

THE GEORGE WASHINGTON UNIVERSITY

Department of Economics

Economics of Network Industries, ECON 2195.13

Fall 2013

TuTh 12:45-2:00 pm, Monroe 250

PROFESSOR: Arun Malik (Office Hours: W 4:00-6:00 pm, and by appointment, Gov 305,
Tel. 202-994-5471, amalik@gwu.edu)

COURSE DESCRIPTION. Network industries are an essential part of the world economy. Salient examples of network industries are computer hardware and software, media and entertainment, and telecommunications. We will explore the unique economic circumstances facing firms in these industries and identify strategies that enable firms to succeed given these circumstances. Among the concepts and issues we will examine are “network effects,” “switching costs,” “lock-in,” and “standards wars.” Among other things, we will identify pricing and product differentiation strategies employed by firms in these industries, understand the strategic implications of lock-in and switching costs, and examine how firms take advantage of network effects.

PREREQUISITES. Econ 2101 or Econ 2103 is a prerequisite for the course, as is knowledge of differential calculus.

LEARNING OBJECTIVES. Examples of the types of questions you should be able to answer by the end of the course are:

- Why do some firms in the IT industry give away their products for free?
- Why do firms force consumers to buy bundles of goods rather than just the components they want?
- How can hardware and software firms increase profits by damaging their product, even when doing so increases costs?
- What are the implications of standards wars, such as the war between Sony and Toshiba over a high-definition DVD format? Should firms be forced to adopt a common standard?

REQUIREMENTS AND GRADING. Five **problem sets** will be assigned over the course of the semester. They will be due in class two weeks after they are assigned. They will not be accepted after this date, but the lowest score on a problem set will be dropped. Problem sets will be checked for completeness and returned with a detailed answer sheet. Feel free to ask me about problems you have trouble with. Depending on circumstances, I will go over them in class or during office hours.

There will be a **midterm exam** and a **final exam**. The midterm exam is tentatively scheduled for **Thursday, October 10th**.

Unless you make arrangements with me at least one class before an exam, make-ups will not be given without a valid medical excuse.

The course grade will be calculated using the following weights:

midterm exam – 40%; final exam – 40%; problem sets – 20%

TEXTBOOKS. There are two textbooks for the course:

[S&V] Carl Shapiro and Hal R. Varian, *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, 1999.

This now classic book, which unfortunately has not been updated, provides a very readable introduction to network industries, with an emphasis on the application of economic insights to the design of business strategies. There is a website for the book at www.inforules.com. It has slides based on the book, examples, and links to various internet sources; it is worth browsing the website.

[OS] Oz Shy, *The Economics of Network Industries*, Cambridge University Press, 2001.

This book is considered to be an advanced undergraduate textbook. It relies heavily on algebra, and in a few sections, calculus. It is the only textbook, at any level, that is devoted to the economics of network industries. We will go through portions of it over the course of the semester.

Additional required readings will be drawn from a variety of other sources. Some, but not all, of these are listed in the course outline below. These readings will either be posted on Blackboard or handed out in class.

Other books on the economics of network industries include:

[VFS] Hal R. Varian, Joseph Farrell, and Carl Shapiro, *The Economics of Information Technology: An Introduction*, Cambridge University Press, 2005. [A draft of the first half of this short book is available online at: www.sims.berkeley.edu/~hal/Papers/mattioli/mattioli.pdf]

[SL] Stan Liebowitz, *Re-Thinking the Network Economy: The True Forces That Drive the Digital Marketplace*, American Management Association, 2002. [An audio summary of this book and sample chapters are available at: www.utdallas.edu/~liebowit/book/chapter1.html]

[JF] Jeffrey Rolfs, *Bandwagon Effects in High Technology Industries*, MIT Press, 2001. The author of this book coined the term network externalities (or bandwagon effects in the traditional economic literature).

Hal Varian, one of the most prolific economists in this field, has a large selection of his papers available online at: www.sims.berkeley.edu/~hal/people/hal/papers.html. Many of them are written for a broad audience and provide surveys of the literature on topics within the economics of network industries.

ACADEMIC INTEGRITY. The George Washington University is guided by the standards of academic integrity. Students are reminded to honor the Code of Academic Integrity, which can be viewed at

<http://www.gwu.edu/~ntegrity/code.html>

Section 1 of the Code is especially relevant for students.

STUDENTS WITH DISABILITIES. Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss specific needs. Please first contact the Office of Disability Support Services at 202 -994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to <http://gwired.gwu.edu/dss>.

TENTATIVE OUTLINE OF THE COURSE

TOPIC 1—INTRODUCTION

A brief overview of the economic features that distinguish network industries and their implications for firm behavior and market structure and conduct.

Readings: S&V, Chapter 1
OS, Chapter 1

TOPIC 2—REVIEW OF KEY CONCEPTS FROM MICROECONOMICS

Review of basic concepts from microeconomic theory and game theory, including: fixed, quasi-fixed and sunk costs, elasticities, economies of scale and scope, monopoly power, market failures, Nash and dominant strategy equilibria.

Readings: microeconomics textbook of your choice. One good one is:

[P&R] Robert Pindyck and Daniel Rubinfeld, *Microeconomics*

TOPIC 3—MARKET POWER AND PRODUCT DIFFERENTIATION

A survey of oligopoly models with and without product differentiation relevant to the study of network industries.

Readings: Selections from [C&W] Jeffrey Church and Roger Ware, *Industrial Organization: A Strategic Approach*, Irwin McGraw-Hill 2000, posted on Blackboard
TED lecture by Malcolm Gladwell on product differentiation (February 2004),
http://www.ted.com/talks/lang/eng/malcolm_gladwell_on_spaghetti_sauce.html

TOPIC 4—PRICING STRATEGIES

First-, second- and third-degree price discrimination, and the feasibility of employing them when pricing network goods.

Readings: S&V, Chapter 2
P&R, Chapter 11, Sections 11.1-11.4
C&W, pp. 155-168
Robert Weiss and Ajay Mehrotra, “Online Dynamic Pricing: Efficiency, Equity and the Future of E-commerce,” *Virginia Journal of Law and Technology*, vol. 6(2), Summer 2001. Available at: www.vjolt.net/vol6/issue2/v6i2-a11-Weiss.html .

TOPIC 5—VERSIONING AND BUNDLING

Quality discrimination or versioning, bundling and tying of product sales, and their implications for the design of product lines.

Readings: S&V, Chapter 3
P&R, pp. Chapter 11, Sections 11.5
Hal Varian, “Versioning Information Goods,” conference paper, March 1997.
Available at: www.sims.berkeley.edu/~hal/Papers/version.pdf

TOPIC 6—SWITCHING COSTS AND LOCK-IN

Examination of costs faced by consumers when attempting to switch products and the resulting lock-in to a given product.

Readings: S&V, Chapter 5
SL, Chapter 3
Hal Varian and Carl Shapiro, "Switching Costs," Notes to Accompany *Information Rules*.
Available at: <http://www.inforules.com/models/m-switch.pdf>
Stan Liebowitz and Stephen Margolis, "Typing Errors," *Reason Magazine*, June 1996.
OS, Section 8.1.1 (pp. 188-191), Appendix C (pp. 307-311), Section 11.5 (pp. 28-81)

TOPIC 7—NETWORK EFFECTS

How demand for a good can depend directly or indirectly on the number of people who use it, giving rise to direct or indirect "network effects" or "network externalities." Market dynamics in the presence of network effects and positive feedback, and implications for market strategies.

Readings: S&V, Chapter 7
OS, Sections 5.1-5.2, 3.5, 10.2-10.3
Carl Shapiro and Hal Varian, "Network Effects," Notes to Accompany *Information Rules*.
Available at: <http://www.inforules.com/models/m-net.pdf.pdf>

TOPIC 8—COOPERATION, COMPATIBILITY AND STANDARDS

The role of cooperation, compatibility, and standards in markets subject to network effects and positive feedback. Strategies for setting standards and for waging standards wars.

Readings: S&V, Chapters 8 and 9
Stanley Besen and Joseph Farrell, "Choosing How to Compete: Strategies and Tactics in Standardization," *Journal of Economic Perspectives*, vol. 8(2), Spring 1994
OS, Section 4.1