be done better? would the empirical results hold in different samples?). Hence, you should be thinking about these questions while you are reading the papers.

### **Grading**

Grading is based on four activities:

1. Presentations and participation in class discussions: 40%;
2. Two *School's Brief* on an appropriate topic of your choosing. I will discuss what this and hand out examples in class (30%). The first brief is due March 11, the second is due April 22.
3. A final exam, 30%. On April 22.

Grading of participation will inevitably be carried out on rather crude scale. During class discussions, there will be ample opportunity for all members of the class to participate fully, because students who are not participating will be invited to contribute by means of direct questions about the paper(s). If you have read the papers, and thought seriously about some new directions the work could take, you will have no problem with this part of the requirements.

The final exam focuses more on the lessons learned than on the mathematical details of the papers.

### **Notes on the readings**

Each section in the remainder of this syllabus has two required readings (one required reading may consist of a pair of papers). I expect you to have read and thought about these before each class. There are also many papers listed under supplementary readings. I do not expect you to have read these (there is no time). In many cases, these are references to papers that I will talk about in my mini lectures. You might want to dip into them here and there, to check a result or to verify that they did indeed claim what I said they claimed.

### **Week 1 (January 7). Introduction**

*Traditional models of industry equilibrium (as learned in your first year microeconomics classes) imagine that there exists a pool of atomistic potential entrants standing by ready to enter an industry as soon as it shows above-normal profits. The traditional models are very neat, but largely uninformative. The paper by Geroski documents some surprising facts – for example, high incumbent profits do not predict entry – that might get you to doubt the traditional model. Parker’s review reminds us that firms are founded by people rather than by atomistic agents, with social histories and diverse backgrounds, and diverse motivations for founding firms.*

1. Geroski, Paul A. (1995): “What do we know about entry?” *International Journal of Industrial Organization*, **13**(4):421-440.
2. Parker, Simon C. (2005): "The economics of entrepreneurship: What we know and what we don't." *Foundations and Trends in Entrepreneurship*, **1**(1):1-54.

## **Part A. Who Becomes an Entrepreneur?**

### **Week 2 (January 14). The most and least competent**

*In each of the next three weeks, we consider one of the classic canonical models of entrepreneurial choice. This week we focus on Lucas’ theory of assignment based on ability. Lucas’ model assumes individuals vary in their ability to manage businesses. The most able managers become managers, while the rest become wage workers. While an obvious idea on its face, Lucas’ classic paper also explores the model’s implications for the distribution of firm size and for firm growth. Jovanovic makes a small change to Lucas’ model and shows that the key result about assignment is not robust. The second reading suggests that Lucas’ model may be inappropriate in a world of frictions.*

1. Lucas, Robert E., Jr. (1978): "On the size distribution of business firms." *Bell Journal of Economics*, **9**(2):508-523 *and* Jovanovic, Boyan (1994): "Firm formation with heterogeneous management and labor skills." *Small Business Economics*, **6**(3):185-191.
2. Åstebro, Thomas, Jing Chen, and Peter Thompson (2008): "Stars and misfits: Self-Employment and Labor Market Frictions." *Management Science*, **57**:1999-2017 (November 2011).

#### Supplementary readings

- Jovanovic, Boyan and Peter Rousseau (2001): "Why wait? A century of life before IPO." NBER Working Paper No. W8081.
- Rosen, Sherwin (1981): "The economics of superstars." *American Economic Review*, **71**(6):845-858.
- Ohyama, Atsushi (2007): "Entrepreneurship and advanced technical knowledge." Working paper, SUNY Buffalo.

#### **Week 3. (January 21) The most innovative**

*The notion that the most important function of entrepreneurs is to innovate is attributed to work carried out by Schumpeter prior to WWII. It took a long time for an interesting formal model of innovative entrepreneurship to be developed. Holmes and Schmitz develop a model in which some people are serial innovators, some innovate just once, and others buy and manage businesses founded by others. The paper by Chen and Thompson highlights how sensitive models of business turnover are to basic assumptions*

1. Holmes, Thomas J., and James A. Schmitz, Jr. (1990): "A theory of entrepreneurship and its application to the study of business transfers." *Journal of Political Economy*, **98**(2):265-294.
2. Chen, Jing, and Peter Thompson (2014): "New Firm Performance and the Replacement of Founders." Working paper.

#### Supplementary readings

- Aghion, P., and J. Tirole. 1994. "On the management of innovation." *Quarterly Journal of Economics*, **109**:1185-1209.
- Braguinsky, Serguey, Yuji Honjo, Sadao Nagaoka, and Kenta Nakamura (2012): "Evaluation and transfer of science-based business: Theory and evidence." Working Paper, Department of Social and Decision Sciences, Carnegie Mellon University.
- Kortum, Samuel, and Josh Lerner (2000): "Assessing the contribution of venture capital to innovation." *RAND Journal of Economics*, **31**(4): 674–692.
- Malmendier, Ulrike and Josh Lerner (2005): "Contractibility and the design of research agreements." NBER Working Paper No. 11292.
- Hellman, Thomas F. (2007): "The role of patents for bridging the science to market gap" *Journal of Economic Behavior and Organization*, **63**(4):624-657.

#### **Week 4. (January 28) The least risk averse**

*The risk-bearing role of entrepreneurs was first described (in modern terms) by Frank Knight in 1921. Yet again, formal modeling in a manner that would capture the profession's attention took a while. In last week's mini-lecture, I gave a brief overview of the Kihlstrom-Laffont model (the concepts are simple). This week's readings covers some evidence and theory. The evidence is so mixed, that Vereshchagina and Hopenhayn came up with a clever model to explain why risk-averse individuals would invest in risky projects that don't offer higher returns. It's a cool model, worth taking a look at.*

1. Hamilton, Barton (2000): "Does entrepreneurship pay? An empirical analysis of the returns to self-employment," *Journal of Political Economy*, **108**:604-31 *and* Moskowitz, Tobias J., and Annette Vissing-Jørgensen (2002): "The returns to entrepreneurial investment: A private equity premium puzzle?" *American Economic Review*, **92**(4):745-778.
2. Vereshchagina, Galina, and Hugo A. Hopenhayn (2009): "Risk taking by entrepreneurs." *American Economic Review*, **99**(5):1808-1830

#### Supplementary readings

- Kihlstrom, Richard E., and Jean-Jacques Laffont (1979): "A general equilibrium entrepreneurial theory of firm formation based on risk aversion." *Journal of Political Economy*, **87**(4):719-748.
- Rosen, Harvey, and Paul Willen (2002): "Risk, return, and self-employment." Working paper, Department of Economics, Princeton University.
- Cramer, J.S., J. Hartog, N. Jonker, C.M. Van Praag (2002): "Low risk aversion encourages the choice for entrepreneurship. An empirical test of a truism." *Journal of Economic Behavior and Organization*, **48**(1):29-36.
- Brockhaus, R. (1980): "Risk-taking propensity of entrepreneurs." *Academy of Management Journal*, **23**(3):509-520.
- Wu, Brian, and Anne-Marie Knott (2006): "Entrepreneurial risk and market entry." *Management Science*, **52**(9):1315-1330.
- Rigotti, Luca, Matthew Ryan and Rhema Vaithianathan (2005): "Tolerance of ambiguity and entrepreneurial innovation." Working paper, Fuqua School of Business, Duke University.
- Busenitz, L.W. (1999): "Entrepreneurial risk and strategic decision making: It's a matter of perspective." *Journal of Applied Behavioral Science*, **35**(3):325-340.

#### **Week 5. (February 4) People with diverse skills**

*Lazear proposed a novel theory that entrepreneurs are selected based on their ability to engage effectively in multiple tasks. In contrast, individuals who are much better at one task than another (even if they are relatively good at both) select wage employment where they specialize in one task. The model is intuitive, but there remains much empirical work to be done. The empirical work to date generally involves linking variety in employment backgrounds to entry into self-employment*

1. Lazear, Edward P. (2002): "Entrepreneurship." *Journal of Labor Economics*, 23(4):649-680.
2. Wagner, Joachim (2006): "Are Nascent Entrepreneurs Jacks-of-all-trades? A Test of Lazear's Theory of Entrepreneurship with German Microdata," *Applied Economics*, 38:2415-19.  
*and* Silva, Olmo (2007): "The Jack-of-all-trades entrepreneur: Innate talent or acquired skill?" *Economics Letters*, 97(2):118-123.

#### Supplementary readings

- Wagner, Joachim (2003): "Testing Lazear's Jack-of-all-trades view of entrepreneurship with German microdata," *Applied Economics Letters*, 10(11):687-689.
- Chen, Li-Wei and Peter Thompson (2014): "Skill Balance and Entrepreneurship. Evidence from Online Career Histories." Working Paper.

#### **Week 6. (February 11) People with a taste for variety**

*One reason that entrepreneurship may be associated with people with varied skills or backgrounds is that entrepreneurship simply attracts people who enjoy doing different things (i.e. who easily get bored by routine). Put another way, the theory states that people who like being entrepreneurs are more likely to become entrepreneurs. This is the sort of quasi-tautological claim that economists usually have some difficulty with! The required reading establishes that there are in fact observable (i.e. testable) implications of such a claim.*

1. Munasinghe, Lalith and Karl Sigman (2004): "A Hobo syndrome? Mobility, wages and job turnover." *Labour Economics*, 11:191-218.
2. Åstebro, Thomas, and Peter Thompson (2008): "Entrepreneurs: Jacks of all trades or hobos?," *Research Policy*, 40:637-664 (June 2011).

#### Supplementary readings

- Benz, Matthias and Bruno S. Frey (2004): "Being Independent Raises Happiness at Work." *Swedish Economic Policy Review*, 11(2):95-134.
- Hyytinen, Ari and Pekka Ilmakunnas (2007): "Entrepreneurial aspirations: Another form of job search?" *Small Business Economics*, 29(1):63-80.

#### **Week 7. (February 18) The rich**

*Capital markets for entrepreneurs do not work efficiently. It then follows that wealth facilitates entry. Evans and Jovanovic were among the first to develop and test a formal model of wealth constraints. A surprising implication of their model (but one that will be easy to explain) is that the most able people are the most likely to be wealth-constrained. We will also review some of the innovative empirical work that has been done to test the theory (most of which has been concerned with the problem of identifying variation in wealth that is uncorrelated with entrepreneurial ability).*

1. Evans, David S., and Boyan Jovanovic (1989): "An estimated model of entrepreneurial choice under liquidity constraints." *Journal of Political Economy*, 97(4):808-827.

- Lindh, Thomas, and Henry Ohlsson (1996): "Self-employment and windfall gains: evidence from the Swedish lottery." *Economic Journal*, 106(439):1515-1526 and Chen, Jing (2008): "Wealth constraints and self-employment: Evidence from birth order." Working Paper Copenhagen Business School.

#### Supplementary readings

- Cagetti, Marco, and Mariacristina De Nardi (2006): "Entrepreneurship, frictions, and wealth." *Journal of Political Economy*, 114(5):835-870.
- Holtz-Eakin, Douglas, Joulfaian, David, and Rosen, Harvey S. (1994): "Sticking it out: Entrepreneurial survival and liquidity constraints." *Journal of Political Economy*, 102(1): 53-75.
- Holtz-Eakin, Douglas, David Joulfaian, and Harvey S. Rosen (1994): "Entrepreneurial decisions and liquidity constraints." *RAND Journal of Economics*, 25(2): 334-347.
- Hurst, Erik and Annamaria Lusardi (2004): "Liquidity constraints, household wealth, and entrepreneurship." *Journal of Political Economy*, 112(2):319-347.
- Nanda, Ramana (2008): "Cost of external finance and selection into entrepreneurship." HBS Working Paper 08-047, Harvard Business School.
- Xu, Bin (1998): "A re-estimation of the Evans-Jovanovic entrepreneurial choice model." *Economics Letters*, 58(1):91-95.
- Johansson, Edvard (2000): "Self-employment and liquidity constraints: Evidence from Finland." *Scandinavian Journal of Economics*, 102(1):123-134.
- Meyer, Bruce D. (1990): "Why are there so few Black entrepreneurs?" NBER Working Paper no. 3537.

#### **Week 8. (February 25) Sneaky people with good ideas**

*If entrepreneurs are often innovative, it follows that employees of incumbent firms who leave to form their own company are also often innovative. But what induces a worker to leave and form his or her own company rather than work with his/her employer to implement an idea? The answer turns on the difficulties of writing complete contingent contracts in the face of asymmetric information. Most of the theories about employee spinoffs are based on the notion that ideas occur privately to an employee who may sometimes find it more profitable to implement the idea in a new firm. These theories raise many questions about the correct way to write contracts.*

- Amador, Manuel, and Augustin Landier (2003): "Entrepreneurial pressure and innovation." Working paper.
- Hellman, Thomas (2007): "When do employees become entrepreneurs?" *Management Science*, 53(6):919-933.

#### Supplementary readings

- Anton, James J., and Dennis A. Yao (1995): "Start-ups, spin-offs, and internal projects." *Journal of Law, Economics, and Organization*, 11:362-378.
- Chatterjee, Satyajit, and Esteban Rossi-Hansburg (2007): "Spin-offs and the market for ideas."

NBER working paper no. 13198.

Klepper, Steven and Sally D. Sleeper (2005): "Entry by spinoffs." *Management Science*, 51(8):1291-1306.

Gromb, Denis, and David Scharfstein (2002): "Entrepreneurship in equilibrium." NBER working paper No. 9001.

Franco, April M., and Darren Filson (2006): "Spin-outs: Knowledge diffusion through employer mobility." *RAND Journal of Economics*, 37(4):841-860.

Christensen, C.M. (1993): "The rigid disk drive industry: a history of commercial and technological turbulence." *Business History Review*, Winter, 531-88.

Pakes, Ariel, and Shmuel Nitzan (1983): "Optimum contracts for research personnel, research employment, and the establishment of 'rival' enterprises." *Journal of Labor Economics*, Review of Economic Dynamics. 14:455-474 (June 2011) (4):345-65.

### **Week 9. (March 4) The frustrated**

*Is it true that employees leave with good ideas they fail to reveal to their employees? Klepper and Thompson are skeptical. They develop another approach, in which employees fully reveal their ideas, but in which there is genuine disagreement about their value. In such a setting, how do disagreements arise, and what does this imply for the timing of employee spinoffs?*

1. Klepper, Steven, and Peter Thompson (2010): "Disagreements and intra-industry spinoffs." *International Journal of Industrial Organization*, 28(5):526-538. And Thompson, Peter and Jing Chen (2010): "Disagreement, employee spinoffs and the choice of technology." *Review of Economic Dynamics*. 14:455-474 (June 2011)

### Supplementary readings

### **Week 10. (March 11) The overoptimistic**

*Some people may form businesses because they think they have a good idea when they don't, or they think the environment is more favorable than it really is, or they think they are smarter than they really are. What does overoptimism imply for entry and performance? And what is the evidence for overoptimism?.*

1. Baron, R. A. (1998): "Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other persons." *Journal of Business Venturing*, 13:275-294 and Cooper, A.C., Woo, C.A., and W. Dunkelberg (1988): "Entrepreneurs perceived chances for success." *Journal of Business Venturing*, 3:97-108.
2. Bernardo, Antonio, and Ivo Welch (2001): "On the evolution of overconfidence and entrepreneurship." *Journal of Economics and Management Strategy*, 10:301-30.

### Supplementary readings

- Landier, Augustin, and David Thesmar (2009): "Financial contracting with optimistic entrepreneurs." *Review of Financial Studies*, 22(1):117-150.
- Arabsheibani, G., J. de Meza, J. Maloney, and B. Pearson (2000): "And a vision appeared unto them of a great profit." *Economics Letters*, 67:35-41.
- Baron, R. A. (1998): "Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other persons." *Journal of Business Venturing*, 13:275-294.
- Buehler, R., Griffin, D., and M. Ross (1994): Exploring the "planning fallacy": Why people underestimate their task completion times." *Journal of Personality and Social Psychology*, 67:366-381.
- Busenitz, L., and J. Barney (1997): "Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making." *Journal of Business Venturing*, 12(1):9-30.
- Camerer, Colin, and D. Lovallo (1999): "Overconfidence and excess entry: An experimental approach." *American Economic Review*, 89:306-318
- Gervais, S. & Terry Odean (2001): Learning to be overconfident." *Review of Financial Studies*, 14(1):1-27.
- Gervais, S., Heaton, J. B. & Terry Odean (2004): "Overconfidence, investment policy, and executive stock options." Working paper, Wharton School.
- Griffin, D.W., and Amos Tversky (1992): "The weighing of evidence and the determinants of confidence." *Cognitive Psychology*, 24:411-435.
- McKenzie, C.R.M. (1997): "Underweighting alternatives and overconfidence." *Organizational Behavior and Human Decision Processes*, 71:141-160.
- Mahajan, J. (1992): "The overconfidence effect in marketing management predictions." *Journal of Marketing Research*, 29:329-342.
- Van den Steen, Eric (2004): "Rational overoptimism (and other biases)." *American Economic Review*, 94(5):1141-51.

## **Week 11 (March 18) Spring Break**

### **Part B. The Performance of Young Firms and Industries**

#### **Week 12. (March 25) The persistence of founding conditions**

*It is obvious, and therefore uninteresting, to note that founders of firms who are well prepared or who enter under ideal circumstances, are more likely to survive their first few years. Less obvious, and therefore more interesting, is the fact that founding conditions have influences on survival and performance that may persist for decades after entry. This week, we explore the evidence for the persistence of the effects of founding conditions, and some theories to explain it.*

1. Klepper, Steven (2002): "The capabilities of new firms and the evolution of the US automobile industry." *Industrial and Corporate Change*, 11(4):645-666.
2. Jovanovic, Boyan, and Peter Rouseau (2001): "Vintage organization capital." NBER working paper no. 8166.



### Supplementary readings

- Geroski, Paul A., José Mata, and Pedro Portugal (2010): "Founding conditions and the survival of new firms." *Strategic Management Journal*, 31(5):510-529.
- Johnson, Jay (2003): "The Determinants of Entry: An analysis of entrants and non-entrants into the market for MTBE." Unpublished paper.
- Klepper, Steven, and Kenneth Simons (2000): "Dominance by birthright: entry of prior radio producers and competitive ramifications in the U.S. television receiver industry." *Strategic Management Journal*, 21(10-11):997-1016.
- Klepper, Steven, and Kenneth Simons (2000): "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):728-760.
- Thompson, Peter (2005): "Selection and firm survival. Evidence from the shipbuilding industry, 1825-1914." *Review of Economics and Statistics*, 87(1):26-36.

### **Week 13. (April 1) Firm age and growth**

*For almost 80 years, the standard view of firm growth was that it followed Gibrat's Law. But new datasets made available in the 1980s began to reveal some subtle deviations from Gibrat's Law that many economists suspected may have important implications for our understanding of industry evolution. In particular, it was repeatedly shown that firm age has a robust (negative) effect on growth. How can the effects of firm age be explained?*

1. Cooley, Thomas F. and Vincenzo Quadrini (2001): "Financial markets and firm dynamics." *American Economic Review*, 91(5):1287-1310.
2. Klepper, Steven, and Peter Thompson (2007): "Submarkets and the evolution of market structure." *RAND Journal of Economics*, 37(4):862-888.

### Supplementary readings

- Jovanovic, Boyan (1982): "Selection and the evolution of industry." *Econometrica*, 50(7):649-670. (read only sections 1-3).
- Baldwin, John R., Lin Bian, Richard Dupuy, and Guy Gellatly (2000): "Failure rates for new Canadian firms: New perspectives on entry and exit." Working paper, Statistics Canada.
- Cabral, Luís, and José Mata (2003): "On the evolution of the firm size distribution: Facts and theory." *American Economic Review*, 93(4):1075-1090.
- Cooley, Thomas F. and Vincenzo Quadrini (2001): "Financial markets and firm dynamics." *American Economic Review*, 91(5):1287-310.
- Disney, Richard, Jonathan Haskel, and Ylva Heden (2000): "Entry, exit and establishment survival in UK manufacturing." Manuscript: Queen Mary and Westfield College, London
- Dunne, Timothy, Mark J. Roberts, and Larry Samuelson (1988): "Patterns of firm entry and exit in U.S. manufacturing industries." *RAND Journal of Economics*, 19(4):495-515.
- Dunne, Timothy, Mark J. Roberts, and Larry Samuelson (1989): "The growth and failure of U.S. manufacturing plants." *Quarterly Journal of Economics*, 104(4):671-698.

- Evans, David S. (1987a): "Tests of alternative theories of firm growth." *Journal of Political Economy*, 95(4):657-674.
- Evans, David S. (1987b): "The relationship between firm growth, size, and age: Estimates for 100 manufacturing industries." *Journal of Industrial Economics*, 35(2):567-581.
- Hall, Bronwyn H. (1987): "The relationship between firm size and firm growth in the U.S. manufacturing sector." *Journal of Industrial Economics*, 35(4):583-606.
- Ijiri, Y., and Herbert Simon (1977): *Skew distributions and the sizes of business firms*. New York: North Holland Publishing Co.
- Jovanovic, Boyan (1982): "Selection and the evolution of industry." *Econometrica*, 50(7):649-670.
- Klette, Tor Jakob, and Samuel Kortum (2004): "Innovating firms and aggregate innovation." *Journal of Political Economy*, 112(5):986-1018.
- Mata, José, and Pedro Portugal (1994): "Life duration of new firms." *Journal of Industrial Economics*, 27:227-46.
- Persson, Helena (2002): "The survival and growth of new establishments in Sweden, 1987-1995." Working paper, Stockholm University.
- Sutton, John (1998): *Technology and Market Structure*. Cambridge, MA: MIT Press.
- Sutton, John (2002): "The variance of firm growth rates: The 'scaling' puzzle." *Physica A: Statistical Mechanics and its Applications*, 312(3-4):577-590

#### **Week 14. (April 8) Industry shakeouts**

*It has been noted that many industries go through a shakeout, a phase characterized by a large increase in output and a concurrent crash in the number of active firms. What drives this? The shakeout seems to be too sharp to just be a gradual rise to dominance of the best firms. The paper by Jovanovic and MacDonald studies the early US tire industry, arguing that the shakeout was driven by a specific technological innovation that raised the minimum efficient scale. Klepper and Simons study the same industry to argue that that there was no specific innovation behind the shakeout.*

1. Jovanovic, Boyan, and Glenn MacDonald (1994): "The life cycle of a competitive industry." *Journal of Political Economy*, 102:322-47.
2. Klepper, Steven, and Simons, Kenneth L. (2000): "The making of an oligopoly: Firm survival and technological change in the evolution of the U.S. tire industry." *Journal of Political Economy*, 108:728-60.

#### Supplementary readings

- French, Michael (1986): "Structural change and competition in the United States tire industry." *Business History Review*, 60(1):28-54
- Gort, Michael, and Steven Klepper (1982): "Time paths in the diffusion of product innovations." *Economic Journal*, 92:630-53.
- Horvath, Michael, Fabiano Schivardi, and Michael Woywode (2003): "On industry life-cycles: Delay, entry, and shakeout in beer brewing." *International Journal of Industrial Organization*, 19(7):1023-1052.

Jovanovic, Boyan, and Chung-Yi Tse (2006): "Creative destruction in industries." NBER working paper no. 12520.

Klepper, Steven (1996): "Entry, exit, growth, and innovation over the product life cycle." *American Economic Review*, 86(3):562-583.

Utterback, James, and Fernando Suarez (1993): "Innovation, competition, and industry structure." *Research Policy*, 22(1):1-21.

**Weeks 15 (April 15). Two topics to be chosen by students.**

**Week 16 (April 22) Final Exam**