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## I. INTRODUCTION

U.S. telecommunications regulation has long been characterized by contentious disputes. Pricing, subsidies, and legal authority to regulate have certainly been prominent, but one other theme has been prominent if not dominant: rights of access to incumbent networks. Past disputes of this sort led to a series of separation rules that, in part because of their cumbersome nature, resulted in a judicial rather than regulatory remedy, the 1984 breakup of (the "old") AT&T into a nominally competitive long distance and equipment companies and seven regulated local exchange monopolies.

It hardly needs to be said that the telecommunications landscape has changed considerably since the 1984 divestiture. Thanks to the ubiquity of packet-switching and the explosive growth in mobile communications, the long distance and voice service landline markets central to the antitrust case are almost distant memories. But disputes over pricing, subsidies, legal authority, and rights of access remain. They have moved over to the broadband internet services provided both through landlines (cable television systems or telephone company digital subscriber line service ("DSL") and fiber-optic service) and to mobile smartphones over cellular communications networks.

Perhaps the most contentious of these issues is network or "net" neutrality. Although some observers have found it an elastic concept, the central idea is nondiscrimination—that providers of broadband internet service should treat all content identically, in particular not block any content, and let users know how they manage content. The U.S. Federal Communications Commission ("FCC") recently defined it by three "Open Internet" principles:

- *Transparency*. Broadband providers must disclose information regarding their network management practices, performance, and the commercial terms of their broadband services.
- *No Blocking*. Fixed broadband providers (such as DSL, cable modem, or fixed wireless providers) may not block lawful content, applications, services, or non-harmful devices. Mobile broadband providers may not block lawful websites, or applications that compete with their voice or video telephony services.

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- *No Unreasonable Discrimination*. Fixed broadband providers may not unreasonably discriminate in transmitting lawful network traffic over a consumer's broadband internet access service. Unreasonable discrimination of network traffic could take the form of particular services or websites appearing slower or degraded in quality. [2]

The no blocking and non-discrimination requirements preclude charging content providers for carriage—otherwise, those who do not pay would be blocked—and, secondarily but importantly, preclude allowing content providers to pay for premium or priority carriage. A corollary is that if the broadband provider is also a content or service provider, it has to grant its competitors in those markets, such as alternate video or voice telephony service, the same access to its network that it grants itself.

A kicker, of course, is the meaning of "unreasonable" and by implication what has to be conveyed through the transparency requirement. On that, the FCC says:

> In addition, in the Open Internet Report and Order the Commission recognizes that an open, robust, and well-functioning Internet requires that broadband providers have the flexibility to manage their networks, including but not limited to efforts to block spam and ensure that heavy users don't crowd out other users. For this reason, the no blocking and no discrimination rules are subject to reasonable network management.[3]

Largely for this reason, the FCC chose not to apply the non-discrimination rule to mobile broadband providers and restricted the no blocking provision to competing voice and video services. We will come back to the "reasonable management" issue below.

The standard rationales for these rules primarily involve thwarting the exercise of market power by the broadband service providers. The other side argues primarily that such rules stifle innovation, the broadband market is sufficiently competitive to not need such requirements, and that *ex post* enforcement following bad acts is all that is necessary. The thesis here is that neither side has it entirely right, in large measure because they are "barking up the wrong tree." The relevant market failure is not insufficient competition but failure to recognize the network externality in the broadband environment: the value of internet access to a content supplier depends upon its viewers' ability to access links in its content. This market failure does not justify full net neutrality, in particular, a non-discrimination rule. It does suggest a minimum quality standard, which I understand is the preferred approach in the European Union, as stated in the Universal Service Directive as amended in 2009:

> In order to prevent the degradation of service and the hindering or slowing down of traffic over networks, Member States shall ensure that national regulatory authorities are able to set minimum quality of service requirements on an undertaking or undertakings providing public communications networks.[4]

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[2] http://www.fcc.gov/topic/open-internet, accessed March 15, 2012.

[3] *Id*.

[4] Directive 2002/22/EC (Universal Service Directive), Article 22(3) (2009), *Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009*, OFFICIAL JOURNAL OF THE EUROPEAN UNION L 337/11, 25 (18 December 2009).

Whether the costs of a minimum quality standard exceed the benefits remains a debatable question.[5] But that, rather than the FCC's stronger non-discrimination rule, is what the debate should be about.

## II. PROBLEMS WITH MARKET POWER JUSTIFICATIONS

Proponents of net neutrality offer three primary arguments. The first is that allowing broadband providers to discriminate, particularly against competitors of affiliated content and service providers, is inherently anticompetitive. A second is that the "little guy" will be unable to secure the same access as large incumbents, blocking the path to innovation that made the internet what it is today. Third, proponents can point to a small number of incidents where a broadband service provider blocked traffic for essentially political reasons.

On the economics side, the first of these is most interesting. As noted above, there is a long history of concern regarding discrimination in access to telecommunication networks. The antitrust case against AT&T was largely motivated by a belief that AT&T had discriminated against competing equipment and long distance service providers in getting access to their local telephone monopolies.[6] However, in that history, the potentially discriminating firm was a regulated monopoly. When regulation holds down prices, the firm has an incentive to integrate into unregulated markets and discriminate against competitors through (non-price) degradation of service quality. The artificial competitive advantage this creates for the affiliate allows this monopolist to recapture some of the profits that regulation otherwise precludes.[7]

This story does not hold when the potentially discriminating firm is unregulated, as it can exploit whatever market power it has directly, and thus lacks this incentive to discriminate.[8] Without price regulation, the likelihood of discrimination against content providers and the incremental effect of its doing so is, at worse, unpredictable. The more robust and varied the content, the more people would pay for access to it and the more money the firm can make by leaving access unfettered. Hence, the first-order effect of discrimination is to sacrifice profits. That sacrifice may well be warranted by cost savings or other efficiencies associated with content delivery, e.g., marketing both the conduit and the content together or improving overall functionality through congestion management.

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[5] Martin Cave & Pietro Crocioni, *Net neutrality in Europe*, 3 COMMUNICATIONS & CONVERGENCE R. 57-70 (2011).

[6] Timothy Brennan, *Why Regulated Firms Should Be Kept Out Of Unregulated Markets: Understanding the Divestiture in U.S. v. AT&T*, 32 ANTITRUST BULL. 741-93 (1987).

[7] A simple numerical illustration may help. Suppose a monopolist could charge 20 for access to its service, but its regulated price is 12, leaving per unit monopoly profits of 8. It enters a competitive business that needs access to its regulated service. The cost of providing that competitive service is 15 apart from access cost. If regulation is working, the total cost of service would be 12 + 15 or 27. If the regulated firm can impose non-price costs on its rivals in the competitive market through discrimination in access of 5, the rivals' cost becomes 12 + 15 + 5 or 32. The monopolist essentially exploits its monopoly by creating a profit of 5 (32 less its costs of 27) in the ostensibly competitive market. In principle, if it could impose non-price discriminatory costs on its rivals of 8 or more, it could fully capture the monopoly profit by charging 35 in the competitive market, using vertical integration to evade the regulation entirely.

[8] Returning to the numerical example, if the monopoly can already charge 20, it can capture the 8 in monopoly profits directly.

In principle, discrimination could be a strategy to preclude entry, but without space to get into that here, these situation-specific theories do not appear to be empirically relevant or compelling.[9] One might argue based on the U.S. antitrust case against Microsoft that a broadband provider was discriminating against competing content providers to prevent their entry into broadband provision, as Microsoft was alleged to have discriminated against competing browsers to protect its monopoly over future application platforms.[10] In this setting, few people, if any, expect content providers to be getting into the very expensive business of providing the wire or spectrum conduits to deliver internet service.

Looking more directly at pricing, Economides & Tåg have noted that in some circumstances it would optimal for a broadband service provider to charge no price or even subsidize content providers, increasing value to those who use it to access content.[11] In such cases, positive prices to content providers might maximize a broadband provider's profits but may not be economically efficient overall. As noted above, charging positive prices to content providers implies blocking content of those who do not pay. However, the theoretical possibility that content providers should get free access seems insufficiently general to justify prohibiting positive prices through a net neutrality rule.

Other arguments are based on market power but not necessarily on strategic incentives to exercise it. Some net neutrality proponents have argued that creating a "fast lane" on the internet will relegate small, new start-ups to the sidelines and stifle the source of creativity that made the internet what it is today. My admittedly instinctive reaction is that argument rests on a romantic notion of the little guy pioneer from the early days of internet, with limited relevance to a mature sector where successful innovations are likely to require substantial investments. Another argument is that broadband providers will block traffic as a political tactic, with allegations including denying traffic to the website of a striking union or to a group lobbying for legislation to change the provider's pricing system.[12] The arguments for intervention on these grounds are likely to be more political than economic; I return to them below.

## III. ARE THE OPPONENTS' ARGUMENTS BETTER?

The arguments against net neutrality also focus on market power. Rather than cast doubt on the theoretical soundness of intervention given market power concerns, they emphasize four themes. The first is that competition in broadband service provision is sufficient to eliminate a presumption that there is a problem. With two landline providers in most jurisdictions—cable television lines and either DSL or fiber-optic service from telephone companies— and a number of wireless providers with increasing transmission speeds, there may be some reason for optimism on that score. On the other hand, the FCC's own net neutrality rules exempt mobile providers on the grounds that they lack the capacity of wire-based networks and thus may not be

[9] Brennan, *supra* note 1 at 66-68.

[10] Timothy Brennan, *Do Easy Cases Make Bad Law? Antitrust Innovation or Missed Opportunities in U.S. v. Microsoft*, 69 GEORGE WASHINGTON L. R. 1042-1102 (2001).

[11] Nicholas Economides & Joacim Tåg, Network Neutrality on the Internet: A Two-Sided Market Analysis (Dec. 12, 2011), *available at* http:// ssrn.com/ abstract =1019121.

[12] Paul Ganley & Ben Allgrove, *Net Neutrality: A User's Guide*, 22 COMPUTER, LAW & SECURITY REPORT 454-63, 458 (2006).

effective competitors to landline providers. If so, a landline duopoly is not so self-evidently competitive to preclude the possibility that cable or telephone service providers might have the discretion to favor particular content suppliers.

A duopoly, however, could support a the second theme in opposition to net neutrality, which is that any enforcement should apply general antitrust laws following bad acts rather than be imposed in advance by a regulator on the basis of (questionable) theoretical concerns.[13] While appealing, it faces severe legal constraints in the United States. A number of Supreme Court decisions in the last eight years have concluded that when a sectoral regulator has jurisdiction over the conduct at issue, antitrust enforcement is precluded.[14] In that event, jurisdiction over net neutrality-related complaints falls to the FCC. One could then look at the FCC's *ex ante* rule as doing the industry a favor by reducing uncertainty regarding its *ex post* enforcement, since it would be the enforcer.

The third- and fourth-related net neutrality opposition themes are more persuasive. One is that the wire-based systems, even with higher capacity, also require congestion management that justifies prioritizing traffic, which is inherently discriminatory.[15] During peak demand periods in North America, real-time entertainment constituted a reported 53.5 percent of aggregate traffic and 60 percent of downloaded traffic.[16] The other is that the ability to offer and charge for priority delivery of traffic, such as real-time entertainment but also applications in finance, science, and medicine, allows the creation of revenue streams that can provide incentives for innovation in the internet.[17]

## IV. THE RIGHT TREE: NETWORK EXTERNALITIES

Neither arguments for net neutrality based on market power, nor those against net neutrality based on its absence or relying on case-by-case antitrust enforcement, are compelling. One might then conclude that there is not much of a policy issue to debate. That would be incorrect. The focus on market power has all but obviated the more likely compelling market failure: network externalities. This lack of recognition of the importance of network externalities is all the more striking in telecommunications, where network externalities have long played a crucial policy role. The very term "internet" refers to network externalities twice, with the "inter" from "interconnected" and net from, well, "network."

Network externalities refers essentially to the idea that a particular service is more valuable to its users the more users that service has.[18] Examples abound. The Microsoft Office suite possesses network externalities in that the value to users of Word, Excel, and Powerpoint is

[13] Gerald Faulhaber, *The Economics of Net Neutrality*, 34 REGULATION 18-25 (Winter 2011-2012).

[14] The leading cases are United States Postal Service v. Flamingo Industries, et al., 540 U.S. 736 (2004); Verizon v. Trinko, 540 U.S. 398 (2004); Credit Suisse v. Billing, 551 U.S. 264 (2007). The *Trinko* decision is noteworthy because it applied to discrimination exercised by telecommunications monopolies with a result counter to that in the AT&T antitrust case settled in 1984. Timothy Brennan, *Trinko v. Baxter: The Demise of U.S. v. AT&T*, 50 ANTITRUST BULL. 635-64 (2005).

[15] Christopher Yoo, *Network Neutrality and the Economics of* Congestion, 94 GEO. L.J. 1847-1908 (2006).

[16] Sandvine Incorporated ULC, GLOBAL INTERNET PHENOMENA REPORT FALL 2011 6 (2011).

[17] Christopher Yoo, *Network Neutrality or Internet Innovation?* 33 REGULATION 22-29 (Spring 2010).

[18] One can think of congestion as the opposite of a network externality, in which a service is less valuable to any user the more users the service has.

enhanced if not fundamentally determined by the fact that the lion's share of other users also use these programs for documents, spreadsheets, and presentations. Although one might expect network externalities to lead to monopoly provision, as the Office example suggests[19] network externalities can be managed in a number of ways. Industry groups can set standards, e.g., determining the frequency and voltage of electricity delivered to end users and the shape of plugs, so anyone wanting to sell an electricity-powered device knows how to design it to work wherever it is used (at least within a country or continent). The rules for packet-switched communications known as the "Internet protocol" allow computing devices and communications networks to provide the interactive variety of services that define this information age.

Network externalities also have motivated public policy regarding telecommunications. A major argument for universal service subsidies in traditional voice telephony was that the value of having a phone to any user was increased by having more people she could call. As technological change began to eliminate the physical scale economies that had made local telephone service a monopoly, one could be concerned that these network externalities would preclude local competition. For that reason, the U.S. government required telephone networks to provide interconnection so any participant in the market could benefit from network externalities based on the ability for a subscriber to any provider to reach subscribers on every provider.

In light of this history, one might have expected the debate about content carriage policy in broadband to have focused on network externalities but, in the United States at least, that has not been the case. With broadband, the relevant network externality is not on the side of the users so much as on the content side. Content providers frequently, if not typically, post links to other content on their websites and social network pages or in their emails and tweets. Consequently, the value to content provider A of internet access depends on the A's confidence that its viewers will be able to access links to B's content that A may post.[20] This confidence depends upon the quality of service that the broadband service providers, to which A's viewers subscribe, can access B's content.

It is important to understand why this can be a market failure. Viewers of A's content need not be subscribers to A's broadband provider, so A cannot effectively choose its service provider on the basis of the quality of content access it provides to anyone to which its readers may subscribe. A needs to rely on the quality of the access other service providers with whom it does not deal offers to B. The infeasibility of having all content providers making arrangements for all service providers underlies the market failure. If A thinks some of those service providers may block or delay B's content, A has no practical way to provide incentives to guarantee otherwise.

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[19] It has long been controversial as to whether a market settles on the right standard. In theory, accidents of history and the inertial cost of switching from one standard to another could leave an economy with a standard inferior to one that would generate greater net economic benefit.

[20] Cave & Crocioni argue against the network externality justification by claiming that with the advent of search engines, individuals "hop from website to website using links." Cave & Crocioni, *supra* note 5 at 64. Of course, the links returned by search engines are exactly of the sort described in the text, suggesting that the content-side network externality mentioned above is particularly relevant for search engines.

It is important to see that competition in broadband service provision exacerbates this failure. If there were a monopoly broadband provider, it would internalize this externality, profiting because it could increase A's willingness to pay for its service by improving the quality of access it provides to B. The more broadband providers there are, the more likely it will be that improvements in quality of access offered by B's service provider will benefit other service providers and their subscribers, and thus not be captured by B. The predictable result would be less than optimal access quality.

## V. MATCHING THE RESPONSE TO THE PROBLEM

That there may be a significant market failure apart from the exercise of market power does not revive the case for net neutrality. The network externality problem would not arise because all content might not be treated identically. It would arise because some broadband providers might not provide sufficient quality so that content providers using other broadband providers lack assurance that links they make can be accessed with sufficient quality. This indicates that instead of the FCC's non-discrimination approach, the E.U.'s minimum quality standard is the appropriate policy response.[21]

Not only is a minimum quality standard best suited to address network externalities; it also addresses the major contentions on both sides of the net neutrality debate. For those in favor of network neutrality, a minimum quality standard prevents permanent blocking. It thus would prevent the occurrence of the isolated but compelling horror stories that have energized much of their concern. For network neutrality opponents, a minimum quality standard does not preclude above-minimum quality services and pricing schemes that could improve incentives to improve broadband networks and facilitate innovation in the development and marketing of audio and video content. Moreover, a minimum quality standard should reduce the costs of and impediments to congestion management necessary under net neutrality.

Considering network congestion reminds us that even if a minimum quality standard is preferable to net neutrality, serious implementation problems remain. A first is what would go into a standard. Would it be a minimum transmission rate every second of every day? Would it be a stochastic average, or a minimum over X percent of the time? Would some maximum latency be the standard?[22]

Once one has come up with the form of a standard, one has to address the level. In theory, that would be where the marginal benefits of increasing the level just match its marginal cost, but measuring either of those in practice would be difficult. On the benefit side, the

[21] I do not know whether the E.U.'s adoption of a minimum quality standard, *supra* note 4, took account of network externalities. Cave & Crocioni suggest that the network externality justification is "a somewhat different justification" from others in the European net neutrality discussion. Cave & Crocioni, *supra* note 5 at 64, citing an earlier version of Brennan, *supra* note 1.

[22] These complications also indicate that merely adopting "transparency" regarding management practices, as in the first of the three prongs of the FCC's "Open Internet" rules (*supra* note 2 and accompanying text) is likely to have little practical benefit. These practices are likely to employ highly complicated congestion management algorithms regarding stochastic effects on traffic delivery delays. Consumers may not be able to factor this sort of information into their choice of broadband service provider.

discussion above suggests that there is likely to be some network externality associated with access quality, but it does not suggest how big that effect is or any practical way to measure it.

On the cost side, two types of costs need to be recognized. One is that a binding minimum quality standard will virtually certainly raise costs, which means raising prices and thus reducing demand. Ironically, the very network externalities justifying such a standard indicate that the costs are not only the losses to those priced out of the market but to others who are using networks with fewer subscribers. Another cost is that a minimum quality standard does not eliminate potential costs of congestion and its management, including expanding capacity just to meet the standard. Even if those costs are lower than with full net neutrality, they remain something policy makers would have to consider. With arguments likely to rest on sophisticated engineering technicalities, these will not be easy judgments to make.

For all of these reasons, not only am I unable to say what the minimum quality standard should be, but also I cannot say that the benefits of imposing any standard at all would exceed costs from higher prices and less flexibility in managing congestion. All I suggest is that a focus on market power, with net neutrality as the solution, brings the wrong remedy to the wrong problem. The debate should be about whether a quality of service standard is appropriate and, if so, how to impose one. On this score, the European Union is closer to the United States in getting the right question on the table.