CHAPTER ONE

INTRODUCTION

THE TWENTIETH CENTURY has come to a close in the midst of a technological revolution that is affecting virtually every aspect of life in the United States. An important part of this revolution is the expansion of the Internet, which has triggered explosive growth in information technology. According to a 1999 study by the University of Texas at Austin and Cisco Systems, the Internet economy, broadly defined as those industries and professions that deal either directly or indirectly with the Internet, has already created more than 1.2 million jobs and generated more $300 billion in revenue.[1] In terms of user base, 72 million Americans are expected to have access to the web by the end of 2000, up from 14.3 million in 1995.[2] The Internet, by all accounts, has drastically changed the manner in which business is done. Anything from material goods, such as groceries and compact discs, to information goods, such as database access and newspaper text, can be acquired with a mouse click or a keystroke.

The ease with which goods and services are purchased today is the result of a dramatic rise of web-based businesses, known generally as electronic commerce, or "e-commerce." As of December 1999,

1. Barua and others (1999).
2. Atkinson and Court (1998).

there were more than 4.9 million commercial websites on the web, and that number was growing at a rate of almost 500,000 per month.[3] With the proliferation of commercial websites, not to mention the potential profits associated with such ventures, entrepreneurs have rushed in to carve out niches in this new marketplace. New market opportunities and business strategies that would have seemed fantastic years ago are quickly becoming commonplace.

New Practices and Problems

New business models are emerging everywhere. Recognizing the Internet's capacity for collecting valuable consumer information, firms have started giving away their products and services in exchange for data on consumers' tastes and preferences. In 1999 "FreePC.com," for instance, presented computers to consumers who would allow themselves to be monitored online and targeted for advertisements.[4] Believing that the Internet could significantly streamline sales processes, IBM announced in October 1999 that it would be selling all of its desktop computers only on the web.[5] Even major consumer durables such as automobiles have found a place on the web: numerous sites now provide the 40 percent of potential customers who use the Internet in their car hunts with information to help them find their perfect rides.[6]

With these wondrous changes and the lowering of commercial barriers have come new debates and serious policy considerations

3. The term "commercial" website refers specifically to those websites that have a ".com" suffix. If one includes those commercial sites that use ".org," ".net," or some other suffix, then the number would be substantially larger. Estimates from: www.netcraft.com/survey/reports.

4. Hansell (1999a).

5. Hansell (1999b).

6. Swoboda and Brown (1999).

about what this technology will mean for international trade, education, and consumer welfare. One such question arose in November 1999, when the online bookstore Amazon.com began receiving orders for Adolf Hitler's *Mein Kampf* from buyers in Germany, where the German-language version is banned.[7] Another growing concern is the ease with which school children can download pornography and other inappropriate material from the Internet and whether schools and public libraries should install Internet filter software that would block access to such sites. These issues, in turn, have raised a host of questions about freedom of speech. Though investors and market analysts seem intrigued by these new market developments, not everyone is thrilled, as is evident from the 18,600 Internet-related complaints that the Federal Trade Commission received in 1999, up from 8,000 in 1998.[8] This statistic provides a mere glimmer of the growing attention that the legislative, executive, and regulatory arms of government are focusing on this new medium as they seek to understand it and its potential for both growth and misuse.

Learning about the "Information Economy"

What, precisely, is the "information economy," and how will the Internet affect our lives? In the United States, educational institutions have responded to this question with aggressive investigation. The Stanford Graduate School of Business, for one, has established the Center for Electronic Business and Commerce in the heart of Silicon Valley to study how the Internet and electronic commerce is affecting American society. Analogous research centers have been

7. Burgess (1999).
8. Drezen (2000).

established at numerous schools, including the Owen School of Management at Vanderbilt University, the Sloan School of Management at the Massachusetts Institute of Technology (MIT), and the University of Texas at Austin. The courses offered by professional schools across the country run the gamut from "Internet and Society: Technologies and Politics of Control" (Harvard Law School) to "Internet Ventures" (University of Chicago Law School) and "Internet Strategy and Marketing" (Yale School of Management). It is hard to imagine that ten years ago any of these topics would have been considered appropriate for professional school training, yet today many are viewed as necessary components of any curriculum.

Amid the great acclaim that media commentators heap on the Internet, some wonder how much of this is "hype" and to what extent the "digital revolution" can really affect the world. Now that a variety of new business models are taking hold, it seems timely to ask how the government might become involved in Internet-related issues. So far, government entities seem to have been hesitant to intervene for fear of throwing a proverbial monkey wrench into the works of (what appears to be) an exceptionally smooth economy. According to a recent report by the International Competition Policy Advisory Committee, for example, the expansion of e-commerce could pose several threats to competition, notably through cartel creation and price signaling. While not offering any specific policy recommendations, the committee urged governments to be very attentive to the ongoing development of the e-marketplace, and to be ready to respond with appropriate antitrust enforcement measures.[9]

The government's reluctance to take action without further guidance raises some important questions for economic practitioners and politicians. A fundamental question is whether new theories

9. ICPAC (2000).

need to be constructed in order to explain the internal workings of the digital market? Or do "a few basic economic concepts go a long way toward explaining how today's industries are evolving"?[10] I try to answer this question in the pages that follow.

One important task in such an exercise is to review some of the recent literature dealing with the economics of the Internet, especially in relation to the pricing of access to the Internet, the pricing of goods sold via the Internet, network externalities, and Internet taxation. This makes it possible to collect some thoughts about the future development of the Internet with respect to market structure, consumer welfare, and likely areas of government intervention. While none of these topics is covered in complete detail, this book provides a roadmap of the current terrain in Internet-related economic matters, as well as a framework for future analysis.[11]

The discussion begins in chapter 2 with a brief nontechnical description of the origins and current state of the Internet and an outline of the technologies discussed in subsequent chapters. Chapter 3 covers current pricing practices for providing Internet access, as well as theoretical possibilities that have yet to be implemented. Chapter 4 takes up the question of how the environment of the Internet, especially with respect to its relatively low search costs and a variety of easy-access information, will shape the pricing of goods and services sold online. The literature pertaining to network externalities is the subject of chapter 5, which also touches on the

10. Shapiro and Varian (1999: 2).

11. The topics covered in this book were selected for investigation primarily because of the sizable body of existing (and relevant) economic research. A nonexhaustive list of additional Internet-related topics might include commercial fraud, electronic payment systems, security and privacy of Internet transactions, copyright protection, and advertising strategies. For a discussion of several of these subjects, see Choi, Stahl, and Whinston (1997); Litan (1999); Shapiro and Varian (1999); and Swire and Litan (1998).

possible application of theoretical models of network creation to the current state of the Internet. Chapter 6 moves beyond theoretical and empirical studies to a topic of widespread interest at present: taxation of online commerce. Chapter 7 brings the discussion to a close with some general observations and comments about possible areas of future research.

The phrase "we are living in interesting times" seems more applicable now than at any other time in history. The Internet could well enable us to realize some of our grandest science-fiction-based visions of the future. Many of us have dreamed of conducting all of our necessary transactions and communications electronically, earning our bachelor's or advanced degrees from our living room, and accessing all forms of recorded or processed information on demand. While such activities seem feasible and by some measures attractive, a great deal of uncertainty remains as to how these fast-emerging markets will stabilize, who the dominant players will be in tomorrow's economy, and how government activity might help or hinder those who seek to harness the full potential of the Internet. This book is a first step toward understanding what economics can tell us about where we are going and where we need to look next.