

Introduction

For most of those born after 1985, it is hard to imagine a world without the Internet. Although it was initially supported by government funding, the Internet has emerged as a commercial force through the efforts of actors in the private sector. Telephone companies built its fiber-optic “backbone,” which routes an unimaginably large and increasing volume of data, voice, and video traffic to Internet users through “last mile” connections to homes and offices. These connections exploit wireline and, increasingly, wireless technologies. In addition, millions of privately owned companies, big and small, provide the content on websites and applications (“apps”) that makes the Internet so popular and so valuable. The latest Internet phenomenon, social networking, illustrates how the Internet is changing not only our commercial lives but also the way that we interact with each other.

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All of this activity is made possible by broadband connections, made through the wire-based networks (millions of miles of copper-based coaxial or fiber-optic cables) and wireless networks (satellites and cell towers) that constitute the foundation of the modern Internet. The “broad” in broadband refers to the number of “bits” of voice and data that are able to travel per second through various “pipes,” or channels. When the term was first used in the 1990s, the Federal Communications Commission (FCC)—a regulatory body about which we will have much to say throughout this book—defined the minimum broadband speed to be 256,000 bits per second, or 256 kilobits per second (kbps).

Just as Moore’s Law accurately predicted the doubling of computing power every twelve to eighteen months, the speed of broadband networks has advanced at a remarkable rate over the last two decades. Today, the FCC defines the minimum acceptable broadband speed at 4 megabits per second (Mbps) for downloading information (1 Mbps for uploading it), and the agency has designed many of its policies and strategies to ensure that all Americans have access to at least one provider of such a service through a fixed physical wire—coaxial, beefed-up copper, or a fiber-optic cable—and actually use it. By that definition, more than 90 percent of American households are able to buy such a service. As of 2011, the latest year for which the FCC has reliable data, only about 7 million U.S. households did not have broadband access. If wireless broadband technologies—mobile phones or satellites—are counted, the unserved population drops by anywhere from 25 to 75 percent, so that the true number of households without access to broadband at the FCC’s minimum speed is probably in the range of 2 to 5 million.¹

Yet the minimum is just that, a floor. In many areas of the country, technology has made it possible to deliver broadband connections

at much greater speeds, double or more the 4 Mbps threshold. By 2012, cable infrastructure had been upgraded to so-called “next generation technology” (labeled DOCSIS 3.0), achieving average download speeds of 15 to 20 Mbps. At that time the technology was available in almost 100 million U.S. households, and telephone fiber-optic service at similar speeds was available in roughly half that number of homes. In addition, advanced 4G LTE wireless service with download speeds of 15 Mbps—the latest in seemingly never-ending jumps in technological capability, like the increases in the power of computer chips—was offered by providers such as AT&T and Verizon in many parts of the country, and certainly more areas will be included over time.

Although we have chosen to write this book on the future of telecommunications policy and regulation, we focus on broadband service because it is both the technology and metaphor for a new digital age of telecommunications that is based on an “Internet protocol” (IP). IP-based systems allow the convergence of what were once entirely separate media—voice over telephone wires, television over the air (technically, the radio-magnetic spectrum) or through cable, and data through the Internet. The FCC has historically regulated each of these media in a different manner.

The central thesis of this book is that the new digital IP world calls for an entirely different regulatory approach, one that recognizes that old telecommunications “silos” are anachronistic. Instead, today’s broadband industry is both dynamic and, given the right regulatory environment, far more competitive than the twentieth-century telecommunications industries that it is replacing. The new realities imply a much more limited but still important role for the FCC going forward. Although many of our recommendations for getting to this brave new world are broadband specific, others are more general in nature and consistent

with our broader argument that the time is now ripe for a complete overhaul of the FCC and its mission.

The stakes are high because a regulatory and policy structure that promotes deployment of rapid broadband and its use will deliver great benefits to the American people. But, as we highlight in chapter 5, the social benefits of broadband are tied to its speed.

Economists like to point to the “network externalities” afforded by technologies like broadband: the greater the number of people and businesses that are connected, the greater the benefits to all users. Those benefits are what one might call demand-side externalities. Another kind of network externality is found on the supply side. It manifests itself in a virtuous cycle between technology platforms and the applications that run on them: the more applications that run on a desktop operating system such as Windows or Mac OS or a mobile device platform such as Android or iOS, the more desirable the system or platform is. Likewise, the more ubiquitous a fast broadband network, the likelier it is that more applications in a range of industries and sectors—including health care, education, and energy, to name just a few—will be developed, to the benefit of consumers.

It should not be surprising that “broadband penetration”—the share of a nation’s population that has access to or has adopted broadband in some form—has become a widely accepted way of measuring a country’s technological sophistication. Unfortunately, the only internationally comparable broadband penetration data, compiled by the Organization for Economic Cooperation and Development (OECD), count only fixed or wire-based broadband services delivered at the now poky rate of 256 kbps. Even by this outmoded measure, which ignores the rapidly growing use of mobile devices by people around the world to access the Internet

at much faster speeds, the United States has consistently lagged behind a number of other countries. This pattern remains true in the most recent OECD data, which show that by year-end 2011, wire-based broadband was used in almost 28 percent of U.S. households while many European countries, Korea, and Canada had achieved more than 30 percent penetration.

Because all of the countries with higher broadband penetration rates have lower GDP per capita than the United States, this particular variable cannot explain America's lagging broadband take-up rate (although across all countries there is still a positive correlation between GDP per capita and fixed broadband penetration). Nor can population density account for all of the difference. Canada, after all, has consistently outranked the United States on penetration rate despite its low density.

Differences in policies, therefore, must play some role in explaining the variation in broadband penetration rates. Implicitly reflecting this view, the FCC's latest strategic policy statement ranks the active promotion of broadband technologies at the top of both the U.S. telecommunications policy agenda and the commission's mission statement. As the agency's 2012–16 strategic plan states, the FCC exists to

promote innovation, investment, competition, and consumer empowerment in and on top of the communications platforms of today and the future—maximizing the power of communications technology to grow our economy, create jobs, enhance U.S. competitiveness, and unleash broad opportunity and a higher quality of life for all Americans.²

That is ambitious stuff. Who would quarrel with having more jobs and receiving higher wages generated through continuing advances in and deployment of communications technology? In

practice, however, the FCC has pursued a much more limited agenda: ensuring maximum adoption of wire-based broadband services only at its defined minimum acceptable speed (4 Mbps for downloading, 1 Mbps for uploading). Although at first glance one might think that that is a sensible “first things first” objective, it is insufficiently ambitious in at least three key respects.

First, the FCC’s current focus on fixed broadband entirely ignores wireless broadband, which can deliver information at speeds exceeding the commission’s minimum threshold.

Second, as we document later, much larger social benefits are associated with enhancing competition in areas of the country where currently there is only one wireless broadband provider. More competition leads to lower prices, which enhances penetration and thus makes it profitable for more applications to be developed on top of the broadband platform. Lower prices and more services in combination represent large potential gains for consumers.

Third, despite the broad language used in the FCC’s latest strategic plan, in reality current policy has so far paid more attention to the adoption of broadband service than it has to the deployment of or investment in broadband technology. That is shortsighted. The best way to ensure more adoption, and hence more penetration, is to adopt policies that promote the construction of broadband facilities, both wire-based and wireless.

In short, we advocate, instead of the FCC’s demand-side approach, a “build it and they will come” approach to the broadband challenge. The more choices that consumers have for making fast broadband connections (those offering speeds above 4 Mbps) in particular, the lower prices will fall, thus enhancing consumer take-up rates.

Fortunately, it is possible to realize both the FCC’s narrow goal of maximizing adoption of what it has defined as minimally

acceptable broadband service and our more ambitious objective through one common policy: accelerating and expanding the auction of wireless spectrum. We also support the removal of several regulatory impediments to more effective broadband competition, which we lay out in more detail in chapter 4.

There is a limited role for subsidies in our approach. Through much of the twentieth century, national policy favored indirect and later more direct subsidies of basic telephone service. Presumably that policy was motivated not only by the desire to achieve “network effects” from having everyone connected but also by the recognition that having basic telephone service is necessary to have access to other basic services, such as police and fire protection and emergency medical transportation. Likewise, so far in the twenty-first century, it has been national policy to ensure that all Americans have access to at least some basic broadband service and, ideally, use it. For low-income households, especially those living in hard-to-reach rural areas, subsidies may be required to ensure access.

So far, however, subsidies have not been supplied in the most effective way to achieve that goal. They have been largely directed at telephone companies offering fixed wireline broadband service (through fiber-optic cables); alternative broadband technologies (particularly wireless) have less access to support. The subsidies also have provided a fixed amount per household and thus do not take into account the varying costs of reaching the relatively few households that still do not have access to broadband at minimum acceptable speeds. We believe that it is easy to remedy these shortcomings, and we offer recommendations for doing so. We do not call for subsidies to address the larger challenge of enhancing competition in the half of the country, roughly speaking, where only one wireline broadband provider now exists. Instead, in our

view the right approach there is to reduce or eliminate existing regulatory barriers that inhibit competition. In effect, current policies represent self-inflicted wounds that must be healed.

We proceed from here in several steps. In chapter 2 we briefly describe how the United States got to this point, highlighting in particular the telecommunications policies that thus far the country has embraced for promoting broadband deployment and adoption. We concentrate on the provisions in the Telecommunications Act of 1996 that were designed to promote more competition between the traditional telephone companies and cable television providers, and we summarize the country's approach to spurring wireless telecommunications services.

Still, if one common theme ran through telecommunications policy in the twentieth century—even as late as the 1990s, when broadband was first becoming a reality—it was that different technologies must be regulated differently. That “silo” approach was suitable for a world in which the different technologies carried different kinds of information—voice, data, sound, and images—but it clearly has its shortcomings in a world in which broadband and IP are making it possible to deliver all kinds of content through multiple technologies. That is why, in chapter 3, we lay out the case for adopting a very different policy framework for the new broadband age in the twenty-first century. Several features of this new age already are evident. It is more dynamic than its predecessor: the transmission speed and thus volume of data that can be transmitted continue to escalate. The different technologies—wire-based and wireless—compete with one another in the delivery of content. Indeed, many wire-based customers have already “cut the cord” by going entirely wireless, and increasing numbers are projected to do so. And because the delivery mechanisms are reasonably interchangeable, the telecom-

munications landscape is more competitive now than it was in the twentieth century.

Today, a new policy framework is needed, one that permits broadband competitors to battle for customers largely unimpeded by regulatory restrictions. Indeed, current restrictions are slowing the inevitable transition to the broadband era by frustrating the efforts of potential providers of broadband services to expand into regions of the country that are currently served by only a single provider. In chapter 4, we offer a set of specific recommendations for removing or curtailing the current impediments, some of which, such as rules purporting to enforce “network neutrality,” are specific to broadband. Others, such as the dual jurisdiction of the FCC and the Department of Justice over mergers, are more general.

We do not discuss the non-economic policies of the FCC relating to its regulation of the content of radio and television programming. That issue, which turns on political judgments tempered by the First Amendment’s free speech provision, are better addressed by political scientists and lawyers in other contexts. We concentrate instead on the broader but strictly economic issues concerning the FCC’s management of the telecommunications industry, primarily through its extensive and expensive rule-making process, and its management of the radio magnetic spectrum, whose “scarcity” the FCC and the courts have invoked as a major rationale for FCC regulation.

We believe and argue in more detail below that the FCC nonetheless still has a useful although limited role to play in this regard. Relying on antitrust litigation and the courts alone to police discriminatory conduct in the telecommunications industry after the fact is not an optimal policy. Incumbents have a huge advantage in delaying judicial outcomes. There are certain harms,

such as a reduction in independent voices, that are not cognizable under the antitrust laws. Moreover, case law is not always clear enough to reduce uncertainties that can deter new entry and investment decisions by existing firms. Accordingly, we favor a trimmed-down FCC that would retain a modest role as gatekeeper in policing discriminatory conduct by market actors. But policing should be done after the fact in individual cases—as it is in other contexts—rather than through ostensibly forward-looking rulemakings that not only can take years to complete, given frequent litigation, but also have difficulty keeping up with the rapid changes in technology and markets that can occur during the process. Gone would be the days of a 200-plus page Open Internet Order (which we describe later in more detail), endlessly appealed by Internet service providers and consuming FCC (and taxpayer) resources in court. The concept in the antitrust law that is the closest that we can find to the approach that we outline here is the rule-of-reason analysis for most vertical restraints. In contrast, price fixing among horizontal competitors (those in the same line of business) is considered *per se* illegal. Because vertical restraints in the telecommunications world may be motivated by efficiency reasons, the FCC should similarly embrace a rule-of-reason approach and refrain from banning their existence on an *ex ante* basis (that is, refrain from treating certain vertical restraints as *per se* offenses).

In addition, it makes little sense for the commission to have overlapping and duplicative authority to review communications mergers when the antitrust enforcement agencies already do so under the Clayton Act. Defenders of dual jurisdiction no doubt will point to the separate legal standard—whether a merger is in the “public interest”—that the FCC is asked to administer when considering mergers. But we are not the first to note that the public

interest standard is so broad as to be operationally meaningless. For precisely that reason, the FCC has used the standard to extract concessions from merging parties that meet the whims of a majority of the commissioners who happen to be in power at the time that a merger is proposed. This is not a system of laws but of men (and women)—one not suited to the American view that it is the rule of law that matters.

Meanwhile, the long-standing technological rationale for the commission's existence—the supposed scarcity of the electromagnetic spectrum—has been eroded by technological advancement itself. The brilliant technologist-lawyer Peter Huber presciently argued more than a decade ago that engineers would prove adept at continually coming up with new ways to use broader portions of the spectrum for sending data or voice signals, or both, while slicing existing blocks of spectrum into ever-thinner portions, permitting more competitors to broadcast signals. And that is exactly what has happened.

To its credit, the FCC has taken an economic approach to facilitate continued innovation by using auctions over the past fifteen years to award spectrum licenses, a suggestion endorsed broadly by economists over many decades. (It took the commission a full thirty-five years to conduct the first spectrum auction after Nobel prize winner Ronald Coase explained its efficacy in a seminal article in 1959.) The agency should be more aggressive, however, in opening up more of the spectrum for auction, not principally to raise revenue but to accommodate rapidly growing demand for wireless communications and to promote continued innovation in the industry.

In sum, a much slimmer FCC with a very limited mandate is all that is called for. Arguably, this has been the right approach to the FCC for decades. But with the advent of the Internet and all of the

changes in telecom technologies and markets that have occurred over the past decade, it is certainly the right approach now.

We conclude in chapter 5 by describing the broad range of social benefits that would be generated by the widespread availability and adoption of rapid broadband that would be made possible by our recommended telecommunications policy and a slimmed-down FCC. Getting broadband policy right would produce hundreds of thousands of broadband-related jobs and billions of dollars in economic output. Broadband deployment also would increase productivity, increasing incomes for those employed in segments that rely heavily on information technology. Finally, increasing broadband access would generate significant spillover benefits in industries that can exploit broadband connections, including health care, education, and energy.