

Economics of the Internet

SPRING 2002

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Time and location: MW 4:10-5:25, 517 HAM

TA Section: M 2-3:30, 503 HAM

Office hours:

Instructor - M 5:30-7:00 TA - W 2-3:30, room1007A, International Affairs Building

Reading Material There is no textbook for this class. Since the Internet is a recent phenomenon and since it is very fast-moving, no one available book includes all relevant material for this class. Therefore, we will have multiple sources of information:

a) lecture notes - this will be the principal source of class-material. The lectures will be available online at my home-page (see address above and access syllabus by going to the "Courses" page and clicking on "W4490 Syllabus"). The notes are currently being updated - the present version is from Spring 2001 - and the major part of the updating should be finished by the second week of class. Students can however start using the lecture notes right away.

b) three books that will be used as background material for several of the topics are

- *Information Rules*, 1999, Carl Shapiro and Hal Varian, Harvard Business School Press, Boston, MA, and
- *Theory of Industrial Organization*, 1993, Jean Tirole, MIT Press, Cambridge, MA.
- *Strategies and Games*, 1999, Prajit K. Dutta, MIT Press, Cambridge, MA.

The three books will be on reserve at the Business Library.

Finally, students are required to keep abreast of current developments in the Internet sector. Suggested sources include The New York Times, and The Wall Street Journal.

Professional Practice A major goal of this class is integrate the actual working of the Internet sector with the economic theory of Internet markets. This will be done in two principal ways:

a) Industry Presentations - Upto four presentations will be made in class by senior managers of firms engaged in the Internet sector. The speakers will talk about their firm or sector, its challenges and achievements and will take questions from the students.

Companies that will be represented include Morgan Stanley and EBay. Details on dates and presenters will be forthcoming.

b) Case-Studies - Groups of students, five students in each group - will work on a case-study. Each case-study will be on a single internet company and will provide a brief history of the company, an economic and financial performance analysis and - most importantly - a business plan to expand, improve, and grow. (More details on logistics below). The case-study (summaries) will be presented in class by each group. The last three weeks of class will be devoted to the case-study presentations.

Case-Study Logistics Formation of a group and choice of company is yours (but has to be cleared with TA). Group needs to form by end of Week 2, i.e., Feb 7 (so every student must be in a group by then), and the choice of company has to be made by end of Week 4, i.e., Feb 21. An outline ("Executive Summary") of three pages should be submitted to the TA by April 4. The presentations will begin (around) April 16 and by the

time of presentation each group will be expected to have its case-study essentially done. A final draft - based on comments at the presentation and further work in April - will be written up and submitted by May 13. Approximate length - 20/25 pages.

Grading There will be periodic problem sets, a midterm exam, a final, and a group case-study. The problem sets will count for 10%, the mid-term and the case-study for 25% each and the final will count for 40% of the grade. The midterm exam will be on Tuesday, March 26.

Description of the Course

This course will explore the economic issues underlying the internet. We will start with a history of the medium to establish its background and current status. The economic analysis is in three parts. First, we will discuss the cost side of internet markets with special emphasis on the cost structure of information goods. Second, we will look at the demand side under price competition and entry and explore the implications for firm profits and consumer welfare. Third, we will discuss the demand side under internet market characteristics that lead to market power for particular firms, especially early entrants. These characteristics include network externalities and lock-in. There will also be case-studies from internet markets that will be presented by the Instructor in class.

Topics (Lecture Numbers refer to online Lecture Notes)

Each topic is expected to take a week except for the two case-studies that should take a class each.

Part I - Background

Topic 1 History of the Internet and Overview (Lecture 1)

a) Technology: Internet history and infrastructure - ARPANet, NSFNet, private net; Communication networks - similarities and differences with other forms
b) Business: Electronic commerce - current size, sectoral break-down and growth forecast; Convergence of media - video, cable, wireless.

Topic 2 Elementary Game Theory - An Overview (Lecture 4)

Games, Nash equilibrium, Oligopolies

Reading

Strategies and Games, 1999, Prajit K. Dutta, MIT Press, Cambridge, MA, Chapters 3 & 5.

Part II - The Cost Side

Topic 3 Cost Functions, Returns to Scale and Information Goods (Lecture 3)

Constant and Increasing Returns to Scale, Characteristics of information goods - easy reproducibility, non-depletability, large fixed costs.

Readings

Shapiro-Varian, Chapter 2.

Intermediate Microeconomics, Walter Nicholson (or any other Intermediate Microeconomics text) - chapters on production and cost functions.

Part III - The Demand Side: Competitive Forces

Topic 4 Competition for Homogenous Information Goods (Lecture 5)

Bertrand Price Competition with identical products - price competition, consumer welfare.

Reading

Tirole, Chapter 5.

Topic 5 Competition for Differentiated Goods - Horizontal Differentiation (Lecture 6)

Bertrand Price Competition with differentiated products - easing in price competition, consumer welfare. Entry - effect on firm profits, long-run implications.

Readings

Tirole, Chapter 7 & 8.

Shapiro-Varian, Chapter 2.

Topic 6 Case Study - Financial Brokerage (Lecture 8)

Developments in the brokerage industry; advent of online brokerage, reaction of old-line brokerage firms; E-trade, Merrill Lynch

Readings

TBA.

Part IV - The Demand Side: Market Power and Early Entry

Topic 7 Competition for Differentiated Goods - Vertical Differentiation (Lecture 7)

Bertrand Price Competition with vertically differentiated products

Topic 8 (Lack of) Competition with Network Externalities (Lecture 9)

Concept of network externalities; demand side economies of scale; first-mover advantage.

Readings

Tirole, Chapter 10.

Shapiro-Varian, Chapters 7 and 8.

Topic 9 Case-Study - Online auctions (Lecture 10)

EBay

Readings

TBA.