Center for Technology, Innovation and Competition

Penn Law

http://www.law.upenn.edu/academics/institutes/ctic/

University of Pennsylvania Law School
3400 Chestnut Street
Philadelphia, PA 19104-6204

December 22, 2014

Via ECFS

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte Submission*
Protecting and Promoting the Open Internet, GN Docket 14-28
Preserving the Open Internet, GN Docket 09-191
Framework for Broadband Internet Service, GN Docket 10-127

Dear Ms. Dortch:

President Obama's November 10 statement on network neutrality focused the policy debate on whether the Commission should reclassify broadband Internet access as a Title II service. As the John H. Chestnut Professor of Law, Communication, and Computer & Information Science and the Founding Director of the Center for Technology, Innovation and Competition at the University of Pennsylvania, I submit this ex parte to offer my views on this important policy issue.[1]

I. LEGAL OBSTACLES TO TITLE II RECLASSIFICATION

On multiple occasions dating back to 1998, the Commission has ruled that broadband access services are information services that fall outside of Title II.[2] The Supreme Court applied *Chevron* deference to uphold this determination in *Brand X* as a reasonable interpretation of the

---

[1] I have not been retained by any party of the parties in the above captioned matter. The Center for Technology, Innovation and Competition does receive support from numerous parties on both sides of this issue, including AT&T, Comcast, CTIA, Google, Microsoft, NCTA, Time Warner Cable, and Verizon. All supporters do not have control over the positions taken by the Center. Much of the discussion in this ex parte has been adapted from Christopher S. Yoo, Wickard *for the Internet?: Network Neutrality after* Verizon v. FCC, 66 FED. COMM. L.J. 415 (2014), which is available on Westlaw.

[2] *See* Federal-State Joint Board on Universal Service, Report to Congress, 13 FCC Rcd. 11501, 11520–23 paras. 39–43, 11536–40 paras. 73–81 (1998); Inquiry Concerning High-Speed Access to the Internet over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd. 4798, 4820 para. 34, 4822–23 paras. 38–39 (2002), *aff'd sub nom.* Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967, 996–1000 (2005); Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd. 14853, 14862–63 paras. 12–14, 14909–12 paras. 102–107 (2005); United Power Line Council's Petition for Declaratory Ruling Regarding the Classification of Broadband over Power Line Internet Access Service as an Information Service, Memorandum Opinion and Order, 21 FCC Rcd. 13281, 13285–86 paras. 8–10 (2006); Appropriate Regulatory Treatment for Broadband Access to the Internet over Wireless Networks, Declaratory Ruling, 22 FCC Rcd. 5901, 5909–11 paras. 19–27 (2007).

Communications Act.[3] The Commission floated the possibility of reclassifying broadband access as a Title II service while considering the Open Internet Order.[4] It ultimately declined to do so, but left the Title II reclassification proceeding open.[5]

As *Brand X* made clear, *Chevron* does not preclude the Commission from modifying its construction of a statute that it administers so long as it provides an adequate justification for the change.[6] Thus, the fact that the Commission has ruled on multiple occasions that broadband access is not a Title II telecommunications service does not foreclose the Commission from revisiting that conclusion.

To say that the agency may reevaluate its construction, however, does not relieve it from satisfying *Chevron*'s standard of review. *Chevron* Step one requires that the statute's text not foreclose the proffered construction of the statute. If Congress has directly addressed the issue, congressional intent controls.[7]

1. Statutory Barriers to Reclassification

I have addressed the statutory barriers to Title II reclassification elsewhere and will only sketch my objections here.[8] The statute defines a "telecommunications service" as a provider that offers for a fee directly to the public "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."[9] The Commission (with the Supreme Court's and the D.C. Circuit's approval) has characterized telecommunications as "pure" transmission that does not involve computer processing or storage.[10]

The statutory requirement that the transmission take place between points *specified by the user* prevents much of broadband Internet access from being reclassified as a Title II telecommunications service. On the Internet, physical locations are identified by an Internet Protocol (IP) address, which in the case of IP version 4 is usually represented by four numbers between 0 and 255 separated by dots (such as 128.91.34.233, which is one of the IP addresses assigned to the University of Pennsylvania).[11] End users and applications typically do not rely on IP addresses, however. Instead, they generally use domain names _ universal record locators (such as upenn.edu) to access Internet resources, relying on a service known as the Domain Name System (DNS) to map domain names onto IP addresses.[12] The fact that end users can choose their DNS provider does not change the analysis. Selecting an alternative DNS provider

---

[3] Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 968–69 (2005).

[4] Framework for Broadband Internet Service, Notice of Inquiry, 25 FCC Rcd. 7866, 7867 para. 2, 7919 (2010); JULIUS GENACHOWSKI, THE THIRD WAY: A NARROWLY TAILORED BROADBAND FRAMEWORK 4 (2010), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-297944A1.pdf; AUSTIN SCHLICK, A THIRD-WAY LEGAL FRAMEWORK FOR ADDRESSING THE *COMCAST* DILEMMA 3 (2010), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-297945A1.pdf.

[5] *See* Wireline Competition Bureau Seeks to Refresh the Record in the 2010 Proceeding on Title II and Other Potential Legal Frameworks for Broadband Internet Access Service, Public Notice, 29 FCC Rcd. 5856 (2014).

[6] *Brand X*, 545 U.S. at 981.

[7] *Id.* at 982.

[8] Christopher S. Yoo, *Is There a Role for Common Carriage in an Internet-Based World?*, 51 HOUS. L. REV. 545, 563-70 (2013).

[9] 47 U.S.C. § 153(46) (2006).

[10] Amendment of Section 64.702 of the Commission's Rules and Regulations (Second Computer Inquiry, Final Decision, 77 F.C.C.2d 384, 420 para. 96 (1980); *Brand X*, 545 U.S. at 976-77; *Verizon*, 740 F.3d at 630.

[11] Yoo, *supra* note 8, at 565.

[12] Yoo, *supra* note 8, at 565.

simply transfers the decision about the points of transmission to a different third-party. Unless the end user operates a private DNS service or invokes IP addresses by number instead of relying on URLs, it is the third-party DNS provider that specifies the endpoint of the transmission, not the end user.[13]

The fact that the end user does not specify the points of communication is apparent to anyone who has attempted to access Google's website from another country.[14] Simply put, there is not a one-to-one correspondence between IP addresses and URLs that can be performed mechanically. Instead, the DNS often routes the same domain name to different locations based on its inference of which location is most likely to be the one the end user wants. Moreover, the same URL often maps onto multiple IP addresses. To cite one example, the website for the University of Pennsylvania actually consists of two unique IP addresses: 128.91.34.233 and 128.91.34.234. It is the DNS that determines which location will serve a particular request, not the end user.

Content delivery networks (CDNs) provide another illustration of this dynamic.[15] CDNs store popular web content in thousands of locations around the world. For example, market leader Akamai uses nearly 150,000 servers throughout the network to serve 30% of the world's web content.[16] CDNs like Akamai rely on DNS to determine from which their thousands of caches they should serve any particular request.[17]

The Supreme Court has upheld the conclusion that the DNS and caching functions associated with the typical broadband access service inevitably involve both computer processing and storage and thus take broadband access outside the scope of Title II.[18] Although the National Science Foundation is currently studying a proposal to restructure Internet addresses so that they refer to particular content rather than particular locations,[19] such proposal have yet to be adopted. And if they are adopted someday, they will not change the fact that the statute defines telecommunications service (and thus the scope of Title II) in terms of locations, not content.

Thus, unless the user employs IP addresses instead of domain names or maintains his or her own DNS, it is a third-party DNS provider that selects the points of transmission, not the end user. As a result, it is impossible to see how broadband access can fit within the statutory definition of telecommunications service governed by Title II under *Chevron* step one.

2. Difficulties Implementing Forbearance

Furthermore, any solution based on Title II reclassification would require the Commission to forbear from a number of statutory provisions, as both the Commission[20] and

---

13 *Id.* at 564.

14 *Id.* at 567.

15 *Id.* at 566.

16 Press Release, NanoTech's Nuvola NP-1 4K Streaming Media Player Demonstrated with Akamai Media & Delivery Solutions at NAB 2014 (Mar. 19, 2014), *available at* http://finance.yahoo.com/news/nanotech-nuvola-np-1-4k-204400686.html.

17 Yoo, *supra* note 8, at 567.

18 *Brand X*, 545 U.S. at 998–1000.

19 Named Data Networking, http://named-data.net/ (last visited May 23, 2014).

20 *2014 Open Internet NPRM*, *supra* note **Error! Bookmark not defined.**, at 5615–16 paras. 153–155.

advocates of reclassification have noted.[21] The forbearance provision enacted by the Telecommunications Act of 1996 requires the Commission to forbear from "applying any regulation or any provision of [Title II] to a telecommunications carrier" that the agency finds is not necessary to ensure just and reasonable practices and is not necessary to protect consumers and that forbearing from such regulation is "consistent with the public interest."[22] In making determining whether to forbear, the Commission must consider "whether forbearance . . . would promote competitive market conditions."[23]

Scholars have criticized the agency's initial attempts to implement forbearance for failing to establish clear evidentiary standards.[24] Of particular note, the Commission's early decisions approved partial forbearance in medium-sized cities[25] yet denied it in major urban areas most likely to be competitive only to see the latter decision overturned by the courts as arbitrary and capricious.[26] Moreover, with respect to voice services, the Commission's framework overlooked the extent to which mobile wireless and VoIP served as substitutes for traditional wireline services.[27]

But more importantly for purposes of Title II reclassification, the Commission has made market power the touchstone for forbearance.[28] The Commission's approach is problematic in two ways. First, establishing a market power test based on marginal cost pricing that is inherently inconsistent with the high fixed-cost nature of telecommunications networks.[29]

Second, the Commission would have to find that these markets are subject to sufficient potential competition to justify forbearance. Such a finding would have broad implications that would affect a wide variety of other regulatory proceedings.

---

[21] *See* Comments of the Open Technology Institute at the New America Foundation and Benton Foundation at 26, Protecting and Promoting the Open Internet, FCC GN Docket No. 14-28 (rel. May 15, 2014), *available at* http://newamerica.net/sites/newamerica.net/files/profiles/attachments/OTI_NN_Comments_FINAL.pdf.

[22] 47 U.S.C. § 160(a) (2006).

[23] *Id.* § 160(b).

[24] Rob Frieden, *Case Studies in Abandoned Empiricism and the Lack of Peer Review at the Federal Communications Commission*, 8 J. ON TELECOMM. & HIGH TECH. L. 277, 292 (2010).

[25] Petition for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Omaha Metropolitan Statistical Area, Memorandum Opinion and Order, 20 FCC Rcd. 19415 (2005) [hereinafter Omaha Forbearance Order], *aff'd sub nom.* Qwest Corp. v. FCC, 482 F.3d 471 (D.C. Cir. 2007); Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act of 1934, as Amended, for Forbearance from Sections 251(c)(3) and 252(d)(1) in the Anchorage Study Area, Memorandum Opinion and Order, 22 FCC Rcd. 1958 (2007), *modified by* Petition for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Omaha Metropolitan Statistical Area, Memorandum Opinion and Modified Protective Orders, 23 FCC Rcd. 1716 (2008).

[26] Petition of Verizon Telephone Companies for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Boston, New York, Philadelphia, Pittsburgh, Providence, and Virginia Beach Metropolitan Statistical Areas, Memorandum Opinion and Order, 22 FCC Rcd. 21293 (2007), *remanded sub nom.* Verizon Tel. Cos. v. FCC, 570 F.3d 294 (D.C. Cir. 2009).

[27] Seth L. Cooper, *Forbearance Follies: What the FCC's New Framework Portends for the "Third Way"* 3–4 (Free State Found., Perspectives from FSF Scholars Vol. 5 No. 18, 2010), *available at* http://www.freestatefoundation.org/images/Forbearance_Follies_070810.pdf.

[28] Petition of Qwest Corp. for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area, Memorandum Opinion and Order, 25 FCC Rcd. 8622, 8645 para. 41 (2010); Omaha Forbearance Order, *supra* note 25, at 19425-26 para. 18.

[29] George S. Ford & Lawrence J. Spiwak, *The Impossible Dream: Forbearance After the Phoenix Order* (Phx. Ctr. for Advanced Legal & Econ. Pub. Pol'y Studs., Paper No. 10-08, 2010), *available at* http://ssrn.com/abstract=1740558.

II. POLICY CONSIDERATIONS WEIGHING AGAINST TITLE II RECLASSIFICATION

Even if the legal obstacles to reclassifying broadband Internet access as a Title II service were somehow overcome, the Commission should evaluate whether reclassification makes sense from the standpoint of policy. If the purpose of reclassification is to prohibit paid prioritization, the Commission should keep in mind that Title II has never served as a bar to charging different amounts for different tiers of service. Moreover, during the 1980s, the Commission was largely moving away from common carriage, because of its direct costs and its tendency to limit service offerings, distort investment decisions, inflate costs, and dampen incentives for innovation.[30]

A. Difficulties Implementing Common Carriage

Proponents of Title II reclassification must come to grips with how difficult common carriage has proven to implement in practice. I have addressed the statutory barriers to Title II reclassification elsewhere and will only sketch my objections here.[31]

1. Nondiscrimination

Nondiscrimination prohibits charging different prices for the same goods that are not justified by differences in cost. The result is that any decision-maker confronted with a nondiscrimination claim would have to evaluate differences in product quality and in production technologies. Such disputes are likely to involve nonprice terms and conditions as well. Furthermore, unless to yield consumer benefits, any nondiscrimination regime must be accompanied by rate regulation.

a. Differences in Quality

Nondiscrimination requires determining whether any prices differences are justified by differences in product characteristics. Such an inquiry is simple when the product quality varies only on a small number of dimensions that are easily measurable, as is the case with water, electric power, natural gas, and conventional telephone service.

Broadband Internet access varies in quality on a wide range of dimensions, including bandwidth, delay, jitter, and reliability. Moreover, customers are demanding an ever-broadening range of services that are more highly differentiated. Conventional public utility-style regulation such as common carriage is ill suited to such situations.[32]

---

[30] *See* Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations Therefor, First Report and Order, 85 F.C.C.2d 1 (1980) (as well as subsequent five orders); Comprehensive Review of Rate of Return Regulation of the U.S. Telecommunications Industry, 51 Fed. Reg. 36837 (Oct. 16, 1986) (notice; request for comments); NAT'L TELECOMMS. & INFO. ADMIN., U.S. DEP'T OF COMMERCE, NTIA REGULATORY ALTERNATIVES REPORT 13–31 (1987), *available at* http://www.its.bldrdoc.gov/publications/87-222.aspx; John Haring & Evan Kwerel, *Competition Policy in the Post-Equal Access Market* 5–11 (FCC Office of Plans & Pol'y, Working Paper, 1987), *available at* http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp22.pdf. *See generally* Scott M. Schoenwald, *Regulating Competition in the Interexchange Telecommunications Market: The Dominant/Nondominant Carrier Approach and the Evolution of Forbearance*, 49 FED. COMM. L.J. 367, 414–16 (1997) (providing a brief overview of these criticisms).

[31] Yoo, *supra* note 8, at 573-605.

[32] For examples from cloud computing, see Ergin Bayrak, John P. Conley & Simon Wilkie, *The Economics of Cloud Computing*, 27 KOREAN ECON. REV. 203, 211–12 (2011); Erik Brynjolfsson, Paul Hofmann & John Jordan, *Cloud Computing and Electricity: Beyond the Utility Model*, COMM. ACM, May 2010, at 32, 34; Kenji E. Kushida,

b. Differences in Cost

Nondiscrimination also requires determining whether any rice differentials are justified by differences in cost. Indeed, charging the same price for products with different costs is itself a form of discrimination.

While such inquiries are easier when production technologies are uniform, they become quite complex when production technologies vary widely and are dynamic, as is the case in broadband. Moreover, the cost of network services varies with the density, which makes charging the same amount for both urban and rural service discriminatory.[33] Moreover, a truly nondiscriminatory regime would have to into account the differences in cost during times of day.

c. Nonprice Terms and Conditions

There is no reason to expect that disputes over discrimination will be limited to price. On the contrary, one should expect disputes over discrimination to include nonprice terms and conditions as well.[34]

This implies that regulators who wish to mandate network neutrality will have to police nonprice terms of service. This might be feasible when the product is simple and the interface is easy to monitor and requires little information.[35] As the Supreme Court recognized in *Trinko*, nondiscrimination is difficult to supervise when the product is complex and the interface between telecommunications providers creates myriad nonprice-related dimensions along which the providers can discriminate,[36] as is the case with broadband.

d. The Inevitability of Rate Regulation

In addition, nondiscrimination mandates aimed at preventing exclusion inevitably requires some form of rate regulation. Consider first the case in which the provider is vertically integrated. Vertically integrated broadband Internet access providers could exclude simply by charging a prohibitively high price to both affiliated and unaffiliated content providers. This would not harm the vertically integrated providers, as it would simply transfer profits from the content division to the networking division. It would still effectively exclude the unaffiliated content provider.

Eliminating this incentive through structural separation would not eliminate the need for rate regulation. As an initial matter, as the third *Computer Inquiry* and the breakup of AT&T demonstrated, structural separation mandates impose significant costs. More importantly, structural separation without rate regulation would not stop the broadband Internet access providers that possess market power from charging all content providers a supracompetitive price, in which case the regulation would not yield any consumer benefits at all.

Jonathan Murray & John Zysman, *Diffusing the Cloud: Cloud Computing and Implications for Public Policy*, 11 J. INDUS. COMPETITION & TRADE 209, 212 (2011).

[33] *See* Verizon Commc'ns Inc. v. FCC, 535 U.S. 467, 480 (2002) (candidly acknowledging that rate averaging represents "state-sanctioned discrimination").

[34] *See* Christopher S. Yoo, *Network Neutrality and the Economics of Congestion*, 94 GEO. L.J. 1847, 1896-97 (2006) [hereinafter Yoo, *Congestion*]; Christopher S. Yoo, *Vertical Integration and Media Regulation in the New Economy*, 19 YALE J. ON REG. 171, 244-46, 268-69 (2002).

[35] *See* Gerald R. Faulhaber, *Policy-Induced Competition: The Telecommunications Experiments*, 15 INFO. ECON. & POL'Y 73, 76-86 (2003).

[36] Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP, 540 U.S. 398, 414–15 (2004).

2. Rate Regulation

Rate regulation is thus an inevitable part of any nondiscrimination regime. Title II would also require decision-makers to ensure that rates are just and reasonable.[37]

The methodologies for evaluating the reasonableness of rates have long been criticized as problematic. Indeed, the Supreme Court has called determining whether a particular rate is reasonable is an "embarrassing question."[38] Justice Brandeis similarly called assessing the reasonableness of rates a "laborious and baffling task."[39] The classic problems include:

- Determining the proper rate of return
- Determining whether to determine the rate base using historical or replacement cost;
- Avoiding cost inflation by limiting recovery of costs to prudent investments without inducing hindsight bias;
- Avoiding compensating regulated entities for obsolete technologies;
- Allocation of common costs across multiple services;
- Discouraging innovation through guaranteeing rates of return on existing products;
- Avoiding biases towards inefficient, capital-intensive solutions (Averch-Johnson effect);
- Information asymmetry;
- The tendency to forestall competitive entry; and
- The need for constant exceptions for unique business models.[40]

Although price caps were supposed to eliminate such problems, they raised problems of their own. Classic problems include determining the appropriate inflation index, the fact that initial rates are based on historical cost, determining truly exogenous costs, and avoiding ex post regulatory opportunism in setting the productivity dividend to capture any benefits from cost reductions. The empirical record is mixed at best.[41]

3. Facilitation of Collusion

Common carriage also mandates numerous practices that facilitate collusion. These include:

- Entry restrictions,
- Standardization of products and pricing,
- Pooling of pricing and product information,
- Advance notice of changes in price and product,
- Prohibition of hidden price cuts, and

---

[37] 47 U.S.C. § 201(b) (2006).

[38] Smyth v. Ames, 169 U.S. 466, 546 (1898).

[39] Missouri *ex rel.* Sw. Bell Tel. Co. v. Pub. Serv. Comm'n, 262 U.S. 276, 292 (1923) (Brandeis, J., concurring).

[40] Yoo, *supra* note 8, at 581–95.

[41] Yoo, *supra* note 8, at 595–600.

- Allowing the government to serve as the means for forcing parties to adhere to the agreed upon prices.[42]

Moreover, with respect to traditional telephony, the increasingly specialized needs of business customers led them to request an ever-growing number of special access tariffs and waivers designed to tailor services to individual customers' particular needs. In light of the growing diversity of Internet applications, imposition of Title II regulation would likely deluge regulators with a similar range of requests.

B. The Permissibility of Prioritized Service

Common carriage does not prohibit the creation of different classes of service so long as it provides each class of service to all comers.[43] Thus, notwithstanding the claims of some network neutrality proponents, Title II reclassification would not necessarily prevent broadband access providers from offering premium services at premium prices.[44]

In fact, even common carriers typically enjoy the ability to offer different classes of service and to charge different amounts for them. In one extreme case, AT&T created a separate class of service for a single customer; the FCC's attempt to prevent AT&T from doing so was overturned in the courts.[45] Ironically, in declaring prioritized service to be presumptively invalid, the nondiscrimination rule in the Open Internet Order would have forbidden a practice that common carriage would have explicitly permitted.[46]

III. THE PROBLEMS WITH EXTENDING NETWORK NEUTRALITY TO INTERCONNECTION AGREEMENTS

Both the 2010 Open Internet Order and the 2014 Open Internet Notice of Proposed Rulemaking made clear that the rules were designed to ensure equal treatment of traffic *within* a broadband access provider's network. The rules were not meant to equalize the terms under which traffic *arrives* at a broadband provider's network.

As a result, the Commission has repeatedly clarified that the Open Internet rules do not apply to interconnection agreements between Internet service providers (ISPs).[47] Some voices have begun to call for bringing interconnection agreements within the scope of the network neutrality debate.

Attempting to equilibrate interconnection agreements would turn every bilateral negotiation between two ISPs into a regulatory matter. Indeed, in a network comprised of more than 30,000 networks interconnected through bilateral agreements, variations in price and latency are endemic.

---

[42] *Id.* at 602–05. *See generally* Scott M. Schoenwald, *Regulating Competition in the Interexchange Telecommunications Market: The Dominant/Nondominant Carrier Approach and the Evolution of Forbearance*, 49 FED. COMM. L.J. 367, 414–16 (1997) (providing a brief overview of these criticisms).

[43] *See supra* notes 43–**Error! Bookmark not defined.** and accompanying text.

[44] Yoo, *supra* note 8, at 574 n.183.

[45] AT&T Communications, Revisions to Tariff FCC No. 12, Memorandum Opinion and Order, 4 FCC Rcd. 4932, 4938 para. 57 (1989), *rev'd and remanded sub nom.* MCI Telecomms. Corp. v. FCC, 917 F.2d 30, 37 (D.C. Cir. 1990).

[46] *See* Daniel A. Lyons, *Net Neutrality and Nondiscrimination Norms in Telecommunications*, 54 ARIZ. L. REV. 1029, 1058 (2012).

[47] *See infra* notes 87-88 and accompanying text.

1. The Mischaracterization of Peering as Zero-Price Interconnection

It is often said that the Internet is a network of networks.[48] What this means in practice is that traffic that originates on one network often terminates on another network.[49] To make this possible, ISPs enter into contracts with other Internet service providers ("ISPs") to exchange traffic. Because the terminating ISP also incurs costs,[50] the traditional rule was that the originating ISP would make what is known as a transit payment to compensate the terminating ISP for providing services to the originating ISP's customers.[51]

If traffic is roughly symmetrical, ISPs can reduce costs by foregoing monitoring and billing for the exchange of traffic and instead calling it a wash, a practice commonly known as settlement-free peering.[52] Such arrangements make economic sense only if the traffic exchanged is symmetrical in terms of cost and value. If traffic becomes out of ratio, peering contracts typically call for transit-style payments.[53]

The fact that peering agreements include a symmetry requirement underscores that they are more properly regarded as a form of barter that is conditional on an even exchange.[54] Consider what would happen if one of the parties to a peering contract that was roughly in balance suddenly signed up a customer that caused a significant increase in the amount of traffic that it was handing off to the other party for termination. At this point, the traffic would likely be out of ratio, in which case the terminating ISP would have to incur significant costs to terminate the traffic and the peering contract would typically call for the originating ISP to make a payment to the terminating ISP. Insisting that all interconnection occur at a zero price regardless of the amount of traffic is inconsistent with the barter-based justification underlying peering arrangements.

Certainly, the originating ISP would like the terminating ISP to bear all of the costs of doing so. Conversely, the terminating ISP would like the originating ISP to pay for the costs, as required by the typical peering contract. Both parties benefit from delivering greater value to the end users. The usual solution would be for both parties to bear part of the costs based on their relative elasticities of demand.[55] Mandating zero-price interconnection would prevent this from occurring.

---

[48] The discussion that follows is adapted from my testimony before the Senate Judiciary Committee on April 9, 2014. *Examining the Comcast-Time Warner Cable Merger and the Impact on Consumers: Hearing Before the S. Comm. on the Judiciary*, 113th Congress (2014), *available at* http://www.judiciary.senate.gov/imo/media/doc/04-09-14YooTestimony.pdf.

[49] Michael Kende, *The Digital Handshake: Connecting Internet Backbones*, 11 COMMLAW CONSPECTUS 45, 51 & n.60 (2003) ("In a settlement arrangement . . . the carrier on which the traffic originates pays the other carrier to terminate the traffic.").

[50] *Id.* at 47–52.

[51] CHRISTOPHER S. YOO, THE DYNAMIC INTERNET 64, 94 (2012).

[52] Kende, *supra* note 49, at 49.

[53] YOO, *supra* note 51, at 64, 95–96.

[54] Kende, *supra* note 49, at 52 ("[P]eering agreements are the result of commercial negotiations; each backbone bases its decisions on whether, how and where to peer by weighing the benefits and costs of entering into a particular interconnection agreement with another backbone.").

[55] For a detailed discussion of Internet backbone competition in light of end user demand elasticity, see Jean-Jacques Laffont et al., *Internet Interconnection and the Off-Net-Cost Pricing Principle*, 34 RAND J. ECON. 370 (2003).

2. The Multiple Functions Performed by Prices

Insisting that interconnection always occur at a zero price would also ignore the important role that prices play in any market economy. In terms of Internet interconnection, prices perform three key functions.

First, prices allocate scarce resources and allow markets to clear while helping to ensure that those resources are employed only when the benefits of doing so exceed the costs.[56] Second, they provide an incentive for interconnection partners to conserve on bandwidth. Third, if supracompetitive prices emerge, they signal to other actors that the market is in short-run disequilibrium and provides the incentive for others to enter the market. Entry by other players shifts the supply curve out until the market is once again in long-run equilibrium.[57]

Imagine what would happen if all interconnection prices were required to equal zero. First, because prices could not rise, markets could not clear, so they would end up in persistent shortage.[58] Second, interconnection partners would have no incentive to rationalize their consumption or to invest in technologies that consume less bandwidth.[59] Third, and worst of all, zero-price interconnection would prevent those who invest in value-creating activities from earning a return and thus risk inhibiting innovation.[60]

Internet companies are investing in their businesses in an attempt to gain an edge on the competition, and any advantage gained only serves to force competitors to make new investments of their own. Consider the impact that the cable industry's deployment of DOCSIS 3.0[61] and the advent of Google Fiber[62] have had on telephone companies. The higher investments by these companies are forcing AT&T to respond in kind. [63] Faced with competitors able to deliver significantly higher bandwidth, AT&T has begun deploying more advanced DSL technologies capable of delivering between 45–100 Mbps service.[64] Where these services have been deployed, AT&T is successfully taking customers from the cable companies with which it competes.[65]

---

[56] Yoo, *Congestion*, *supra* note 34, at 1864.

[57] Christopher S. Yoo, *Rethinking the Commitment to Free, Local Television*, 52 EMORY L.J. 1579, 1590–91 (2003).

[58] *See, e.g.*, DANIEL F. SPULBER & CHRISTOPHER S. YOO, NETWORKS IN TELECOMMUNICATIONS: ECONOMICS AND LAW 78–83 (2009) (discussing the harmful economic consequences of price controls).

[59] *See* Yoo, *supra* note 56, at 1864–65.

[60] *See* Yoo, *supra* note **Error! Bookmark not defined.**, at 48–53; Christopher S. Yoo, *Network Neutrality, Consumers, and Innovation*, 2008 U. CHI. LEGAL F. 179, 235–37 [hereinafter Yoo, *Consumers*].

[61] *See Eighth Broadband Progress Report*, *supra* note **Error! Bookmark not defined.**, at 10385 para. 92.

[62] *See* John Brodkin, *Google Fiber Chooses Nine Metro Areas for Possible Expansion*, ARS TECHNICA (Feb. 19, 2014, 1:00 PM), http://arstechnica.com/business/2014/02/google-fiber-chooses-nine-metro-areas-for-possible-expansion/.

[63] *See, e.g.*, Applications and Public Interest Statement of Comcast Corp. and Time Warner Cable Inc. at 42–52, Applications of Comcast Corp. and Time Warner Cable Inc. for Consent to Assign and Transfer Control of Licenses and Other Authorizations, FCC MB Docket No. 14-57 (rel. July 10, 2014), *available at* http://corporate.comcast.com/images/Comcast-Public-Interest-Statement-April-8.pdf (chronicling virtuous cycle of investment by cable and telco broadband providers in infrastructure upgrades including FTTN and VDSL2 with pair bonding).

[64] Press Release, AT&T, AT&T to Invest $14 Billion to Significantly Expand Wireless and Wireline Broadband Networks, Support Future IP Data Growth and New Services (Nov. 7, 2012), http://www.att.com/gen/press-room?pid=23506&cdvn=news&newsarticleid=35661&mapcode=.

[65] *See* Mark A. Israel, Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters at 71 para. 80, Applications of Comcast Corp. and Time Warner Cable Inc. for Consent to Assign and Transfer Control of Licenses and Other Authorizations, FCC MB Docket No. 14-57 (rel. July 10, 2014),

This type of dynamic is not limited to horizontal competition. Service providers are providing high-value content and services with strong customer appeal. The desirability of these products in turn strengthens these companies' hand when negotiating interconnection agreements.

Indeed, this is exactly what appears to be occurring with Netflix. Netflix has been a spectacular success, largely because of the billions of dollars in forward contracts in content that it has undertaken.[66] These risks have paid off spectacularly, and Netflix has grown to more than one-third of all primetime Internet traffic in the U.S.[67] Like any for-profit company, Netflix would prefer it if the ISPs bore as much of the burden of the additional costs of carrying this traffic as possible. Indeed, that is the gist of its Open Connect program, which requires ISPs to terminate Netflix traffic for free.[68] The strong bargaining leverage created by Netflix's investments has led many ISPs to embrace Open Connect.[69]

Netflix must be permitted to exercise the bargaining power created by its investments if it is to be expected to continue to invest in the future. Other ISPs have resisted and have made investments of their own in an attempt to gain bargaining leverage.[70] This pattern of move and countermove in an attempt to reap economic benefit is what drives investment and innovation. This is the true virtuous circle of innovation.

All of this is a natural part of healthy bargaining process. As in the typical case, both sides reached an interconnection agreement that divides the costs. Applying network neutrality to such disputes would turn every garden-variety bargain over price that characterizes every arms-length economic transaction into a regulatory matter. To the extent that it deprives firms of returns that are the result of the entrepreneurial risks they have taken, it threatens to cause the virtuous circle to stall. Determining the price that appropriately divides the costs is greatly complicated by the fact that the Internet constitutes a two-sided market.[71] The economics of two-sided markets are somewhat complex.[72] Conventional economics has long recognized the existence of "network economic effects," which cause a network to increase in value as the number of users connected to it increases.[73] To use a classic example, the value of a telephone

---

available at http://corporate.comcast.com/images/2014-09-23-REDACTED-Comcast-TWC-Opposition-and-Response-Exhibit-1-Israel.pdf.

[66] *See, e.g.*, Mark Sweney, *Netflix to Spend $3bn on TV and Film Content in 2014*, THE GUARDIAN (Feb. 5, 2014, 11:07 AM), http://www.theguardian.com/media/2014/feb/05/netflix-spend-3-billion-tv-film-content-2014

[67] SANDVINE, GLOBAL INTERNET PHENOMENA 1H2014, at 5–6(2014), *available at* https://www.sandvine.com/downloads/general/global-internet-phenomena/2014/1h-2014-global-internet-phenomena-report.pdf.

[68] *See* Jon Brodkin, *Netflix's Many-Pronged Plan to Eliminate Video Playback Problems*, ARS TECHNICA (May 13, 2014, 11:15 AM), http://arstechnica.com/information-technology/2014/05/netflixs-many-pronged-plan-to-eliminate-video-playback-problems/

[69] *Id.*

[70] *Id.*

[71] The discussion that follows is adapted from Christopher S. Yoo, *Network Neutrality After* Comcast*: Toward a Case-by-Case Approach to Reasonable Network Management*, *in* NEW DIRECTIONS IN COMMUNICATIONS POLICY 55, 71–76 (Randolph J. May ed., 2009). For a more extended discussion of the implications of the economics of two-sided markets for network neutrality, see Yoo, *Consumers*, *supra* note 60, at 222–27.

[72] For overviews of the economics of two-sided markets, see David S. Evans & Richard Schmalensee, *The Industrial Organization of Markets with Two-Sided Platforms*, 3 COMP. POL'Y INT'L 151 (2007), *available at* https://www.law.berkeley.edu/files/Evans_and_Schmalensee_-_Two_Sided_Markets.pdf; Jean-Charles Rochet & Jean Tirole, *Two-Sided Markets: A Progress Report*, 37 RAND J. ECON. 645 (2006); Roberto Roson, *Two-Sided Markets: A Tentative Survey*, 4 REV. NETWORK ECON. 142 (2005), http://www.bepress.com/rne/vol4/iss2/3.

[73] *See* Yoo, *supra* note **Error! Bookmark not defined.**, at 33.

network to consumers is thus determined by more than just the price charged and the services provided, as is the case with most goods. It also depends on the number of other subscribers connected to the network. The more people each user can reach through the network, the more valuable it becomes to all users.

The telephone system is an example of a one-sided market, as the value to any particular caller is determined in no small part by the number of similarly situated callers. When a market is two-sided, instead of bringing together a single class of similarly situated users, networks bring together two completely different classes of users.[74] In those cases, the value is determined not by the number of users of the same class, but rather the number of users of the other class. To put it in terms of a concrete example, consider the economics of broadcast television, which generates revenue from advertisers based on the number of viewers the industry can deliver.[75] The value of the network for advertisers is not determined by the number of other advertisers. Instead, the value of the network increases with the number of a different class of network participants (i.e., television viewers).

The economics of two-sided markets indicate that it may be socially beneficial for content and application providers to subsidize the prices paid by end users.[76] The fact that the Internet has become increasingly dominated by advertising revenue paid to content and application providers rather than network providers makes this particularly likely to be true. An advertiser's willingness to pay for an ad on any particular website depends on the number of end users viewing that website. Under these circumstances, the optimal solution may be for the website owner to subsidize the total number of end users by making payments to the network provider to help defray their costs of connection.[77] The costs of subsidizing more users would be more than offset by the additional revenue generated by the fact that advertisers can now reach more potential customers.[78]

These revenue-side pressures are reinforced by cost-side considerations. The cost of connecting content and application providers to the Internet is quite low, typically only requiring a single high-speed line to a small number of business locations.[79] The cost of connecting end users to the Internet is much higher, requiring the wiring and upgrading of equipment in entire neighborhoods. In an industry in which the primary revenue is flowing to content and application providers and the costs involved in connecting content and application providers are much smaller than the costs of connecting end users, one would expect some cash to flow from content and application providers to those who are providing connections to end users.[80]

These dynamics are again well-illustrated by broadcast television. In many ways, broadcast television and the Internet are analogous. The movie studios that create television programs play a similar role to content and application providers. Television networks aggregate programs and deliver them nationally in much the same manner as server-side network providers and backbone providers.[81] Local broadcast stations provide last-mile connectivity that is quite

---

[74] *See* Yoo, *Consumers*, *supra* note 60, at 223.

[75] *Id.* at 237

[76] *See id.* at 237–38.

[77] *Id.*

[78] *Id.* at 225–26.

[79] *Id.* at 237.

[80] Peyman Faratin et al., *The Growing Complexity of Internet Interconnection*, COMM. & STRATEGIES, 4th Quarter 2008, at 51, 59.

[81] JEFF ULIN, THE BUSINESS OF MEDIA DISTRIBUTION: MONETIZING FILM, TV, AND VIDEO CONTENT 224–25 (1st ed. 2010).

similar to the role played by DSL and cable modem providers. In addition, the revenue structure is quite comparable, in that television networks receive advertising revenue in much the same manner as content and application providers. Furthermore, the cost structure is somewhat similar in that connecting individual homes is much more costly than distributing programming nationally.

For decades, the standard business arrangement has been for television networks to subsidize the operations of local broadcast stations by paying them to be members of their television networks.[82] The industry's revenue and cost structure make such arrangements quite logical. The cost of paying these broadcast stations to affiliate with a network is more than offset by the increase in advertising revenue made possible by the fact that the network is now able to reach a larger audience.[83] Broadcast television thus represents a prime example of when firms operating on one side of the market find it economically beneficial to subsidize end users on the other side of the market.

Furthermore, the magnitude of the affiliation fees that the networks pay to broadcast stations is anything but uniform. The precise amount paid varies with the relative strength of the network and the relative strength of the broadcast station.[84] Stronger broadcast stations receive more, while weaker ones receive less. Equally interesting is the fact that in recent years, the cash flow has begun to vary in its direction as well as magnitude, with weaker stations having to pay rather than be paid to be part of the television network.[85] The dynamic nature of this pricing regime benefits consumers by providing incentives for networks to invest in better quality programming and by providing an incentive for stations to provide better carriage.

The core insight of two-sided market is that prices can vary widely in magnitude and direction. Sometimes money flows from content providers to network providers, and sometimes it naturally flows the other way. All of this underscores the difficulty of identifying the optimal price as well as the fact that requiring all interconnection occur at a zero price would be an economic anomaly. Prices are how market-based economies allocate goods, provide incentives to minimize costs, and signal producers that the market is in disequilibrium. Freezing those prices would dampen those signals and risk forestalling the quest for bargaining leverage that is the engine that drives the virtuous circle of innovation forward.

3. The Danger of Regulating Interconnection Agreements

Although some have suggested that such interconnection agreements represent network neutrality violations,[86] network neutrality only applies to how traffic is handled *within* an ISP's

---

[82] Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Fifteenth Report, 28 FCC Rcd. 10496, 10599 para. 208 (2013) [hereinafter *Fifteenth Video Competition Report*], *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-13-99A1.pdf.

[83] *See* Yoo, *Consumers*, *supra* note 60, at 237.

[84] *Id.*.

[85] *Fifteenth Video Competition Report*, *supra* note 82, at 10599–600 paras. 208–209 ("Network compensation to television broadcast stations has all but disappeared, and today, television stations instead commonly pay compensation to networks in order to air their programming." (citations omitted)).

[86] *See, e.g.*, Reed Hastings, *Internet Tolls and the Case for Strong Net Neutrality*, NETFLIX US & CANADA BLOG (Mar. 20, 2014, 2:00 PM), http://blog.netflix.com/2014/03/internet-tolls-and-case-for-strong-net.html; Stacey Higginbotham, *Paid Peering Is Not a Net Neutrality Issue But Level 3 Wants to Make It One*, GIGAOM (Mar. 18, 2014, 9:26 AM), https://gigaom.com/2014/03/18/level-3-gets-the-problems-of-peering-fights-so-right-and-then-so-wrong/; Mark Rogovsky, *Comcast-Netflix Didn't Violate Net Neutrality But It Wasn't Benevolent, It Was Business*,

network. It does not apply to how the traffic arrives at an ISP, which inevitably travels by paths of different lengths and incurs different costs as it traverses a system composed of 47,000 separate networks tied together through arms-length interconnection agreements. Indeed, this is why the Open Internet Order specified that it does not apply to interconnection agreements,[87] why Commission Chairman Julius Genachowski made clear that the Open Internet Order does not apply to interconnection disputes,[88] and why Chairman Wheeler has indicated the same.[89] The proposed rule that the Commission adopted on May 15, 2014, tentatively reiterated the conclusion that the rules would apply only to a broadband access provider's own network and not to traffic exchanged between networks.[90]

The Comcast-Netflix interconnection agreement appears to be nothing more than a typical case of such bargaining. One advantage is that because it now is a direct customer of Comcast, it gains the benefit of the guaranteed service levels in Comcast's standard service-level agreement. Indeed, media reports indicate that Comcast customers are experiencing a quality enhancement in their Netflix experience.[91]

The agreement reduces Comcast's costs, while the impact on Netflix is ambiguous: while it now must pay Comcast to terminate its traffic, it no longer needs to pay the third-party ISP on which it previously relied to reach Comcast in a classic case of efficiencies through cutting out the middleman. Although some have suggested that this might lead to a net reduction in Netflix's costs, that information is confidential and cannot be verified. In any event, interconnection represents a trivial revenue stream for Comcast and a tiny portion of Netflix's cost structure, which is dominated by program acquisition costs, which means that the transaction is unlikely to have any material effect on Netflix subscription prices.[92]

In addition, interconnection in the Internet space is fundamentally different from carriage agreements in cable television. In cable television, the failure to come to an agreement means that subscribers cannot receive particular content.[93] With respect to the Internet, multiple ways to reach consumers always exist. In fact, Comcast maintains 40 settlement-free peering

---

FORBES (Feb. 24, 2014, 9:07 AM), http://www.forbes.com/sites/markrogowsky/2014/02/24/comcast-netflix-didnt-violate-net-neutrality-but-it-wasnt-benevolent-it-was-business/

[87] *2010 Open Internet Order*, *supra* note **Error! Bookmark not defined.**, at 17933 para. 47 (noting the Open Internet Order's inapplicability to "Internet backbone services"); *id.* at 17944 n.209 (noting the Open Internet Order's inapplicability to interconnection).

[88] *Network Neutrality and Internet Regulation: Warranted or More Economic Harm than Good?, Hearing before the Subcomm. on Communications and Technology, H. Comm. on Energy and Commerce*, 102d Cong., 1st Sess. 102 (2011), *available at* http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg65940/pdf/CHRG-112hhrg65940.pdf.

[89] Brendan Sasso, *Netflix's Net-Neutrality Plea Gets Rejected by the FCC*, NAT'L J. (Apr. 1, 2014), http://www.nationaljournal.com/tech/netflix-s-net-neutrality-plea-gets-rejected-by-the-fcc-20140401.

[90] *2014 Open Internet NPRM*, *supra* note **Error! Bookmark not defined.**, at 5617 para. 59.

[91] *See, e.g.*, Chloe Albanesius, *Netflix Speeds Jump 65 Percent on Comcast After Deal*, PC MAG. (Apr. 14, 2014, 5:37 PM), http://www.pcmag.com/article2/0,2817,2456553,00.asp.

[92] Dan Rayburn, *Here's How the Comcast & Netflix Deal Is Structured, with Data & Numbers*, STREAMING MEDIA BLOG (Feb. 27, 2014, 12:14 PM), http://blog.streamingmedia.com/2014/02/heres-comcast-netflix-deal-structured-numbers.html; Joan E. Solsman, *Netflix vs. the Comcast-TWC Merger: Nothing to Lose*, CNET (Apr. 22, 2014, 5:54 AM), http://www.cnet.com/news/netflix-a-comcast-merger-nemesis-of-convenience/.

[93] For instance, in early 2014, after Viacom failed to reach a deal with Cable One, a small cable company, subscribers lost access to all Viacom channels, including Comedy Central and MTV. Alex Ben Block, *Viacom Blackout Continues as Small Cable Company Takes Stand in Retrans Fight*, HOLLYWOOD REPORTER (Apr. 2, 2014, 5:06 PM), http://www.hollywoodreporter.com/news/viacom-blackout-continues-as-small-693143.

relationships and over 8,000 paid transit relationships.[94] That means that edge providers will always have some way to reach Comcast customers even if they are unable to reach a direct interconnection agreement.[95] The only bargaining advantage that Comcast would enjoy is the different between the interconnection terms and the cost of Netflix's next-best interconnection option.[96] Although some have speculated that Comcast might still be able to discriminate against Netflix traffic flowing over other paths, that traffic is mixed with the traffic of other end users, which would require Comcast to inspect all of the traffic coming through that connection,[97] which would be unrealistic and prohibited by Comcast's commitment to abide by the terms of the Open Internet Order.[98]

As an added benefit, absent the interconnection agreement, all of Comcast's customers would have had to bear the costs of Netflix's increase in traffic regardless if they used the service or not. The interconnection agreement promotes fairness by ensuring that those who derive the benefits are the ones who bear the costs. The elimination of zero-cost pricing also avoids the problems that arise when edge providers have no incentive to economize on the volume of traffic they send, as well as address the legal concerns raised by Judge David Tatel in his decision in *Verizon v. FCC*.[99]

CONCLUSION

Title II reclassification thus faces significant legal barriers. Common carriage regulation has also proven difficult to implement and would not bar paid prioritization. Extending Open Internet regulation to interconnection disputes also threatens to disrupt normal bargaining processes through which markets return to long-run equilibrium.

I continue to believe that a Section 706 approach based on commercial reasonableness would represent the best approach. *Cellco Partnerships* and the discussion of that decision in *Verizon v. FCC* essentially guarantee that such a rule would survive judicial scrutiny. Moreover, commercial reasonableness has been used effectively in a wide range of other contexts, including unconscionability, health care contracts, maritime contracts, bankruptcy, and environmental law, just to name a few. Any assessment of commercial reasonableness would necessarily require an evaluation of industry practices, which would bring in industry norms.

---

[94] *Competition in the Video and Broadband Markets: The Proposed Merger of Comcast and Time Warner Cable: Oversight Hearing Before the Subcomm. on Regulatory Reform, Commercial and Antitrust Law of the H. Comm. on the Judiciary*, 113th Cong. (May 8, 2014) (Joint Written Statement of David L. Cohen, Executive Vice President, Comcast Corp., and Robert D. Marcus, Chairman and Chief Executive Officer, Time Warner Cable), *available at* http://judiciary.house.gov/?a=Files.Serve&File_id=E55CD2D5-C965-4D7B-84E0-BFD386769F2C.

[95] Christopher S. Yoo, *Innovations in the Internet's Architecture That Challenge the Status Quo*, 8 J. ON TELECOMM. & HIGH TECH. L. 79, 86 (2010).

[96] Stanley M. Besen et al., *Advances in Routing Technologies and Internet Peering Agreements*, 91 AM. ECON. REV. (PAPERS & PROC.) 292, 295 (2001).

[97] *Cf.* Timothy B. Lee, *The Durable Internet: Preserving Network Neutrality Without Regulation* 15–23 (Cato Inst., Policy Analysis No. 626, 2008), *available at* http://object.cato.org/sites/cato.org/files/pubs/pdf/pa-626.pdf (arguing that ISP efforts to degrade or discriminate against disfavored Internet traffic are unlikely to succeed for technical and economic reasons).

[98]. Applications of Comcast Corp., General Electric Co. & NBC Universal, Inc., Memorandum Opinion and Order, 26 FCC Rcd. 4238, 4275 para. 94 (2011) [hereinafter *Comcast-NBCU Order*] (barring Comcast from discriminating against unaffiliated Internet traffic and requiring Comcast to abide by the rules contained in the 2010 Open Internet Order).

[99] Verizon v. FCC, 740 F.3d 623, 658 (D.C. Cir. 2014).

It would be easy to distinguish commercial reasonableness from a traditional common carriage regime. Indeed, common carriage has historically not required market power.[100] Adding a market power filter would represent a clear distinction between Title II regulation and a regime based on Section 706.

Pursuant to Section 1.1206 of the Commission's Rules, this letter is being filed electronically. Please contact the undersigned if you have any questions.

Sincerely,

Christopher S. Yoo
John H. Chestnut Professor of Law, Communication, and Computer & Information Science
Founding Director, Center for Technology, Innovation, and Competition

Enclosure

---

[100] Herbert Hovenkamp, *Regulatory Conflict in the Gilded Age: Federalism and the Railroad Problem*, 97 YALE L.J. 1017, 1045 (1988); Susan P. Crawford, *Transporting Communications*, 89 B.U. L. REV. 871, 882-84 (2009); Thomas B. Nachbar, *The Public Network*, 17 COMMLAW CONSPECTUS 67, 97-100 (2008).