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**Testimony of**

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Studies**

**Before the**

**Federal Communications Commission**

**Open Meeting on Network Neutrality and Broadband Network  
Management**

**Stanford University**

**April 17, 2008**

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**Stanford University, April 17, 2008**

Mr. Chairman and Commissioners, good afternoon and thank you for inviting me to testify today.

My name is Dr. George S. Ford, and I am the Chief Economist of the Phoenix Center for Advanced Legal and Economic Public Policy Studies, a non-profit 501(c)(3) organization that studies broad public policy issues related to governance, social and economic conditions, with a particular emphasis publishing scholarly research on the law and economics of telecommunications and high-tech industries. We have written nearly fifty papers on telecommunications policy in the last nine years, many of which have been published in scholarly journals. Moreover, we make all of our research—as well as rebuttals by those who do not agree with us—available for free at our website, [www.phoenix-center.org](http://www.phoenix-center.org).

Before beginning my testimony today, I wish to make it clear that the Phoenix Center makes it a policy not to endorse or support any particular proposed regulation or

regulatory outcome. Our mission is not to tell policymakers *what* to think about an issue, but to help them with *how to think* about it. We do so by constructing analytical frameworks for evaluating problems and policy proposals as well as empirics that attempt to quantify the relevant tradeoffs. We believe that in the absence of a suitable analytical framework, it is difficult if not impossible to make a decision that will do more good than harm. Further, unlike many participants in the policy debate, we refuse to ignore the institutional realities and economic constraints of the communications business. Economic theories derived in an idealized environment are often not useful in industries like telecommunications that have scale economies, externalities, and regulation. There are simply no easy answers here.

The Phoenix Center has published a number of studies on the economics of network neutrality and broadband network management. Almost all of these papers include original theoretical or empirical work. Our efforts to model theoretically the consequences of particular and general proposals on network neutrality and network management reveal, almost universally, that the efforts to place more regulation on the Internet are problematic, and in many cases, decidedly anti-consumer. These results are consistent with other research.<sup>1</sup>

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<sup>1</sup> B. E. Hermalin and M. L. Katz, *The Economics of Product-Line Restrictions: With An Application to the Network Neutrality Debate*, COMPETITION POLICY CENTER PAPER CPC06-059 (July 2006) (available at:<http://repositories.cdlib.org/iber/cpc/CPC06-059>); M. Jamison and J. Hauge, *Getting What You Pay For: Analyzing the Net Neutrality Debate*, Working Paper: <http://ssrn.com/abstract=1081690>; N. Economides and

## **The Importance of a Sound Analytical Framework when Considering Network Neutrality Regulation**

The task of policymakers is to sort through the many and varied claims of interested parties and determine which policy prescription can be expected to advance the interests of consumers and overall economic welfare best. It is the responsibility of the parties and other participants, like me, to provide you with the tools and information you need to make prudent policy decisions. As such, every request to impose significant regulatory change should be accompanied by a serious attempt to determine the probable winners, losers, and other consequences of the proposed changes. If the parties fail to provide you such a framework and analysis, then regulation is little more than a religion.

Today, the arguments for network neutrality seem more like a Christmas list of “I wants” than a serious effort to improve on the status quo. You, the government, play the role of Santa Claus, checking twice to determine whether firm conduct is “naughty” or “nice.” The idea of network neutrality is an important one and deserves much better. The undeveloped and unspecific state of network neutrality proposals opens the door for effective and often lethal criticism. Research by the Phoenix Center and others, for example, shows that the very entities intended to be helped by many of the proposed regulations would, in many cases, actually be harmed by those proposals. The

inconsistencies between intent and consequence arise due to the lack of any analytical foundation for existing network neutrality proposals.

So how can we improve the status of the network neutrality debate? My recommendation to you is that you first insist that all proponents of network neutrality or network management regulation show convincingly that the proposed rules will indeed have their intended effect of increasing consumer and/or social welfare. Second, the regulation must do so efficiently, in that the expected costs of the regulations are less than the expected benefits. The burden of proof should rest on those proposing regulation, since the 1996 Act explicitly calls for deregulation in communications.<sup>2</sup> Thus far, such analyses are completely absent from the debate.

This additional discipline will greatly simplify your work, since most of what is proposed and debated today could not satisfy either requirement. As I discuss below, what little research we have seen supporting network neutrality regulation shows that network neutrality regulation has, at best, ambiguous welfare effects and, at worst, is decidedly anti-consumer and harmful to the content industry it aims to protect or enrich. At the Phoenix Center, we have provided policymakers with some theoretical and empirical analysis of network neutrality and network management proposals, with

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<sup>2</sup> 1996 TELECOMMUNICATIONS ACT, Preamble (“to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.”).

our focus being upon the welfare impacts of proposed regulation. We find generally that the welfare effects of the existing network neutrality proposals do not increase consumer or aggregate welfare. While we do not pretend to have all the answers, we do believe that our approach to these questions is important to your deliberations, and I welcome this opportunity to present our research to you.

### **Impact of Network Neutrality Regulation on Market Structure**

The Phoenix Center takes a realistic—some would say pessimistic—view of the potential for competition and entry into the broadband network industry.

Our core approach to these issues rests upon the reality that building broadband networks—either wireline or wireless—is *difficult and costly*. As explained in PHOENIX CENTER POLICY PAPER NO. 21,<sup>3</sup> policymakers need to recognize and account for this fact. Phoenix Center and other academic research shows that because it is costly to build and operate communications networks, even in a “best case scenario,” only a few firms will be able to provide advanced communications services over their own network.

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<sup>3</sup> G. S. Ford, T. M. Koutsky and L. J. Spiwak, *Competition after Unbundling: Entry, Industry Structure and Convergence*, PHOENIX CENTER POLICY PAPER NO. 21 (July 2005)(available at <http://www.phoenix-center.org/pcpp/PCPP21Final.pdf>) and reprinted in 59 FEDERAL COMMUNICATIONS LAW JOURNAL 331 (2007)I see also J. B. Duvall and G. S. Ford, *Changing Industry Structure: The Economics of Entry and Price Competition*, PHOENIX CENTER POLICY PAPER NO. 10 (Apr. 2001) (available at <http://www.phoenix-center.org/pcpp/PCPP10Final.pdf> and reprinted in 7 TELECOM. AND SPACE JOURNAL 11 (2002)); T. R. Beard, G. S. Ford and L. J. Spiwak, *Why ADCo? Why Now? An Economic Exploration into the Future Industry Structure for the “Last Mile” in Local Telecommunications Markets*, 54 FED. COM. L. J. 421 (May 2002); J. Sutton, *SUNK COST AND MARKET STRUCTURE* (1995).

Policymakers need to begin with the assumption that there will, at best, be only a “few” facilities-based firms. As a result, policies should not impede sustainable competition among the few firms that the market can actually support and should not nudge the industry toward increased consolidation. At the most basic level, our research suggests that policies should be avoided that make the market smaller, promote the commoditization of network services, or raise the entry costs of firms. In an industry with large sunk costs, each of these actions will result in a more concentrated market that can cause harm to consumers. The softening of price competition through, say, consumer-friendly product differentiation may allow multiple firms to exist in a market that is otherwise a natural monopoly with homogeneous products.<sup>4</sup> Commoditization, then, should be avoided in communications markets with large fixed and sunk costs.

Now, what does that have to do with network neutrality and broadband network management?

Understanding the underlying market structure conditions are important because in my opinion, many, if not most, of the proposed network neutrality rules will promote industry concentration by shrinking markets, commoditizing services, and raising entry costs. Proposals that a network firm can deal with congestion only by

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<sup>4</sup> Commoditization results in the possibility of intense price competition that favors highly-concentrated markets. It may seem paradoxical to say that intense price competition in such a situation can harm consumers, but this condition is called the “Bertrand Paradox” and is well-established in economic theory. See J. Tirole, *THE THEORY OF INDUSTRIAL ORGANIZATION* (1995) at 209-212.

expanding capacity obviously will increase the capital outlays required for the network. This will raise the cost of building networks and necessarily reduce the number of firms sustainable in equilibrium.

In addition, network neutrality proposals that would limit network firms to the selling of raw bandwidth capacity would effectively commoditize broadband service. In my opinion, this is the unstated goal of many of those that would have the FCC prohibit broadband network management practices—broadband networks be operated on a “stupid” rather than “intelligent” basis.

Doing so would intensify the role of scale economies and possibly render monopoly outcomes in many markets. In PHOENIX CENTER POLICY PAPER NO. 24<sup>5</sup>, we discuss this issue in relation to network neutrality using a standard, neoclassical economic framework.<sup>6</sup> Our analysis in that PAPER shows that such proposals to “commoditize” broadband access services is likely to deter facilities-based competition,

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<sup>5</sup> G. S. Ford, T. M. Koutsky and L. J. Spiwak, *Network Neutrality and Industry Structure*, PHOENIX CENTER POLICY PAPER NO. 24 (April 2006) (available at: <http://www.phoenix-center.org/pcpp/PCPP24Final.pdf> and reprinted as T. R. Beard, G. S. Ford, T. M. Koutsky, & L. J. Spiwak, *Network Neutrality and Industry Structure*, 29 HASTINGS COMMUNICATIONS AND ENTERTAINMENT LAW JOURNAL 149 (2007)).

<sup>6</sup> Rebuttal to this POLICY PAPER, and the responses thereto, are available on the Phoenix Center website. See *Network Neutrality and Scale Economies: A Response to Dr. Roycroft* (May 2006)(available at: <http://www.phoenix-center.org/RoycroftResponseFinal.pdf>); *A Response to Dr. Roycroft (Redux)* (July 2006)(available at: <http://www.phoenix-center.org/RoycroftReduxFinal.pdf>). Despite repeated correction, however, the Consumer Federation of America, Consumers Union and Free Press continue to mischaracterize our work before the FCC. Comments of the Consumer Federation of America, Consumers Union and Free Press in Docket No. WC Docket No. 07-52, In re Broadband Industry Practices, filed June 15, 2007 at *passim* (available at: [http://fjallfoss.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6519529581](http://fjallfoss.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6519529581)).



reduce the expansion and deployment of advanced communications networks, and increase prices.

The potential impact of network neutrality proposals upon market structure is important. Network neutrality proponents often indicate that their proposed regulations are needed because there is a “broadband duopoly” between cable and telephone firms. But in this situation, the prescription may be worse than the disease, as network neutrality rules can be expected to *encourage more* industry consolidation. The “market power monster” is not slain by network neutrality regulation; instead, it is fed by it. Similarly, in both POLICY PAPER NO. 12 and POLICY BULLETIN NO. 17, we show that it is *regulation* that induces firms to sabotage their rivals.<sup>7</sup> Oddly enough, network neutrality regulation provides the incentives for broadband providers to treat content firms badly; it does not eliminate such incentives.<sup>8</sup>

The impact on market structure is not just a theoretical possibility concocted by the Phoenix Center. Network neutrality advocate David Isenberg, who is known for the

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<sup>7</sup> T. R. Beard, G. S. Ford and L. J. Spiwak, *Why ADCo? Why Now? An Economic Exploration into the Future Industry Structure for the “Last Mile” in Local Telecommunications Markets*, PHOENIX CENTER POLICY PAPER NO. 12 (November 2001) and reprinted in 54 FED. COM. L. J. 421 (May 2002); see also G. S. Ford, T. M. Koutsky and L. J. Spiwak, *Wireless Net Neutrality: From Carterfone to Cable Boxes*, PHOENIX CENTER POLICY BULLETIN NO. 17 (April 2007) (available at: <http://www.phoenix-center.org/PolicyBulletin/PCPB17Final.pdf>).

<sup>8</sup> See J. Farrell and P. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 7 HARVARD JOURNAL OF LAW AND TECHNOLOGY 85-134 (2003). For a thorough analysis of sabotage, see T. R. Beard, D. Kaserman and J. Mayo, *Regulation, Vertical Integration and Sabotage*, 49 JOURNAL OF INDUSTRIAL ECONOMICS 319-333 (2001).

notion of the “Stupid Network,” fully recognizes, to his credit, that it is privately unprofitable to build the ideal neutral network, and that rate-of-return regulation and subsidization of a monopoly is the likely outcome.<sup>9</sup> It is not clear to me that this consequence advances the interests of consumers or society, but reasonable minds can disagree. What is important is to understand the consequences of regulatory actions; we can then debate the desirability of the consequences.

### **Welfare Implications of Broadband Network Management**

With regard to broadband network management specifically, in POLICY PAPER NO. 32<sup>10</sup>, we provided a formal economic analysis of the likely welfare consequences of network management that is designed to control network congestion.

The key point is to recognize that network congestion creates a negative externality, much like pollution. This is a type of market failure. These “congestion externalities” occur when the use of applications by some users harm other users of a broadband network, without compensation, by causing delays or other service quality problems. When one person’s use of BitTorrent affects the quality of the connection to

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<sup>9</sup> D. Isenberg, *The Rise of the Stupid Network*, COMPUTER TELEPHONY (Aug. 1997) at 16-26 (“the best network is the hardest to make money running. So who builds it? Who runs it? Who fixes it when it breaks? And who develops the next generations of faster, simpler infrastructure?”; “The transport companies would be have [sic] government incentives (e.g., assured return on investment), to make fiber, pole attachment, and right of way available to all service providers.”).

<sup>10</sup> G. S. Ford, T. M. Koutsky and L. J. Spiwak, *The Welfare Impacts of Broadband Network Management: Can Broadband Service Providers be Trusted?* PHOENIX CENTER POLICY PAPER NO. 32 (March 2008) (available at: <http://www.phoenix-center.org/pcpp/PCPP32Final.pdf>).

his neighbor, this is a classic negative externality that is not that much different than a farmer who drains a river for irrigation or a chemical factory that spews toxic fumes into the air. The model we present in our PAPER reveals that when a congestion externality is present, network management—including, but not limited to, the differential treatment of particular applications—is pro-consumer and welfare enhancing.

Our approach is useful for policymakers because it shows that from a social welfare perspective, private firms will *inadequately* respond to the congestion externality. For the same reason some argue that broadband firms under invest in network by responding only to profits and not the full social benefits of broadband service, broadband firms can be expected to fail to sufficiently curb congestion. This is because their focus is only on profits and not on the full consumer impact of quality degradation.<sup>11</sup>

What does that mean for the debate we are having today? In one sense, it indicates that perhaps we are looking at network management from the wrong perspective, at least as it applies to congestion. Broadband network providers like AT&T and Comcast are not going to go out willy-nilly and unduly blocking Internet applications and websites at the drop of a hat, even if those uses cause congestion.

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<sup>11</sup> This point is discussed in most general economics texts. See, e.g., D. W. Carlton and J. M. Perloff, MODERN INDUSTRIAL ORGANIZATION (2005) at 82-3; P. R. G. Layard and A. A. Walters, MICROECONOMIC THEORY (1978) at 189-95; R. J. Carbaugh, CONTEMPORARY ECONOMICS: AN APPLICATIONS APPROACH (2006) at 188-91.

Economic theory tells us that these private firms—because they do not fully internalize the negative externality cost of congestion—will actually engage in *less* of this type of behavior than a social welfare-maximizing entity would do. The widespread blocking of P2P traffic on university networks is instructive.

Our approach also provides a framework for analyzing disputes like Comcast-BitTorrent. In particular, once it is shown that a congestion externality is present and that the traffic management technique alleviates that congestion, it appropriate to presume that this type of traffic management is legitimate and welfare enhancing.<sup>12</sup> This places the focus of the analysis upon two particular factual inquiries: (1) whether there a congestion externality that is caused by this particular application; and (2) whether the traffic management technique at issue sufficiently targeted and actually alleviate the congestion.

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<sup>12</sup> This failure to recognize that congestion imposes an externality on users is consistently found in those proponents of network neutrality who argue that broadband providers are too aggressive in the management of congestion and call for *per se* prohibitions against all network management practices. For example, in their petition to the FCC regarding Comcast's treatment of BitTorrent traffic, Free Press and others assert that "no economic argument supports the notion that degrading applications is reasonable network management." In particular, Free Press asserts that "the transaction costs" of metered Internet usage "must not be prohibitively high" because bandwidth use is metered in Australia. As a result, Free Press states that blocking or degrading applications should be prohibited that that network providers simply rely on other options—such as setting "dynamic quotas" on bandwidth for end users, "charge by usage," "provide more bandwidth to all users," or "actually offer high symmetric bandwidth speeds." Free Press, Public Knowledge *et al.* Petition for Declaratory Ruling, CC Docket Nos. 02-33, 01-337, 95-20, 98-10, GN Docket No. 00-185, CS Docket No. 02-52, WC Docket No. 07-52 (filed Nov. 1, 2007) (hereinafter "Free Press Petition"), at 29-32. See also, R. Frieden, *Wireless Carterfone: A Long Overdue Policy Promoting Consumer Choice and Competition*, Working Paper, New America Foundation (2008) (available at: [http://www.newamerica.net/files/Wireless\\_Carterfone\\_Frieden.pdf](http://www.newamerica.net/files/Wireless_Carterfone_Frieden.pdf)); C. Holohan, *Time Warner's Pricing Paradox: Proposed Changes in the Cable Provider's Fees for Web Use Could Crimp Demand for Download Services and Hurt Net Innovation*, BUSINESS WEEK (Jan. 28, 2008).

These inquiries are factual and indeed engineering questions. I would suggest that you speak to and rely upon the judgment of Internet engineers to answer these questions—not the lawyers and economists that are dominating these panels today. In my view, if the answer to the above two factual questions are “Yes,” then it is appropriate to presume that the traffic management tool being employed by the broadband provider is welfare-enhancing.

Our approach also indicates that different networks are likely to have different network management practices. For example, wireless broadband networks today may face more severe capacity constraints than wireline networks, in part because all users share the common pool of spectrum capacity that is used to provide such services. As a result, we should expect that wireless carriers will likely be the most diligent in managing traffic—not because they violate a public trust but simply as a result of network architecture and spectrum limitations. Likewise, it seems that BitTorrent was particularly troublesome for certain cable network architectures and not DSL or fiber networks, so it not surprising that the congestion-relieving action was implemented by cable operators first. Capacity constraints and applications using that capacity are apt to change over time and vary by network. As a result, judging the appropriateness of traffic management techniques is best done on a case-by-case basis rather than through prescriptive, ex ante regulations and prohibitions of general applicability. Further, if we see a pattern of network management that follows these expectations, then we may sensibly start from the position that such actions are legitimate.

### **Incentive to Invest in Network Management Technology**

We have also studied a firm's decision to invest in network management technology and demonstrated that a firm would never invest in network intelligence unless that investment increases consumer welfare.<sup>13</sup> Importantly, we modeled the "worst case" scenario for network neutrality proponents—we modeled a monopoly network provider and a situation in which consumers value a "stupid" broadband network over an "intelligent" one. Even in this extreme situation that is clearly biased against consumer welfare improvements due to investments in network intelligence, we found that the monopoly network provider's incentives to build intelligence into the network align with the interests of consumers.

This is an important point, since most of the network neutrality debate is couched in terms of a zero-sum game of buyers versus sellers. We show that this slant on the issue is inappropriate, and that policymakers should initially trust firms to do what is in the interest of consumers with regard to investments in network intelligence until someone proves otherwise.

### **Differential Impact in Rural, High-Cost Areas**

The distribution of the costs and benefits of network neutrality regulation is also important. In PHOENIX CENTER POLICY PAPER NO. 25 we show that the cost of network

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<sup>13</sup> George S. Ford, Thomas M. Koutsky and Lawrence J. Spiwak, *The Efficiency Risk of Network Neutrality Rules*, PHOENIX CENTER POLICY BULLETIN NO. 16 (May 2006).

neutrality mandates will be felt disproportionately in rural and high-cost regions of the country.<sup>14</sup> Our empirical analysis shows that the distribution of costs across markets of different sizes and population densities causes the network neutrality mandates to more severely curtail of network deployment in rural areas. On average, rural, high-cost areas will bear the burden of network neutrality mandates at a magnitude of six times the impact relative to lower-cost urban areas.

As we described in POLICY BULLETIN NO. 16, if broadband traffic management is prohibited and broadband providers are only permitted to invest in more “bandwidth” to address capacity problems, the potential size of these increased costs, according to some estimates, is very high.<sup>15</sup> In rural, high-cost areas, these increased costs may be the difference between whether entire swaths of this country get left behind and do not see investment in broadband infrastructure.

Stated simply, if you drive up the costs of building and operating a broadband network by limiting traffic management options, then the impact of that decision will be felt far more in high-cost rural areas than Palo Alto, California or Cambridge, Massachusetts.

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<sup>14</sup> G. S. Ford, T. M. Koutsky and L. J. Spiwak, Spiwak, *The Burden of Network Neutrality Mandates on Rural Broadband Deployment*, PHOENIX CENTER POLICY PAPER NO. 25 (July 2006)(available at: <http://www.phoenix-center.org/pcpp/PCPP25Final.pdf>).

<sup>15</sup> G. Ford, T. Koutsky and L. Spiwak, *The Efficiency Risk of Network Neutrality Rules*, PHOENIX CENTER POLICY BULLETIN NO. 16 (May 2006) (available at: <http://www.phoenix-center.org/PolicyBulletin/PCPB16Final.pdf>).

### **Increases in Transaction Costs Can Harm Consumers**

Network neutrality proponents seem ever-fearful of commercial transactions between broadband service providers and on-line content firms. Out of a concern over vertical leveraging, there have been legislative proposals to prohibit AT&T, Comcast, Verizon, or any of the other broadband service providers from contracting with Amazon, Google, the National Football League, or any other content firm to ensure timely delivery of purchased content. (Notably, such voluntary arrangements already exist.<sup>16</sup>) Any arrangement for a higher quality transaction, the argument goes, is best made between the consumer and broadband provider after the transaction is made between the consumer and the content provider. Arguably, the intent of the rule is to protect both consumers and content firms from the exercise of market power by the broadband provider.

In POLICY PAPER NO. 28, however, we showed that under plausible conditions, rules that prohibit efficient commercial transactions between content and broadband service providers could, in fact, be bad for everyone—consumers would pay higher

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<sup>16</sup> S. Nassauer, *ESPN Charges Net Providers for Right to Offer Broadband Web Site*, WALL STREET JOURNAL (Aug. 1, 2006).



prices, broadband service providers earn lower profits, and even the Internet content, software and application firms see lower sales.<sup>17</sup>

Transaction cost economics teaches that over time, the market will tend to develop relationships that are efficient and minimize transaction costs, thereby expanding output. However, a network neutrality rule jumps the government in the middle into these transactions and alters decisions. The result would be that otherwise-efficient transactions are replaced with more expensive ones. This hardly seems like good policy. Despite the obvious shortcomings of prohibiting this entire category of voluntary exchange, calls for such a prohibition remain an important part of the network neutrality agenda.

### **Welfare Consequences of Network Neutrality**

To date, network neutrality advocates have not adequately taken into account the welfare consequences of their proposals. Because the purpose of regulation is to improve welfare, the general absence of welfare analysis is a significant shortcoming.

Instead, what we see are statements that “upstream” providers—the Googles and Microsofts of the world—would benefit if network neutrality rules were applied across the board. But enriching one set of firms at the expense of another says little

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<sup>17</sup> G. S. Ford, T. M. Koutsky and L. J. Spiwak, *Network Neutrality and Foreclosing Market Exchange: A Transaction Cost Analysis*, PHOENIX CENTER POLICY PAPER No. 28 (March 2007)

about overall consumer or social welfare. Little or no research has been done to actually *prove* or *show* that this transfer of wealth from one industry sector to another will actually benefit consumers and society as a whole.

Nicolas Economides, an economist at New York University who has contributed much to network economics over his distinguished career, has presented a theoretical analysis of a two-sided market in which a broadband provider can levy a charge on either or both users and content firms. The problem modeled is clearly relevant to the debate, and Dr. Economides generally supports network neutrality regulation.

Dr. Economides shows that under certain conditions, the upstream charge can reduce welfare, thereby supporting portions of the network neutrality agenda. But it is not difficult to find equally plausible parameterizations of the model where the upstream charge increases welfare. The theoretical result, then, is ambiguous. As an economist, it is difficult to imagine how it could be any other way. Dr. Economides' model, as would any sensible model of this problem, shows that charges by network firms to service providers may enhance welfare—a result that makes untenable the presumption that such charges are always undesirable.

The paper by Dr. Economides is an important contribution, and others have tried to undertake a more technical analysis of network neutrality regulation. Last year,

much was made by network neutrality advocates about a study by University of Florida researchers from the Department of Decision and Information Sciences.<sup>18</sup> Yet the paper is rarely cited today because on close analysis it shows that under no circumstances will consumer welfare be improved by network neutrality regulation. In fact, the Florida Study suggests that the only “winners” from network neutrality regulation are the Internet content providers—with broadband service providers and consumers being worse off (or, in some cases, unaffected).<sup>19</sup>

Moreover, a subsequent study on the same topic by Economics Professor Mark Jamison, also at the University of Florida and a recognized scholar on communications policy, has been entirely ignored by the network neutrality advocates. It tackles the same problem as the original Florida Study, using more reasonable assumptions and better modeling techniques. It comes out with the conclusion that network neutrality regulation would reduce, not increase, network investment. Jamison also finds that offering premium services to content firms stimulates innovation at the network edge and is beneficial to content firms, and more beneficial to smaller content providers than larger ones. Subscription also increases. The analysis suggests that network

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<sup>18</sup> *The Debate on Net Neutrality: A Policy Perspective*, Working Paper, Department of Decision and Information Sciences, Warrington College of Business Administration, University of Florida (Mar. 2007) (“Florida Study”)(available at <http://ssrn.com/abstract=959944>).

<sup>19</sup> George S. Ford, PHOENIX CENTER PERSPECTIVES NO. 07-01: *University of Florida Study Shows Only Winners from Network Neutrality Regulation to be Content Providers, Consumers Lose* (March 14, 2007)(available at: <http://www.phoenix-center.org/perspectives/Perspective07-01Final.pdf>).

neutrality limiting premium services to content firms is obviously not a good thing in nearly any dimension.

With regard to the incentives to engage in the types of behavior network neutrality regulation aims to prevent, the most frequently cited paper is authored by Dr. Barbara Van Schewick.<sup>20</sup> The topic of exclusionary conduct has been widely studied by economists, and Joe Farrell and Phil Weiser provide a good introduction to that literature.<sup>21</sup> Their paper shows that while there are instances where firms have incentives to engage in exclusionary behavior, the general rule is that they do not.<sup>22</sup> Even in the presence of exclusionary conduct, the welfare consequences of exclusionary acts are often ambiguous, so in a policy context not only must one demonstrate the incentive exists for anticompetitive exclusion, but also establish that the act reduces welfare. This is no easy task.

Dr. Van Schewick claims to provide “new exceptions” to the general rule that a monopolist will not leverage its market power into related markets. While she purports to present “new theory,” there is in fact no theoretical analysis in the paper of a technical nature, which is required for these problems. Essentially, Dr. Van Schewick adopts the theoretical conclusions from papers by Farrell and Katz (2000) and Whinston (1990), yet

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<sup>20</sup> Barbara van Schewick, *Toward an Economic Framework for Network Neutrality Regulation*, 5 JOURNAL ON TELECOMMUNICATIONS AND HIGH TECHNOLOGY LAW 329-391 (Winter 2007).

<sup>21</sup> *Supra* n. 8.

<sup>22</sup> This point is echoed by Van Schewick, *supra* n. 20 at 340-1.

applies them to an entirely unrelated set of assumptions than those found in either of papers.<sup>23</sup> Obviously, this approach is invalid. Theoretical conclusions are intimately tied to the assumptions upon which they rest.

Upon closer inspection of Dr. Van Schewick arguments, neither the Farrell-Katz or Whinston paper have anything much to do with her scenarios. In fact, the notion of “outside revenues” that she introduces suggests independent rather than complementary goods, so it seems that much of the exclusionary literature is largely irrelevant to her problem. Models of exclusion, tying, and foreclosure are typically limited to goods with demand interdependencies. It is hard to say much specific about the Van Schewick paper, however, since there is no theoretical model to evaluate. Dr. Van Schewick does not indicate whether her “new theory” is one of fixed or variable proportions, whether goods are complements or independent, whether the cost and demand relationships are linear or otherwise, whether there is perfect or imperfect competition in the complementary market, and so forth. There is no way that the standard tools of economics can be applied to the scenario she describes given the lack of specificity.

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<sup>23</sup> J. Farrell and M. Katz, *Innovation, Rent Extraction, and Integration in Systems Markets*, 48 JOURNAL OF INDUSTRIAL ECONOMICS 413-432 (2000); M. D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AMERICAN ECONOMIC REVIEW 837-859 (1990).

What we can loosely infer from her specific use of Whinston is the following, though I urge caution since it is impossible to say anything too specific given the vagueness of what is been provided in the paper. In the sense Dr. Van Schewick relies on Whinston, for tying to be a profitable strategy to the broadband provider it would need to eliminate all competition in the content market—every single firm.<sup>24</sup> The broadband firm, for example, must monopolize search engines, monopolize book sales, monopolize advertising sales, monopolize pornography sales, and so forth. This seems highly improbable.

The use of Farrell-Katz is perhaps even more awkward, but Dr. Van Schewick relies heavily on their conclusions. Farrell-Katz make the following observations, “[the monopolist] has broad incentives to cooperate with independents, and no incentives to hinder them, whether or not the [the monopolist] is integrated.” And, the authors note, “threatening exclusion could be profitable [for the monopolist] although carrying out the threat is never profitable[.]”<sup>25</sup> Obviously, if you are pushing for network neutrality regulation, this is a somewhat odd paper to rely on.

For one of her “new exceptions,” Dr. Van Schewick merely observes the well known theoretical result that regulation can lead to sabotage. The treatment, or

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<sup>24</sup> Whinston, *id* (“firm 1 would never commit to tying unless this would succeed in driving firm 2 out of the market.”).

<sup>25</sup> Farrell-Katz, *supra* n. 23, at 422.

mistreatment, of VoIP providers is generally based on the regulated price for access charges for such providers (at zero), which incents some local exchange carriers, primarily rural carriers with very high access charges, to sabotage VoIP. This finding is not new, and Dr. Van Schewick mistakes the regulation-induced action for something else. If local exchange carriers were allowed to price more freely, then they would have no reason to sabotage VoIP.

The welfare effects are even more problematic for Dr. Van Schewick. Whinston concludes “when tying does lead to exclusion of rivals, the welfare effects both for consumers and for aggregate efficiency are in general ambiguous.... This fact, combined with the difficulty of sorting out the leverage-based instances of tying from other cases, makes the specification of a practical legal standard extremely difficult.”<sup>26</sup> The same is true for Farrell-Katz. The actions of the monopolist have ambiguous welfare effects.<sup>27</sup>

These first two studies make up the bibliography of the technical analysis that allegedly supports network neutrality regulation. As discussed, neither really does in any unambiguous sense, and one provides senseless results based on senseless assumptions and mathematical error. Dr. Van Schewick’s paper provides no technical analysis, but incorrectly applies theoretical results from entirely different scenarios to her own. Even absent this error, the welfare effects of her alleged exclusionary acts are

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<sup>26</sup> Whinston, *supra* n. 23, at 839, 856.

<sup>27</sup> Farrell-Katz, *supra* n. 23, at 430.

ambiguous, or perhaps uncertain is more legitimate given the lack of specificity in the analysis. The welfare effects in such models, however, are almost always ambiguous.

Advocates for network neutrality are today arguing for significant regulatory intervention into the operation of the Internet. Ignoring the welfare implications of such regulations is unacceptable. Supporting network neutrality regulation with papers showing that that consumers are made worse off by the regulation is shameful. In my opinion, ambiguity in welfare effects is evidence for inaction or at least caution; certainly ambiguity does not support a presumption that a behavior is undesirable.

#### **IV. Conclusion**

Let me summarize my main points:

*First*, I recommend that the FCC insist that all proponents of network neutrality or network management regulation show convincingly that their proposed rules will indeed have the intended effect of increasing consumer and/or social welfare. Moreover, the regulation must do so efficiently, in that the costs of the regulations are less than the benefits. The burden of proof should rest on those proposing regulation, since the 1996 Act explicitly calls for deregulation in communications.

*Second*, I encourage the FCC to avoid policies that nudge the industry in the direction of economic consolidation. The market likely will be concentrated for the foreseeable future, and there is little one can do to improve things. But, policy can make it worse. As a result, try to avoid actions that shrink the revenues of facilities based firms by



excluding or limiting access to markets, avoid actions that increase fixed and sunk entry costs, and avoid exacerbating scale economies by commoditizing services. Policymakers must also recognize that network neutrality regulations are likely to have a disproportional effect on small firms and rural markets.

*Finally*, with regard to broadband traffic management practices in particular, recognize that contrary to popular belief, targeted remedies for congestion are welfare-enhancing. Consumer surplus and total social welfare rise when network operators use traffic management tools such as differential pricing, traffic prioritization, traffic shaping, and even blocking to manage congestion. The welfare gains are larger when the remedy is highly targeted to the source of the problem, even if that source is a particular application. Broad, untargeted solutions are likely to be highly inefficient. Further, because a for-profit network operator will not fully internalize the cost to society of a negative, we can presume that a for-profit network operator's actions to control congestion are legitimate absent compelling evidence otherwise.

Thank you once again for the opportunity to testify before you today, and I look forward to your questions.