

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
Restoring Internet Freedom) WC Docket No. 17-108

**Reply Comments of
Will Rinehart¹**

The *Title II Order* Is Costly and Ineffective, It Should Be Repealed

Network neutrality is an idea, a concept that has come to stand in for all the things people want the Internet to represent. Invariably, the idea has been likened to the civil right battle, a fight for Internet freedom, a Bill of Rights for the Internet, and even a pizza.²³ Unlike lower taxes or the negative income tax, network neutrality isn't a fixed policy. For those that care about rule of law, implementing network neutrality via regulation is a concerning proposition. Because it is such an open concept, the rules that have meant to implement have been similarly be open ended and without the proper limits.

At various points in the last 15 years, ardent supporters of strict network neutrality laws have even come to recognize the overreach. As the Electronic Frontier Foundation explained,

The Commission has an important role to play in promulgating 'rules of the road' for broadband, but that role should be narrow and firmly bounded. We fear the proposed 'general conduct rule' may meet neither criteria. Accordingly, if the Commission intends to adopt a 'general conduct rule' it should spell out, in advance, the contours and limits of that rule, and clarify that the rule shall be applied only in specific circumstances.

With the Restoring Internet Freedom docket, the Federal Communications Commission (FCC) is set to pull back the overreach of previous administrations and reestablish rule of the road on firm ground, which deserves applause. The *Title II Order* (hereafter stylized as *Order*) doesn't establish "real network neutrality" because there has never been a fixed concept to implement. Network neutrality can be implemented through various means. The *Title II Order* was sadly the most costly and detrimental to the ecosystem and thus needs to be replaced.⁴

As will be detailed below, there are countless problems with the *Order*, but there is one glaring issue that deserves highlighting. As the most recent court decision from the DC Circuit explains, "the

¹ Will Rinehart is Director of Technology and Innovation Policy at the American Action Forum.

² Clementine Havemeyer, "Net Neutrality: America's Forgotten Civil Rights Battle," <http://theupstander.com/net-neutrality-americas-forgotten-civil-rights-battle/>.

³ Jana Kasperkevic, "Net neutrality explained: "Imagine internet is pizza..." <https://www.marketplace.org/2017/07/10/tech/net-neutrality-explained-imagine-internet-pizza>.

⁴ Will Rinehart, "Keeping the Internet Open and Free Doesn't Mean Title II," <https://www.americanactionforum.org/insight/keep-internet-open-free/>.

net neutrality rule applies only to ‘those broadband providers who hold themselves out as neutral, indiscriminate conduits’ to any content of a subscriber’s own choosing.”⁵ In other words, if companies really do want to harm consumers, the *Order* provides an exit. Claim that you aren’t providing neutral, indiscriminate conduits and you won’t be regulated.

To ensure both consumers and innovation is protected, reclassification needs to be rescinded. In its place, the Federal Communications Commission should take a page from those institutions that have long determined the direction of the Internet, like the Internet Engineering Task Force (IETF), the Broadband Internet Technical Advisory Group (BITAG), and the 3rd Generation Partnership Project (3GPP). This approach would employ mixed methods, combining the knowledge of the FCC in the broadband industry with the economic analysis and legal footing of the Federal Trade Commission (FTC), which cannot currently regulate broadband providers since reclassification bars it. Like other sectors of the economy with dual agency authority, the two agencies could formalize an agreement, outlining how the FTC and FCC will coordinate consumer protection efforts. As the former FCC Commissioner Rob McDowell explained,

In lieu of new rules, which will be tied up in court for years, the FCC could create a new role for itself by partnering with already established, nongovernmental Internet governance groups, engineers, consumer groups, academics, economists, antitrust experts, consumer protection agencies, industry associations, and others to spotlight allegations of anticompetitive conduct in the broadband market, and work together to resolve them. Since it was privatized, Internet governance has always been based on a foundation of bottom-up collaboration and cooperation rather than top-down regulation.⁶

This submission advocates for the creation of a bottom-up agency function, which could be termed the Broadband Consumer Advocacy Committee (BCAC). To make the affirmative case, a review of the *Title II Order* is needed. As is clear under even a modicum of scrutiny, the *Order* is a vast overreach of the FCC’s powers with little in the way of consumer benefits.

The following comments are organized into three sections. The first explores the framing and development of the concept of network neutrality. The second explores the various problems of the Title II Order and its use of reclassification. And the last section reviews the evidence accumulated on the economics effects of the regulation. Network neutrality has long been used as a weapon and shield. Consumers deserve better. Repealing the *Order* is the first step in putting the agency back in good standing.

How Has the Framing of Network Neutrality Developed?

In the 1950s, philosopher W B Gallie coined the phrase essentially contested concept to denote ideas that are open ended and subject to considerable modification and discussion.⁷ These concepts are appraisive, denote a complex activity, but are used by parties within the discussion both

⁵ United States Court of Appeals For the District of Columbia Circuit, “United States Telecom Association v. Federal Communications Commission and United States of America,” [https://www.cadc.uscourts.gov/internet/opinions.nsf/06F8BFD079A89E13852581130053C3F8/\\$file/15-1063-1673357.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/06F8BFD079A89E13852581130053C3F8/$file/15-1063-1673357.pdf).

⁶ Robert M. McDowell, “Dissenting Statement of Commissioner Robert M. McDowell,” https://apps.fcc.gov/edocs_public/attachmatch/FCC-10-201A4.doc.

⁷ David Collier, Fernando Daniel Hidalgo, and Andra Olivia Maciuceanu, “Essentially contested concepts: Debates and applications,” <http://polisci.berkeley.edu/sites/default/files/people/u3827/Collier%20Gallie.pdf>.

“aggressively and defensively.”⁸ Gallie argued that “art”, “democracy”, “social justice”, and “religion” fit the bill. Network neutrality does as well.

One leading legislative proponent even admitted as such back in 2015. Via a Reddit post, Rep. Anna Eshoo crowdsourced new terms and concepts that would help “to more accurately reflect our goal.”⁹ As she pointed out, “the American people are left with a muddled understanding of what to support” because network neutrality is an ambiguous term that is further complicated by “all of the legal jargon terms like interconnection, Title II and paid prioritization.” In the end however, “Internet users know what they want and expect from the Internet,” but the contested concept of network neutrality “is making it difficult to know what box to check that advances their best interest.”

Gallie noted that essentially contested concepts, “must be derived from an original exemplar (or exemplars) whose authority is acknowledged by all the contestant users of the concept.” For network neutrality, Tim Wu is the source for network neutrality. His article, “Network Neutrality, Broadband Discrimination,” helped turn the phrase into a rallying cry for the nascent tech policy world.¹⁰ To understand how the concept has garnered so much purchase, a sense of history is needed.

From its earliest precursors, the Internet has had its evangelists. And the Silicon Valley offered a unique crucible. Deliberate and unintentional interactions among military researchers, academics, and corporate scientists helped to form the technical features of the medium. Meanwhile, the region was the center of the countercultural movement in the 1960s, the failings of which, wrapped into a technological optimism for the power of the networked computer. Alongside its topological and programmatic development, discussions of its social, cultural, political and economic potential formed the ethical undergirding from the very beginning.¹¹ Internet policy, especially the network neutrality debate, is made in the shadows of ideals set in this early era. Prime among those ideals is a profound faith in the technology’s emancipatory potential to boost democratic participation, trigger a renaissance of moribund communities, and strengthen associational life.

Howard Rheingold, who would popularize the medium as the first executive editor of Wired magazine, once observed that “the granola-eating utopians, the solar-power enthusiasts, serious ecologists and the space-station crowd, immortalists, Biospherians, environmentalists, [and] social activists” populated the community from the beginning.¹² From these diverse groups came the hacker ethics, an impulse that “expresses itself via a constellation of minor acts of insurrection, often undertaken by individuals, creatively disguised to deprive authorities of the opportunity to

⁸ C McKnight, “Medicine as an essentially contested concept,” <http://jme.bmj.com/content/29/4/261>.

⁹ Reddit, “Hi Reddit, this is Congresswoman Anna Eshoo and I am launching a contest on Reddit for you to rebrand net neutrality!”

https://www.reddit.com/r/technology/comments/2e6g4i/hi_reddit_this_is_congresswoman_anna_eshoo_and_i/.

¹⁰ Tim Wu, “Network Neutrality, Broadband Discrimination,”

<https://pdfs.semanticscholar.org/94e2/2a1bad48c13402a76ae052fa2543645d50ab.pdf>.

¹¹ Alain Touraine, *La Société post-industrielle*; Zbigniew Brzezinski, *Between Two Ages*; Daniel Bell, *The Coming of the Post-Industrial Society*; Alvin Toffler, *The Third Wave*; Simon Nora and Alain Minc, *The Computerisation of Society*; and Ithiel de Sola Pool, *Technologies of Freedom*.

¹² Grant Reeher, Steve Davis, and Larry Elin, *Click On Democracy: The Internet's Power To Change Political Apathy Into Civic Action*.

retaliate.”¹³ The emancipatory politics of the hacker ethos is based on two elements. On one hand, it seeks to lift the “shackles of the past,” and on the other, it wants to overcome the repression and domination of powerful individuals and groups, thereby creating a legitimate base of power.

The tension between the technical and the aspiration features of the Internet have long been a characteristic of the medium, divorcing the engineers and the cheerleaders. Network neutrality is a part of this reinterpreted history, stemming from a much more banal concept known as the end-to-end principle. David Clark, a principal engineer on the Department of Defense’s ARPANET project, and co-author of the original end to end paper explains:

Back then we didn’t use the word ‘open’. It’s not really part of our language. We understood generality...if you go back to the end to end paper I wrote with Jerry Saltzer and David Reed – which has been used as a religious tract far beyond what it will sustain if you are a strict constructionist (A person who construes a legal text or document in a specified way) – I believe I verified that the paper does not contain word ‘open’. That paper was about correctness, which is a narrow objective. It’s not even about performance.¹⁴

Yet, it is from this paper that much of network neutrality’s logic is based.¹⁵ The overarching goal of the piece was to lay out the principles for creating accurate and reliable transfer of information across a network.¹⁶ By layering systems on top of each other, lower systems in the network would defray the issue of reliability to applications at the endpoints of the transfer, thus allowing for a proliferation of applications. In this way, computing resides in the end hosts of the network rather than in intermediary routers. These principles were never meant to be strictly interpreted or absolute, as David Clark has mentioned, especially if there are functions that can only be implemented in the core of the network, like ISP service differentiation, spam blocking, and guaranteed service for video delivery. Network management and traffic differentiation aspects of those early conversations haven’t carried over to the policy discussion at the FCC.

Though the language of network neutrality claims roots in this era, it wasn’t until 2002 that the idea was laid down as a principle, and took some time to be adopted. Beginning in 2002, Professors Tim Wu and Lawrence Lessig begin to express their discontent with some of the behaviors of ISPs, which was followed up in 2003 with an *ex parte* letter to the FCC along the same lines. Wu formally committed his ideas to paper in that same year with “Network Neutrality, Broadband Discrimination.”

Near the beginning, Wu acknowledged that the market had been served by a lack of regulation in this area, but thought that ISPs might commit economically imprudent actions that would harm applications in the future:

Basic economic theory suggests that operators have a long-term interest coincident with the public: both should want a neutral platform that supports the emergence of the very

¹³ Brett Scott, “The hacker hacked,” <http://aeon.co/magazine/technology/how-yuppies-hacked-the-original-hacker-ethos/>.

¹⁴ Justin (Gus) Hurwitz and Roslyn Layton, “Debatable Premises in Telecom Policy,” <http://repository.jmls.edu/cgi/viewcontent.cgi?article=1769&context=jitpl>.

¹⁵ J.H. Saltzer, D.P. Reed and D.D. Clark, “End-To-End Arguments in System Design,” <http://web.mit.edu/Saltzer/www/publications/endtoend/endtoend.pdf>.

¹⁶ David D. Clark and Marjory S. Blumenthal, “Rethinking the design of the Internet: The end to end arguments vs. the brave new world,” http://dspace.mit.edu/bitstream/handle/1721.1/1519/TPRC_Clark_Blumenthal.pdf.

best applications. However the evidence suggests the operators may have paid less attention to their long-term interests than might be ideal.

Wu situated the paper within the context of the times. In the coming decades, he writes, regulators will need to arbitrate between broadband providers and “the public’s interest in a competitive innovation environment centered on the Internet.” The argument for network neutrality regulation thus “must be understood as a concrete expression of a system of belief about innovation, one that has gained significant popularity over last two decades.” In short, this system of innovation preserves “a Darwinian competition among every conceivable use of the Internet so that the only the best survive.” Darwinian competition begets innovation, but only if “broadband users have the right reasonably to use their Internet connection in ways which are privately beneficial without being publicly detrimental.” Since the idea had been cast as a user right, broadband providers were obliged to provide a duty to “impose no restrictions on the use of an Internet connection.” As Wu laid out, “operators generally *may* discriminate in their treatment of traffic on the basis of local network criteria.”

Motivating Wu was an important idea, Darwinian competition. However, those following in his wake have fundamentally misunderstood his far more nuanced take of the information ecosystem. To create an innovative ecosystem, which is clearly the goal of network neutrality, network diversity is needed. Indeed, he never had denied that the natural inclination of the ISPs would in fact be in alignment with the public interest. Basic economic theory suggests that operators have a long-term interest coincident with the public interest: “both should want a neutral platform that supports the emergence of the very best applications.” The question animating Wu, and indeed the primary question for the FCC, was far more simple, what safeguards should be in place if networks don’t act in the interest of consumers?

The idea didn’t initially take off. As Tim Lee, a journalist of technology, noted in 2008, “recently, legal scholars have begun using the term ‘network neutrality’ to denote a principle roughly equivalent to the end-to-end principle.”¹⁷ The end-to-end principle had been a far more dominant framing of the topic when it was largely a discussion for policy wonks and legal scholars, not advocates. But as the Internet took off and the media landscape changed in the late 2000s, network neutrality took over where end-to-end had been prominent.

Over time, the rhetoric evolved. Whereas at the beginning, Wu supported price discrimination and made allowances for quality of service, he later dropped these exceptions.¹⁸ Lessig also noted that implementing net neutrality would be difficult, and that the development of new technologies would increase demands for discrimination, “but where and how, consistent with neutrality, is impossibly hard to specify.”¹⁹ That initial skepticism of the rules has since given way to a hardline stance.

In the years since, network neutrality morphed to include more than just a statement about evolutionary innovation. When the FCC pushed their Internet policy statement in 2005, it was a near copy of the tenants that Wu had been advocating. Consumers were entitled “to access the

¹⁷ Timothy B. Lee, “The Durable Internet Preserving Network Neutrality without Regulation,” <http://object.cato.org/sites/cato.org/files/pubs/pdf/pa-626.pdf>.

¹⁸ Tim Wu, “The Broadband Debate, A User’s Guide,” http://www.jthtl.org/content/articles/V3I1/JTHTLv3i1_Wu.PDF.

¹⁹ Lawrence Lessig, “Re-Marking the Progress in Frishmann,” <http://heinonline.org/HOL/LandingPage?handle=hein.journals/mnlr89&div=32&id=&page=>

lawful Internet content of their choice,” “run applications and use services of their choice, subject to the needs of law enforcement,” “to connect their choice of legal devices that do not harm the network,” and “competition among network providers, application and service providers, and content providers.”²⁰

After the courts struck it down, the FCC came back with the 2010 Order, which ratcheted up the restrictions. This time around, ISPs had to be transparent, could not block a range of content and applications, and they were prohibited from unreasonably discriminating in transmitting lawful network traffic.²¹ The resulting report and order expanded on the 2005 Policy Statement, noting that “broadband providers have the incentive and ability to limit Internet openness.” The three-page Policy Statement grew to 194 pages with the 2010 Order. Even still, what came out of 2010 had flexibility. The FCC had prohibited “unreasonable discrimination” but it was widely assumed that the FCC would grant Internet service providers (ISPs) with some leeway.

Again, the issue went to court and again the agency lost. So, in 2014, the agency went back and redrafted the rules. This time around the rules were far more forceful.²² Those 194 pages ballooned to 400 pages in the *Title II Order*. The emphasis changed as the text laid out “Clear, Bright-Line Rules” since the “record overwhelmingly supports adopting rules and demonstrates that three specific practices invariably harm the open Internet.” Even the rules changed, to now include “no blocking,” “no throttling,” and “no paid prioritization.” An amorphous General Conduct provision was added. Interconnection, which had long been a topic outside of the debate, was now on notice. Privacy rules were teed up and cybersecurity regulation was drafted. From the 2005 Policy Statement to the 2015 *Order*, network neutrality has been a story of regulatory creep.

Yet, subtlety, the *Title II Order* included some flexibility to make network operations work, caveating the rules with the phrase “subject to reasonable network management.” Reasonable network management, as the next section will show, is the operative term. From a legal standpoint, the network neutrality debate concerns the limits and the ability of the FCC to push rules. From a technical and economic perspective, the network neutrality debate concerns the limits of network management.

The *Title II Order* isn’t a regulation to love. Advocates for Title II reclassification have sold their plan as the only path for network neutrality, defining this legal path as “real network neutrality” since only it can stop the creation of fast lanes and slow lanes.²³ Yet, even Wu will tell you that, “The fast lane is not a literal truth.”²⁴ Due to the innate flexibility in reading and interpreting the concept, there are countless ways to ensure the Internet remains open and innovative.²⁵ The most expedient of all would be for Congress to enshrine the doctrine in law.

²⁰ Federal Communications Commission, “Policy Statement,” https://apps.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf.

²¹ Federal Communications Commission, “Report And Order,” https://apps.fcc.gov/edocs_public/attachmatch/FCC-10-201A1.pdf.

²² Federal Communications Commission, “Report And Order On Remand, Declaratory Ruling, And Order” https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-24A1.pdf.

²³ Lindsey Jacobson, “What is net neutrality?” <http://abcnews.go.com/Technology/net-neutrality/story?id=48596615>.

²⁴ Robert McMillan, “What Everyone Gets Wrong in the Debate Over Net Neutrality” https://www.wired.com/2014/06/net_neutrality_missing/.

²⁵ Will Rinehart, “A Framework To Reform FCC Competition Policy,” <http://americanactionforum.org/research/a-framework-to-reform-fcc-competition-policy>.

Where the *Title II Order* and indeed much of the debate surrounding network neutrality has failed, lies in the focus. Wu's holistic view of ecosystems and Darwinian competition has given way to narrow renderings of real net neutrality. Ultimately, no one knows what structure the Internet will take, so rules that lock in the status quo are the last things we need. This is the crux of the problem with the *Title II Order*. As one economist so eloquently pointed out, "If you kill variability, you kill selection. If you kill selection, you kill the markets."²⁶ Instead, the Federal Communications Commission should strive for regulatory humility, identifying damages only as they occur and imposing appropriate remedies.

Call it network management, call it prioritization, or call it discrimination, it is inherent in the operation of the Internet. The current ecosystem we have would not have flourished without management. The proper question for the FCC is about what kind of bias should be allowed. But before there are problems for consumers, it is not clear what kinds of bias should exist.

The Fundamentals of the Network in the Network Neutrality Debate

As the building blocks of the modern Internet protocol system were being laid in the early 1980s, technological limitations existed. The Internet Engineering Task Force, the standard setting body for broadband Internet, noted in one of its most important RFCs, "The internet protocol is specifically limited in scope to provide the functions necessary to deliver a package of bits (an internet datagram) from a source to a destination over an interconnected system of networks."²⁷ Routers could only handle so much data in the early 1980s, but as capacity advanced, more information could be processed. Yet, the protocols remained well into 2015.²⁸ The lessons of this early era are well worth heeding. Decisions made early can have durable effects on a network.

Within this context, the *Title II Order* pushed by the Federal Communications Commission in 2015 committed a volley of errors. Some have argued that the rules are needed to ensure a level playing field, allowing for permissionless innovation to thrive online. Yet, it makes little sense how pricing regulation and strict *per se* limitations on network architecture allows for this more innovative world to come about. In the aftermath of the *Title II Order*, three conclusions can be drawn. First, the *Title II Order* ignores a long regulatory history behind Internet classification. Second, ISPs don't hold all the cards to deceive consumers. And third, the *Order* glosses over actual network management practices, since neutrality has never been a primary component of network design.

Is Internet a telecommunications service?

After the passage of the 1996 Telecommunications Act, an important question endured. What separates a telecommunications service from an information service? Because the two were regulated differently, definitions mattered. The Act defined "telecommunications," as "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," while "information service" was defined as the "offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications"

²⁶ Dr. Pasquale Cirillo, "If you kill variability, you kill selection. If you kill selection, you kill the markets," <https://twitter.com/DrCirillo/status/749227385254535168>.

²⁷ Internet Engineering Task Force, "RFC 791: Internet Protocol DARPA Internet Program Protocol Specification," <https://tools.ietf.org/html/rfc791#page-1>.

²⁸ Scott Hogg, "ARIN Finally Runs Out of Ipv4 Addresses," <https://www.networkworld.com/article/2985340/ipv6/arin-finally-runs-out-of-ipv4-addresses.html>.

The Stevens Report, named after Senator Ted Stevens, focused on the definitions and the intent of the Act's drafters, and was meant to solve this issue when it was released in 1998. This report confirmed what had been a long history of regulatory separation, stretching back to 1976. Internet providers and other related services would be under light touch regulation in a separate regulatory silo from telecommunications. In that report, Senators Ashcroft, Ford, John F. Kerry, Abraham and Wyden even emphasized that "[n]othing in the 1996 Act or its legislative history suggests that Congress intended to alter the current classification of Internet and other information services or to expand traditional telephone regulation to new and advanced services." Indeed, changes were made in the legislative process because managers appear to have been concerned that the original language might lead courts to interpret "telecommunications service" too broadly, and inappropriately classify cable systems and broadcasters as telecommunications carriers.²⁹

The *Title II Order* recasts nearly 40 years of regulation, offering up a revisionist history. Through successive Republican and Democratic administrations, the FCC has ruled time and again that the Internet should be regulated lightly and separate from the onerous provisions on the telephone system. In 1998, when the issue wasn't being pushed by activists, then Democratic FCC Chair Bill Kennard said to Congress, "We recognize the unique qualities of the Internet, and do not presume that legacy regulatory frameworks are appropriately applied to it."³⁰ Indeed, before advocate pressure was placed on the agency from all sides, reclassifying the Internet was considered unthinkable, "the nuclear option."³¹

To fit the regulatory straightjacket of Title II, oversights had to be made. For example, the *Order* asserts that the phrase "points specified by the user" is ambiguous. Yet the concept of a point is used widely within the telephone industry to talk about the end point of the public switched telephone network (PSTN) and the corresponding telephone number. The FCC has a long history of regulating up to the demarcation point, since it delineates the end of the public switched telephone network. Additionally, in the second edition of the McGraw-Hill Illustrated Telecom Dictionary, Jade Clayton defines point to point, as a "reference to a switched service, like a plain telephone line where communications links are switched from one point to another, depending on the number dialed." Each dialed number has a unique endpoint. In short, points specific by the user refers to those endpoints that are dialed.

Do ISPs hold all the tools necessary to deceive consumers?

At best, the *Title II Order* is based on a view of networks that has long since been replaced. At worst, it is based in alternative facts. Importantly, it is not the case that "broadband providers hold all the tools necessary to deceive consumers, degrade content, or disfavor the content that they don't like." The tools necessary to deceive consumers, degrade content, or disfavor the content exist at many sources within the technology stack and across the ecosystem. ISPs aren't the sole source of power within the Internet. Domain services, content providers, edge providers, and browsers all maintain power to deceive, degrade and disfavor. Thus, the focus on the ISP consumer relationship, named within the Order as broadband Internet access service (BIAS), is misplaced.

²⁹ Federal Communications Commission, "Report to Congress," http://transition.fcc.gov/Bureaus/Common_Carrier/Reports/fcc98067.pdf.

³⁰ Ibid.

³¹ Grant Gross, "Net neutrality: Reclassifying broadband would be a long road," <http://www.pcworld.com/article/2236980/net-neutrality-reclassifying-broadband-would-be-a-long-road.html>.

Netflix serves as a test case. In 2016, the company admitted that they were slowing down speeds to wireless consumers, violating the spirit of network neutrality in the words of one Commissioner.³² The admission didn't come as a total surprise as there were open questions about their network practices beginning with consumer complaints of slow speeds in 2013.³³ At the time, Netflix was gaining a foothold in the Content Delivery Network (CDN) space, moving from third party servers to their own CDN network, Open Connect, which has put them on technological par with Apple, Amazon, Google, and Facebook.

Yet, it seems the company might have been shaping their network characteristics to gain an upper hand in negotiations throughout 2013 and into 2014. Data during this period suggested that Netflix's speeds simultaneously suffered throughout the country for many of the largest ISPs like AT&T, Comcast, CenturyLink, Time Warner Cable, and Verizon. Then, around March 2014, performance returned, just as the company had signed long term deals with the largest ISPs. Additionally, ISPs that already had a deal with Netflix did not experience similar declines in performance, so commentators blamed the ISPs for the source of the problems, a confirmation about their power.

Yet, Netflix seems to have been able to wring a better deal from the ISPs than other CDN services at the time, which undermines the clean narrative about their powerlessness.³⁴ Moreover, as insider Dan Rayburn noted, "In a little known, but public fact, anyone who is on Comcast and using Apple TV to stream Netflix wasn't having quality problems."³⁵ Because Netflix used Level 3 and Limelight to stream their content to the Apple TV device, the stream was much higher in quality, implicating Netflix as the culprit. Also, the company would later admit in a filing that by 2012 they had "began to transition its traffic off of CDNs and onto transit providers with settlement-free routes into Comcast's network."³⁶ While the company might have benefited from lower costs, given long standing norms in the industry, Netflix should have expected increased network congestion over time.³⁷ As third party studies began to proliferate, evidence mounted, indicating that the company's own actions were responsible for the dramatic, simultaneous decline in performance.³⁸ Even before the *Title II Order* dropped, the markets had sorted themselves out.

Other examples of this power exist. Microsoft toyed with setting the Internet Explorer 10 browser to have a Do Not Track specification on by default.³⁹ Changing the default would have clearly disfavored content that uses cookies, affecting platforms that run on advertising dollars. For their

³² John Eggerton, "Netflix Gets Hammered Over 'Throttling,'" <http://www.broadcastingcable.com/news/washington/netflix-gets-hammered-over-throttling/154964>.

³³ Steven Musil, "Netflix: We're the ones throttling video speeds on AT&T and Verizon," <https://www.cnet.com/news/netflix-admits-throttling-video-speeds-on-at-t-verizon/>.

³⁴ Dan Rayburn, "Inside The Netflix/Comcast Deal and What The Media Is Getting Very Wrong," <http://blog.streamingmedia.com/2014/02/media-botching-coverage-netflix-comcast-deal-getting-basics-wrong.html>.

³⁵ Dan Rayburn, "Here's How The Comcast & Netflix Deal Is Structured, With Data & Numbers," <http://blog.streamingmedia.com/2014/02/heres-comcast-netflix-deal-structured-numbers.html>.

³⁶ Netflix, "Petition to Deny of Netflix, Inc.," <https://www.fcc.gov/ecfs/filing/6018325295>.

³⁷ Fred Campbell, "Netflix Secretly Holds Subscribers Hostage to Gain Favorable FCC Internet Regulations," <http://techknowledge.center/blog/2014/09/netflix-secretly-holds-subscribers-hostage-to-gain-favorable-fcc-internet-regulations/>.

³⁸ Dan Rayburn, "New Study From M-Lab Sheds Light On Widespread Harm Caused By Netflix Routing Decisions," <http://blog.streamingmedia.com/2014/10/mlab-netflix-routing-decisions.html>.

³⁹ Ryan Singel, "IE 10's 'Do-Not-Track' Default Dies Quick Death," <https://www.wired.com/2012/06/default-do-not-track/>.

own part, domain name servers could either hamstringing sites or giving them a leg up by responding to requests for certain web sites at slower or quicker rates.

The content delivery landscape is not egalitarian either. Large content providers maintain their own dedicated networks to better serve their content across wide distances. Google has 100,000s of miles of fiber cable, 8 subsea cables, and over 100 Internet POPs (points of presence).⁴⁰ Tom Evslin, a pioneer in VoIP explained what this means in practice:

Web giants like Google and Amazon have private networks that connect to the internet in many locations. They have data caches (think of them as content warehouses) around the world. Their websites do pop up faster than yours because their bits travel mostly on their private networks and avoid internet backbone and interchange congestion. In other words, they have their own private fast lanes. You can't achieve this speed for your website unless you build a private network of your own (unlikely) or host your website on Amazon or Google, in which case they may share some of their private access network. I have hosted services on Amazon, and they charge me more depending on how many locations from which I want my data served. In other words, faster is more expensive on their network.⁴¹

None of these examples serve as reasons to regulate either the BIAS portion or the entirety of the Internet. The power to deceive consumers, degrade content, or disfavor content is a power that is accessible to a wide range of actors. Moving away from a regulatory system that only focuses on the relationship between ISPs and consumers, and towards an understanding of the myriad players in the ecosystem would create better outcomes for everyone.

Is the Internet neutral?

The *Title II Order* advances a view of the Internet that never existed. The network isn't neutral and never has been. As network engineer Martin Geddes noted of this debate, "The utopian view of network is everyone plays nicely. But other internet users are not neutral to you."⁴² He continued, "So really it's a war, a battle for resources, in which the greediest application over the biggest pipe triumphs. The strongest will always win." Every packet is pollution. And network operators have long been engaged in pollution abatement measures.

Although the FCC has been involved in the network neutrality debate for almost 15 years, the agency is a relative newcomer to the debate. The technical community has long been involved in practical discussions over just how far can traffic management could go in the name of efficiency. In 2015, the Broadband Internet Technical Advisory Group (BITAG) released a paper on the topic of differentiation which hardly got the attention it deserved. The paper laid out three lessons from the field worth repeating here.⁴³ First, any sufficiently large file being transferred over the Internet is practically guaranteed to create recurring momentary congestion at some point along its network path. Even if capacity is increased, the effect cannot be eliminated. Larger capacity can mitigate

⁴⁰ Tom Krazit, "Google unveils a new, cheaper networking option for cloud customers: the public internet," <https://www.geekwire.com/2017/google-unveils-new-cheaper-networking-option-cloud-customers-public-internet/>.

⁴¹ Tom Evslin, "Internet Fast Lanes: You May Be Surprised by Who Actually Has Them," <https://morningconsult.com/opinions/internet-fast-lanes-may-surprised-actually/>.

⁴² Andrew Orlowski, "WTF is NET NEUTRALITY, anyway? And how can we make everything better?" http://www.theregister.co.uk/2014/05/09/net_neutrality_explained_and_how_to_get_a_better_internet/?page=2.

⁴³ Broadband Internet Technical Advisory Group, "Differentiated Treatment of Internet Traffic," http://www.bitag.org/documents/BITAG_-_Differentiated_Treatment_of_Internet_Traffic.pdf.

congestion. Second, the absence of differentiation doesn't imply comparable behavior among applications. The Transmission Control Protocol shares capacity between competing connections, not applications. So those applications that use multiple connections are already better positioned than those that just utilize one. Putting the two together, BITAG emphasized that differentiated treatment can improve the quality of broadband for users, so it should come as little surprise that it is widely practiced.

Engineers built differentiation into the core of the Internet in the early 1980s, understanding that networks would need to tradeoff between different kinds of quality of service.⁴⁴ Both IPv4 and IPv6 have fields to support traffic differentiation, indicating routing parameters around delay, rate, and reliability. Initially, this information was included in IPv4's Type of Service field, which has since morphed into the Differentiated Service Field.⁴⁵

Today, operators routinely use shaping to limit customer traffic and scheduling to manage traffic at times of congestion. Since networks carry a mix of traffic, including a variety of customer traffic and network control traffic, the latter is typically prioritized among all others to ensure that the network is stable. For consumers, traffic can include not just regular Internet traffic, but IPTV and voice service. Again, the latter two services retain priority. Moreover, it is common for businesses to sign a service level agreements (SLA) which determine quality of service (QoS). While costlier, these enhanced QoS services ensure that businesses can build their own technology on top of their Internet access. Within the network, this kind of traffic is differentiated to ensure it conforms to the SLA. TV studios have SLAs to ensure their video feeds maintain consistent quality. Financial firms pay for enhanced service to ensure their trades go to market. Research firms pay for enhanced QoS if they need to run computations over several campuses. Critical to business, SLAs violate the very spirit of network neutrality, and yet they were carved out the *Title II Order*.

Neutrality has never been a driving principle of network design because neutrality assumes that tradeoffs don't have to be made. Take the problem of reliability. Figuring out if a packet has been received is typically achieved via a packet response. However, by building in a response mechanism, latency drops since the network is waiting for a response. Video buffering offers another example. Buffering video mitigates jitter, but in turn, it creates a latency problem. Networks are built on tradeoffs.

Tim Wu readily admitted this balance in his original articulation of network neutrality:

Network design is an exercise in tradeoffs, and IP's designers would point out that the approach of avoiding QoS had important advantages. Primarily, it helped IP be "downwardly" neutral as to the underlying physical media. But this requires us to be more circumspect in our discussions of network neutrality. IP's neutrality is actually a tradeoff between upward (application) and downward (connection) neutrality. If it is upward, or application neutrality that consumers care about, principles of downward neutrality may be a necessary sacrifice.

Wu recognized, contrary to many others within the debate, that to achieve application neutrality, connection neutrality might be a needed sacrifice. From all the indicators, the requirements of the

⁴⁴ Internet Engineering Task Force, "RFC 791: Internet Protocol DARPA Internet Program Protocol Specification," <https://tools.ietf.org/html/rfc791#page-1>.

⁴⁵ Internet Engineering Task Force, "RFC 2475: An Architecture for Differentiated Services," <https://tools.ietf.org/html/rfc2475>.

Internet of Things will necessitate more application neutrality as the cost of connection neutrality.⁴⁶ The wireless 5G standards currently being developed will employ even more sophisticated mechanisms to handle different kinds of traffic flows, far beyond the range of use cases that prior technology generations, such as 3G and 4G, needed. Many of the applications envisioned for 5G are like the network control traffic mentioned above, which means they need minimal delay and high reliability. What was once a simple network with similar users has since changed into a complex web of heterogeneous uses by vastly heterogeneous users. Decisions must be made among those competing interests within a network. The underlying question, then, is the same as it has been for some time. What should be the constraints on differentiation?

The Economics and Effects of Network Neutrality Regulation

The network neutrality debate has spurred a voluminous literature about network innovation. In general, the debate has been split between advocates and lawyers on one side, and economics and network operators on the other. The view of the economists was summed up nicely by Roger Noll, who noted that there is no closed form solution where the network neutrality rules creates positive negative or neutral welfare effects. The effects are ambiguous and will need to be understood on a case by case basis.⁴⁷ Within antitrust, it has come to be understood that *per se* regulation, the type that the *Title II Order* codifies, has its limits. Since the late 1970s, strict limitations have given way to more nuanced cases. The trend began with the 1977 *Sylvania* decision and had continued with *Khan* in 1997, *Trinko* in 2004, and *Leegin* in 2007. True case by case regulation wouldn't assume, like the *Order* does, that a whole rash of actions should be prohibited.

This section focuses on three aspects around the economics and effect of the *Title II Order* and network neutrality regulation. First, what kinds of principles should animate the FCC? Second, what does the economic literature have to say about the problems in network neutrality? And finally, what do we know about the effects of the current *Title II Order*?

Principles for Regulation

Regulating the tech sector is particularly tough since the process of dynamism is messy. Some firms innovate and expand to become giants. Others are bought up by incumbents once they reach scale. But the clear majority simply fail. Understanding how the future will unfold in these spaces is a difficult task.

If you were to ask in 2002 who would be the most innovative companies in the next decade within the cell phone market, few would have guessed Google and Apple. Steve Ballmer, Microsoft CEO, seems to have been quite prophetic, "There's no chance that the iPhone is going to get any significant market share." A decade earlier, Bill Gates thought, "We'll have infinite bandwidth in a decade's time."⁴⁸ Even Robert Metcalfe, a supporter of onerous regulation, once said, "I predict the Internet will soon go spectacularly supernova and in 1996 catastrophically collapse."

A more difficult task than predicting the future involves selecting those practices which will yield harm in the long term. Delineating between beneficial and deleterious practices in the high-tech space presents both the FCC and the FTC with challenges. Although he was speaking about

⁴⁶ Peter Rysavy, "How 'Title II' Net Neutrality Undermines 5G," <http://www.rysavy.com/Articles/2017-04-How-Title-II-Net-Neutrality-Undermines-5G.pdf>.

⁴⁷ Technology Policy Institute, "The Future of the Internet Ecosystem in a Post-Open Internet Order World," <https://www.youtube.com/watch?v=Gz4W0sDxkfs>.

⁴⁸ George Gilder, "The Bandwidth Tidal," <http://www.discovery.org/a/35>.

antitrust, Judge Frank Easterbrook's comments should be heeded by both agencies of high tech as well,

If the court errs by condemning a beneficial practice, the benefits may be lost for good. Any other firm that uses the condemned practice faces sanctions in the name of stare decisis, no matter the benefits. If the court errs by permitting a deleterious practice, though, the welfare loss decreases over time. Monopoly is self-destructive. Monopoly prices eventually attract entry. True, this long run may be a long time coming, with loss to society in the interim. The central purpose of antitrust is to speed up the arrival of the long run.⁴⁹

Both the FCC and the FTC have an uneven track record when it comes to regulating high tech. The Federal Trade Commission justified the imposition of conditions in the 2000 AOL-Time Warner merger because AOL, as the "leading provider of narrowband internet access," was "likely to become the leading provider of broadband internet access as well." That kind of market foreclosure never did occur.

Importantly, the Department of Justice has come to recognize internally the power that the agency wields and the problems that can occur if prohibitions like the *Title II Order* are allowed to stand. Their submission in 2007 on the issue of broadband regulation should serve as a partial corrective to advocates of the *Order*:

However well-intentioned, regulatory restraints can inefficiently skew investment, delay innovation, and diminish consumer welfare, and there is reason to believe that the kinds of broad marketplace restrictions proposed in the name of "neutrality" would do just that with respect to the Internet...

Based on the record in this proceeding to date, proponents of "net neutrality" regulation have failed to show that a sufficient case exists for imposing the sorts of broad marketplace restrictions that have been proposed. Moreover, the Department has grave concerns about the potential negative consequences of such restrictions were they to be enacted. Given the dynamic and evolving nature of the Internet, the Department finds that there are especially strong reasons to be cautious about imposing restrictive regulations in this context.⁵⁰

Following from this, the FCC should put together a committee that is dedicated to ensuring consumers are protected. This BCAC would follow a three-step analysis, which has been adopted from the law and economics literature to ensure consumers are protected:⁵¹

1. Prove the existence of market failure due to actual consumer harm, following the lead set by the Federal Trade Commission;⁵²

⁴⁹ Frank H. Easterbrook, "The Limits of Antitrust,"

http://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=2152&context=journal_articles.

⁵⁰ Department of Justice, "Ex Parte Filing," <https://www.justice.gov/atr/ex-parte-filing-united-states-department-justice-matter-broadband-industry-practices>.

⁵¹ Adam Thierer and Berin Szoka, "Online Advertising & User Privacy: Principles to Guide the Debate," <http://www.pff.org/issues-pubs/ps/2008/pdf/ps4.19onlinetargeting.pdf>.

⁵² Federal Trade Commission, "FTC Policy Statement on Unfairness," <http://www.ftc.gov/ftc-policy-statement-on-unfairness>.

2. Explain that current law is inadequate, and that there exists no alternatives including market correctives, deregulatory efforts, or public/private partnerships to solve the market failure; and
3. Demonstrate how the benefits of regulation will outweigh the potential countervailing benefits, implementation costs and other associated regulatory burdens.

With this proceeding, the Federal Communication Commission has an opportunity to get regulation right, and ensure that regulatory burdens do not stifle this sector. That goal, more than others, should be a guiding light.

Economics of Network Neutrality

As Wu pointed out in his original paper, “Basic economic theory suggests that operators have a long-term interest coincident with the public: both should want a neutral platform that supports the emergence of the very best applications.” Basic economic theory doesn’t make a showing the *Title II Order*. As the agency explained in the 2010 Order, “because broadband providers have the ability to act as gatekeepers even in the absence of market power with respect to end users, we need not conduct a market power analysis.” The 2015 *Order* goes further. The agency gave the silent treatment to three of its former chief economists, interpreted studies in such a way as to receive formal rebukes from authors, tacitly admitted that the rules will “cement the advantages” of incumbents, and agreed that it had no experience with paid prioritization but then banned it anyway.⁵³ Economists and antitrust experts are in agreement.⁵⁴ Not only must harm be firmly established before regulation is put into place, the economics of network neutrality were contorted in the *Title II Order*. A review of the literature follows.

Content makes broadband access more valuable since they are complementary goods. The more content that flows over the pipes, like Google searches, Netflix movies, and Facebook posts, the more valuable the pipes are to consumers. In turn, total economic surplus increases, allowing broadband companies to take home a bigger revenue share. Some lament that US broadband costs are relatively high, but Americans consume about twice as much data as Europeans on average. If we assume that this content has at least some value, then the value of broadband access to Americans is quantitatively higher than the Europeans which contributes to the higher cost.

The *Title II Order* uses the term virtuous cycle to connote how “innovations at the edges of the network enhance consumer demand, leading to expanded investments in broadband infrastructure that, in turn, spark new innovations at the edge.” Economics, however, has employed the term complementary goods for much longer, and yet no mention of this basic concept is present in the *Order*.

In the Commission’s own words, “These rules do not address, and are not designed to deal with, the acquisition or maintenance of market power or its abuse, real or potential.” The *Title II Order* roots its logic in the concept of a terminating access monopoly, which has gained purchase in recent years. Because ISPs are terminating access monopolies, the *Order* argued that no further economic exploration.

⁵³ Will Rinehart, “Court Finds Network Neutrality Rules Both Legal and Bad Policy,” <https://www.americanactionforum.org/insight/court-finds-network-neutrality-rules-legal-bad-policy/#ixzz4r9wn59C0>.

⁵⁴ Washington Bytes, “Bringing Economics Back Into The Net Neutrality Debate,” <https://www.forbes.com/sites/washingtonbytes/2017/07/12/bringing-economics-back-into-the-net-neutrality-debate/#72ceb3f769da>.

Terminating access monopolies can be understood as consumer facing networks that possess monopoly power over third-party senders of traffic regardless of their size or competitive environment because they are funnel through which consumers receive that content. If this were true, then there should be examples of small competitive providers charging very high rates to the senders of that incoming traffic. Intriguingly, this phenomenon rarely arises outside of the voice-interconnection context, which is likely due to the restrictive rate regulation scheme that is laid on top of these players. In the paid TV market, for example, programmers clearly have power over multichannel video programming distributors (MVPDs), otherwise the blackout of CBS content on Time Warner Cable would not have induced consumers to switch from the TV service. In the Internet ecosystem, small and medium sized ISPs should be able to extract rents from data being sent into their networks. And yet, these smaller ISPs tend to pay the larger networks to carry their traffic.⁵⁵

If the terminating access monopoly argument has explanatory value, then why don't we see the deleterious outcomes? Of course, this is yet another logical gulf that lies at the heart of the *Order*. Setting aside the regulated relationship between ISP and consumers under BIAS, if the problems are so rampant, they should occur in each of the other markets where the same kind of terminating access monopoly occurs, including the interconnection market, the MVPD markets, and even the non-regulated business-to-business market for SLAs.

By focusing on ISPs and consumers, the *Order* misses the rest of the ecosystem, which is crucially important to understand which actions are in the best interest of consumers. Since content is the relevant product, a bilateral monopoly exists between the content producer as a monopoly and the ISP as a monopsony. In this relationship, the ISP acts an agent of their consumers, a confirmation of the basic economic argument that Wu had first suggested. Again, this environment calls for a case by case analysis to problems not a restrictive band.

Legal scholars Jonathan Neuchterlein and Christopher Yoo, put this into perspective for the network neutrality argument:

A small rural MVPD/ISP may be the gatekeeper for access to its customer set, but HBO is likewise the gatekeeper for access to its programming, and Netflix is the gatekeeper for access to its streaming video service. The rural MVPD/ISP's possession of a terminating access monopoly does not itself tell us very much about how it will fare in its negotiations with those other gatekeepers.

As detailed in an earlier section, content networks have far more power than the *Order* grants because content doesn't conform to an ideal of perfect competition. There are search costs, barriers to entry exist, content has market power and there are significant transactions costs. Because the *Order* doesn't take seriously a world where content is differentiated, it fails to recognize the myriad places where its policies in the name of network neutrality are likely to fail.

Take zero rating. Perhaps instead of outright blocking, ISPs will bias their preferred content as it seems they do with zero-rating. In a world before zero-rating, affiliated and non-affiliated content are both constrained by the data cap. However, once affiliated content has been zeroed out, then the cost to consume non-affiliated has been reduced. Think of it like this. To make things simple, let's say your plan allows for 100 hours of downloadable content. In a non zero-rated world, you

⁵⁵ Jonathan E. Neuchterlein and Christopher S. Yoo, "A Market-Oriented Analysis of The "Terminating Access Monopoly" Concept," https://www.ftc.gov/system/files/documents/public_statements/894663/151129nuechterleinyooarticle.pdf.

consume 50 hours of affiliated content and 50 hours of unaffiliated content. Once affiliated content has been zeroed out of your plan, you effectively gain 50 hours of downloads, making it more likely you'll select unaffiliated content. To those who only see the marketplace in a static mindset, it is deeply paradoxical to learn that the Binge-On program nearly doubled video viewing for T-Mobile, which was able to sustain average billing rates even as it zeroed out the biggest sources of data usage.⁵⁶

The Effect of the Title II Order

In 2015, the FCC under the Wheeler administration made bold claims about the benefits that would accrue due to the *Title II Order*. After decrying the threats to Internet openness, the *Order* continued, "The 2010 rules helped to deter such conduct while they were in effect. But, as Verizon frankly told the court at oral argument, but for the 2010 rules, it would be exploring agreements to charge certain content providers for priority service." Those who were present in the court knew the implication. Verizon wanted to partner with ESPN to create an integrated phone.⁵⁷ Famously, Verizon and ESPN fumbled in 2006 when they teamed up together for a branded phone, but they wanted to try again with a new project.⁵⁸ It was widely surmised at the time that such a project might trigger a network neutrality violation.⁵⁹

Very little ink has been spilled about this deal within the larger policy fight, but the implications should be evident. There is a use case for paid prioritization. Of course, in the business to business market, paid prioritization has long occurred in the form of SLAs. Hiding behind the *Order* is the assumption that consumers will never benefit from. In the UK, there are Internet services geared towards gamers that aim for low latency, a violation of network neutrality in the US.⁶⁰ Indeed, efforts to engineer networks so that VOIP or live video conferencing runs more smoothly are also limited by network neutrality laws. A couple of years back, Mung Chiang, a professor of electrical engineering at Princeton, believed he could give customers more control over their wireless service by nudging them to reduce their peak-period traffic, making some costly network upgrades unnecessary. His innovation and company are at the whims of FCC's net neutrality politics.⁶¹

The *Order* is a regulatory nightmare. To compound all of the other problems, when FCC Chairman Wheeler reclassified Internet to be a Title II service, Section 208 was included. This section allows the FCC to regulate prices in the future. In allowing for this provision to stand, the *Order* put the industry on notice. The reclassification also allowed the agency to push privacy rules and consider cybersecurity regulation. It is worth noting that the FCC enacted nearly similar privacy rules on telecommunications companies in the 1990s, a bevy of evidence was presented showing how the

⁵⁶ Adam Levy, "Where Is T-Mobile's Subscriber Growth Coming From?"

<http://www.fool.com/investing/general/2016/05/05/where-is-t-mobiles-subscriber-growth-coming-from.aspx>.

⁵⁷ "ESPN Eyes Subsidizing Wireless-Data Plans," <http://allthingsd.com/20130509/espn-eyes-subsidizing-wireless-data-plans/>.

⁵⁸ T. Lowry, "ESPN's Cell-Phone Fumble," <https://www.bloomberg.com/news/articles/2006-10-29/espn-s-cell-phone-fumble>.

⁵⁹ Rob Frieden, "Content Provider Wireless Subsidies," http://telefrieden.blogspot.com/2013_05_05_archive.html.

⁶⁰ UK Fast, "PlusNet launches new gaming servers," <https://www.ukfast.co.uk/hosting-news/new-gaming-servers-launched-by-plusnet.html>.

⁶¹ George Anders, "The Right Way to Fix the Internet," <https://www.technologyreview.com/s/531616/the-right-way-to-fix-the-internet/>.

rules had hurt investment in telecommunication.⁶² The combination of network neutrality rules, privacy rules, and the threat of cybersecurity regulation injected real uncertainty in the regulatory regime of broadband in 2015. As Chekhov once famously said, “If in the first act you have hung a pistol on the wall, then in the following one it should be fired.”

To traffic in this sort of ignorance, the *Order* muddles core financial concepts, “Major infrastructure providers have indicated that they will in fact continue to invest under the framework we adopt, despite suggesting otherwise in their filed comments in this proceeding.” Some basic finance can help clear up the confusion.

For one, spending to maintain infrastructure says nothing about the returns that will be garnered from that asset. Since technology is continually changing, an operator will need to invest to keep up with competitors, but over time declining returns could catch up with the firm. For example, Google invested heavily in their Fiber project, but it is largely assumed that the project wasn’t getting much return.⁶³ Diversified companies make complex investment decisions, but all capital expenditures typically fall into two categories. Maintenance capex includes the necessary expenditures required to keep existing operations running smoothly, while growth capex comprises the discretionary investments used to attract new customers or create the capacity for a bigger business.⁶⁴ While the major infrastructure providers will continue to invest to maintain current networks, new and potentially disruptive projects with thinner margins both within the company and within the same industry will find it harder to get off the ground.

Regulatory regime change won’t affect current operations all that much. At the point in which networks were built out, the future cash flows were determined. Sunk investment decisions are just that. New projects, like network expansions, suffer instead. As Pindyck & Solimano detail, investments expenditures are in part irreversible and cannot be recovered if the market turns sour.⁶⁵ Because firms have some flexibility over the timing of their investments, they can delay new investments until information arrives that alleviates the uncertainty. Thus, investment decisions are sensitive to the uncertainty of future payoffs. As they continue, “there is reason to expect changing economic conditions that affect the perceived riskiness of future cash flows to have a large impact on investment decisions.” Regulatory changes matter, as does regulatory uncertainty, both of which are injected into the market with the *Order*.

First, the *Order* readily admits that its rules will negatively affect investment. Trying to turn a negative into a positive, the *Order* spins the history of one spectrum block, saying, “Verizon Wireless has invested tens of billions of dollars in deploying mobile wireless services since being subject to the 700 MHz C Block open access rules, which overlap in significant parts with the open

⁶² Julie Tuan, “U.S. West, Inc. v. FCC,”

<http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1276&context=btlj>.

⁶³ Brian Fung, “Why google Fiber is no longer rolling out to new cities,”

https://www.washingtonpost.com/news/the-switch/wp/2016/10/26/why-google-fiber-is-no-longer-rolling-out-to-new-cities/?utm_term=.18c6a0ade8ed.

⁶⁴ Divestopedia, “What’s the difference between growth capex, maintenance capex and internally financed capex?” <https://www.divestopedia.com/7/6677/valuation/free-cash-flows/whats-the-difference-between-growth-capex-maintenance-capex-and-internally-financed-capex>.

⁶⁵ Robert S. Pindyck and Andres Soliman, “Economic Instability and Aggregate Investment,” <http://www.nber.org/chapters/c11002.pdf>.

Internet rules we adopt today.” Since this block provided a natural experiment of the rules, it is startling to learn that the rules reduced the winning bid by some 60 percent.⁶⁶

While advocates might point to increasing investment as a sign that the regulations haven’t affected broadband development, the conclusions cannot be trusted. Because there is no control, there no baseline to judge the trend. It could have been the case that \$3.25 billion *should* have been invested, and instead \$3 billion was. Only the difference-in-difference method can solve this problem. However, since the entire industry is subject to the treatment, then there isn’t a natural counterfactual to compare the current trend and so one must be constructed. Economist George Ford wrote the only study of this type, using synthetic control to deal with the counterfactual world, and found that investment was down nearly 30 percent. Moreover, his work suggests that the downtrend in investment began in 2010 just as the FCC solidified its more expansive rules.

Conclusion

The FCC never did its due diligence for this rulemaking. Instead of being an expert agency by consulting economists, engineers, and the FTC, it made policy to appease the Obama Administration and network neutrality advocates. The previous FCC administration’s unwavering fixation on principles unrooted from reality blinded them from creating flexibility and working policy. The *Order* isn’t flexible and doesn’t protect consumers. This docket, however, corrects that. In short, the FCC should roll back reclassification of the Internet, return the Internet to previous classification, and put the agency back on track by creating a Broadband Consumer Advocacy Committee. Only then will both consumers and innovators flourish.

⁶⁶ Gerald R Faulhaber and David J. Farber, “The Open Internet: A Customer-Centric Framework,” <http://ijoc.org/index.php/ijoc/article/viewFile/727/411>.