

# Law and the Open Internet

Adam Candeub\*

Daniel McCartney\*\*

I.	INTRODUCTION .....	494
II.	ECONOMIC ANALYSIS DOES NOT PROVIDE POLICY GUIDANCE .....	499
A.	<i>Is Vertical Foreclosure the Right Lens for Network Openness?</i> .....	502
B.	<i>Is Foreclosure a Reasonable Concern?</i> .....	505
1.	The Single Monopoly Rent Theorem, Vertical Integration Stories, and Broadband .....	506
C.	<i>Does Characterizing Broadband Service Provision as a Two-Sided Market Further the Analysis?</i> .....	512
1.	Does Two-Sided Market Analysis Apply to Broadband Service Provision? .....	513
D.	<i>Does Anyone Know Anything About Dynamic Efficiency?</i> .....	517
III.	NETWORKS DISCRIMINATE, AND NETWORK ENGINEERING GIVES POLICY MEANS NOT ENDS .....	520
A.	<i>Selecting Where and What to Build</i> .....	523
B.	<i>Configuring to Discriminate</i> .....	524
1.	“Best Effort” .....	525
2.	“Quality of Service” .....	526

---

\* Professor of Law, Director, Intellectual Property, Information, and Communications Law Program, Michigan State University College of Law.

\*\* Software engineer, patent attorney, GrubHub.com.

C. Selective and "Fair" Interconnection .....	529
IV. AN EMPIRICAL, NONTHEORETICAL LAW OF THE OPEN INTERNET .....	531
A. BitTorrent-Comcast Controversy.....	533
B. Cogent-Sprint Disconnection.....	536
C. Madison River.....	537
V. A JURISDICTIONAL POSTSCRIPT .....	537
VI. CONCLUSION .....	548

## I. INTRODUCTION

The FCC has recently issued a new set of Internet access regulations and policies: the *Open Internet Proceeding Report and Order*.<sup>1</sup> This order culminates over a decade of intense policy debate on whether any rules, and, if so, which rules will work best to structure the Internet's component markets. Advocates of regulation frame it as an effort to preserve "net neutrality."<sup>2</sup> They fear dominant broadband providers, such as AT&T and Comcast, will use their market power in consumer markets unfairly, favoring Internet content in which they have financial interest.<sup>3</sup> They argue that the FCC should introduce strong regulation to defend the Internet—a place that teems with decentralized creativity—from the centralizing strictures of a glorified content delivery system.<sup>4</sup> Foes of Internet

1. Preserving the Open Internet Broadband Indus. Practices, *Report and Order*, 25 F.C.C.R. 17905 (2010) [hereinafter *Open Internet Proceeding Report and Order*].

2. See, e.g., Robert Friedan, Summary of FCC's Net Neutrality Report and Order, TELEFRIEDAN, <http://telefrieden.blogspot.com/2011/01/summary-of-fccs-net-neutrality-report.html> ("Broadband providers may not unreasonably discriminate in transmitting lawful network traffic while mobile carriers face a general no blocking rule that guarantees end users' access to the web and protects against mobile broadband providers' blocking applications that compete with their other primary service offering—voice and video telephony. The Report and Order rejects assertions that network neutrality requirements would stifle innovation reduce incentives to invest in network infrastructure.").

3. Josh Halliday, *Al Franken Warns of 'Outright Disaster' Over Net Neutrality*, PAIDCONTENT (Mar. 14, 2011), <http://paidcontent.org/article/419-al-franken-warns-of-outright-disaster-over-net-neutrality/> ("Net neutrality advocates fear that internet providers, most pertinently Comcast which controls a large stake in both TV and internet provision, could downgrade rivals' content and boost delivery of their own.").

4. See generally LAWRENCE LESSIG, THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD 34–35 (2001); Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257, 294 (2007) (emphasizing the decentralized nature of the Internet); Rob Frieden, *Network Neutrality or Bias?—Handicapping the Odds for a Tiered and Branded Internet*, 29 HASTINGS COMM. & ENT. L.J. 171, 174–75 (2007); Lawrence B. Solum & Minn Chung, *The Layers Principle: Internet Architecture and the Law*, 79 NOTRE DAME L. REV. 815 (2004); Tim Wu, *The Broadband Debate, A User's Guide*, 3 J. ON TELECOMM. & HIGH TECH. L. 69, 95 (2004); Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. ON TELECOMM. & HIGH TECH. L. 141 (2003); Kevin

regulation fear that openness mandates might create burdensome government intrusion and reduce infrastructure investment.<sup>5</sup> They fear that the FCC's fitful fantasy of slaying anticompetitive dragons will impose new government controls that smother the real and innovative wonder of a free Internet.<sup>6</sup>

The Open Internet Proceeding focuses on one issue: "last mile" anticompetitive foreclosure.<sup>7</sup> Broadband access providers, like AT&T, Comcast, or Verizon, might favor affiliated online content and disfavor competitors. For example, Verizon might block access to Skype, a competitor in telephony; Comcast might block or degrade online video downloads from Netflix, a competitor in cable television services; or any of them might accept money from Google to degrade Yahoo's traffic.

The FCC *Open Internet Order* employs the normative principle of "reasonable discrimination" as the legal standard for Internet regulation,<sup>8</sup> following the FCC's analysis in the NPRM.<sup>9</sup> Applying this principle to

---

Werbach, *A Layered Model for Internet Policy*, 1 J. ON TELECOMM. & HIGH TECH. L. 37, 67 (2002); Mark A. Lemley & Lawrence Lessig, *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era*, 48 UCLA L. REV. 925, 970 (2001); Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Commons and User Access*, 52 FED. COMM. L.J. 561, 562 (2000).

5. Commissioner Robert McDowell, *Hands off the Internet*, WASH. POST, April 9, 2010, <http://www.washingtonpost.com/wpdyn/content/article/2010/04/08/AR2010040803375.html> ("Nonetheless, the FCC may still consider imposing early-20th-century vintage "common carrier" regulations on 21st-century broadband technologies. One result of the new rules could be to make it harder for the operators of broadband "pipes" to build "smart" networks, which offer connectivity and other services or products.").

6. Daniel L. Brenner, *Creating Effective Broadband Network Regulation*, 62 FED. COMM. L.J. 13, 76 (2010) ("This Article has focused on that regulator-the FCC. It appears limited in its ability to function as the creator or wise arbiter of ex ante rules, measured by what it is, its resources, and its record of success and failure in guiding and governing communications networks."); C. Scott Hemphill, *Network Neutrality and the False Promise of Zero-Price Regulation*, 25 YALE J. ON REG. 135, 152 (2008); Gerald R. Faulhaber, *Network Neutrality: The Debate Evolves*, 1 INT'L J. COMM. 680, 680–82 (2007); J. Gregory Sidak, *A Consumer-Welfare Approach to Network Neutrality Regulation of the Internet*, 2 J. COMPETITION L. & ECON. 349, 356 (2006) ("Ex ante regulation in the name of network neutrality would be a costly mistake that policy makers still have the ability to avoid."); Christopher S. Yoo, *Network Neutrality and the Economics of Congestion*, 94 GEO. L.J. 1847, 1907–08 (2006); Christopher S. Yoo, *Beyond Network Neutrality*, 19 HARV. J.L. & TECH. 1, 12 (2005); *see generally* NET NEUTRALITY OR NET NEUTERING: SHOULD BROADBAND INTERNET SERVICES BE REGULATED? (Thomas M. Lenard & Randolph J. May eds., 2006).

7. See, e.g., Barbara van Schewick & David Farber, *Point/Counterpoint: Network Neutrality Nuances*, 52 COMM. ACM 31, 31–32 (2009).

8. *Open Internet Proceeding Report and Order*, *supra* note 1, at 17905–06.

9. Preserving the Open Internet Broadband Indus. Practices, *Notice of Proposed Rulemaking*, 24 F.C.C.R. 13064, paras. 8, 103 (2009) [hereinafter *Open Internet NPRM*] ("[B]roadband Internet access service providers may have both the incentive and the means

how the network transmits packets of data, some phrase the rule as requiring that “like content” gets “like treatment” without discriminating based on the type of application or discriminating by the identity of the sender or receiver.<sup>10</sup> The *Open Internet Order* applies this principle to broadband access providers.<sup>11</sup>

This Article first shows that this regulatory approach and the attendant scholarly debate are fatally narrow. With their noses buried in the last mile, commentators and regulators do not account for the full range of tactics available to a network when it wants to discriminate. Internet networks—beginning with those networks adjacent to the last mile—enable alternate modes of control over user traffic.

Beyond merely discriminating among packets of data upon entry into the last mile (the exclusive concern of the FCC proposals), a broadband provider can also discriminate among interconnecting networks. Comcast or Verizon could thereby “outsource” the discrimination deeper into the network by the terms and conditions under which it interconnects with these other networks. Defending only the last mile will yield an open doorway to a closed Internet.

Compounding this shortsightedness, the relevant vertical foreclosure discussions have not been helpful. As the following discussion concerning economic analysis shows, law professors fumble outside their expertise by dressing up unsettled economic theory as if it were resolved and canonical. Their efforts, however intriguing and provocative, have avoided carefully examining the effectiveness of actual network regulations.

Second, we detail how the FCC, like academia, erroneously translates normative standards of nondiscrimination and fairness into rules for Internet engineering. These efforts fail because *any* network will carry some traffic types better than others. Building and configuring a network to

to discriminate in favor of or against certain Internet traffic and to alter the operation of their networks in ways that negatively affect consumers, as well as innovators trying to develop Internet-based content, applications, and services . . . . [T]he ability of network operators to discriminate in price or service quality among different types of traffic or different providers or users may impose significant social costs . . . . The key issue we face is distinguishing socially beneficial discrimination from socially harmful discrimination in a workable manner.”).

10. Lawrence Lessig & Robert W. McChesney, *No Tolls on the Internet*, WASH. POST, June 8, 2006, at A23; *Network Neutrality, Broadband Discrimination*, *supra* note 4, at 167–68 (“In technical terms, this means discrimination based on IP addresses, domain name, cookie information, TCP port, and others as we will describe in greater detail below.”).

11. The proposal carves out an exception for “managed services.” *Open Internet NPRM*, *supra* note 9, at para. 149 (“[T]hese managed or specialized services may differ from broadband Internet access services in ways that recommend a different policy approach, and it may be inappropriate to apply the rules proposed here to managed or specialized services.”). It remains to be seen if this is an exception that swallows the rule.

route packets will necessarily discriminate. An almost unconscious importing of earlier telephone or telegraph regulation into the Internet policy debate accounts in part for the mistake of blanket opposition to discrimination.<sup>12</sup>

As a regulatory concept, discrimination made sense with the old, telephone circuit-switched network, which involved distinct and exclusive connections, i.e., circuits, over which people communicated. At switch points, circuits could be mandated for equal treatment because a circuit was a real and singular item. Previous “open network” regulation—such as the Modified Final Judgment’s mandated equal access for competitive long distance companies or the local competition under the 1996 Telecommunications Act (“the 1996 Act”)—required quite simply that networks create places at which competitors could place their wires in an equal manner.<sup>13</sup> Discrimination, therefore, had a clear and distinct meaning in the old telephone network.

In packet-switched networks, like the Internet, the circuits are virtual. Legal scholars have yet to comprehend how the virtualizing of the circuit has shattered the possibility of coherent *nondiscrimination* regulation.<sup>14</sup> The crucial and difficult inquiry begins with an effort to distinguish “good” from “bad” discrimination. But any regulation must realize that no single rule can properly distinguish in a general way. Rather, the distinctions *must* be contextual to the consumers’ experiences, markets, and social environments.

Third, we suggest a more productive framing for defending the open Internet. The inevitability of discrimination need not paralyze policy—it merely urges a different conception of the task. To defend an open Internet does not require (to borrow the phrase from employment law) “equal, non-discriminatory treatment” of bits or traffic as the FCC and many scholars

---

12. See *infra* Section II for a discussion of the translation of normative-legal concepts of discrimination that work (or do not work) in a circuit and packet-switched network.

13. See CHARLES H. KENNEDY, AN INTRODUCTION TO U.S. TELECOMMUNICATIONS LAW 46 (2d ed. 2001).

14. The failure to recognize that Internet networks by their nature discriminate is endemic to the legal scholarship. Nonetheless, there have been some who recognize the difficulties. See Kevin Werbach, *Only Connect*, 22 BERKELEY TECH. L.J. 1233, 1279 (2007) (“The second element of the mainstream network neutrality argument is a claim that a non-discrimination rule can effectively address the innovation-killing behavior of network operators. Yet that assumes government can craft and enforce a rule that distinguishes benign from anti-competitive discrimination, which is more difficult than it might seem.”). See also Tim Wu & Christopher Yoo, *Keeping the Internet Neutral?: Tim Wu and Christopher Yoo Debate*, 59 FED. COMM. L.J. 575, 577 (2007) (“[N]o one really believes in systems that ban discrimination completely . . . [T]he network neutrality debate—the useful part of it—is getting a better grip on what amounts to good and bad forms of discrimination on information networks.” (statement of Tim Wu)).

propose.<sup>15</sup> Instead, it requires “equality of outcomes,” i.e., equality of Internet experience, for user applications.<sup>16</sup> Whether it is Voice over Internet Protocol (“VoIP”), video, web browsing, or whatever might come next, the public cares about what it can do, not the component parts of how whatever it does gets done. The obsession with packet-wise equality, i.e., a complete lack of network discrimination, is aimless. Packet-wise equality may prevent some of the worst abuses of a hostile network, but the treatment of a given packet relates only indirectly to human concern. The immediate concern is what the transmitted packets combine to accomplish in actual online experience. Contrary to the assumptions in the debate,<sup>17</sup> there is no necessary relationship between packet-wise equality and online experience of Internet applications.

Determining equality of outcomes is highly contextual. It often involves issues that have little to do with traffic treatment, as we discuss in Section IV. Where others begin with vague principles, we begin with facts. We look at the prominent Internet controversies of the last decade. Our analysis shows that discriminatory treatment, as such, was not the animating concern. For instance, when Comcast inserted a packet into the TCP stream to spoof the closing of a peer-to-peer connection, this was not about discrimination.<sup>18</sup> We argue it was an issue of privacy and the expectation of message integrity—not a concern over discriminatory treatment.<sup>19</sup>

Finally, we address the primary legal question on appeal of the *Open Internet Order*, which is whether the FCC has jurisdiction to impose any sort of regulation on the Internet. We argue that conventional wisdom misunderstands the impact of the 1996 Act on FCC’s jurisdiction. We

15. Joel Wm. Friedman, *Redefining Equality, Discrimination, and Affirmative Action Under Title VII: The Access Principle*, 65 TEX. L. REV. 41, 43 (1986) (“Traditionally, equality in the employment context has been perceived as requiring either equal treatment of, or equal achievement by, minority and nonminority applicants and employees; the former is achieved by procedural symmetry in the methods of selection and treatment of all employees and the latter by outcome proportionality in the number of applicants and employees of different groups who receive jobs or advancement on the job.”).

16. We are indebted to the work of Jerry Kang who first suggested analyzing Internet discrimination under a more fluid conceptual framework. See Jerry Kang, *Race.Net Neutrality*, 6 J. TELECOMM. & HIGH TECH. L. 1, 4 (2007) (“What lessons can be drawn from a comparison between discrimination in both domains, race and net? First, we immediately notice how the definition of discrimination is sharply contested.”).

17. *See supra* notes 4–6.

18. Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications, *Memorandum Opinion and Order*, 23 F.C.C.R. 13028, para. 30 (2008) [hereinafter *BitTorrent Order*]; Comcast Corp. v. FCC, 600 F.3d 642 (D.C. Cir. 2010).

19. *See infra* Section IV.

argue that the Act did not disrupt the existing structure of FCC regulations set forth in the *Computer Inquiries* and the original 1934 Communications Act:<sup>20</sup> the FCC regulates basic communications service while deregulating more advanced services that can be provided through the telephone network, such as FAX<sup>21</sup> or internet access.<sup>22</sup> The 1996 Act's technical, and as we shall see, nonsensical definitions—"telecommunications,"<sup>23</sup> "telecommunications service,"<sup>24</sup> and "information service"<sup>25</sup>—did not change this structure. Indeed, the authors of the 1996 Act would *never* have foreseen or desired such a result. Thus, the FCC has jurisdiction to promulgate the *Open Internet Order* pursuant to its authority to ensure basic communications pursuant to a regulatory structure that Congress never intended to change.

The Article proceeds as follows. In Section II, we explore the concepts of "discrimination" and "fairness" through the lens of network engineering to properly understand how networks discriminate. In Section III, we catalog recent Internet controversies to begin growing the body of "Internet case law" and to show that nondiscrimination concerns only motivate a part, perhaps a small part, of Internet controversies. Section IV sets forth the components of a regulatory regime that responds in a bottom-up manner to the complexity of Internet concerns. Finally, Section V provides an analysis of the FCC's jurisdictional authority to impose such a regime.

## II. ECONOMIC ANALYSIS DOES NOT PROVIDE POLICY GUIDANCE

The network openness debates have swirled around two economic questions. The first question is whether the last mile access provider—the ISP, such as Comcast or Verizon—can or will block (or degrade) access to unaffiliated content providers (i.e., "vertical foreclosure").<sup>26</sup> In other

---

20. Communications Act of 1934, ch. 652, 48 Stat. 1064 (codified as amended at scattered sections 47 U.S.C.).

21. Policy and Rules Concerning the Interstate, Interexchange Marketplace, *Further Notice of Proposed Rulemaking*, 13 F.C.C.R. 21531, para. 1 (1998).

22. See Access Charge Reform, *First Report and Order*, 12 F.C.C.R. 15982 (1997).

23. 47 U.S.C. § 153(50).

24. *Id.* § 153(53).

25. *Id.* § 153(24).

26. Compare Faulhaber, *supra* note 6, at 691 ("Perhaps the most vexing issues surrounding net neutrality involve potential abuses by broadband ISPs of their power to foreclose or otherwise exploit vertical markets . . . [I]n order to reach their broadband customers, application providers must use the services of broadband ISPs; typically, customers have a choice of at most two such broadband providers: their local cable company (cable modem) or their local telephone company (DSL)."), and Sidak, *supra* note

words, might Comcast block access to Hulu because it competes to provide video services? Broadband providers, who have significant market power, control the “bottleneck.” With this point of control, the broadband providers can discriminate among content kind and source to consumers’ detriments.<sup>27</sup>

Conceiving of market power in broadband services in this way ignores how broadband providers connect with other networks. As we discuss in detail below, when an access network discriminates, it hurts the adjacent network, which now provides incrementally weaker connectivity to all ends within the access provider network. It is not clear that adjacent networks (transit and peering networks) would permit the access provider to do this, because such discrimination undermines the service that the adjacent networks are providing to networks on the other side, i.e., the adjacent network’s sell “reachability.”<sup>28</sup> When an access provider discriminates, it reduces this valuable characteristic of the adjacent network. Since it is not clear that an access provider would always be able to dictate such terms to adjacent networks, a bottleneck model is likely not universally accurate.

But even assuming that the vertical foreclosure model is applied, attempts to regulate will fail if they only forbid the access provider from discriminating. An access provider, like Comcast, can effectively discriminate without actually performing the packet discrimination in its network.

An access provider can “outsource” discrimination by adopting discriminatory terms in peering and transit contracts with other network providers. The literature on Internet openness, for the most part, ignores this possibility.<sup>29</sup> While its order concentrated on vertical foreclosure, the

6, at 351 (“Network neutrality regulation would constrain the behavior of a downstream broadband Internet access provider *vis-à-vis* its users and upstream providers of Internet content and applications.”), with Barbara van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*, 5 J. TELECOMM. & HIGH TECH. L. 329, 390 (2007) (“In the absence of network neutrality regulation, there is a real threat that network providers will discriminate against independent producers of applications, content or portals or exclude them from their network. This threat reduces the amount of innovation in the markets for applications, content and portals at significant costs to society.”).

27. See van Schewick, *supra* note 26, at 390.

28. Nicholas Economides, *The Economics of Internet Backbone*, in 2 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS 376–77 (2005) (“[A]n ISP needs to interconnect with other ISPs so that its customers will reach all computers/nodes on the Internet. That is, interconnection is necessary to provide universal connectivity on the Internet, which is demanded by users.”).

29. We have found one notable exception. See Christopher T. Marsden, *Net Neutrality: The European Debate*, 12 J. INTERNET L. 2, 7 (2008) (“[S]uch discrimination may possibly be detected by the end-user when it is conducted by its ISP, while a far more pernicious and

FCC does hint at the problem and suggest the possibility of a regulatory response.<sup>30</sup>

Setting aside these alternate discriminatory tactics and looking simply at whether the access provider vertically forecloses competitors, the scholarship has been unhelpful. The debate has assumed an arid nature. Economists experiment with theories built on myriad assumptions and caveats that render them too immature to guide policy. Law professors play economists by arguing for or against these theories, but, as we will show, they reach their conclusions by relying on intuitive, imprecise judgments about the costs and benefits of Internet regulation versus laissez faire.

The second economic question is whether Internet openness will increase or decrease investment and innovation (“dynamic efficiency”). From Mark Lemley and Larry Lessig’s article on end-to-end architecture<sup>31</sup> to Yochai Benkler’s *Wealth of Networks*,<sup>32</sup> much ink has been spilled over whether the Internet’s architecture provides an altogether special type of innovation that must be protected.<sup>33</sup> In the other corner, laissez faire defenders argue that enforcing any type of Internet design will lead to decreased investment both in infrastructure and content.<sup>34</sup>

---

potentially undetectable discrimination may occur at peering points.”); *see also id.* at 7 n.13 (“The debate in regard to the subtleties of service degradation is beyond this article, and experts at the Paris conference of 29 May 2007 were divided as to whether degradation that is deliberate could be well enough disguised to suggest off-net discrimination.”).

30. *Open Internet NPRM*, *supra* note 9, at paras. 104–10.

31. Lemley & Lessig, *supra* note 4.

32. YOCHAI BENKLER, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM (2006).

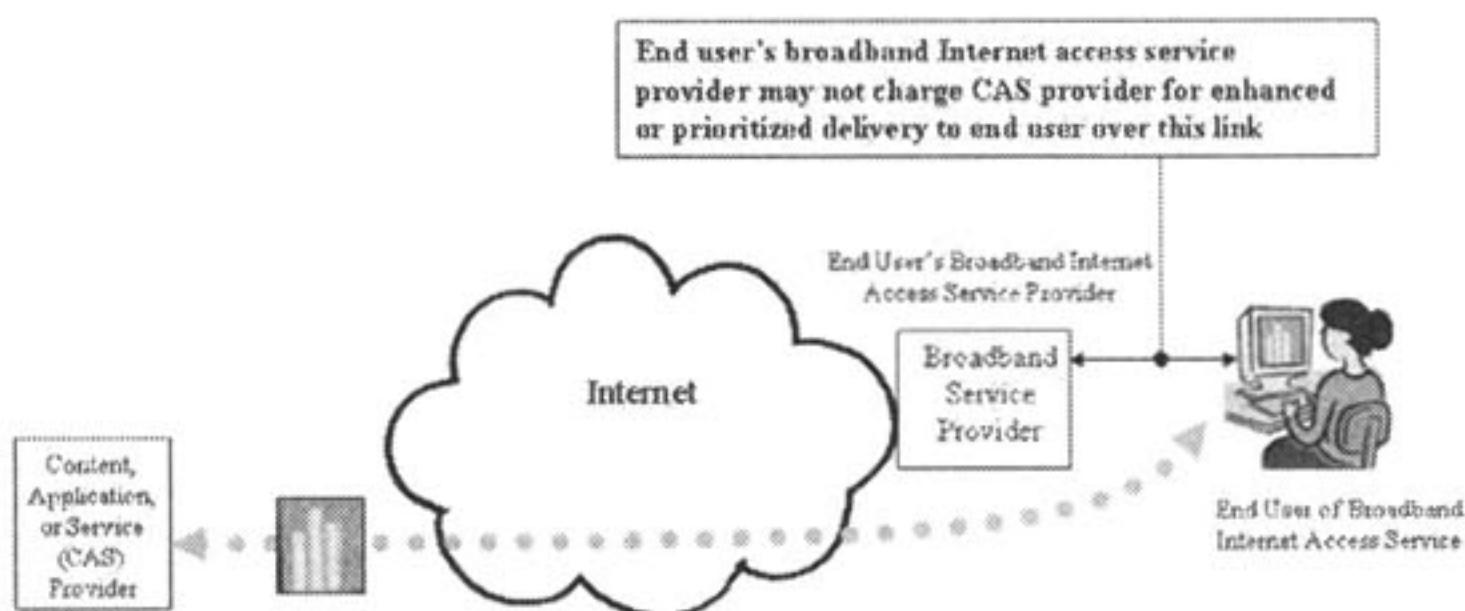
33. LESSIG, *supra* note 4, at 34–35; Susan P. Crawford, *The Internet and the Project of Communications Law*, 55 UCLA L. REV. 359, 392 (2007) (“[O]nline diversity stems from allowing the end-to-end, content-neutral, layer-independent functions of the Internet to flourish . . .”); Brett M. Frischmann & Barbara van Schewick, *Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo*, 47 JURIMETRICS J. 383, 398 (2007) (“The Internet is currently a *mixed infrastructure* that supports the production of a wide variety of private, public, and nonmarket goods—many of which yield socially valuable spillovers . . . [T]he Internet is a general purpose, enabling platform for users. Common nondiscriminatory access to this platform facilitates widespread end-user participation in a variety of socially valuable productive activities.”).

34. J. Gregory Sidak, *Innovation, Spillovers and the “Dirt Road” Fallacy: The Intellectual Bankruptcy of Banning Optional Transactions for Enhanced Delivery Over the Internet*, 6 J. COMPETITION L. & ECON. 521, 525 (2010) (“The FCC’s October 2009 notice of proposed rulemaking (NPRM) on network neutrality only partially chronicles the robust body of literature that criticizes proposals for network neutrality regulation with respect to its effect on investment and innovation.”); *see also* Joelle Tessler, *House Republicans Move to Block FCC Internet Regulations*, HUFFINGTON POST (Feb. 18, 2011, 12:07 AM), [http://www.huffingtonpost.com/2011/02/18/house-republicans-block-net-neutrality\\_n\\_824917.html](http://www.huffingtonpost.com/2011/02/18/house-republicans-block-net-neutrality_n_824917.html).

These investment and innovation arguments dazzle and ask deep questions, but they are inconclusive as guides for regulation. The Internet architecture may very well be unique in human history and may transform economic innovation and human communications. However, recognizing its uniqueness does not provide real insight into what types of discrimination are acceptable nor provide guidance as to which network configurations the FCC should prohibit and which it should not. On the other side, limits on how broadband service providers discriminate may indeed decrease profits under certain scenarios. But a hypothetical drop in profitability is both speculative and possibly justified if it achieves some other end. *Laissez faire* advocates do not know.

#### *A. Is Vertical Foreclosure the Right Lens for Network Openness?*

As mentioned above, the FCC follows most scholarly and policy analysis in viewing the problem as vertical foreclosure, in which the unregulated broadband service provider could exercise control over traffic to the end user. Reflecting the conventional assumptions, the FCC's NPRM includes the following drawing:<sup>35</sup>



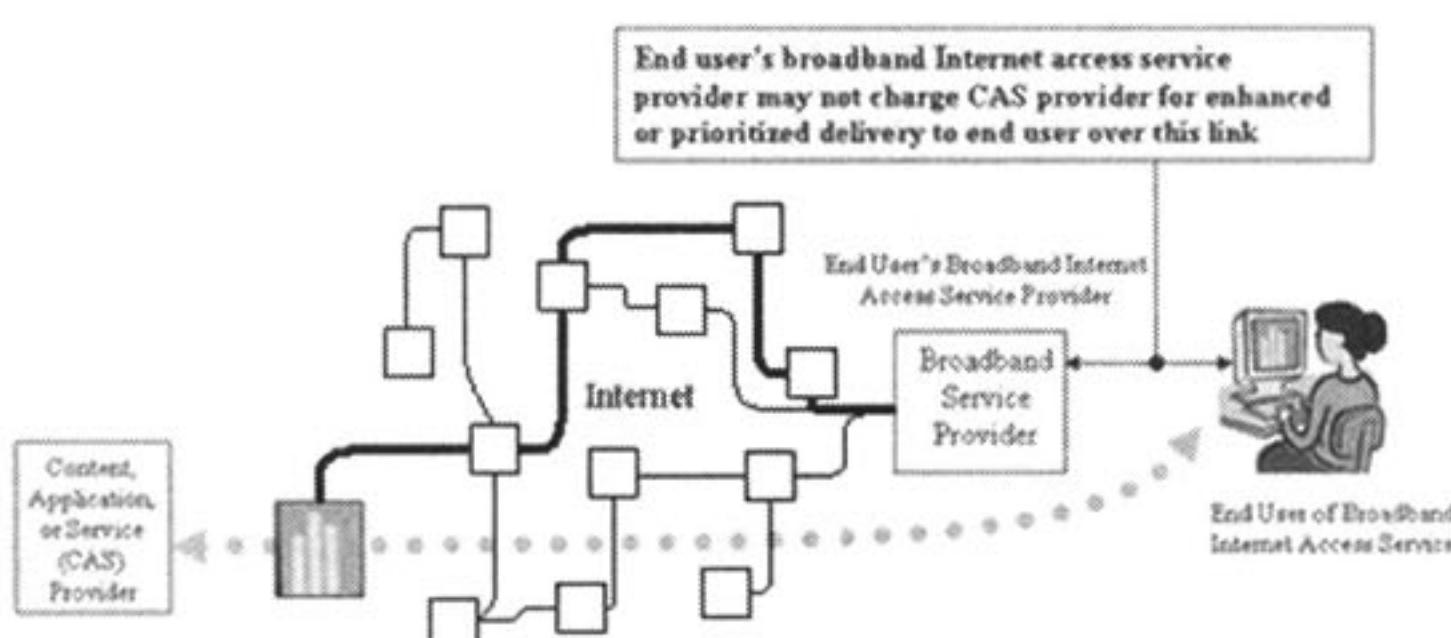
This picture illustrates the broadband provider exercising a bottleneck control over content, blocking unaffiliated content in favor of its own.

AT&T and several other commentators (including this Article's authors) observed in their comments in the Open Internet Proceeding that this picture does not portray Internet markets.<sup>36</sup> A more realistic picture looks like this:

---

35. *Open Internet NPRM*, *supra* note 9, at 13105 Diagram 2.

36. See *Open Internet Proceeding Report and Order*, *supra* note 1, at 3–10; Comments of MSU College of Law IP & Comm. Law Program at 3, Preserving the Open Internet Broadband Industry Practices, WC Docket No. 07-52 (rel. Jan. 14, 2010); Comments of AT&T at 55–58, Preserving the Open Internet Broadband Industry Practices, WC Docket No. 07-52 (rel. Jan. 14, 2010) [hereinafter Comments of AT&T].



For decades, the basic structure of the Internet has been changing, and retail broadband provider services, like Comcast or AT&T, are only one part. They connect through peering and transit agreements to backbone providers, which connect the various Internet networks.<sup>37</sup> The FCC, the Government Accounting Office, and the Federal Trade Commission recognize this structure in their publications.<sup>38</sup>

While the general outline of the Internet interconnection market is well known, very little is publicly known about the contractual bases—or market power—under which traffic is exchanged in the Internet. Backbone providers are classified by size (Tier 1, Tier 2, and Tier 3).<sup>39</sup> By conventional wisdom, Tier 1 backbones exchange traffic for free (“peer”) but require smaller backbones to “transit” for a fee.<sup>40</sup> However, it is difficult to determine at any one time who is, in fact, a Tier 1 provider. The lack of knowledge about the market upon which the entire information economy depends is almost comical. For instance, an FTC report on Internet competition produced two years ago contains a discussion of interconnection markets that relies almost exclusively on an FCC research paper published in the late 1990s, which states explicitly that it lacks any rigorous information about interconnection markets.<sup>41</sup>

37. Peyman Faratin et al., *The Growing Complexity of Internet Interconnection*, 72 COMM. & STRATEGIES 51, 55–56 (2008).

38. See generally Michael Kende, *The Digital Handshake: Connecting Internet Backbones* (FCC Office of Plans and Policy, Working Paper No. 32, 2000), <http://morse.colorado.edu/~epperson/courses/routing-protocols/handouts/oppwp32.pdf>; FTC, BROADBAND CONNECTIVITY COMPETITION POLICY 25–26 (2007); U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-02-16, CHARACTERISTICS AND COMPETITIVENESS OF THE INTERNET BACKBONE MARKET (2001).

39. Economides, *supra* note 28.

40. *Id.*

41. FTC, *supra* note 38, at 25–26. While everyone recognizes the basic structure of Internet connection, not much is known, at least publicly, about interconnection markets. Agencies charged with regulating them do not seem interested in finding out. Ten years ago the FCC looked deeply into the interconnection markets and found no answers: “The analysis contained in this Article is based solely on publicly available information. As in

Further, beyond the general outline of the Internet interconnection market, there are many features that stymie a simple analysis. For instance, content delivery networks (“CDNs”), which are localized Internet presences, guarantee an improved level of content for their clients.<sup>42</sup> Similarly, large content providers own extensive network infrastructure.<sup>43</sup>

This all shows that a simple foreclosure story is reductive.<sup>44</sup> Market power, to the degree that it exists in the Internet, expresses itself in far more complex ways, and the FCC’s primary proposed remedy, which only looks at the last mile, is woefully inadequate. Broadband providers could evade regulation by outsourcing discrimination further inside the network in its peering and transit agreements. Outsourcing discrimination is already an issue.<sup>45</sup>

More broadly, the economic analyses that are forwarded in this debate, discussed in detail below, assume vertical foreclosure. They miss

most markets, information about Internet backbone prices and costs is proprietary. In addition, information about the nature of relationships between Internet backbone providers is protected by non-disclosure agreements.” Kende, *supra* note 38, at 13 n.51. A year later, the GAO reported similar ignorance: “In the absence of adequate information, it is difficult to fully ascertain . . . the extent of market concentration and competition in the Internet backbone market.” U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 38, at 28. Ten years later, the FTC examined the issue and simply relied almost exclusively on the ten-years-old FCC working paper. *See* FTC, *supra* note 38, at 25–26. Private efforts have also failed to improve the quality and quantity of interconnection data has remained rudimentary. *See* Dmitri Krioukov et al., *The Workshop on Internet Topology (WIT) Report*, 37 ACM SIGCOMM COMPUTER COMM. REV. 69 (2007), <http://www.caida.org/publications/papers/2007/wit/wit.pdf> (“In its current state, Internet topology research is not an informed discipline since available data is not only scarce, but also severely limited by technical, legal, and social constraints on its collection and distribution.”). For a general discussion of the problem of network disclosure, see Adam Candeub & Daniel John McCartney, *Network Transparency: Seeing the Neutral Network*, 8 NW. J. TECH. & INTELL. PROP. 228 (2010).

42. *Only Connect*, *supra* note 14, at 1233 (“CDNs such as Akamai operate distributed networks of caching servers, hosted on large numbers of networks, which automatically serve content to end users from nearby caches.”).

43. *See, e.g.*, *World Wide Wait: The Faster the Internet Becomes, the Slower it Loads Pages*, THE ECONOMIST, Feb. 12, 2010, [http://www.economist.com/science-technology/displaystory.cfm?story\\_id=15523761](http://www.economist.com/science-technology/displaystory.cfm?story_id=15523761) (“Google said this week that it was not going to hang around waiting for the telecoms industry to build the new optical web. The company is planning a low-latency fibre network that will be capable of delivering speeds of over 100 megabytes a second for communities of 50,000–500,000 people.”).

44. We have called for a more accurate understanding of interconnection markets for a long time. *See* Adam Candeub & Daniel McCartney, *Network Neutrality & Network Transparency*, 8 NW. J. TECH. & INTELL. PROP. 228 (2010).

45. *See, e.g.*, George Ou, *FCC NPRM Ban on Paid Peering Harms New Innovators*, DIGITAL SOCIETY (Nov. 10, 2009), <http://www.digitalsociety.org/2009/11/fcc-nprm-ban-on-paid-peering-harms-new-innovators/> (discussing discrimination in peering and transit relationships).

the possibility that market power could be exercised in different ways, i.e., abusive peering policies or interconnection contracts.

### B. Is Foreclosure a Reasonable Concern?

Regardless of whether vertical foreclosure stories rely upon an accurate view of the Internet interconnection market, assume, along with much legal and economic scholarship, that the Internet openness debate is all about foreclosure. The question is whether a broadband provider would, in fact, exclude or degrade content that competed with its own. In other words, would Comcast block Hulu or would AT&T block its competitor's VoIP phone service? This question of economic theory does not have a clear answer emerging.

For the novice, the question boils down to whether a broadband provider could get more money from selling broadband when (1) affiliated content is favored and other content is blocked, leading to a less desirable service, or (2) content is treated the same, leading to less revenue from affiliated content but a more desirable service that would reach a broader market.

Some assume it would be obvious that broadband providers would foreclose. Much legal scholarship as well as policy and popular discussion simply assume this to be the case while others find foreclosure merely hypothetical.<sup>46</sup> While this concern motivates much of the debate, it may not be justified, but economic theory cannot tell for sure. Two approaches have dominated economists' approaches to answering this question: (1) the single monopoly rent theorem and (2) the two-sided markets. Neither comes close to helping either side declare victory.

---

46. Compare Crawford, *supra* note 33, at 397 ("Network providers have ample reasons to discriminate in this way in favor of their own applications."), with James B. Speta, *Handicapping the Race for the Last Mile?: A Critique of Open Access Rules for Broadband Platforms*, 17 YALE J. ON REG. 39, 84 (2000) (In broadband markets "even a monopolist will have the incentive to encourage a wide variety of information services in order to increase subscribership."); see *Network Neutrality and the Economics of Congestion*, *supra* note 6, at 1888 (maintaining that broadband service providers have an incentive to interconnect with complementary innovation to make their networks more profitable); Nicholas Economides, "Net Neutrality," *Non-Discrimination and Digital Distribution of Content Through the Internet*, 4 I/S: J. L. & POL'Y FOR INFO. SOC'Y 209, 232 (2008) ("The present question . . . is whether to allow the Internet to be run without non-discrimination rules or whether to impose specific non-discrimination rules. A number of considerations favor imposing a specific rule supporting 'net neutrality.'"); Faulhaber, *supra* note 6, at 697 ("[T]he problems are all potential problems, not actual problems.").

## 1. The Single Monopoly Rent Theorem, Vertical Integration Stories, and Broadband

The single monopoly rent theorem addresses the question of whether a monopolist, such as Comcast or AT&T, would have the incentive to leverage its market power from broadband provision into content by blocking nonaffiliated content providers. In other words, would AT&T, if it had a dominant position in retail broadband, have the incentive to block VoIP?

Under the single monopoly rent theorem, the answer may be no. Assume that on average individuals will pay up to fifty dollars per month for broadband. Assume further that they would pay sixty dollars if they had access to VoIP service. AT&T can simply charge consumers sixty dollars for broadband service and extract any economic rents the VoIP provider could extract. In other words, if you are the monopolist, you have the incentive to provide as diverse an offering as possible in order to extract additional revenue.<sup>47</sup>

Mirroring the certainty of the “vertical foreclosure will always happen” crowd, many believe that the single monopoly rent theorem “proves” that foreclosure will *never* occur. Of course, even those who know nothing about economics would suspect that these matters do not have clear answers. The following examines arguments that apply the single monopoly rent theorem to the Internet. The theory is inconclusive, but, perhaps more important, the connection between economic theory and reality is less than tenuous; it is systematically disconnected.

The single monopoly rent theorem relies on numerous assumptions as Professor Einer Elhauge recently has shown.<sup>48</sup> It is unclear whether or not many of the assumptions he identifies can be satisfied in broadband service markets. Consider the following:

47. *Beyond Network Neutrality*, *supra* note 6, at 16; see also Daniel F. Spulber & Christopher S. Yoo, *Mandating Access to Telecom and the Internet: The Hidden Side of Trinko*, 107 COLUM. L. REV. 1822, 1836–37 (2007) (“At the same time, economic theorists have questioned the input monopolist’s incentive to engage in vertical exclusion. The driving force behind this critique is the so-called ‘one monopoly rent theorem,’ which holds that there is only one monopoly profit to be gained in any vertical chain of production. As a result, the input monopolist can capture all of the available profit without vertically integrating into another level of production simply by selling the input to all comers at the monopoly price.”).

48. Einer Elhauge, *Tying, Bundled Discounts, and the Death of the Single Monopoly Profit Theory*, 123 HARV. L. REV. 397 (2009).

1. There is a monopoly output supplier whose monopoly is protected by prohibitive barriers to entry, and there is perfect competition in the upstream input market;<sup>49</sup>
2. The monopoly is unregulated;
3. The technology for producing output involves usage of all inputs in fixed proportions;<sup>50</sup>
4. Strong positive demand correlation;
5. Fixed usage of the tying product;
6. Fixed tied market competitiveness; and
7. Fixed tying market competitiveness.<sup>51</sup>

The application of these assumptions to the Internet broadband provision markets is quite fraught. Consider a monopoly input supplier: the amount of monopoly power which broadband operators have is greatly contested. Some see competition everywhere, from satellite, WiFi, wireless, cable, and DSL. Others see at best a duopoly of cable and telephone/DSL.<sup>52</sup> While, in fact, few consumers enjoy more than two providers of residential broadband (cable and phone service), it is not clear how other modes of delivery currently affect these providers' market power. Equally important, it is unclear how emerging technologies will affect their market power. Nonetheless, for the single monopoly rent theorem to apply, one must have a factual basis to determine broadband service providers' market power.

While all agree that the broadband provision is (effectively) unregulated,<sup>53</sup> the third assumption has received little attention in the

---

49. Michael H. Riordan & Steven C. Salop, *Evaluating Vertical Mergers: A Post-Chicago Approach*, 63 ANTITRUST L.J. 513, 517–18. The single monopoly rent theorem is classically formulated as a monopolist in the input and competitive downstream markets. It works in situations in which there is a downstream monopolist and input of competitive markets. See Michael H. Riordan, *Competitive Effects of Vertical Integration* 1, 9 n.6 (Colum. Univ. Dep't Econ., Discussion Paper No. 0506-11, 2005), <http://www.columbia.edu/~mhr21/Vertical-Integration-Nov-11-2005.pdf>.

50. Riordan & Salop, *supra* note 49, at 517–18.

51. Elhauge, *supra* note 48; *see also* van Schewick, *supra* note 26.

52. Compare Faulhaber, *supra* note 6, at 691, and Jack M. Balkin, *The Future of Free Expression in a Digital Age*, 36 PEPP. L. REV. 427, 431 (2009) (“And because we live in what is effectively a cable-phone duopoly for broadband services, market competition would not necessarily counteract this censorship.”), with Marius Schwartz, Professor of Economics, Georgetown University, Statement at National Broadband Plan Workshop: Economic Issues in Broadband Competition 46–47 (2009), [http://www.broadband.gov/docs/ws\\_28\\_economic.pdf](http://www.broadband.gov/docs/ws_28_economic.pdf) (identifying five or six broadband providers that most consumers can access and noting indicators of competition among them).

53. This assertion is a bit of a simplification. Broadband service regulation is currently subject to regulation pursuant to Title I of the 1934 Communications Act, but cable systems, over which cable modems run, are subject to state or local franchising regulations or both. However, this control is very limited.

Internet context, but its application is quite uncertain. Professor Einar Elhauge provides an example of this exception. Consider a monopolist of computer printers. Would such a firm have the incentive to monopolize the printer ink market? At first blush, the single monopoly rent theorem would conclude that there exists one rent in computer printing and, therefore, no incentive to leverage. However, some of the printer manufacturer's customers use a lot of printing, and some use less. By charging more for ink cartridges to the high volume users, the monopolist can extract extra profits and expand its monopoly. In other words, tying (i.e., selling printers bundled with ink cartridges) could help a monopolist price discriminate more effectively.<sup>54</sup>

It is not clear whether this exception applies to the Internet. Certainly Internet users use different services on the Internet (VoIP, browsers, file sharing, and so on) in different proportions. A broadband provider with affiliated interest in one of these services, such as a cable company providing voice telephony, could charge differing rates to high volume users. There is no empirical evidence one way or the other. Indeed, to have some basis for claiming application or nonapplication, a regulator would have to collect evidence of its broadband service pricing schemes. The regulator would have to discover evidence in discrimination—and whether it was motivated in the manner described above. We are not aware of any such data.

The fourth assumption is that a strong positive demand correlation exists; on average, people's demand for the monopoly good and the leveraged good go up and down together. Again borrowing from Professor Elhauge, suppose that a broadband provider has market power in both broadband provision and broadband telephone service. There is a marginal cost of zero dollars for providing both, which is not an inappropriate assumption for broadband provision. There are one hundred buyers with negatively correlated demand. Half of these buyers value broadband at one hundred dollars, but telephone service at zero dollars. But their demand for broadband service and telephone service are not correlated, so that a buyer who values broadband at one hundred dollars could value broadband cable at zero dollars, and vice versa. Either way, their combined demand always equals one hundred dollars.<sup>55</sup>

If the broadband provider could sell only broadband, it would price the broadband at fifty dollars, thereby capturing 51 percent of the customers, earning \$2550. The broadband telephone service, say Vonage,

---

54. Elhauge, *supra* note 48, at 404–05; see also van Schewick, *supra* note 26, at 340 n.38.

55. Elhauge, *supra* note 48, at 406–07.

would sell its service to fifty-one customers as well, also earning \$2550. If there were only one provider, say AT&T, it would sell both at one hundred dollars. All one hundred customers would buy this package, earning AT&T \$10,000. Notice in the first case, people received the “surplus” of their bargain. Although many paid fifty dollars, many valued their broadband service at more than fifty dollars.

Once again, there is little or no empirical evidence on whether this strategy is practicable or prevalent. This would involve an extensive survey of broadband service providers’ pricing schemes and research on consumer demand.

The fifth assumption also has questionable application to broadband provision. A monopolist can use its market power to foreclose competition and entry in the tied application market.<sup>56</sup> In other words, a broadband service provider could foreclose enough of the VoIP market to deter entry into the VoIP market. Broadband telephone service requires significant fixed capital investment. If the broadband service provider could foreclose enough of the market to make it too small for a broadband telephone provider to enter (i.e., fixed costs must be spread over the entire customer base; therefore, if entry has a high fixed cost, there must also be a sufficiently large customer base), then the broadband provider might leverage itself into the telephone market. Similar arguments apply if entry requires economies of scale.

In sum, theory cannot tell us whether the single monopoly rent theorem applies to broadband service providers and Internet applications. Advocates who argue as to whether it applies concede that its application is uncertain, even though the likelihood of its application is central to any regulatory response. If it is likely, a more costly regulatory response is warranted.

Indeed, the comments in the FCC’s Open Internet Proceeding demonstrate the inconclusiveness of these vertical foreclosure theories. For instance, AT&T’s expert, Georgetown University economics professor Marius Schwartz, submitted comments critiquing the work of Stanford Law Professor Barbara van Schewick, who argues that the single monopoly rent theorem may not apply to broadband platforms and upon whose work the FCC Open Internet NPRM relied. Professor Schwartz states:

On the specific issue of anti-competitive discrimination, van Schewick’s article offers a useful compilation of theories [of vertical integration and the single monopoly rent theorem] that are quite familiar to industrial organization economists. But she does not attempt to establish their applicability, stating that there are circumstances in

---

56. *Id.* at 408–10; see also van Schewick, *supra* note 26, at 329–39.

which incentives to engage in anti-competitive discrimination “may” exist, but “[w]hether the conditions . . . are present in a real life situation, is an empirical question.” But there are wide gaps between the assumptions underlying the theories and the actual facts.<sup>57</sup>

Well, what’s good for the goose is good for the gander. Professor Schwartz is no doubt correct that there are wide gaps between theory and reality, but that is true for both critics and advocates of the single monopoly rent theorem. And AT&T, in its comments proper, advocates for the theorem but fails to fill in these underlying assumptions.<sup>58</sup> Professor Schwartz could well critique his own client.

As is obvious from this Section, any Internet regulation that limits the broadband service provider from discriminating might decrease its profits. Less profit might result in lower incentives to invest. At the same time, less discrimination allows users greater freedom in creating applications. Network openness involves a trade-off between providing incentives for infrastructure and application innovations.

Rather than attempt to discover whether the single monopoly rent theorem applies to broadband provision—or to what extent or under what circumstances it might apply—many in this policy debate simply engage in a kind of *ceteris paribus* type of argument, trying to persuade the reader how this trade-off between incentives should come out. In fact, one could go so far as to claim that the differing views over this trade-off characterize the entire legal scholarly debate. Legal academics have provided no data, no industry analysis, and no theory both rich enough to capture the industrial organization of the Internet and sufficiently powerful to produce results useful to regulators in crafting nondiscrimination rules. Instead, they either offer vague trade-offs in which the cost of regulation must be balanced against the risk of anticompetitive behavior,<sup>59</sup> provide vague

57. Declaration of Marius Schwartz for AT&T at 29, Preserving the Open Internet: Broadband Industry Practices, FCC GN Docket 09-191, WC Docket 07-52 (rel. Jan. 14, 2010) [hereinafter Schwartz Jan. 2010 Comments] (citation omitted), available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020377221>.

58. See Comments of AT&T, *supra* note 36, at 120–21 (“Modern antitrust analysis recognizes that, except in very specific contexts, even a *monopolist* in a platform market generally has little incentive to act anticompetitively towards unaffiliated application providers that wish to use its platform. In particular, a platform provider free from retail price regulation—as all broadband providers are today—will normally have incentives to deal evenhandedly with independent providers of [content].”).

59. Tim Wu, *Why Have a Telecommunications Law?: Anti-Discrimination Norms in Communications*, 5 J. ON TELECOMM. & HIGH TECH. L. 15, 45 (2006) (“While loudly proclaimed, the salience of this argument against anti-discrimination rules is greatly overstated. There is little question that market entry in any infrastructure market is likely to be challenging. However, that is for reasons having little to do with anti-discrimination rules and everything to do with recovering the considerable costs of infrastructure deployments.”); see also Susan P. Crawford, *Network Rules*, 70 LAW & CONTEMP. PROBS.

methods to weigh the cost of antidiscrimination rules,<sup>60</sup> or warn of the risks of regulation without forwarding metrics for measuring such risks.<sup>61</sup>

Again, the comments to the Open Network NPRM make this point. Professor Schwartz attacked Professor van Schewick for asserting that antidiscrimination rules will be beneficial even when weighed against the disincentives for investment:

Accepting that intervention could reduce investment and innovation by network providers, van Schewick nevertheless contends that increasing application-level innovation is more important . . . , but, again, with no empirical foundation. Finally, she acknowledges that regulatory costs associated with intervention “are not covered in detail” . . . , but disturbingly seems to assume away such costs by contending that regulation aimed at anticompetitive discrimination will not condemn good conduct nor discourage investment. This is a strikingly optimistic view of the efficacy of regulation.<sup>62</sup>

Professors Schwartz and van Schewick apparently disagree on the value of application-level innovation and the efficacy of network regulation, and its chilling effect on regulation. However, neither

---

51, 53–55 (2007).

60. Joseph Farrell & Philip J. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 HARV. J. L. & TECH. 85, 120–25 (2005) (“This Part discusses how ICE and its exceptions can help frame and evaluate open access obligations . . . . Our analysis suggests that regulators should consider two basic questions: whether an exception to ICE exists, and, if this seems likely, how well the regulator can address the competitive harms that might result. A regulatory regime that addresses both questions will minimize the opportunity for anticompetitive conduct while also being less apt to chill efficient conduct.”); van Schewick, *supra* note 26, at 388–89 (“[I]t is an open question, whether network neutrality regulation will reduce incentives to deploy network infrastructure below the necessary level . . . . As a result, the remaining profit may still be sufficient to motivate them to deploy the necessary infrastructure.”); Hemphill, *supra* note 6, at 149 (“If there is a dynamic efficiency effect, it entails a tradeoff: reduced incentives for entry and investment by content providers, combined with increased incentives to invest in access provider infrastructure, via the contribution to fixed costs just mentioned. As a theoretical matter, it is not apparent which effect is larger.”); Daniel F. Spulber & Christopher S. Yoo, *Rethinking Broadband Internet Access*, 22 HARV. J. L. & TECH. 46, 46 n.258 (2008) (“[F]orcing a monopolist to share an input rescues other firms from having to supply the relevant input for themselves. A growing body of empirical scholarship suggests that mandating access to last-mile broadband networks has deterred investment in precisely this manner.” In support of this proposition is a long footnote, but not one source provides strong support. Rather, the cited sources all point to no detectable relationship between forced vertical deintegration and increased consumer subscribership. This finding could be consistent with any number of stories related to the effect of forced deintegration and investment.).

61. *Beyond Network Neutrality*, *supra* note 6, at 9 (“[N]etwork neutrality threatens to reduce incentives to increase competition through the construction of new networks. Eliminating the potential for short-run supracompetitive returns would also thwart one of the primary mechanisms upon which markets rely to stimulate entry.”).

62. Schwartz Jan. 2010 Comments, *supra* note 57, at 30.

professors nor anyone in the debate provides a principled way of estimating these values.

This entire network openness controversy too often reflects an abuse of economics, asking the discipline to answer questions it currently cannot. What is worse, these economic arguments have little to say about, and may even mask, the regulatory debate's motivating question: how can regulators estimate the incentive trade-offs that network openness regulation will inevitably present?

### C. *Does Characterizing Broadband Service Provision as a Two-Sided Market Further the Analysis?*

Beyond the single monopoly rent theorem, many look to what is known as "two-sided markets" to answer the question of whether broadband providers would foreclose markets. The typical example of a double-sided market is credit cards. Consumers want cards that are accepted by as many merchants as possible, while merchants want to accept cards that are carried by as many consumers as possible.

Pricing in these markets, as anyone with even a passing interest in economics is aware, is far from straight forward. Two-sided markets exhibit network effects (i.e., a credit card brand is worth more to merchants if more people have them and more to consumers if more merchants accept them). In order to capture this value created by networks and scale, the credit card company may price one side of the market (credit card fees or merchant transaction fees) below a competitive level in order to get more people "on board."

Just as with the single monopoly rent theorem, a two-sided market analysis illuminates the question of whether broadband service providers would foreclose certain competing services. The idea would be that the broadband service provider has an incentive to "get more applications and more subscribers on board" to have a more valuable network. Some have claimed that two-sided market analysis "suggests" that discrimination will maximize social welfare.<sup>63</sup>

---

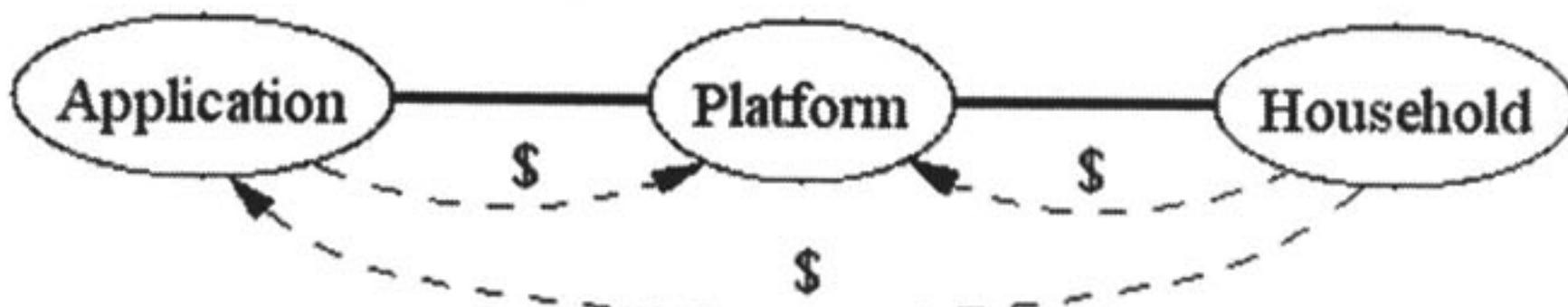
63. See Christopher S. Yoo, *Innovations in the Internet's Architecture That Challenge the Status Quo*, 8 J. TELECOMM. & HIGH TECH. L. 79, 97 (2010) ("The literature suggests that social welfare would be maximized if the network provider were permitted to price discriminate on both sides of the two-sided market. It also suggests that the prices paid by those on each side of the market can differ widely and that in many cases, it is economically beneficial for one side to subsidize the other side of the market. The fact that the Internet has become increasingly dominated by advertising revenue paid to content and application providers suggest that it may be socially beneficial for content and application providers to subsidize the prices paid by end users.").

It is far from clear that two-sided markets apply to broadband provision. The assumptions one must make are simply too heroic and too distanced from what is known about market realities. Second, even if one accepts these models' applicability, they are largely ambiguous even in theory. The various models in the literature come to opposite answers. As even the experts for AT&T concede in the Internet proceeding, the models simply do not give answers that are robust to the likely market conditions.<sup>64</sup>

### 1. Does Two-Sided Market Analysis Apply to Broadband Service Provision?

The most basic question as to whether two-sided markets apply to broadband service providers is identifying the platform they create. It is far from clear what that platform is. In other words, does the broadband provider get the two sides "on board"? One could say they do—they connect applications to users. On the other hand, is Google a "true" two-sided market in that it connects users with advertisers? Or does Google connect users with search results? Only then are websites the "true" two-sided markets. Once again, the complexities of online interaction render questionable even the most basic applicability of economic models.

Let us assume, however, that broadband service providers are the two-sided market connecting households to applications. Presumably, more subscribers would make their network more valuable to content providers, who then would pay broadband providers more for access to their networks. It would look like this<sup>65</sup>:



64. Comments of AT&T, *supra* note 36, at 55–58; Schwartz Jan. 2010 Comments, *supra* note 57, at 17, Exhibit 3 ("[T]he modern world is flush with two-sided markets, and that alone has never been thought sufficient to warrant regulatory mandates that the charging occur only one side. In some two-sided markets both sides pay, in others only one side pays, and the charging conventions can vary over time. Neither the articles cited in the NPRM nor the broader economic literature on two-sided markets supports a policy of banning charges from broadband providers to content providers or vice versa.").

65. These diagrams are adapted from Benjamin E. Hermalin and Michael L. Katz, *The Economics of Product-Line Restrictions With an Application to the Network Neutrality Debate*, Joint Center AEI-Brookings Joint Center for Regulatory Studies Working Paper 07-02 (Feb. 2007).

The most glaring problem is viewing broadband service providers as a platform because they do *not* have any contractual relationship with most content providers. CDNs such as the firm, Akamai, complicate this story because they provide content directly to broadband service providers. However, broadband service providers still only have a contractual relationship with the CDN, which could carry a variety of content providers ranging from e-Bay to Google. While as discussed above, so little is publically known about Internet interconnection markets that it is difficult to generalize. It is a fair assumption that broadband service providers do *not* typically have contractual relations with content providers. As such, they do not receive fees from content providers. The number of “eyeballs” a broadband service provider can offer a content provider is irrelevant and should not affect the fees they charge consumers.

Of course, a broadband provider could become a content provider, by leveraging into the search engine markets. As such, it would have conflicting incentives to “get subscribers on board” to view content and foreclose competitors. However, this would not be a two-sided market. It would be closer to a vertical foreclosure story.

Beyond these most basic problems with applying a two-sided market theory to broadband service provision, the details of the model turn on quite tendentious claims about the market. To get a sense of the distance between these models and reasonable approximations of actual Internet markets, we examine in some detail one of the most influential models in this debate—that of Hermalin and Katz.<sup>66</sup>

Hermalin and Katz begin by describing the problem as “whether providers of ‘last mile’ Internet access services . . . should be allowed to offer more than one grade of service.”<sup>67</sup> The fear is “that offering multiple grades is unfair and results in some consumers’ [sic] being provided unduly low-quality service.”<sup>68</sup> To address this problem, they aim to “examine the effects of product-line restrictions in markets” where a supplier (e.g., the “provider[] of ‘last mile’ Internet access services” such as the “local telephone company offering DSL, a cable company offering cable modem service, or a wireless service such as 3G”) would otherwise be able to offer a full range of different products.<sup>69</sup> Put otherwise, Hermalin and Katz investigate the effects of limiting the number of connection quality types that an Internet access provider may offer.<sup>70</sup>

---

66. See *id.*

67. *Id.* at 1.

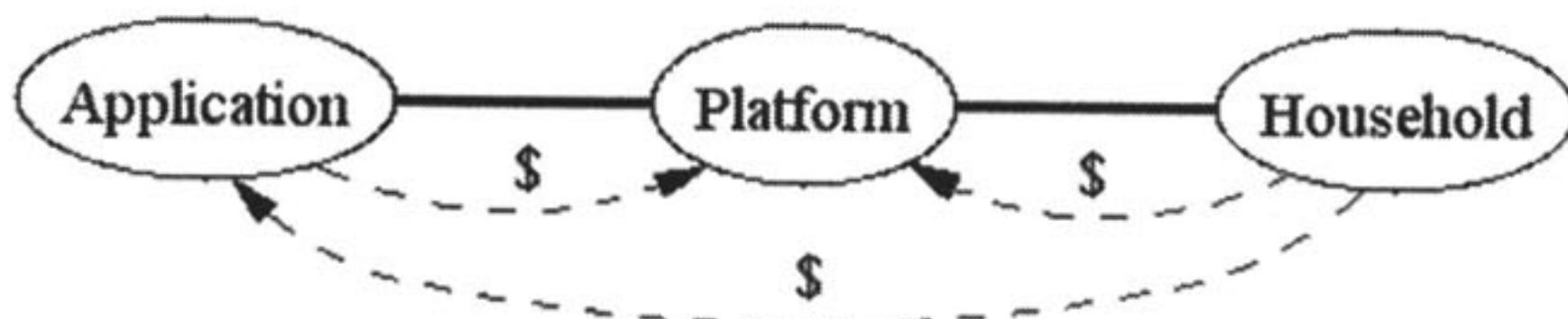
68. *Id.*

69. *Id.*

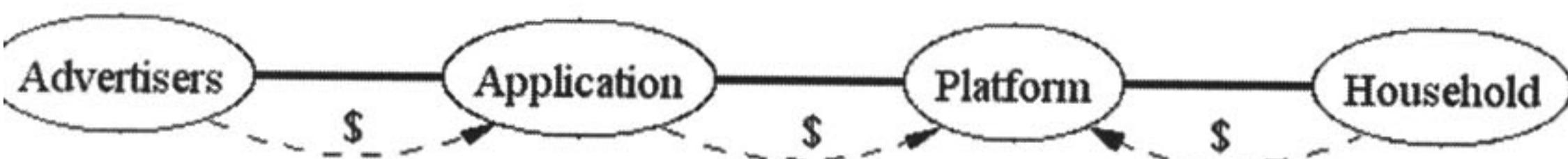
70. *Id.*

In order to both “simplify analysis” and to address concerns that “market power lies at the heart of the problem,” they assume that the *platform* (e.g., the Internet access provider) is a monopoly.<sup>71</sup> They describe two market structures and lay out the actors for each.

In the first—the “fee-for-service” market structure—a *household* pays a transaction fee to an *application provider* “for each use” while both the *household* and the *application provider* pay the *platform* for their respective connections.<sup>72</sup> As we discuss above, this is a simplification that oversimplifies actual broadband service providers’ incentives.



In the second—the “advertiser-supported-content” market structure—the *application provider* receives no transaction fee from the *household*, instead “earn[ing] revenue solely from the sale of advertising.”<sup>73</sup>



Some initial observations can be made about these basic assumptions:

1. *Where is the money going?* As a factual matter of Internet connection markets, it does not seem as if broadband providers receive much money from application providers. The entire peering and transit market is ignored. As we discuss above, the models deviate significantly from what we know of Internet markets.

2. *Are you distributing or are we communicating?* Hermalin and Katz’s model (“H & K model”) describes *households* “using” (or later as “consuming a unit of”) an *application provider*.<sup>74</sup> This description works well in some instances, e.g., a lawyer (the *household*) logs onto Westlaw (the *application provider*) and “uses” it to research. However, it is less conceptually congruent with other situations where

71. *Id.* at 2.

72. *Id.* at 4–5.

73. *Id.* at 4.

74. *Id.* at 5.

the give-and-take between the *application provider* and the *household* does not merely flow from the former to the latter. For example, when a person (the *household*) logs onto Wikipedia (the *application provider*) and then talks over and revises errors in a topic entry, she is not obviously “using” (nor “consuming”) Wikipedia. The exchange might be better described as “participation” rather than “usage,” with some utility flowing back to the application provider and, in this case, to third parties whose utility is increased by her contribution. Their model ignores this two-way flow of utility.

**3. *Copy and pass this around, and talk amongst yourselves.*** Hermalin and Katz’s assumption that the Internet is simply a distribution method leads to a similar shortcoming: their model does not account for “peer-to-peer” (“P2P”) networks within the H & K model. P2P networks can be seen as changing *distribution* (of the file from one provider to many users) into *participation* (with many people cooperating to share the file). Under the H & K’s model this “transaction” is poorly captured because the model focuses on flow from *application provider* to a *household*. In BitTorrent, under the H & K model, the *application provider* (the person who originally posted the “.torrent” file and “seeded” the swarm) has incentivized the *households* to provide the “distribution channel” amongst themselves. This allows the *application provider* to externalize its “distribution” costs onto the *household*, or onto the *platform* to the extent that “extensive” bandwidth usage (uploading) by *households* is not contemplated in their hookup-fees, which would make it a *platform* cost.

With these assumptions, Hermalin and Katz produce results under their two scenarios (fee-for-service and advertiser-supported content). They model profit maximization under both approaches, describe the welfare produced, and demonstrate how the *platform* can capture the *household* surplus by setting the hook-up fee for *households* equal to their total surplus.<sup>75</sup> They show that in the welfare maximizing world the *platform* profits would be equal to the total *household* surplus plus the *application provider* price (the price charged to that type of application provider) minus the cost of providing the connection quality that the application provider would choose.<sup>76</sup>

They then compare two regulatory scenarios: (1) the unrestricted monopoly *platform* that would offer a “profit-maximizing, incentive-compatible, individually rational, price schedule”; and (2) when the

---

75. *Id.* at 8–9.

76. *Id.* at 9–10.

monopoly *platform* is restricted to offering a single quality. The authors explain that this can be alternatively viewed as selecting a minimum type of *application provider*. This is because the selected single-quality will exclude all *application provider* types for which it is not profitable to connect at that quality. Having shown that both the restricted and the unrestricted scenarios are suboptimal when compared with the welfare-maximized ideal, the authors next compare the scenarios with each other. They find that—though it could go either way—the unrestricted scenario would produce the greatest welfare.

The point of this excursus is not to train the reader in economic modeling, but to give a sense of this model's flexibility and ambiguity. We disagree with the literature that points to such models as providing guidance to policy. Indeed, even AT&T's comments in the Open Internet NPRM concede that two-sided markets applied to broadband service provision have no clear results.<sup>77</sup>

#### D. Does Anyone Know Anything About Dynamic Efficiency?

To repeat an oft-heard refrain, the Internet has transformed the nature of communications, cultural and material production, and innovation. Economists call the process of innovation and creative development "dynamic efficiency." Compared to static or allocative efficiency, which looks to welfare maximizing allocation of goods given existing costs and demand, dynamic efficiency is far less understood by economists.<sup>78</sup> For obvious reasons, generalizations about the conditions that generate, let alone optimize, innovation are difficult to reduce to social scientific law.

Legal academics have spilled much ink pondering the nature of the radically different communication. For David Post, the Internet allows for ever greater and newer types of creativity by taking advantage of easily scalable networks, thereby radically transforming the cost and nature of communication.<sup>79</sup> In other words, the Internet is a unique communications medium because it lacks a centralized control, splitting messages into bits

---

77. Schwartz Jan. 2010 Comments, *supra* note 57, at 22 ("The efficient pricing pattern in two-sided markets depends in complex and subtle ways on specific conditions in an industry. Theoretical analyses that yield strong prescriptions hinge on special assumptions.").

78. Barak Y. Orbach, *The Antitrust Consumer Welfare Paradox*, 7 J. COMPETITION L. & ECON. 133, 141 (2011) ("Static efficiency is optimization of production within present technologies to minimize deadweight loss . . . . Dynamic efficiency means increases in resources through investments in education and research and development. Since the 1950s, it has been well established that dynamic efficiency is the major source of economic growth.").

79. DAVID G. POST, IN SEARCH OF JEFFERSON'S MOOSE: NOTES ON THE STATE OF CYBERSPACE 93–98 (2009).

and allowing them to be routed in ever changing, adaptable ways. This allows it to store and send more information than any media before it.<sup>80</sup> Some have looked to the Internet's end-to-end design principle as a special driver of innovation. This design principle provides a uniform layer for computer applications to communicate but allows end users to build applications on top of this basic layer. Mark Lemley and Lawrence Lessig argue that the end-to-end principle "expands the competitive horizon by enabling a wider variety of applications to connect to and to use the network."<sup>81</sup> Susan Crawford has looked to particular economic theories of innovation and the Internet's power to bring people together as creating a special engine of creativity.<sup>82</sup> She argues that growth theorists show that economic development depends on new ideas, and the Internet is great at creating new ideas. Tim Wu argues that application competition is essential on the Internet and must be maintained.<sup>83</sup> Mark Lemley and Brett Frischmann have looked to infrastructure theory and the unique role that the Internet, as an infrastructure, plays in creating spillover innovations and producing second-order type dynamic efficiencies.<sup>84</sup>

80. *Id.* at 75; Hearing on "Network Neutrality" Before the S. Comm. on Commerce, Sci. & Transp., 109th Cong. 6 (2006) (statement of Lawrence Lessig, Professor of Law, Stanford Law School) ("If the principle of end-to-end is abandoned, . . . innovators must now include in their calculation of risk the threat that the network owner might either block or tax a particular application. That increased risk will reduce application investment.").

81. Lemley & Lessig, *supra* note 4, at 931; see also *id.* at 932 ("Innovation will be chilled if a potential innovator believes the value of the innovation will be captured by those that control the network and have the power to behave strategically."); LESSIG, *supra* note 4, at 34–35.

82. Crawford, *supra* note 33, at 387–88 ("The work of growth theorists reveals that choices made by governments to stimulate the production of new ideas can have a significant effect on economic growth . . . . The Internet provides a particularly fertile environment for the development of these diverse new thoughts that will drive growth. It supports the development of groups and other forms of online communication that are potentially highly responsive to the feedback of human beings and highly likely (given the enormous scale and connectivity of the Internet) to trigger exponential development of unpredictably diverse new ideas that are nonrivalrous.").

83. *Why Have a Telecommunications Law?*, *supra* note 59, at 37.

84. Brett M. Frischmann, *An Economic Theory of Infrastructure and Commons Management*, 89 MINN. L. REV. 917, 988–89 (2005) ("The market mechanism exhibits a bias for outputs that generate observable and appropriable benefits at the expense of outputs that generate positive externalities. This is not surprising because the whole point of relying on [private] property rights and the market is to enable private appropriation and discourage externalities. The problem with relying on [private property rights and] the market is that potential positive externalities may remain unrealized if they cannot be easily valued and appropriated by those that produce them, even though society as a whole may be better off if those potential externalities were actually produced."). But see *Beyond Network Neutrality*, *supra* note 6, at 9.

These arguments are quite intriguing and have had a tremendous impact upon the public debate. Law professors have forwarded them at the FCC in favor of some type of network openness regulation. They have demonstrated the importance of Internet regulation to economic and cultural development. The FCC seems to accept them to some degree.<sup>85</sup>

These arguments, however, are theories. They have not been demonstrated despite employing ambiguous formal models, as discussed in the previous section. And despite the framing attempts by Post, Lemley, Lessig, Crawford, Wu, and van Schewick, none have rooted instincts to empirical data. The centralized post office does seem less innovative than the Internet, but it is unmeasured and, therefore, unverified. The end-to-end principle seems to have some neat social effects, but a measurement of these and a comparison of them to a network employing a more centralizing design principle remains elusive. And the question is not whether the Internet has lowered the cost of creating and sharing ideas, but whether something else can do it better.

To illustrate the weakness of these intuitive models in providing policy guidance, consider this example: Asymmetric DSL is the dominant broadband technology offered by telephone companies. It has by design higher download speeds than upload speeds.<sup>86</sup> Network engineering does not dictate this result—the telephone company makes this choice.<sup>87</sup> This architectural feature makes asymmetric DSL massively non-neutral.<sup>88</sup> End users receive downloads, say from a content provider affiliated with the phone company, faster than end users can upload (and thereby share) user-generated content. The architecture at some level makes the Internet into more of a content distribution system than a system that motivates user innovation, as distribution and centralized content is favored over creation and user-sharing.

---

85. See *Open Internet NPRM*, *supra* note 9, at para. 8 (“[B]roadband Internet access service providers may have both the incentive and the means to discriminate in favor of or against certain Internet traffic and to alter the operation of their networks in ways that negatively affect consumers, as well as innovators trying to develop Internet-based content, applications, and services. Such practices have the potential to change the Internet from an open platform that enables widespread innovation and entrepreneurship . . .”).

86. See MATTI SIEKKINEN ET AL., PERFORMANCE LIMITATIONS OF ADSL USERS: A CASE STUDY 145–54 (S. Uhling et al. eds., 2007), [http://folk.uio.no/siekkine/pub/siekkinen\\_07adsl.pdf](http://folk.uio.no/siekkine/pub/siekkinen_07adsl.pdf); Jeff Tyson, *How VDSL Works*, HOWSTUFFWORKS, <http://computer.howstuffworks.com/vdsl3.htm> (last visited Apr. 8, 2012) (“Asymmetric DSL (ADSL) - It is called ‘asymmetric’ because the download speed is greater than the upload speed. ADSL works this way because most Internet users look at, or download, much more information than they send, or upload.”).

87. Bradley Mitchell, *Symmetric and Asymmetric*, ABOUT.COM, [http://compnetworking.about.com/od/dsldigitalsubscriberline/g/bldef\\_symmetric.htm](http://compnetworking.about.com/od/dsldigitalsubscriberline/g/bldef_symmetric.htm) (last visited Apr. 8, 2012).

88. Siekkin, *supra* note 86, at 145–54.

Is this a problem? It depends on what solution you seek. If people are receiving, and want to receive, downloads from a central source, then the problem is how to provide more download bandwidth. If people are stymied in their abilities to share their user-generated movies or programs or other content, then it is a problem.

Even if one were to say that Internet architecture should encourage one type of production (P2P or video distribution), that does not answer the quite specific regulatory question: what percentage bandwidth should be upstream, and what percentage should be downstream in order to provide incentives for the “proper” amount of user-innovation?

### III. NETWORKS DISCRIMINATE, AND NETWORK ENGINEERING GIVES POLICY MEANS NOT ENDS

In the old circuit-switched telephone networks, any two networks either connected or did not. In this old network, an actual dedicated circuit connected two end users. Their traffic flowed along this circuit.<sup>89</sup> Discrimination meant something relatively straightforward: either a network’s wires connected to the telephone network or they did not. Open access regimes mandated connection of incumbent monopolist telephone companies’ networks with competitors and required equal carriage and exchange of traffic.<sup>90</sup> For example, the FCC required local telephone companies to not discriminate among long-distance companies.<sup>91</sup> Local telephone companies were required to permit all qualifying long-distance

89. MARCOS SILVA PINTO, PERFORMANCE MODELING AND KNOWLEDGE PROCESSING IN HIGH-SPEED INTERCONNECTED INTELLIGENT EDUCATION NETWORKS 7 (2007) (“In a circuit-switched network, a dedicated physical circuit is first established between the source and the destination nodes before any data transmission takes place . . . . Furthermore, the circuit remained in place for the duration of the transmission. The public switched telephone network (PSTN) is an example of a circuit-switched network. When we place a telephone call, a direct physical communication path is established between our telephone set and the receiver’s set. The set is a point-to-point connection that interconnects the telephone company’s switches, which are located throughout the telephone network. Once established the circuit is dedicated exclusively to the current transmission.”)

90. J. GREGORY SIDAK & DANIEL F. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT 47 (1997) (“Deregulation of the *network* industries often is accompanied by regulatory policies requiring the *incumbent* utility to provide “open access” to its transmission and reticulation facilities.”).

91. Competition in the Interstate Interexchange Marketplace, *Notice of Proposed Rulemaking*, 5 F.C.C.R. 2627, paras. 40–41 (1990) (“The initial impetus for equal access came from the MFJ and the GTE Consent Decree, which required the BOCs and GTE, respectively, to provide all IXCs with access that is ‘equal in type and quality’ to that provided to AT&T. The Commission implemented and expanded these requirements. Equal access not only ensured that IXCs would receive equal transmission quality, but also that callers would have the opportunity to presubscribe their telephones to an IXC other than AT&T.”).

companies to physically connect their wires.<sup>92</sup> Once connected, calls were carried independent of other calls in separate “circuits.”<sup>93</sup> Similarly, the 1996 Act mandated equality access in deregulation of local telephony in the late 1990s.<sup>94</sup>

But today, on the Internet, the circuit between end users is virtual. Anything sent between end users is shattered into any number of packets, sent out across the Internet’s network, and later reassembled at the other end.<sup>95</sup> This is the wonder of packet-switching networks. It is misleading to conceive of a circuit that connects users across such a network. The component networks of the Internet are variously interconnected.<sup>96</sup> Increasingly, each component network can isolate the kind and count of packets to carry. This gives the lie to the monistic virtual circuit that Internet protocols construct and, ultimately, present to end users.

While it is helpful for an application developer to pretend that TCP creates a connection to another address online and that clicking a link “fetches” the webpage from that address, these are mere metaphors. Out of context, these metaphors are misleading. Public policy must analyze not only what people experience online, but also how those experiences are realized.

When networks online decline to interconnect, the effect is rarely absolute. Likely, the end user can still reach some given destination online, but the packets to or from that destination may be sent round-a-bout or given less priority. Since the Internet supports an ever-growing variety of

---

92. THE FROEHLICH/KENT ENCYCLOPEDIA OF TELECOMMUNICATIONS 344 (1993) (“Among the things that had to be accomplished [after divestiture of AT&T] were the implementation of equal-access arrangements so that all long-distance carriers could compete on an equal basis without significant technical differences or subsidies . . . . Behind this ambitious implementation program was a major task, namely, the design and introduction of software into the telephone switching systems to provide the new switching and transmission features needed for equal access.”).

93. Applications of Ameritech Corp., Transferor, and SBC Commun. Inc., *Memorandum Opinion and Order*, 14 F.C.C.R. 14712 (1999).

94. See 47 U.S.C. § 251(c)(2) (1999) (requiring incumbent local exchange carriers (“LECs”) to provide to “any requesting telecommunications carrier” interconnection that is “equal in quality” to the interconnection LEC provides itself and that is “on rates, terms, and conditions that are . . . nondiscriminatory . . . ”).

95. Federal-State Joint Board on Universal Serv., *Report to Congress*, 13 F.C.C.R. 11501, para. 64 (1998) (“The Internet is a distributed packet-switched network, which means that information is split up into small chunks or ‘packets’ that are individually routed through the most efficient path to their destination. Even two packets from the same message may travel over different physical paths through the network.”).

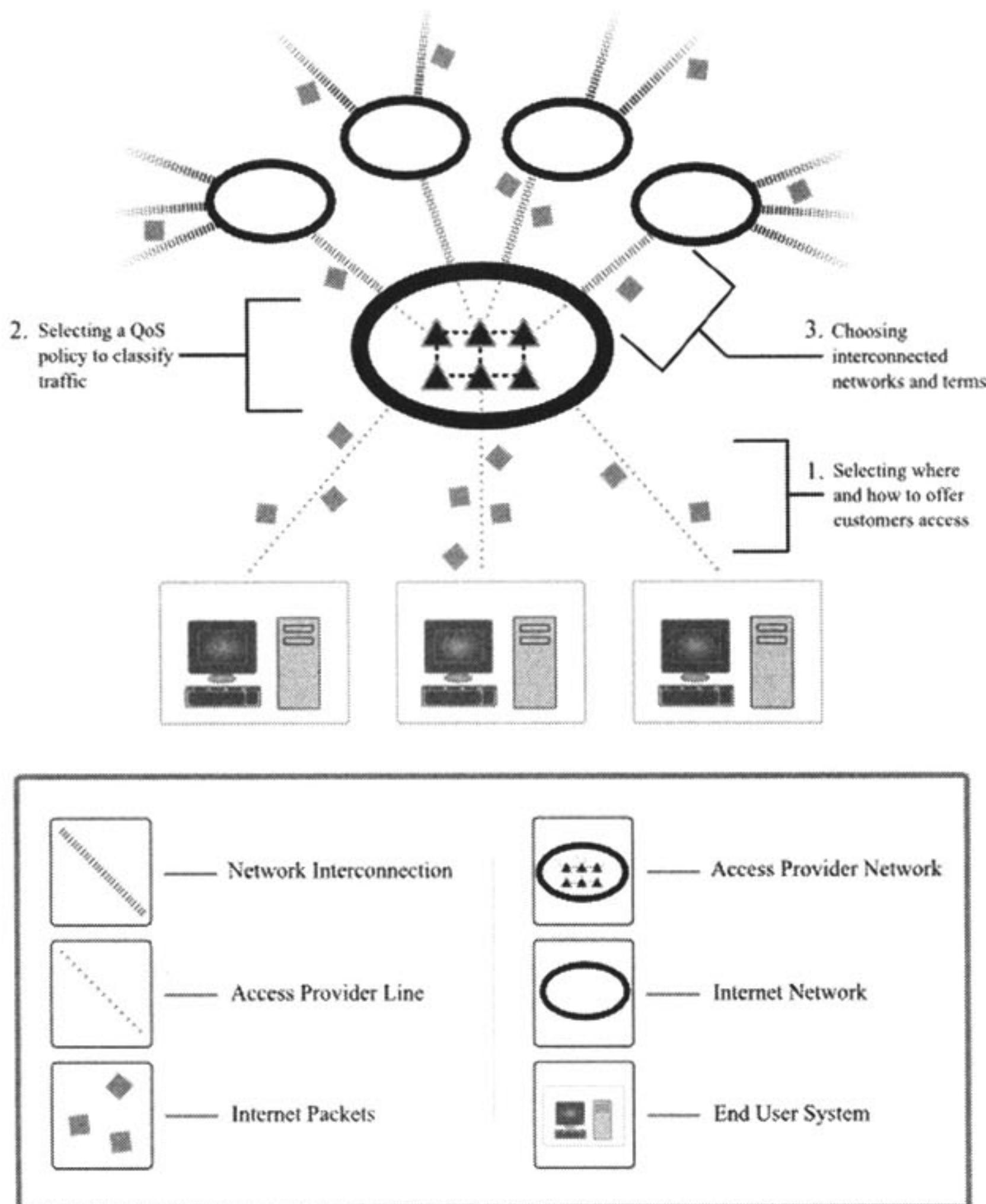
96. United States v. MacEwan, 445 F.3d 237, 245 n.8 (3d. Cir. 2006) (“[T]he Internet is a worldwide communications system composed of an interconnected network of computers, data lines, routers, servers, and electronic signals.”).

applications, this more nuanced discrimination by the network becomes mostly a concern for application developers, who are the front line in the adaptive dance to convince users that they are connected.

To make sense of network configurations in context, regulators must know that all networks discriminate—often deliberately—among various kinds of traffic. These modes of traffic discrimination can be roughly grouped into three broad categories: building the network, configuring the network, and interconnecting the network. We explore what each means in context.

Below is an image depicting the three categories of discrimination, together with a generalized arrangement of customers, the broadband access provider, and the interconnected networks.

## How Access Providers Discriminate



What we show is that all networks discriminate, and we classify three types of discrimination. The FCC's Open Internet Proceeding and the network neutrality debate in general take an erroneously narrow view of discrimination by concentrating on only one type of discrimination: discriminatory network configuration. Further, as we show, the language to describe nondiscriminatory network configuration is misguided and erroneously metaphorical. We conclude that network discrimination, as a concept, reflects an inconsistent and incoherent regulatory standard.

#### A. Selecting Where and What to Build

The first way network owners discriminate is in where and how they build the physical components of their network. A network owner may choose to build in urban rather than rural areas to enjoy increased customer density. A cable broadband provider may delay rolling out DOCSIS 2.0 and 3.0<sup>97</sup>—which better support streaming and P2P video—to avoid cannibalizing its cable television revenue.<sup>98</sup> Meanwhile, a wireless broadband provider might delay rolling out EVDO Rev A and later WiMAX or LTE<sup>99</sup>—which better support VoIP<sup>100</sup>—to avoid cannibalizing its cell phone revenue.

---

97. These are two of the standards used by cable broadband providers in their physical network. Connect America Fund: A Nat'l Broadband Plan for Our Future: High-Cost Universal Serv. Support, *Notice of Inquiry and Notice of Proposed Rulemaking*, 25 F.C.C.R. 6657, 6859 (2010) [hereinafter *National Broadband Notice of Inquiry*] (“*Data Over Cable Service Interface Specification (DOCSIS)*—A cable modem standard from the CableLabs research consortium ([www.cablelabs.com](http://www.cablelabs.com)), which provides equipment certification for interoperability. DOCSIS supports IP traffic (Internet traffic) over digital cable TV channels, and most cable modems are DOCSIS compliant. Some cable companies are currently deploying third-generation (DOCSIS 3.0) equipment. Originally formed by four major cable operators and managed by Multimedia Cable Network System, the project was later turned over to CableLabs.”).

98. Shifting from “flat web pages and email” to “P2P services,” and then to “click-streaming” (e.g., Hulu) has caused wide variability in the symmetry ratio (the amount a user downloaded divided by the amount uploaded) on cable broadband networks. See e.g., Leslie Ellis, *Split the Node, or Do DOCSIS?*, MULTICHANNEL NEWS (Nov. 23, 2008, 7:00 PM) [http://www.multichannel.com/article/101980-Split\\_the\\_Node\\_or\\_Do\\_DOCSIS\\_.php](http://www.multichannel.com/article/101980-Split_the_Node_or_Do_DOCSIS_.php) (“So, in a dozen years, traffic symmetry went from 18:1, to 2.5:1, to around 5:1. These are trends that matter to the overall scalability of any two-way network.”).

99. These are some of the standards for wireless broadband. VERIZON, LTE: THE FUTURE OF MOBILE BROADBAND TECHNOLOGY 2–4 (2010), [http://opennetwork.verizonwireless.com/pdfs/VZW\\_LTE\\_White\\_Paper\\_12-10.pdf](http://opennetwork.verizonwireless.com/pdfs/VZW_LTE_White_Paper_12-10.pdf)

100. See QUALCOMM INC, EV-DO REV. A AND B: WIRELESS BROADBAND FOR THE MASSES 8 (2007), <http://www.qualcomm.com/media/documents/files/ev-do-rev-and-b-wireless-broadband-masses-whitepaper.pdf> (“One of the most significant changes Rev. A brings is the improved RL. The redesigned link provides a significant speed and capacity improvement, and is designed to support low latency applications such as VoIP.”).

Elsewhere, buildout discrimination conflicts with explicit social goals, like universal service in telephony.<sup>101</sup> The FCC's National Broadband Plan is precisely such an effort to direct network expansion to counteract this type of discrimination in broadband rollout.<sup>102</sup> As in the past, the FCC planned implicit and explicit subsidies to counter this tactic, like the various rural subsidy programs.<sup>103</sup> This reflects a federal policy goal of universal service, a goal that was decided not by economics or engineering,<sup>104</sup> but by persuasion and politics—the tools for reconciling conflicts among competing social goals.<sup>105</sup> While all network buildout discriminates in some way, nondiscriminatory buildout is chimerical.

### *B. Configuring to Discriminate*

Once the physical infrastructure is in place, a network operator further discriminates by how it configures the devices on the network. Here the discrimination is most explicit. This configuration is where network neutrality debates rage. This is the mode of discrimination that the FCC and most policy analysts have focused. As we will demonstrate, it is where the Comcast, Madison River, and current proceedings have all focused their attention.<sup>106</sup> It is not the only place, but it is the first place where a bit can be something more than just a bit.

A network configuration necessarily discriminates among various competing uses. Even a simplistic “best effort” network discriminates against applications that would work better over some other kind of

101. See, e.g., 47 U.S.C. § 254(b)(2) (2006) (“Access to advanced telecommunications and information services should be provided in all regions of the Nation.”).

102. See *National Broadband Notice of Inquiry*, *supra* note 97.

103. Connect America Fund, A National Broadband Plan for Our Future, *Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking*, 26 F.C.C.R. 4554, para. 46 (2011) (“A primary policy objective of regulators during the 20th century was to promote universal service through affordable local telephone rates for residential customers. To accomplish this objective, regulators created a patchwork of implicit subsidies. Thus, for example regulators permitted higher rates to business customers so that residential rates could be lower, and they frequently required similar rates for urban and rural customers, even though the cost of serving rural customers was higher. Similarly, AT&T was permitted to charge artificially high long-distance toll rates, and then shared a portion of these interstate revenues with independent telephone companies and AT&T’s Bell Operating Companies (BOCs).”).

104. While some defend rural subsidies on grounds of “spillover” effects, these are speculative. The decision to provide a subsidy is best understood as a raw political choice: everyone should have access to the Internet. See generally, 47 U.S.C. § 151 (1996) (creating the FCC “[f]or the purpose of regulating . . . to make available . . . to all the people of the United States . . . communication service . . . at reasonable charges . . .”).

105. MILTON MUELLER, *UNIVERSAL SERVICE: COMPETITION, INTERCONNECTION, AND MONOPOLY IN THE MAKING OF THE AMERICAN TELEPHONE SYSTEM* 165–66 (1997).

106. See *infra* Sec. IV.

network.<sup>107</sup> To understand the implications of network configurations requires understanding their jargon and methods.

But policy analysts, looking for normative standards, should walk carefully into the terminology of configuring networks. The analytic devices that are useful to engineers do not directly translate into legal, regulatory language. This is especially true here with terms like “best effort,” “fairness,” and “trust.” This area is filled with seemingly normative terms that instead are descriptive references to network components. This brief introduction will give preliminary guidance for comprehending the larger meaning of these network configurations.

### 1. “Best Effort”

The term “best effort” is misleading. Network engineers use it to describe a single default treatment of traffic.<sup>108</sup> To some, this seems to define a neutral network.<sup>109</sup> But is anything really the best if they are all the same? *You are a special little snowflake . . . just like everyone else.* Of course nobody wants your worst effort. Or what if something else is actually treated better? It is literally inaccurate to call it “best” when some are treated better, and it is misleading if none are treated worse.

This casual misuse is similar to that surrounding the anachronistic “most favored nation” (“MFN”) terminology from the international trade lexicon.<sup>110</sup> The misuse of the MFN term—China violates human rights and

---

107. The notion that a best efforts network constitutes some sort of nondiscriminatory ideal is endemic to the debate. See Jonathan E. Nuechterlein, *Antitrust Oversight of an Antitrust Dispute: An Institutional Perspective on the Net Neutrality Debate*, 7 J. ON TELECOMM. & HIGH TECH. L. 19, 26 (2009); Philip J. Weiser, *The Next Frontier For Network Neutrality*, 60 ADMIN. L. REV. 273, 277–79 (2008) (“The Internet developed initially as an academic curiosity, based on a commitment to the ‘end-to-end principle.’ This principle requires that all Internet traffic, whether an email, a Voice over Internet Protocol (VoIP) ‘call,’ or a video stream, be treated equally and managed through ‘best efforts’ connections.”).

108. See JOHN EVANS & CLARENCE FILSFILS, *DEPLOYING IP AND MPLS QOS FOR MULTISERVICE NETWORKS—THEORY AND PRACTICE* 89 (2007) (describing the misuse of “best-effort” since “[b]y definition, best-effort infers no SLA commitments and hence a service which provides any SLA commitments cannot be defined as best-effort, however lowly those commitments might be.”).

109. Robert X. Cringely, *We Don’t Need No Stinking Best Effort: Net Neutrality May Have Been Just a Fantasy All Along*, PBS.ORG: I, CRINGLEY (Apr. 12, 2007) [http://www.pbs.org/cringely/pulpit/2007/pulpit\\_20070412\\_001931.html](http://www.pbs.org/cringely/pulpit/2007/pulpit_20070412_001931.html) (“I looked in the RFCs and saw that the Internet was defined as a ‘best effort’ network, which seemed to embody the principles of net neutrality.”).

110. In the World Trade Organization, MFN does not mean any kind of special treatment as the name suggests, rather it “means non-discrimination—treating virtually everyone equally.” *Principles of the Trading System*, WORLD TRADE ORG., [http://www.wto.org/english/theWTO\\_e/whatis\\_e/tif\\_e/fact2\\_e.htm](http://www.wto.org/english/theWTO_e/whatis_e/tif_e/fact2_e.htm) (last visited Apr. 8,

they are a most favored nation!—prompted Congress to replace MFN with the more accurate “normal trade relations” since the MFN principle was never supposed to treat any nation as most favored but instead to treat them all the same.<sup>111</sup> Similarly, some engineers have discarded best-efforts terminology in favor of less rhetorically vulnerable alternatives to describe a network that gives the same treatment to all traffic.<sup>112</sup> The point here is that best effort really just means a generic treatment of traffic. It just means normal effort.<sup>113</sup> When a network employs some policy other than “best effort,” we must then ask what traffic is not given “normal” treatment.

## 2. “Quality of Service”

When a network treats all types of traffic the same (i.e., it uses “best effort”) but wants to ensure support for an application, it can only do so by overprovisioning network capacity.<sup>114</sup> However, network capacity is costly. So when a network provider wants to support an application without incurring the costs of overprovisioning, it will implement traffic routing policies called “quality of service” (“QOS”) mechanisms. QOS mechanisms identify certain classes of traffic and give them a specified treatment.<sup>115</sup> This is where network discrimination is made explicit.

2012). Both MFN and best effort usefully describe a certain kind of generic treatment, but the literal meaning of each (“most” and “best”) is lost amidst the long list of exceptions (“more than most” and “better than best”). Beyond this shared inaccuracy, the analogy can be stretched a bit further still. A packet receives best-effort treatment (like MFN treatment) so long as it does not fall within a specified class that gets better treatment (like regional trade agreements, e.g., NAFTA). Or they may be treated worse than best-effort if they fall within a class such as blocked SPAM (like non-MFN states that may be subjected to trade sanctions or embargo).

111. H.R. 2676, 105th Cong. § 5003 (1998) (enacted).

112. E.g., EVANS & FILSFILS, *supra* note 108, at 88 (“The term best-effort . . . is often misused.”); *see also id.* at 113 (opting to use “single service class IP network” instead of “best efforts”).

113. We might let this little misnomer slide, except that it causes two problems. It does not mean what it says, so it becomes less useful as an analytical device for engineers. But, more relevant here, it is often misused by outsiders to actually mean what it says. The engineers amongst themselves might be able to overlook the term’s flaws: call it a kind of professional hazing to require new initiates to internalize the jargon. But the danger of leaving it inaccessible crops up when the outsiders try to use the language anyway, and fail.

114. See EVANS & FILSFILS, *supra* note 108, at 87–88 (“If it is possible to ensure that there is always significantly more capacity available than there is traffic load then . . . the service requirements will be easy to meet.”).

115. Although QOS is often less costly than merely over-provisioning, the amount provisioned (capacity planning) is still an important part of an effective QOS implementation. *Id.* at 375–76 (describing how capacity planning is required whether or not QOS mechanisms are implemented). So *some* over-provisioning is still required at a given node, depending on the distribution of arriving traffic and on the link speed. *Id.* at 383 (“The over-provisioning factor . . . depends upon the arrival distribution of the traffic on the link,

The traffic treatment selected to support the application turns on two factors: (1) a presumption about the application's technical requirements; and (2) the value of that particular application's performance relative to other uses of the network. These are then both used, theoretically, to "maximize end-user satisfaction (utility or efficacy) while minimizing cost."<sup>116</sup>

To examine the first factor, we look at a hypothetical corporation that has an existing, fully managed, and internal corporate network—they control the users, the devices, everything. At the outset, the network gives no special treatment to any kind of traffic (that is, it gives generic "best effort" treatment to all traffic). Now imagine this business decides it wants to support a private VoIP network for its employees to use internally. It will use QOS to support this, since it wants to support the application without having to massively buildout network capacity (recall, overprovisioning network capacity is always an alternative to QOS mechanisms).

The corporation's network engineers (or those of the service provider it hires) will translate the requirements of the selected VoIP application into a set of quality metrics with ranges of acceptable values.<sup>117</sup> These metrics are then used to design the network and to check whether the network has met the requirements.<sup>118</sup> When the network designers select a set of minimum quantities for these quality metrics—if they are made explicit—the minimum quantities are called the service level agreement ("SLA") requirements for that application.<sup>119</sup> Thus, the SLA requirements are the first factor influencing the treatment that the class of traffic receives; they are the presumed technical requirements of the application that creates the traffic.

The second influence on QOS policy is the relative value that is attached to that application's performance.<sup>120</sup> To understand this, we continue with the corporate scenario above. Imagine the CTO wants to

---

and the link speed.").

116. *Id.* at 88–89.

117. The most important of these metrics are delay, delay variation ("jitter"), packet loss, throughput, availability, and sequence preservation. *Id.* at 2. *See also id.* at 4–7 (delay); *id.* at 8 (delay variation); *id.* at 9–11 (packet loss); *id.* at 12–18 (throughput); *id.* at 20–22 (availability); *id.* at 18–19 (sequence preservation). There are certainly other metrics that are used, but these tend to be more application specific. *Id.* at 24 (describing voice, video, and gaming "quality of experience" measures).

118. *Id.* at 87–90.

119. *Id.*

120. WILLIAM B. NORTON, THE INTERNET PEERING PLAYBOOK: CONNECTING TO THE CORE OF THE INTERNET 49 (draft 2011), *available at* <http://www.nanog.org/papers/playbook.doc>.

make sure that his boss, the CEO, has excellent quality for all his VoIP calls. The CTO has already crafted SLA requirements (a selection of values from the ranges of each quality metric required by the application) that will provide “good” VoIP service to the entire company with the currently available network capacity. But when he decides to spoil his boss, he is constrained by costs so he cannot just build out network capacity. Instead he creates two classes of VoIP service: one for the CEO’s calls (with “excellent” SLA requirements) and one for the rest of the company’s calls (with slightly reduced SLA requirements).

The rest of the company’s traffic must have slightly reduced SLA requirements because the cost-constrained network capacity must now support the CEO’s “excellent” class of VoIP traffic as well. These two classes of VoIP traffic receive treatment based not only on the application-specific requirements of VoIP (the first discussed factor) but also on the relative value of each class (the CEO’s valued higher than the rest). The CTO’s decision—to treat the CEO’s calls better than the rest of the calls—is an example of the second factor influencing the QOS policy of the corporation’s network: the relative value of each class. Taken together, these two factors dictate QOS policy.<sup>121</sup> The first factor is derived from the technical application requirements and is, in that sense, objective.<sup>122</sup> The second factor involves the more subjective valuing of the communications themselves.

The corporate scenario described above makes one very dangerous assumption: that the network is fully managed by the operator. This is a critical difference between this hypothetical network and the public Internet, which is not fully managed.<sup>123</sup>

Even though the public Internet is not fully managed, as in our hypothetical, this story is important. It explains some of the unreality that unfolds when network engineers and policy makers try to talk. Network engineers make things work; that is what engineers do. The fully managed scenario described above is the sort of problem that they are trained to

---

121. *Id.* at 50–51.

122. *Id.* at 50–52.

123. The network, as the boundary of administrative control, has deep roots. One ambition of the original DARPA project of designing the Internet protocols was “to come to grips with the problem of integrating a number of separately administrated entities into a common utility.” See David Clark, *The Design Philosophy of the DARPA Internet Protocols*, 18 SIGCOMM COMPUTER COMM. REV. 106, 106–14 (1988) (describing “some of the early reasoning which shaped the Internet protocols” to explain “why the protocol is as it is”). There is far more to say on this, but for now, it is important to see that two concerns of network neutrality are *who* and *when*: (1) *who* is making the valuation of the relative benefits between classes of traffic—a role played by the CTO in our story; and (2) *when* the valuation is being made—before or after the application is available for use-testing.

solve. Much of the engineering jargon that is misused by policy analysts was developed to reflect this fully managed perspective on network engineering. So it is misleading when used in the context of the public Internet.

### C. Selective and “Fair” Interconnection

The final way a network discriminates is by choosing to interconnect with select networks in select locations. This blends many of the dynamics of buildout and configuration discrimination. Like buildout, the decision to interconnect is a broad strategic decision. Indeed, interconnection is often a substitute for buildout. Like nimble network reconfiguration, once two networks are situated nearby, they can cheaply interconnect (or disconnect).<sup>124</sup>

The ongoing costs of traffic carriage across the interconnection complicate the negotiation, even when you ignore the external discriminatory goals of the participants. This bargaining is not straightforward; indeed it is an art.<sup>125</sup> Between two networks it can be difficult to agree *ex ante* on what constitutes a fair exchange. An entrant acquires market presence as it grows its array of interconnections. These interconnections can be either to reduce transit costs or to improve performance.<sup>126</sup> At some point the relative contribution the growing network makes to any given interconnection exchange begins to flip: the consumer becomes the producer. Thus, a dominant network, faced with an up-and-coming network wanting to interconnect, has a shifting mix of incentives to strike a deal (or not). Moreover, a network can bluff about connectivity, surprise with traffic loads, or circumvent the interconnected network entirely by connecting directly with its adjacent networks.<sup>127</sup> At the 2009 Workshop on Internet Economics, Ike Elliott proposed a set of “fair peering” principles.<sup>128</sup> He opened with a discussion of how peer networks *should* behave. He did not discuss any network’s possible interest in discrimination or “unfairness.” Rather, he focused on the network’s cost and bargained-for expectations during the sale or exchange of traffic carriage. His principles were aimed at reducing arbitrage: the profitable,

---

124. See WORLD TRADE ORG., *supra* note 110 and accompanying text.

125. NORTON, *supra* note 120, at 2, 4.

126. *Id.*

127. *Id.* at 4, 7–9.

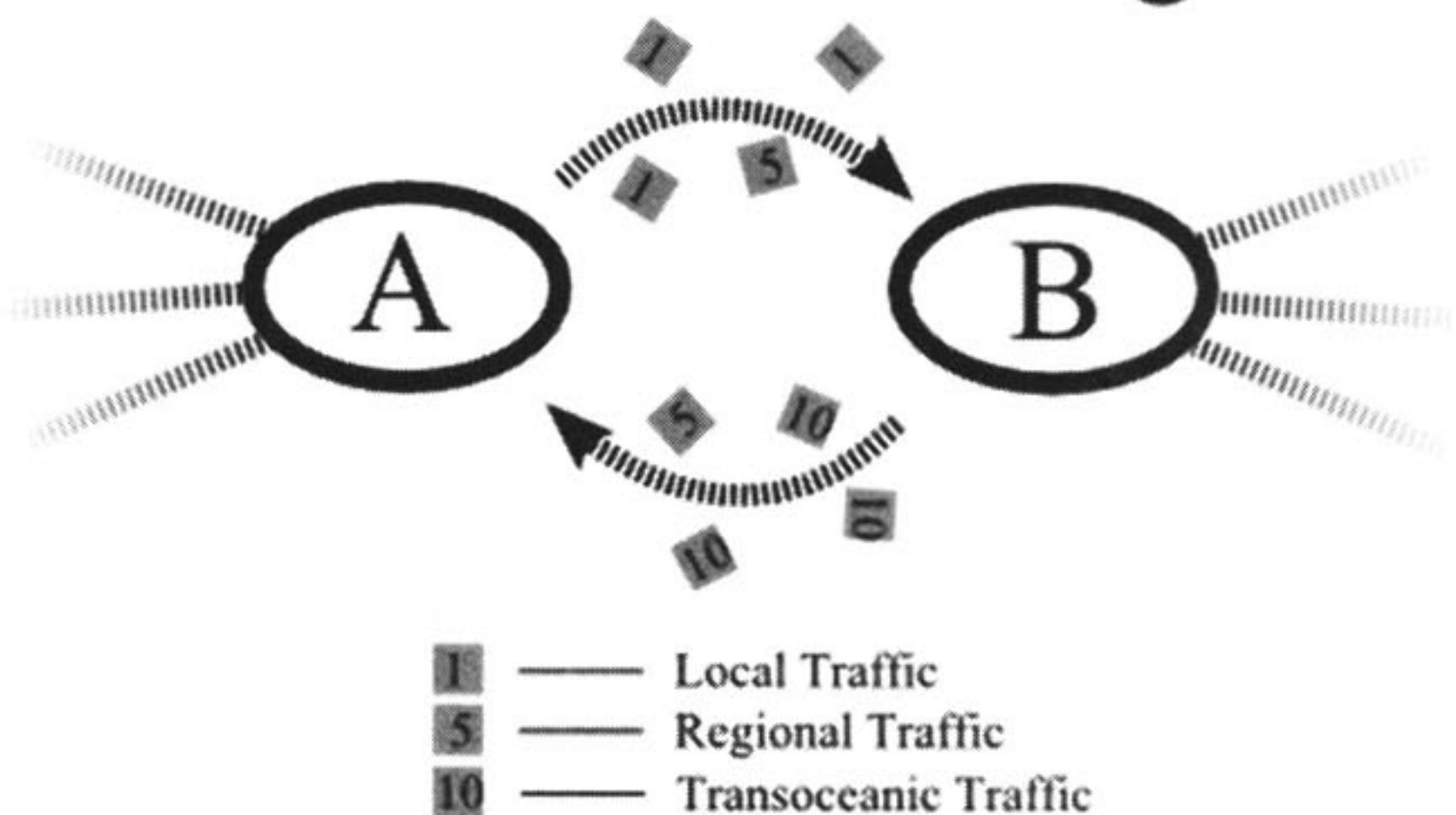
128. K.C. CLAFFY, WORKSHOP ON INTERNET ECONOMICS (WIE 2009) REPORT 3 (2009), [www.caida.org/publications/papers/2010/wie\\_report/wie\\_report.pdf](http://www.caida.org/publications/papers/2010/wie_report/wie_report.pdf).

but efficiency-warping, practice of dumping unexpected traffic loads across cheaply or freely interconnected networks.<sup>129</sup>

His principles create a system for tracking usage among “fair peers” and detecting imbalances. The goal is to place equal cost on each peer, and the principles do this by having each “fair peer” announce the costs associated with each type of traffic.

The example scenario he gives involves two peers, A and B.<sup>130</sup> They interconnect to carry three types of traffic from each other: local, regional, and transoceanic—with costs of one, five, and ten, respectively. It is easy to see the imbalance if A passes off only local traffic while B passes off mostly transoceanic traffic. In this scenario, the fair peering principles create mechanisms for B to correct the imbalance.

## "Unfair" Peering



One mechanism is for B to simply reduce or stop sending so much of the costly traffic over A’s network by using other routes. Another mechanism is for B to peer with A in other locations so that A does not have to carry B’s traffic as far. And “as a last resort,” B could simply pay A. Beyond reducing arbitrage (the primary benefit), Elliott suggests that these principles may have other follow-on benefits.<sup>131</sup> One is to encourage interconnections in more geographic places. This decentralizing could

---

129. *Id.* at 3 (equating “fair peering” with the elimination of these economic windfalls). To a market participant, this “efficiency-warping” practice is helpfully described as “unfair.” *Id.*

130. NORTON, *supra* note 120, at 2.

131. *Id.*

reduce the vulnerabilities associated with having a small number of peering locations carrying such a large chunk of the Internet's traffic.<sup>132</sup>

Elliott attempts to harness the floating mix of incentives at play to simplify negotiations and reduce transaction costs for interconnecting networks. This is an area worth investigating for anyone seeking to understand interconnection markets. But this mix of incentives faces another complexity when we add the overarching incentives to discriminate. This is the secondary inquiry that public policy analysts must investigate. Industry has an interest in reducing uncertainty in negotiations (except those who profit from it by a dicey game of digital brinkmanship). It is the public policy analysts that must decipher and account for the potentially discriminatory interconnection practices along dimensions other than simple traffic profile.

A network that would like to discriminate, but is prohibited from discriminating because of its network configuration or its network buildout, can still achieve the same discriminatory end by interconnecting. It can "outsource" the discriminatory tasks to an adjacent interconnected network that will do the job.<sup>133</sup> Instead of discriminating with a flat refusal to interconnect, a network can use this tactic and its corollaries for a significant premium. These techniques hide the real power that shapes traffic discrimination online. Further, the notion of fair interconnection makes no real sense; enforcing (or even determining) terms and conditions of an ideally socially efficient interconnection is well beyond policy makers' abilities.

#### IV. AN EMPIRICAL, NONTHEORETICAL LAW OF THE OPEN INTERNET

The debate about Internet openness has proceeded in abstraction. We have shown that this has led regulators down several blind alleys. While getting tangled in speculative economics, legal and policy analysts have ignored the actual structure of Internet markets. Moreover, the failure to analyze the meaning of discrimination in a packet-switched network has led many in the debate to apply theoretical, even metaphorical, solutions that lack practical applications and leave engineers scratching their heads. For instance, Internet pioneer David Clark remarked that "[m]ost of what

---

132. *Id.*

133. See Marsden, *supra* note 29, at 7 ("[S]uch discrimination may possibly be detected by the end-user when it is conducted by its ISP, while a far more pernicious and potentially undetectable discrimination may occur at peering points.") ("The debate in regard to the subtleties of service degradation is beyond this article, and experts at the Paris conference of 29 May 2007 were divided as to whether degradation that is deliberate could be well enough disguised to suggest off-net discrimination."). *Id.* at 7 n.13.

we have seen so far [concerning internet openness] . . . either greatly overreaches, or is so vague as to be nothing but a lawyer's employment act.”<sup>134</sup>

Instead of using a top down, theory-to-reality approach, we argue for a bottom up, fact-to-theory approach. Actual disputes, such as the BitTorrent-Comcast disputes, Cogent-Level 3 disconnection, and the Madison River case, are not about discrimination.<sup>135</sup> To the contrary, other concerns, such as the integrity of messages and privacy or the reliability of communications, seem to control.

Since what is important is not equality of treatment but equality of outcomes of Internet experience, Internet regulations must be open to myriad values and normative goals. Like the common law, it must be able to grow and change along with the Internet and its role in our society. We, therefore, side with the FCC employing adjudication rather than ex ante rulemaking.<sup>136</sup> Agencies have tremendous liberty to determine whether to use rulemaking, which yields a law-like rule of general application, or adjudication, which involves judicial-like decisions of actual controversies and the emergence of flexible principles.<sup>137</sup>

In developing this body of regulatory law, we suggest looking to the copyright “fair use” doctrine as a conceptual model. While some have rightfully complained that fair use is too uncertain and unpredictable for modern technology, it nonetheless does its job. It balances the set of productive incentives given to the original author against the set of incentives for the next author. Additionally, it leaves a realm of judicial flexibility where islands of certainty emerge, but the outer reaches remain subject to changed circumstances. This is precisely the kind of balancing the Internet needs.<sup>138</sup> Internet regulation must balance the need to spur

134. David D. Clark, *Network Neutrality: Words of Power and 800-Pound Gorillas*, 1 INT'L J. COMM. 701, 708 (2007).

135. *BitTorrent Order*, *supra* note 18; Comcast Corp. v. F.C.C., 600 F.3d 642 (D.C. Cir. 2010).

136. We agree with Philip Weiser, who has also argued for adjudication as opposed to rulemaking for Internet disputes. See Philip J. Weiser, *The Future of Internet Regulation*, 43 U.C. DAVIS L. REV. 529 (2009).

137. SEC v. Chenery Corp., 332 U.S. 194 (1947).

138. We recognize that any regulation policy that serves multiple masters may end up serving neither well. See Lili Levi, *Reflections on the FCC's Recent Approach To Structural Regulation of The Electronic Mass Media*, 52 FED. COMM. L.J. 581, 617 (2000) (“One of those questions arises out of the contending values served by structural deregulation in a converging media environment. But another is whether a multipart strategy such as the one the Commission appears to be following can adequately neutralize the concerns posed by media consolidation. Questions as to the viability of such an approach are raised both in principle and in the context of concrete attacks on the particular strategies chosen by the Commission to achieve its goal of regulatory balance.”). Given the multitude of value that

infrastructure investment against the need to preserve the ever-changing social interest in the content that rides across it.

Rather than a single rule, the fair use doctrine is a patchwork of rulings made by judges, which set out the growing bounds of this body of law.<sup>139</sup> Many things are clearly prohibited, while others proceed under flexible standards. To see how this would work for Internet regulations, the following discusses the major Internet controversies, showing the values and issues they involve that reach beyond simplistic discrimination.

#### A. BitTorrent-Comcast Controversy

BitTorrent is a peer-to-peer file sharing protocol that can efficiently employ any unused bandwidth in a network.<sup>140</sup> Comcast—ostensibly to conserve bandwidth—began to take steps to prevent users from using BitTorrent on its network. It inspected packets that traversed its network, and when it detected BitTorrent sessions between users, it would forge packets to simulate the termination of the session.<sup>141</sup> It then inserted these spoofed packets into the BitTorrent stream.<sup>142</sup> These packets, when received by the end user's computers, instructed them that the other was no longer communicating, i.e., the other side had gone away.<sup>143</sup> To use a metaphor, this technique was like a telephone company breaking in on your telephone call and impersonating one party and saying, “Oh, gotta go.” The other party then hangs up.<sup>144</sup>

Network users discovered Comcast's behavior, and a public interest group brought a complaint against the FCC.<sup>145</sup> The FCC declared Comcast's actions illegal.<sup>146</sup> The FCC's stated rationale demonstrates how difficult it is to codify discrimination in the context of network regulations.

---

impact on Internet interconnection regulation has, we argue that a multivalent approach is inevitable.

139. Matthew Fagin et al., *Beyond Napster: Using Antitrust Law to Advance and Enhance Online Music Distribution*, 8 B.U. J. SCI. & TECH. L. 451, 520 (2002) (“While fair use exceptions to copyright presently cover a patchwork of rights accorded to consumers, librarians, and educators, some commentators would simplify this regime by focusing copyright restrictions on commercial.”).

140. *Comcast*, 600 F.3d at 644; see Peter Svensson, *Comcast Blocks Some Internet Traffic*, ASSOCIATED PRESS, Oct. 19, 2007, available at <http://www.washingtonpost.com/wp-dyn/content/article/2007/10/19/AR2007101900842.html>.

141. See Svensson, *supra* note 140.

142. *Id.*

143. *Id.*

144. To return to earlier discussion of packets versus circuit-switched networks, this involved breaking the virtual circuit. Notably, the analogy to the broken telephone call equates the virtual and the real circuits.

145. *BitTorrent Order*, *supra* note 18, at paras. 1–7.

146. *BitTorrent Order*, *supra* note 18, at paras. 6, 10.

What motivated the proceeding was the nature of Comcast's traffic management.

Comcast secretly "broke into" parties' conversations. The sanctity of private communications, at least from government snooping, has been recognized from the earliest times in our history. The Continental Congress, when it assumed control of the postal system, forbade the reading or interception of mail.<sup>147</sup> The Act authorizing the first postal system contained similar protections. In the nineteenth century, in *Ex Parte Jackson*, the Supreme Court held that letters enjoyed Fourth Amendment protections,<sup>148</sup> which at least according to some, formed the basis of the constitutional protection of privacy in electronic communications under the Fourth Amendment.<sup>149</sup> In response to *Olmstead v. United States*,<sup>150</sup> a Supreme Court case that held Fourth Amendment protections did not apply to electronic communications, the 1934 Communications Act prohibited any person not authorized by the sender to intercept any wire or radio communications.<sup>151</sup> Finally, in *Katz v. United States*<sup>152</sup> and *Berger v. New York*,<sup>153</sup> the Supreme Court overruled *Olmstead* and extended Fourth Amendment protections to telephone communications.

Similarly, keeping telephone companies from using private information has long been protected. Wiretapping laws apply to telephone companies; they cannot listen to or monitor your conversation except when required for management of their networks.<sup>154</sup> Strict regulation concerning

147. AN ORDINANCE FOR REGULATING THE POST OFFICE OF THE UNITED STATES OF AMERICA, J. CONT'L. CONG. 1774–1789 670, 671 (Gaillard Hunt ed., 1914) ("And be it further ordained by the authority aforesaid, that the Postmaster General, his clerk or assistant, his deputies, and post and express-riders, and messengers, or either of them, shall not knowingly or willingly open, detain, delay, secrete, embezzle or destroy, or cause, procure, permit or suffer to be opened, detained, delayed, secreted, embezzled or destroyed any letter or letters . . .").

148. *Ex parte Jackson*, 96 U.S. 727, 733 (1877) ("Letters and sealed packages of this kind in the mail are as fully guarded from examination and inspection . . . as if they were retained by the parties forwarding them in their own domiciles.") (emphasis added).

149. See Anuj C. Desai, *Wiretapping Before the Wires: The Post Office and the Birth of Communications Privacy*, 60 STAN. L. REV. 553, 554–56 (2007).

150. *Olmstead v. United States*, 277 U.S. 438 (1928).

151. 47 U.S.C. § 605(a) (2006) ("[N]o person receiving, assisting in receiving, transmitting, or assisting in transmitting, any interstate or foreign communication by wire or radio shall divulge or publish the existence, contents, substance, purport, effect, or meaning thereof . . . . No person not being authorized by the sender shall intercept any communication . . .").

152. 389 U.S. 347, 364–67 (1967).

153. 388 U.S. 41 (1967).

154. See 18 U.S.C. § 2511(2)(a)(i) (2006) (A communications firm may intercept, use, or disclose a communication if "necessary incident to the rendition of his service . . . except that a provider . . . shall not utilize service observing or random monitoring except for

telephone companies' abilities to store and use customer data has existed for decades.<sup>155</sup> Congress expressly limited the power of communications firms, including Internet service providers, from disclosing contents of electronic messages.<sup>156</sup>

Given this background of privacy laws and expectations, Comcast's actions were reprehensible because its actions violated the integrity of messages—something the post office has been prohibited from doing since the time of the Continental Congress. Ignoring this salient issue, the FCC's order simply determined that its treatment of BitTorrent was not "reasonable network management."<sup>157</sup> Its analysis was remarkably weak and demonstrates the problem of determining a general rule for network discrimination.

As we have argued, a rule distinguishing good from bad discrimination is by nature contextual. To determine reasonableness, the FCC, drawing on constitutional jurisprudence, stated that any network management protocol must be narrowly tailored to deal with congestion.<sup>158</sup> This whole system of shifting presumptions and quasi-constitutional tests the FCC used is completely novel and has no precedent in any FCC regulatory process. Nor is it clear *why* this approach should be used. To determine the degree to which Comcast's treatment of BitTorrent was narrowly tailored, the FCC first simply footnoted several Internet experts.<sup>159</sup> Whatever the merits of the FCC's result, simply assembling a list of experts hardly constitutes a cognizable rule. Second, the FCC ruled that Comcast's treatment of BitTorrent was not reasonable because (1) it is application specific (only applies to P2P); (2) it is not specific to the time of congestion; and (3) it is not specific to geographic areas of congestion. This is a remarkably weak analysis because by focusing on congestion, it leaves unanswered the questions about other clearly acceptable network discrimination, like that against spam or malware. This type of discrimination is application-specific, and it is neither time nor geography sensitive. Would antispam or antimalware efforts be "reasonable network management?" Why? Both antimalware and Comcast's BitTorrent

---

mechanical or service quality control checks.").

155. See *United States v. W. Elec. Co.*, 673 F. Supp. 525, 567 n.190 (D.D.C. 1987), *rev'd in part, aff'd in part*, 900 F. 2d 283 (D.C. Cir. 1990) (limiting the ability of the Bell companies to collect and use customer data out of a fear that it would become a "Big Brother" type relationship with all those residing in its regions"); see 47 U.S.C. § 222 (2006).

156. 18 U.S.C. § 2511(3)(b) (2006).

157. *BitTorrent Order*, *supra* note 18, at paras. 13–15.

158. *Id.*

159. *Id.* at 46–48.

treatment arguably treat certain traffic differently so that the entire network benefits. The FCC's myopia has failed to set forth any cognizable rule or regulatory aim.

### *B. Cogent-Sprint Disconnection*

In October 2008, Sprint Nextel, a company that controls significant parts of the Internet backbone, severed its peering connection with Cogent, preventing Sprint customers from seeing Cogent-hosted sites. Cogent has filed suit, and the two sides sued each other. The dispute involved allegations that Cogent was not meeting its obligation for traffic volume under the peering agreement,<sup>160</sup> although this is simply speculation because, as discussed above, all such agreements are typically secret. The parties settled and eventually restored connection a few days later.<sup>161</sup>

Even this short traffic outage created a bit of an uproar.<sup>162</sup> The question is why this short outage incited concern. After all, many goods and services malfunction without creating a sense of panic or outrage. The answer is simply that we expect, and come to expect, a high degree of reliability from our communications networks. This is no accident. The FCC and state public service commission had, and continue to have, exacting QOS regulation for telephone service, specifying everything from the number of allowable dropped calls to the acceptable static levels.<sup>163</sup>

The expectation of reliability is not irrational. Reliable communications is a public good, for it facilitates emergency responders and other government functions, public discourse, and economic efficiency. Modern life relies upon it. It may be an appropriate area for regulation, because the market may not provide an optimal level to all segments in

160. Shane Greenstein, *Glimmers and Signs of Innovative Health in The Commercial Internet*, 8 J. ON TELECOMM. & HIGH TECH. L. 25, 66–68 (2010).

161. See Jacqueline Emigh, *Sprint Restores Cogent Network Connection, but Only for Now*, BETANEWS, INC., <http://www.betanews.com/article/Sprint-restores-Cogent-network-connection-but-only-for-now/1225738880>.

162. Scott Woolley, *The Day the Web Went Dead*, FORBES (Dec. 2, 2008, 6:00 AM), [http://www.forbes.com/2008/12/01/cogent-sprint-regulation-tech-enter-cz\\_sw\\_1202cogent.html](http://www.forbes.com/2008/12/01/cogent-sprint-regulation-tech-enter-cz_sw_1202cogent.html).

163. See, e.g., FCC, REPORT OF INDUSTRY ANALYSIS AND TECHNOLOGY DIVISION, QUALITY OF SERVICE OF INCUMBENT LOCAL EXCHANGE CARRIERS 1 (2009) (examining the quality of service provided to both retail customers (business and residential) and access customers (interexchange carriers)); Policy and Rules Concerning Rates for Dominant Carriers, *Report and Order and Second Further Notice of Proposed Rulemaking*, 4 F.C.C.R. 2873, para. 2 (1989) (discussing FCC's monitoring of quality of service of AT&T); NAT'L REGULATORY RESEARCH INST., TELECOMMUNICATIONS SERVICE QUALITY iv (1996) (indicating that thirty-two state regulatory commissions and the District of Columbia have instituted quality of service standards since the AT&T divestiture).

society. But this concern has nothing to do with network openness or neutrality.

### C. Madison River

The Madison River Telephone Company controversy involved a small telephone company that also provided Internet access service.<sup>164</sup> Interestingly, the company received an enormous percentage of its revenue from long distance service.<sup>165</sup> Perhaps due to these financial pressures, it decided to block access to VoIP providers, like Vonage, that provided long distance at a much cheaper rate using an Internet connection. The blocking was quite blatant and obvious: the Internet ports that carry VoIP. This action led to an FCC enforcement inquiry that determined Madison River's action to be illegal.<sup>166</sup> The FCC entered into a consent decree with Madison River that avoided consideration of the deep legal and policy issues related to the network.<sup>167</sup>

Of these controversies, Madison River is closest to a pure discrimination issue. The discrimination was blatant: the ports were blocked. The motivation clear: Madison River had significant revenue to protect. Anticompetitive intent was reasonable to infer.

The Madison River controversy reflects a reasonable approach to Internet regulation. Rather than announce a rule of general application, the Madison River adjudication creates a clear rule that operates on a distinct set of facts relying on and building upon a set of general principles. Like fair use, this approach does not presume to determine every case but rather examines the facts of each. It provides guidance on specific sets of facts, creating islands of certainty without relying on broad principles fraught with unforeseen results.

## V. A JURISDICTIONAL POSTSCRIPT

As expected, the affected industries appealed the *Open Internet Order*, and the case is currently before the D.C. Circuit.<sup>168</sup> The chief issue on appeal almost certainly will be jurisdiction: whether the 1934 Communications Act, as amended by the Telecommunications Act of 1996, gives the FCC the authority to regulate the Internet. The legal issue

---

164. Madison River Comms., LLC, *Order*, 20 F.C.C.R. 4295, para. 3 (2005) [hereinafter *Madison River*]; see also Brenner, *supra* note 6.

165. Local telephone companies make money from long distance by collecting legally mandated fees from long distance companies for the origination and termination of long distance traffic.

166. *Madison River*, *supra* note 164.

167. *Id.*

168. Verizon v. FCC, Case No: 11-1355 (D.C.C. Oct. 5, 2011).

proceeds from a strange regulatory history which recent debates have obscured. If the D.C. Circuit vacates the *Open Internet Order*, the deregulation of national communications will have occurred almost *sub rosa* through a strange alignment of an ambiguous statute and an ideologically hostile D.C. Circuit. No fair reading of the 1934 Communications Act—or the amending 1996 Act—could conclude that the Congress ever intended, or even contemplated, a complete retreat from regulating the dominant medium of communication, whether telephones or Internet.

Contrary to much judicial and scholarly opinion, we argue that the statutory definitions cannot be controlling, because they are inherently ambiguous. Instead, a fair reading of the statute reveals unchanged statutory *structure* in which the FCC has—and always has had—regulatory authority over the primary means of national communications. This argument is historical—and thus we must tell a strange, if not sometimes dry, story. Let us begin.

In the beginning, there was Section 201 of the Communications Act of 1934. It is incredibly broad and, for legislation written in 1934, quite forward-thinking in its “technological neutrality.” It states:

It shall be the duty of every common carrier engaged in interstate or foreign communication by wire or radio to furnish such communication service upon reasonable request therefor; and, in accordance with the orders of the Commission, in cases where the Commission, after opportunity for hearing, finds such action necessary or desirable in the public interest, to establish physical connections with other carriers, to establish through routes and charges applicable thereto and the divisions of such charges, and to establish and provide facilities and regulations for operating such through routes.<sup>169</sup>

Section 201 regulated anything that could be characterized as a “common carrier” that used “wire or radio.” Common carrier refers to “any person engaged as a common carrier for hire, in interstate or foreign communication by wire or radio or interstate or foreign radio transmission of energy . . . .”<sup>170</sup> The FCC regulated myriad technologies under this provision from telephones and telegraphs<sup>171</sup> to “message cables,” i.e., early data-carrying wires.<sup>172</sup> The power to regulate these entities as common

169. 47 U.S.C. § 201(a) (2006).

170. *Id.* § 153(10).

171. Tomas Nonnenmacher, *History of the U.S. Telegraph Industry*, EH.NET (Feb. 1, 2012, 5:21 PM), <http://eh.net/encyclopedia/article/nonnenmacher.industry.telegraphic.us>.

172. Overseas Comms. Servs., *Notice of Proposed Rulemaking*, 84 F.C.C.2d 622, para. 3 (1980) [hereinafter *Overseas NPRM*]; see Gregg Daffner, Note, *United States Regulation of International Record Telecommunications: The Domestic/International and Basic/Enhanced Dichotomies in U.S. Telecommunication Regulation*, 3 B.U. INT'L L. J. 99, 100–01 (1985).

carriers is broad and not limited to telephony but rather to any electronic message carried by wire. It is an error to state, as Commissioner McDowell did, citing the D.C. Circuit, in his dissent to the *Open Internet Order*, that “Titl[e] II . . . of the Communications Act give[s] the FCC the power to regulate specific, recognized classes of electronic communications services, which consist of common carriage telephony . . . .”<sup>173</sup>

Beginning in the 1960s, however, new computer technologies emerged that used telephone wires to transmit data and presented the question of whether Section 201 should regulate them. The FCC decided, starting with the *Computer I Inquiry*—and then followed by the *Computer II* and *III* inquiries—not to regulate these computer-based technologies under Title II. Rather, they received their own regulatory regime specified under the *Computer Inquiries* that exempted them from access charges (the subsidization scheme that used high long distance rates to lower local costs). Thus, the Computer Inquiry regulations covered “enhanced services,” i.e., services with significant computer-based features, while Title II continued to cover “basic services,” i.e., telephones that consumers used.<sup>174</sup>

For every new computer-based technology that came down the pike, the FCC had to determine: (1) whether it should be regulated as an enhanced service or basic service; and (2) if it is an enhanced service, what types of anti-competitive regulation would be appropriate. The FCC has produced thousands of orders answering these questions. The FCC classified and regulated countless technologies—ranging from Centrex systems, which allow typically large businesses to manage their own internal switching,<sup>175</sup> to Point-of-Sale Data Processing, which allows merchants to track retail sales,<sup>176</sup> to various flavors of speed dialing and call forwarding.<sup>177</sup>

One would think that with all this impressive bureaucratic effort a clear line would emerge between “enhanced services” and “basic services.”

---

173. *Open Internet Proceeding Report and Order*, *supra* note 1. As described in Section II.B, interconnected VoIP services, which include some over-the-top VoIP services, “are increasingly being used as a substitute for traditional telephone service.” *Id.*

174. See generally Robert Cannon, *The Legacy of the Federal Communications Commission’s Computer Inquiries*, 55 FED. COMM. L.J. 167 (2003); Reg. and Pol’y Problems Presented by the Interdependence of Computer and Comm. Servs. and Facilities, *Tentative Decision*, 28 F.C.C.2d 291, para. 15, 18 Rad. Reg. 2d (P&F) 1713 (1970) [hereinafter *Computer I Tentative Decision*].

175. Nynex Tel. Cos. Offer of Comparably Efficient Interconnection to Providers of Enhanced Servs., *Order*, 11 F.C.C.R. 2419, para 6 (1996).

176. Amendment of Section 64.702 of the Comm’n’s Rules and Regs., *Final Decision*, 77 F.C.C.2d 384 (1980).

177. *Computer I Tentative Decision*, *supra* note 174.

This could not be further from the truth. The FCC's definitions constantly shifted. In the *Computer I Inquiry*, the FCC defined "communications service as including 'message-switching; which in turn includes "the computer-controlled transmission of messages, between two or more points, via communications facilities, wherein the content of the message remains unaltered."<sup>178</sup> Data processing, on the other hand, involves "the use of the computer for operations which include, inter alia, the functions of storing, retrieving, sorting, merging and calculating data, according to programmed instructions."<sup>179</sup> From the beginning, this distinction was unstable and the FCC in *Computer I*, created hybrid services that were a little of both, recognizing "[t]he problem is that there is computer processing in both communications and data communications."<sup>180</sup>

The reason for all this fudging was quite simple. Plain old telephone service ("POTS") became more reliant on computer-based technologies. Voice waves ceased to be transmitted using distinct circuits and became processed as data. As the decades wore on, the distinction became increasingly legal and metaphorical and had less and less direct relationship to technological reality.

Thus, in *Computer II*, the FCC acknowledged "the inadequacy of the hybrid service definitions in the existing rule."<sup>181</sup> It set forth a new distinction between "basic services" and "enhanced services." These terms were defined as follows:

- Basic service is the offering of "a pure transmission capability over a communications path that is virtually transparent in terms of its interaction with customer supplied information."<sup>182</sup>
- Enhanced services are "communications, which employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information . . . provide the subscriber additional,

178. Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities, *Final Decision and Order*, 28 F.C.C.2d 267, 287 (1971).

179. *Id.*

180. Amendment of Section 64.702 of the Comm'n's Rules and Regs., *Tentative Decision and Further Notice of Inquiry and Rulemaking*, 72 F.C.C.2d 358, para. 86 (1979) [hereinafter *Computer II Notice of Inquiry*].

181. *Id.* at para. 86.

182. See N. Am. Telecomm. Ass'n Petition for Declaratory Ruling Under § 64.702 of the Commission's Rules Regarding the Integration of Centrex, Enhanced Servs., and Customer Premises Equip., *Memorandum Opinion and Order*, 101 F.C.C.2d 349, para. 23 (1985) [hereinafter *NATA Centrex Order*].

different, or restructured information . . . or involve subscriber interaction with stored information.”<sup>183</sup>

Yet, the FCC continued to have problems with the distinctions. For example, the FCC classified certain types of “protocol processing” as basic service, specifically, “communications between a subscriber and the network itself for call setup, call routing, call cessation, calling or called party identification, billing, and accounting.”<sup>184</sup> This is a problem because “enhanced services” include “protocol processing.” But, the FCC reasoned, if this type of processing was considered enhanced, then plain old telephone services would be enhanced as well. To avoid this result, the FCC classified as basic services those protocol processing that were somehow intrinsic to basic services.<sup>185</sup>

Beyond relying on vague, categorical distinctions having no real meaning in technical or engineering terms, the FCC blurred the distinction further stating that a basic service is present “whether data calls are routed over a circuit switched network or a packet network.”<sup>186</sup> This concession to technical reality undermined the claim that basic services are “transparent”; they too are processes. For example, switched virtual circuits (“SVCs”) in connection-oriented packet-switched networks such as X.25,<sup>187</sup> Frame Relay,<sup>188</sup> and ATM were considered basic services,<sup>189</sup> even though they package voice and treat it like data, much as the Internet does. As a final example of blurring, the FCC in the *NATA Centrex Order* described another hybrid regulatory category: “adjunct to basic services” that facilitate the use of traditional telephone service but do not alter the

---

183. Amendment of Section 64.702 of the Commission’s Rules and Regulations (Second Computer Inquiry, *Memorandum Opinion and Order*, 84 F.C.C.2d 50, 50 n.6 (1980). I am indebted to the research of Kendall Koning for this analysis of VANS and protocol processing.

184. *Id.*

185. Again, I am grateful to Kendall Koning for this insight.

186. Amendment to Sections 64.702 of the Commission’s Rules and Regulations (Third Computer Inquiry) and Policy and Rules Concerning Rates for Competitive Common Phase II Carrier Service and Facilities Authorizations Thereof Communications Protocols under Sections 64.702 of the Commission’s Rules and Regulations, *Report and Order*, 2 F.C.C.R. 3072, para. 69 (1987).

187. Amendment to Sections 64.702 of the Commission’s Rules and Regulations (Third Computer Inquiry); and Policy and Rules Concerning Rates for Competitive Common Carrier Service and Facilities Authorizations thereof Communications Protocols under Sections 64.702 of the Commission’s Rules and Regulations, *Memorandum Opinion and Order on Reconsideration* 3 F.C.C.R. 1150, para. 53 (1988).

188. Bell Atlantic Telephone Companies Offer Of Comparably Efficient Interconnection To Intranet Management Service Providers, *Order*, 13 F.C.C.R. 15617, para. 11 (1998).

189. Bell Operating Companies Joint Petition For Waiver Of Computer II Rules, *Order*, 10 F.C.C.R. 13758, 13773 (1995).

fundamental character of telephone service.<sup>190</sup> These included voicemail and automated telephone menu systems that, like enhanced services, provide the subscriber with “additional, different, or restructured information; or involve subscriber interaction with stored information.”<sup>191</sup>

Adding to the technical confusion concerning the difference between enhanced services and basic services, there emerged confusion in legal terminology. The 1984 MFJ prohibited the Baby Bells from offering “information services.”<sup>192</sup> It defined this term as “the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing or making available information which may be conveyed via telecommunications . . .”<sup>193</sup> It was using the term to refer to things such as electronic yellow pages, but later, the FCC began to use the term interchangeably with enhanced services.<sup>194</sup>

The 1996 Act created additional levels of terminological confusion. It was primarily concerned with introducing competition in telecommunications markets allowing the Baby Bells to get into long-distance, and overcoming the MFJ’s prohibition. The 1996 Act also aimed to open the Baby Bells’ local monopolies to competition; it did this by requiring the Baby Bells to open their local networks to competitors.<sup>195</sup>

The Act also introduced new terms, “telecommunications” and “telecommunications services.” They became the defining terms for the Act’s scheme of deregulation as the services for which BOCs and LECs had deregulation and unbundling requirements. These terms were vague:

- “The term ‘telecommunications’ means the transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received.”<sup>196</sup>

190. See *NATA Centrex Order*, *supra* note 182, at paras. 23–28.

191. *Id.* at para. 39 (footnote omitted).

192. *United States v American Tel. and Tel. Co*, 552 F Supp. 131, 226–34 (D.D.C. 1982).

193. *Id.* at 179.

194. *Filing and Review of Open Network Architecture Plans, Memorandum Opinion and Order*, 4 F.C.C.R. 1, 23 n.60, 65 Rad. Reg. 2d (P&F) (1988) (“[T]he antitrust consent decree which compelled AT & T [sic] to divest the BOCs, originally prohibited the BOCs from offering any ‘information services,’ a class of services that apparently is similar to enhanced services.”).

195. Ernest A. Young, *State Sovereign Immunity and The Future of Federalism*, 1999 SUPREME COURT REV. 1, 39 (1999) (“In the 1996 Telecommunications Act, Congress broadly sought to open up local telephone markets to competition by preempting state-law monopolies over local phone service and requiring incumbent monopolists to facilitate market entry by granting competitors access to their networks.”).

196. 47 U.S.C. § 153(50) (2006).

- “The term ‘telecommunications service’ means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.”<sup>197</sup>

The Act also used the term “information services,” which was based on the definition in the MFJ<sup>198</sup> and which had a definition that was quite similar to the then-used definition for enhanced services. The Act, however, was not concerned with information services, using the term twenty-one times, as compared to the hundreds of times it used “telecommunications” or “telecommunications services.”<sup>199</sup> The FCC used the 1996 Act’s term “information services” interchangeably with “enhanced services.”<sup>200</sup>

In sum, after the 1996 Act, Section 201 continued to regulate common carriers, which were all bearers of “electronic messages.” Section 251 created deregulatory mandates for “telecommunications services,” which were also regulated under Section 201.<sup>201</sup> Meanwhile, for decades, FCC regulation had been creating definitions for “enhanced services” and “information services,” generally concluding that these terms were the same thing.<sup>202</sup> Finally, the 1996 Act adopted the FCC’s definition of “information services,” which is for the most part the same as “enhanced services.”<sup>203</sup> The Act, however, says next to nothing about the term, using the term twenty times out of its roughly 46,000 words.

Ironically, the Act’s passage preceded, by only a year or so, a tectonic shift in technology: the emergence of the World Wide Web and the Internet as a mass phenomenon. Prior to the Act, dial-up Internet service was regulated as an enhanced information service; the question quickly emerged was how broadband would be regulated. The FCC had two choices. It could classify broadband as a telecommunications service and

---

197. *Id.* § 153(53).

198. Cf. H.R. Rep. No. 104-204(I), pt. 1 at 125 (1995) (“Information service” and “telecommunications” are defined based on the definitions used in the MFJ).

199. These numbers are our own count.

200. In the *Non-Accounting Safeguards Order*, the FCC stated that interpreting “information services” to include all “enhanced services” provides a measure of regulatory stability for telecommunications carriers and ISPs alike, by preserving the definitional scheme under which the FCC exempted certain services from Title II regulation. Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, *First Report and Order and Further Notice of Proposed Rulemaking*, 11 F.C.C.R. 21905, para. 102 (1996) [hereinafter *Non-Accounting Safeguards Order*]; see also Federal-State Joint Board on Universal Service, *Report and Order*, 12 F.C.C.R. 8776, para. 788 (1997).

201. See *infra* Sec. V.

202. See *supra* notes 192–200 and accompanying text.

203. *Id.*

regulate it, or classify it as an information service. If it did the latter, it could regulate the Internet under Title I, a provision that gives the FCC “ancillary jurisdiction” over technologies that are related to a regulated technology.<sup>204</sup>

Then under the deregulatory-minded Chairman Michael Power, the FCC chose to classify broadband as an “information service” regulated under Title I, its “ancillary jurisdiction.”<sup>205</sup> This section of the Act gives the FCC the power to “perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of its functions.”<sup>206</sup> Because it did not want to apply the unbundling and interconnection mandates of the 1996 Act, regulating broadband under this jurisdiction seemed appropriate.

There was only one catch: the Act hardly mentions information services and gives the FCC no direct authority to regulate them. The FCC’s regulatory role was unclear. Some past precedent had read Title I authority quite expansively, most notably in *Southwestern Cable*,<sup>207</sup> which allowed the FCC to regulate cable television as ancillary to over-the-air. Later precedent was less expansive.

There was also a second catch, and one that has not truly been recognized: how regulating the Internet as the dominant form of communication under its ancillary jurisdiction disrupts the structure of regulating basic service, i.e., the dominant form of communication while deregulating the extras. The FCC argued that broadband service was different from “telecommunications” because it bundled telecommunications with information services—presumably transforming the service.<sup>208</sup> When everyone used telephones as the dominant form of communication, regulating enhanced services under Title I seemed logical. But, technologically, things flipped. The Internet became the dominant form of communication with voice communications literally (as with VoIP) riding on top of it. If anything, one could logically regulate telephones

204. Aaron K. Brauer-Rieke, *The FCC Tackles Net Neutrality: Agency Jurisdiction and the Comcast Order*, 24 BERKELEY TECH. L.J. 593, 602 (2009). The FCC has typically relied on its “ancillary jurisdiction” under Title I of the Act to regulate the Internet. See 47 U.S.C. § 159.

205. Brauer-Rieke, *supra* note 204; see also § 154(i) (This section authorizes the FCC to “perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of its functions.”).

206. 47 U.S.C. § 154(i) (2006).

207. United States v. Sw. Cable Co., 392 U.S. 157, 167 (1968).

208. Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facils., *Declaratory Ruling and Notice of Proposed Rulemaking*, 17 F.C.C.R. 4798, para. 2 (2002).

under Title I as ancillary to Title II Internet jurisdiction. Nonetheless, the FCC's regulatory scheme remained the same.

Regardless of the FCC's inconsistencies, the Supreme Court bought its argument in the famous *National Cable Telecommunications Association v. Brand X Internet Services* case.<sup>209</sup> By upholding the FCC's classification of Internet access as an information service as well as the FCC's assertion of Title I jurisdiction, the FCC was free *not* to impose the regulatory mandates. It could impose Title I regulations—a possibility that brought shivers to Justice Scalia in his dissent—but it was unknown if Title I would give adequate authority for any meaningful regulation.<sup>210</sup>

In its reasoning, the FCC relied on the *Computer II* basic/enhanced distinction, claiming that it was reflected in the telecommunications/information services distinction.<sup>211</sup> This is a bit of a stretch because, while there is evidence that Congress modeled “information services” on “enhanced services,” there is no evidence (either in the text or the legislative history) that basic services were meant to correspond to telecommunications.

The Court also claimed that telecommunications, like basic services in *Computer II*, is transparent, and therefore not a regulated telecommunications service:

[I]n the *Computer II* order establishing the terms “basic” and “enhanced” services, the Commission defined those terms functionally, based on how the consumer interacts with the provided information . . . . [T]he transmission occurs only in connection with information processing. It was therefore consistent with the statute’s terms for the Commission to assume that the parallel term “telecommunications service” in § 153(46) likewise describes a “pure” or “transparent” communications path not necessarily separately present in an integrated information-processing service from the end user’s perspective.<sup>212</sup>

---

209. 545 U.S. 967 (2005).

210. *Id.* at 1013 (Scalia, J., dissenting) (“[W]hat the Commission hath given, the Commission may well take away--unless it doesn't. This is a wonderful illustration of how an experienced agency can (with some assistance from credulous courts) turn statutory constraints into bureaucratic discretions . . . . Under its undefined and sparingly used ‘ancillary’ powers, the Commission might conclude that it can order cable companies to ‘unbundle’ the telecommunications component of cable-modem service. And presto, Title II will then apply to them, because they will finally be ‘offering’ telecommunications service! . . . Such Möbius-strip reasoning mocks the principle that the statute constrains the agency in any meaningful way.”).

211. *Id.* at 993–96.

212. *Brand X*, 545 U.S. at 970.

Of course, decades earlier the FCC conceded that “transparency” could not possibly serve as a distinction between basic and enhanced services, given its classification of packet switching and similar technologies as “basic.”<sup>213</sup>

Thus, *Brand X*, without acknowledging the great change it allowed the FCC to make, turned the Act upside down. Neither the *Computer Inquiries* nor the Act disrupted an essential regulatory structure that existed for almost one half a century: the form of dominant communications remained under regulation, whether that be Section 201 common carriage or Computer II’s basic service. However, by allowing the FCC to deregulate the dominant form of communications (via regulation under Title I)—simply because of technological shift from telephones to the Internet—the Supreme Court affects a sea change.

It is fair to say that few in 1996 foresaw that Internet communications would become dominant and replace telephones. Rather, it was assumed that the FCC would maintain authority over telephones—and any other dominant “wire communications”—as common carriers. The 1996 Act would have been far more controversial had its purpose been to remove federal control over the dominant form of national communication. The possibility of such a dramatic regulatory retreat does not appear anywhere in the legislative history.

To reiterate the point using statutory terms, by creating the term “telecommunications,” the 1996 Act never intended to undo Section 201’s broad jurisdictional scope. Rather, the term was used to define the scope of the 1996 Act’s deregulatory regime, i.e., local and long distance telephones. Similarly, information service was never meant to be some strange statutory waiting room in which the FCC would place into regulatory limbo new technologies. But that is what happened.

Of course, the one problem in this regime is that the scope of ancillary jurisdiction is unclear. As a result, when the FCC chose to regulate on that basis, as it did when it ordered Comcast to stop its secret disruption of P2P communications, Comcast successfully appealed. The D.C. Circuit ruled that the regulation of the Internet exceeded Title I ancillary jurisdiction because—as was evident since the *Brand X* decision—it was unclear to what the Internet regulation was ancillary.<sup>214</sup>

---

213. *Id.*

214. *Comcast Corp. v. FCC*, 600 F.3d 642, 646, 661 (D.C. Cir. 2010). The Court stated the rule: “‘The Commission . . . may exercise ancillary jurisdiction only when two conditions are satisfied: (1) the Commission’s general jurisdictional grant under Title I [of the Communications Act] covers the regulated subject and (2) the regulations are reasonably ancillary to the Commission’s effective performance of its statutorily mandated responsibilities.’” *Id.* at 646 (quoting *Am. Library Ass’n v. FCC*, 406 F.3d 689, 691–92 (D.C. Cir. 2005)).

As a final twist in this story, the FCC in the *Comcast* case relied (unsuccessfully) upon Section 706. This section gives the FCC authority to encourage deployment of “advanced services,” a term that the 1996 Act invented, including information services, and probably was intended to include the Internet. In the *Comcast* decision, the Court brushed aside Section 706 jurisdiction on the grounds that the FCC in a prior order had stated that Section 706 lacked jurisdictional import.

At last, we have arrived at how the D.C. Circuit will rule on the jurisdictional challenge in the *Open Internet Order*. Given the Supreme Court’s recent ruling in *FCC v. Fox Television Stations, Inc.*,<sup>215</sup> which gives the FCC great latitude to change its mind, the D.C. Circuit will have to rule on whether Section 706 gives the FCC sufficient authority to regulate the jurisdiction, rather than dismiss on those grounds because the FCC once determined that they lacked jurisdictional basis.

This is not the place to discuss whether the FCC was correct that Section 706 does grant jurisdiction and the level of deference its determination should receive.<sup>216</sup> We suspect that whether the *Order* will be upheld will depend on whether the D.C. Circuit dismisses the text as exhortatory, in which case jurisdiction is unlikely to be found.

Yet, what has gone unremarked upon is that the FCC also relied upon Section 201 in the *Open Internet Order*. It stated that it had ancillary authority to its Section 201 authority to regulate over-the-top VoIP services, which “are increasingly being used as a substitute for traditional telephone service.”<sup>217</sup> This is the *Computer Inquiries*, indeed the history of Section 201 jurisdiction, flipped on its head. Once computer-based communications were ancillary to telephony—now telephony is ancillary to computer-based communications.

What is amazing about this regulatory transformation is that the statute never changed. The statutory authority of the FCC never changed with regard to the Internet and communications in general. No one can fairly look at the text or legislative history of the 1996 Act and see Congress’s intent to retreat from regulating the nation’s dominant communications network. Nothing in the 1996 Act evidences any congressional judgment that the dominant form of wire communications should be regulated as a common carrier. Nothing in the 1996 Act

---

215. 129 S. Ct. 1800 (2009).

216. It may very well be wrong. See Daniel A. Lyons, *Tethering the Administrative State: The Case Against Chevron Deference for FCC Jurisdictional Claims*, 36 J. CORP. L. 823 (2010); Nathan Alexander Sales & Jonathan H. Adler, *The Rest is Silence: Chevron Deference, Agency Jurisdiction, and Statutory Silences*, 2009 U. ILL. L. REV. 1497, 1526–28 (2009).

217. *Open Internet Proceeding Report and Order*, *supra* note 1, at para. 125.

evidences a retreat from the basic structure of regulating basic communications—and leaving more advanced technologies to the market. Whether one believes this transformation is a good or a bad thing is an ideological question about which, given our skepticism voiced earlier in the Article, we do not believe firm conclusions are possible at this time. But what is remarkable is that such a radical change could occur without a direct democratic input. This shift speaks to the power of agencies and those who influence them, a power that our strange and ambiguous regulatory statutes magnify.

## VI. CONCLUSION

The network neutrality debate has suffered from lawyers playing economists. Legal scholars and policy wonks have bandied about economic theories without collecting information about industry organization to make intelligent conclusions about these theories' applications. Further, it is not clear that economic theory is currently in a position to offer any clear policy guidelines. Even more fundamentally, the debate, as well as the FCC Open Internet Proceeding, has suffered from an uncritical use of the term "discrimination." It is a concept with which lawyers are quite familiar, and it has an established meaning in circuit-switched telephone networks referring to an "equality of treatment" at switch points. We show, however, that discrimination in Internet networks is far more complex, involving a type of "equality of outcomes." In the Internet, there is no necessary relationship between equality of treatment in Internet traffic and equality of outcomes—at least outcomes people care about. Finally, actual Internet controversies, such as BitTorrent, implicate issues beyond Internet traffic protocol. Our suggestion responds to the unsettled industrial theory and the heightened normative concerns with a solution of law. The FCC should pursue case-by-case adjudication. This adaptive approach lets principles emerge from practice, and thus grows doctrines of law for the open Internet.