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Telecom Regulatory Authority of India )  
Consultation Paper on Differential Pricing for Data Services )  
Consultation Paper No. 8/2015 )  
New Delhi, 9 December, 2015 )

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**DECLARATION OF JEFFREY A. EISENACH, PH.D.**

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## I. PURPOSE OF DECLARATION AND SUMMARY OF FINDINGS

1. My name is Jeffrey A. Eisenach. I have been asked by Facebook, Inc. to assess from an economic perspective the issues raised in the Consultation Paper on Differential Pricing for Data Services issued by the Telecom Regulatory Authority of India (TRAI) on 9 December 2015 (“Consultation Paper”).<sup>1</sup> This Declaration summarizes the results of my assessment.

2. The Consultation Paper raises certain questions about the use of differential pricing by Telecom Service Providers (TSPs), including whether the use of differential pricing goes against the principles of non-discriminatory tariffs or transparency, and accordingly whether it may have anticompetitive effects or otherwise harm consumers. At the same time, the Consultation Paper recognizes that differential pricing may enable wider access to the Internet. Accordingly, it concludes that “potential benefits and disadvantages of such practices have to be weighed in order to determine the regulatory approach.”<sup>2</sup>

3. My assessment of the differential pricing practices at issue here is consistent with the benefit-cost framework put forward in the Consultation Paper. Like many forms of business conduct in markets involving the Internet ecosystem, differential pricing has the potential *in the abstract* to have both positive and negative effects. The *actual* effect of such practices depends on the specifics of the practices themselves and on the market context. Accordingly, it is appropriate to assess the specific nature of both the practices and the markets at issue.

4. In this context, having examined both the practices and the markets at issue here, my analysis indicates that the potential benefits of the differential pricing practices discussed in the Consultation Paper exceed any potential costs, and accordingly that such conduct should not be prohibited or proscribed. Specifically, I conclude:

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<sup>1</sup> TRAI, Consultation Paper on Differential Pricing for Data Services, Consultation Paper No. 8/2015, 9 December 2015 (Consultation Paper).

<sup>2</sup> Consultation Paper at ¶ 17.

- Under very general conditions, differential pricing in Internet ecosystem markets is a welfare-enhancing practice which reflects the characteristics of such markets. In particular, differential pricing allows Internet services to be extended to a larger user base, thereby exploiting both supply- and demand-side economies of scale and scope and setting in motion a “virtuous cycle” from which all market participants benefit, especially consumers who would otherwise not have had access to Internet services.
- The exceptional conditions that would create the potential for anticompetitive practices or otherwise harmful applications of differential pricing are not present in the Indian market for Internet services. Most importantly, the markets for Internet access and for online content and applications are highly competitive. The use of differential pricing is itself evidence of the competitiveness of the market, as it constitutes a form of non-price competition under which TSPs seek to win customers by offering differentiated services that create value for consumers.
- The forms of differential pricing observed in the Indian marketplace are *prima facie* not anticompetitive. To the contrary, the practices involved are neither exclusive nor discriminatory, but rather available to all similarly situated firms on non-discriminatory terms.
- To prohibit or proscribe the kinds of differential pricing practices addressed in the Consultation Paper would slow innovation, harm competition and reduce consumer welfare.
- There are strong marketplace incentives for firms to identify and implement alternative pricing schemes to expand Internet access to a greater proportion of the population. By contrast, the complexity and dynamism of the marketplace make it unlikely that regulatory efforts to devise such schemes would be successful.
- Any residual concerns about anticompetitive or other harmful effects of differential pricing are best addressed under existing antitrust and consumer protection laws and regulations.

5. The remainder of this Declaration is organized as follows. In Section II, I summarize my qualifications. In Section III, I review the characteristics of Internet ecosystem markets and present a conceptual framework for assessing the benefits and costs of differential pricing. In Section IV, I provide an overall assessment of the competitiveness of the markets for Internet services (including Internet access as well as content and applications) in India. In

Section V, I provide a response to the specific questions posed by TRAI in its Consultation Paper. Section VI presents a brief summary of my conclusions.

## II. QUALIFICATIONS

6. My name is Jeffrey A. Eisenach. I am a Senior Vice President and Co-Chair of the Communications, Media and Internet Practice at NERA Economic Consulting. NERA is a global economic consultancy with more than 25 offices in North America, Europe and Asia-Pacific. My primary business address is 1255 23<sup>rd</sup> St. NW, Washington, DC 20037. I hold a Ph.D. in Economics from the University of Virginia and a B.A. in Economics from Claremont McKenna College. I have previously served in senior policy positions at the U.S. Federal Trade Commission and the White House Office of Management and Budget, and on the faculties of Harvard University's Kennedy School of Government and Virginia Polytechnic Institute and State University. I have been studying, writing about and teaching telecommunication regulation for nearly 20 years, and have published articles on telecommunications regulation in journals such as *Telecommunications Policy*, the *Review of Network Economics* and the *Federal Communications Law Journal*; and, I have testified and/or submitted expert reports on communications matters before the U.S. Congress and the Federal Communications Commission (FCC), and before regulatory agencies in numerous U.S. states and territories and several foreign countries. In addition to my position with NERA, my other current affiliations include serving as an Adjunct Professor at George Mason University Law School (where I teach the course on Regulated Industries), as a Visiting Scholar at the American Enterprise Institute, as a member of the Board of Directors of the Information Technology and Innovation Foundation, and as a Member of the Executive Committee of the Economic Club of Washington. A copy of my

*curriculum vita* is at Exhibit A. Earlier this year I prepared an analysis of *The Economics of Zero Rating*,<sup>3</sup> upon which this declaration is partially based. That paper is at Exhibit B.

### III. ASSESSING THE EFFECTS OF DIFFERENTIAL PRICING

7. In this section I put forward an analytical framework for assessing the effects of differential pricing. First, I describe the relevant characteristics of Internet ecosystem markets, such as the markets for mobile Internet connectivity and online content and applications, which form the basis for assessing the effects of practices such as differential pricing. Second, I apply the resulting conceptual framework to the conduct at issue here to assess its potential benefits and costs.

#### A. Relevant Characteristics of Internet Ecosystem Markets

8. In general, the welfare effects of pricing schemes and other business practices depend on the characteristics of the markets in which they are deployed. The markets at issue here are Internet ecosystem markets, which are distinguished from more traditional “textbook” markets by three primary characteristics: *dynamism*; *modularity*; and *demand-side effects*.<sup>4</sup>

9. *Dynamism* refers to the significance of innovation as a measure of market performance: In dynamic markets, the ability of a firm to offer new and improved products

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<sup>3</sup> Jeffrey A. Eisenach, *The Economics of Zero Rating*, NERA Economic Consulting (March 2015).

<sup>4</sup> This section relies in part on Jeffrey A. Eisenach and Ilene Knable Gotts, “In Search of a Competition Doctrine for Information Technology Markets: Recent Antitrust Developments in the Online Sector,” in Fabrizio Cugia di Sant’Orsola, Rehman Noormohamed, and Denis Alves Guimarães, eds., *Communications and Competition Law: Key Issues in the Telecoms, Media and Technology Sectors* (Wolters Kluwer Law and Business, 2014) 69-90. For a more extensive discussion of these phenomena and their implications for competition analysis, see Jeffrey A. Eisenach, *Broadband Competition in the Internet Ecosystem* (American Enterprise Institute, 2012); see also Oz Shy, *The Economics of Network Industries* (Cambridge University Press, 2001).

plays at least as significant a role in its success (*i.e.*, its profitability) as the ability to produce and sell existing products at lower prices.<sup>5</sup>

10. Typically, Internet ecosystem firms create new products by making significant sunk cost investments (which may take the form of either “R&D” or capital expenditures in non-recoverable facilities). As a result, production benefits from economies of scale – *i.e.*, average total costs that decline at higher levels of production, but always exceed marginal costs. Producers are able to recoup their sunk cost investments because products are differentiated through innovation (innovation can be thought of as simply product differentiation over time), meaning that long-term prices in such markets are higher than marginal cost, notwithstanding the existence of robust competition. Under traditional antitrust doctrine, the ability to earn high margins might be mistaken for monopoly power (the ability to earn excess profits), but assuming low entry barriers, it is not only consistent with, but necessary for, robust competition and the maximization of consumer welfare in these types of dynamic markets. In such markets, high accounting margins not only allow firms to recoup sunk cost investments, but also provide the incentive to take the risks inherent in innovation.<sup>6</sup>

11. A second characteristic that distinguishes Internet ecosystem markets is *modularity*, or what is sometimes referred to as “platform competition.” From an economic perspective, modularity is associated with strong complementarities in production or

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<sup>5</sup> See William J. Baumol, *The Free Market Innovation Machine: Analyzing the Growth Miracle of Capitalism* (Princeton University Press, 2002), at 4 (“Innovation has replaced price as the name of the game in a number of important industries. The computer industry is only the most obvious example, whose new and improved models appear constantly, each manufacturer battling to stay ahead of its rivals.”).

<sup>6</sup> Especially in dynamic markets with high rates of innovation, high margins as measured by accounting data do not necessarily equate to high profits from the perspective of economics or competition analysis. The seminal reference is Franklin M. Fisher and John J. McGowan, “On the Misuse of Accounting Rates of Return to Infer Monopoly Profits,” *American Economic Review* 73:1 (March 1983) 82-97.

consumption: Operating systems are strong complements with personal computers; smart phones are strong complements with both communications networks and online content, such as mapping services, restaurant reviews, or social networks. Modularity also creates demand for compatibility or “interconnection.” Firms that produce complementary products (*e.g.*, Microsoft and Nokia, or Facebook and Reliance Communications)<sup>7</sup> may team up to create platforms (sets of compatible complements); in other cases (*e.g.*, Apple, BlackBerry) firms choose to achieve compatibility through vertical integration. Competition in such markets takes place both within platforms (*e.g.*, between HTC and Samsung for share on the Android platform) and among them (*e.g.*, between the Android and iOS operating environments).

12. Finally – and importantly for assessing differential pricing schemes like those addressed in the Consultation Paper – Internet ecosystem markets are also characterized by significant *demand-side effects*, including economies of both scale and scope. Demand-side economies of scale, also known as network effects, imply that a product is more valuable to consumers as the number of users increases. The prototypical, if now somewhat dated, example is the fax machine. Demand-side economies of scope, by contrast, imply that a product’s value increases with the diversity (as opposed to simply the number) of users: The value of a credit card network to both consumers and merchants depends on the presence of the other *type* of participant. Markets characterized by demand-side economies of scope are referred to as “two-sided” or “multi-sided.” Another characteristic of multi-sided markets, discussed further below, is the virtuous cycle by which all market participants benefit from the growth of the market.

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<sup>7</sup> “Examples include Reliance Communications coming together with Facebook to provide free access to 38 websites including Facebook, Wikipedia, Reliance Astrology, AajTak etc.” (TRAI, Regulatory Framework for Over-the-Top (OTT) Services, Consultation Paper No: 2/2015, March 27, 2015, ¶ 6.1.)



Thus, for example, both TSPs and content providers benefit from the market expansion that results from differential pricing.

13. The relationship between competition and consumer welfare in markets with demand-side effects is more complicated than in more traditional markets in several ways. For example, it is well established that the operator of a two-sided market has strong incentives to set efficient relative prices (*i.e.*, to engage in efficient price discrimination).<sup>8</sup>

## **B. Potential Benefits of Differential Pricing**

14. The discussion above provides a conceptual framework for assessing the effects of differential pricing regimes like those addressed in the Consultation Paper. This section applies this framework to assess the potential benefits of differential pricing in the markets for online content and applications, mobile access, and the Internet ecosystem overall. Specifically, it discusses: (1) the role of differential pricing in capturing network externalities (demand side economies of scale); (2) the efficiency of differential pricing in dynamic markets; and (3) differential pricing as a mechanism for competitive product differentiation in mobile wireless markets. In each of these respects, differential pricing of the sort discussed in the Consultation Paper is under general conditions best understood as a market-driven mechanism for achieving economically efficient (and socially desirable) outcomes.

### **1. Differential Pricing and Network Effects**

15. Online content providers and mobile networks operate in markets that can have network effects, in that the value of the network to customers grows with the addition of other customers. The extent and nature of network effects can vary significantly in particular cases. In

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<sup>8</sup> See, e.g., Julian Wright, "One-Sided Logic in Two-Sided Markets," *Review of Network Economics* 3(1) at 44 (2004).

some cases, expansion increases the value for all customers on the network. In others, the effects are limited to additions within smaller groups. And in others, benefits arise when different kinds of participants join a network.<sup>9</sup> Thus, it is often in the interests of current participants in a network to promote its growth in some form, and sometimes in the interests of society generally to promote universal participation. Governments often subsidize participation in industries with network effects through direct or indirect government subsidies (e.g., universal service for telephone and, more recently, broadband adoption).

16. One significant benefit of differential pricing is to expand participation in online content and applications, while also increasing mobile wireless penetration, especially in developing economies.<sup>10</sup> There is a substantial literature in support of the proposition that expanded Internet access, principally through higher mobile wireless adoption, has a variety of economic and societal benefits.<sup>11</sup> Such benefits should be of particular interest in India, which –

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<sup>9</sup> The impact of network effects can depend on a variety of factors. For example, some of the network effects of increasing wireless penetration are shared among carriers thanks to the fact that carriers interconnect with one another (so subscribers to each network can call subscribers on other networks). Carriers may seek to capture some of these effects through programs (“friends and family” plans) that encourage in-network calling.

<sup>10</sup> For example, a 2010 program by Turk Cell involving Twitter resulted in a 340 percent increase in Twitter traffic. See Internet Governance Forum, *Net Neutrality, Zero Rating and Development: What’s the Data?* (transcript), September 3, 2014 Facebook reports that its Internet.org program has resulted in a 50 percent increase in the rate at which new users sign up for mobile data services. See Facebook, *Comments on the Report of the DoT Committee on Net Neutrality* (August 14, 2015) at 2 (“Facebook Comments”)

<sup>11</sup> See e.g., Chandra Gnanasambandam *et al.*, *Online and Upcoming: The Internet’s Impact on India*, McKinsey & Company (2012) (available at [www.mckinsey.com/~/media/mckinsey%20offices/india/pdfs/online\\_and\\_upcoming\\_the\\_internets\\_impact\\_on\\_india.ashx](http://www.mckinsey.com/~/media/mckinsey%20offices/india/pdfs/online_and_upcoming_the_internets_impact_on_india.ashx) internet penetration benefits india); see also *Value of Connectivity: Economic and Social Benefits of Expanding Internet Access* (Deloitte 2014 (available at [https://fbcdn-dragon-a.akamaihd.net/hphotos-ak-ash3/t39.2365/851546\\_1398036020459876\\_1878998841\\_n.pdf](https://fbcdn-dragon-a.akamaihd.net/hphotos-ak-ash3/t39.2365/851546_1398036020459876_1878998841_n.pdf)); see also *Digital Entrepreneurship in Kenya 2014* (GSMA, 2014) (available at [http://www.gsmaentrepreneurshipkenya.com/GSMA\\_KENYA-AR2014-060214-WEB-SINGLE-PGS.pdf](http://www.gsmaentrepreneurshipkenya.com/GSMA_KENYA-AR2014-060214-WEB-SINGLE-PGS.pdf)).

despite having a very large online population – continues to experience relatively low rates of Internet penetration.<sup>12</sup>

17. The power of network effects is sometimes greatest within “communities of use.” That is, the value of adding an additional member is greater for members who are more closely connected with (i.e., who value interactions with) existing members than those who are (in the same sense) further away. In this context, differential pricing is appropriately understood as a mechanism for achieving increased participation within relatively small communities, including within lower-income populations in developing economies.<sup>13</sup>

18. By promoting the positive network effects of increased adoption, differential pricing thus generates positive social as well as economic externalities.

## **2. Differential Pricing in Dynamic Markets**

19. Both online content providers and mobile broadband services are characterized by dynamic competition – that is, both industries make large, non-recoupable investments in R&D and physical infrastructure which are largely invariant to the number of users. As discussed above, in such industries, the average cost curve is declining over the relevant range of output: Simply put, it always costs less to produce an incremental unit of output than it costs, on average, to make the previous ones.

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<sup>12</sup> ITU, *ICT Facts and Figures 2015*, (<http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>) Individuals\_Internet\_2000-2014.xls.

<sup>13</sup> Social networks like Facebook and Twitter have been shown to play a significant role in driving Internet adoption in developing countries, where the proportion of Internet users who use such applications is higher than in the U.S. See e.g., Lee Rainie and Jacob Poushter, “Emerging Nations Catching Up to U.S. on Technology Adoption, Especially Mobile and Social Media Use,” Pew Research Center (February 13, 2014) (available at <http://www.pewresearch.org/fact-tank/2014/02/13/emerging-nations-catching-up-to-u-s-on-technology-adoption-especially-mobile-and-social-media-use/>).

20. Just as with markets in that experience network effects, consumer welfare can be increased in dynamic markets if firms are able to identify and offer discounts to “marginal” customers, that is, those with lower willingness (or ability) to pay, thus expanding the size of the market and generating the additional revenues that can be used to defray the fixed costs of investment and innovation. It is widely agreed that such differential pricing – referred to by economists as – “competitive price discrimination” – is not only widespread, but generally improves economic efficiency and increases consumer welfare.<sup>14</sup>

21. In this context, differential pricing can be understood economically as a mechanism by which mobile carriers engage in efficient price discrimination through the bundling of two goods (mobile wireless service and content), thereby creating the ability for marginal consumers to pay a reduced price by choosing a differentiated product in the form of a “basic” form of online access.<sup>15</sup> In so doing, differential pricing improves economic efficiency by supporting continuing investment and innovation in both networks and content while expanding Internet access to consumers who would otherwise be unserved.

22. These effects are accentuated by the two-sided nature of Internet ecosystem markets, as the benefits accrue to both content providers (by increasing the number of

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<sup>14</sup> See e.g., William J. Baumol and Daniel G. Swanson, “The New Economy and Ubiquitous Competitive Price Discrimination: Identifying Defensible Criteria of Market Power,” *Antitrust Law Journal* 70 (2003) 661-685 at 665; see also, e.g., Hal R. Varian, “Differential Pricing and Efficiency,” *First Monday* 1;2 (August 1996) at 2 (“[M]any important industries involve technologies that exhibit increasing returns to scale, large fixed and sunk costs, and significant economies of scope. Two important examples of such industries are telecommunications services and information services. In each of these cases the relevant technologies involve high fixed costs, significant joint costs and low, or even zero, marginal costs. Setting prices equal to marginal cost will generally not recoup sufficient revenue to cover the fixed costs and the standard economic recommendation of ‘price at marginal cost’ is not economically viable. Some other mechanism for achieving efficient allocation of resources must be found.”).

<sup>15</sup> Facebook and its partners in Free Basics have made extensive investments to understand the realities of Internet access in the developing world and to use this knowledge to develop ways to expand Internet access in such countries.

subscribers) and subscribers (by increasing the amount of available content).<sup>16</sup> In the case of applications like Facebook, Twitter and Wikipedia, in which “consumers” are also content creators, the benefits are enhanced still further: by attracting additional participants onto the platforms of such services, differential pricing increases *both* the number of content consumers and the amount of content available. This “virtuous cycle” effect helps to explain why firms like Facebook are taking the lead in encouraging differential pricing programs.<sup>17</sup>

### **3. Differential Pricing and Competition in Mobile Wireless Markets**

23. Lastly, firms in dynamic industries are better able to defray their fixed costs to the extent they can differentiate their products and attract more consumers. Differential pricing programs are an instrument by which mobile wireless firms can differentiate themselves from competitors by offering access to customized content with their mobile wireless services. Product differentiation also can serve to intensify competition in such markets. In this context, it is notable that the most prominent examples of differential pricing in the U.S. have involved MetroPCS, Sprint and T-Mobile,<sup>18</sup> all of which have used zero-rated offerings to differentiate their products from larger competitors. Similarly, differential pricing has played a significant role in product differentiation for Globe (Philippines), which has offered zero-rated access to Facebook and other applications as part of its marketing campaigns.<sup>19</sup> Thus, differential pricing

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<sup>16</sup> To the extent content providers contribute financially to differential pricing programs through sponsored data programs, they do so in reflection of the increased value (at least over the long run) of enhanced distribution. But carriers may (and do) choose to offer differential pricing even without a financial payment from content providers simply because it increases the value of their platforms.

<sup>17</sup> Relatedly, to the extent differential pricing ultimately increases the audience for mobile content services, it also implicates yet another “side” of the multi-sided mobile wireless ecosystem – advertisers.

<sup>18</sup> MetroPCS is now part of T-Mobile.

<sup>19</sup> See “Globe Telecom Expands Mobile Data Business with Free Facebook, Free Viber Offer,” *Adobo Magazine* (January 8, 2015) (available at <http://www.adobomagazine.com/philippine-news/globe-telecom-expands-mobile-data-business-free-facebook-free-viber-offer>).

generally contributes to the competitiveness of mobile wireless markets. As discussed further in Section IV, there is evidence that differential pricing in the Indian wireless market is an important element of competition.

### **C. Potential Costs of Differential Pricing**

24. As noted at the outset, differential pricing has the potential, in the abstract, to harm competition and consumers. In theory, for example, a monopolist might seek to forestall entry into a market by bundling its services in such a way as to raise rivals' costs; or, it might condition access to its products and services by downstream firms on agreements to purchase all or some substantial proportion of their output from the monopolist (thereby effectively foreclosing some or all of the market from competitors).<sup>20</sup>

25. In order for these effects to occur in the real world, however, a number of conditions must be met, both in terms of the characteristics of the market and the nature of the conduct. Most importantly, the firm(s) engaging in such conduct must have sufficient market power to succeed in actually foreclosing competition – that is, to raise rivals' costs sufficiently to actually foreclose entry (or expansion) by an otherwise equally efficient competitor. As discussed in Section IV below, the evidence shows that such market power does not exist in either the TSP market or in the market for online content and applications in India. Secondly, the nature of the conduct must be such that it can plausibly be construed as having anticompetitive effects. As I explain further in Section V below, the differential pricing practices discussed in Consultation Paper do not appear to pass this basic test – that is, they do not appear

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<sup>20</sup> See e.g., Einer Elhauge, “Tying, Bundled Discounts, and the Death of the Single Monopoly Profit Theory,” 123 *Harvard Law Review* (2009) 399-481.

to discriminate against actual or potential competitors of the firms engaged in differential pricing.

26. As the Consultation Paper explains, another potential cost of differential pricing could take the form of consumer deception (i.e., lack of transparency).<sup>21</sup> For example, consumers might be tricked by differential pricing plans into believing, say, that all data services are free when in fact many are still subject to data charges, and thereby subjected to fees they did not expect or desire to incur. There are several reasons to believe that such practices are unlikely, including (as discussed further in Section IV) the vigorous competition and attendant high rates of turnover (churn) in the Indian mobile wireless market, which suggests that firms engaging in such deception would suffer loss of market share as a result. Further, as I explain in Section V, if such conduct were to be observed in the marketplace, the appropriate response would be to enforce existing consumer protection regulations<sup>22</sup> rather than to prohibit or proscribe an otherwise presumptively beneficial business practice.

#### **IV. COMPETITION IN RELEVANT INTERNET SERVICES MARKETS**

27. As discussed immediately above, economic assessment of the impact of differential pricing schemes depends in significant measure on the competitiveness of the underlying markets. If markets are competitive, then the likelihood of anticompetitive effects of differential pricing is effectively eliminated, and the ability of the market to police deceptive conduct without regulatory intervention is enhanced. The evidence in this section suggests that

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<sup>21</sup> See Consultation Paper at ¶ 6.

<sup>22</sup> For example, TRAI recently made it mandatory for mobile network operators to inform their customers about data usage. (Telcos must inform customers about data usage: TRAI, *The Times of India*, August 8, 2015.)

both the mobile wireless market and the markets for online content and applications in India are highly competitive.

28. First, the evidence demonstrates that the Indian market for telecommunications services is among the most competitive in the world.<sup>23</sup> As reported in the most recent TRAI Indian Telecom Services Performance Indicators,<sup>24</sup> as of June 2015 there were 319.4 million Internet subscribers.<sup>25</sup> As shown in Figure 1, Internet subscription occurs principally through mobile wireless access.<sup>26</sup>

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<sup>23</sup> The TRAI tariff framework companies are comprised of Internet Service Providers (ISPs) and Data Service Providers (mobile wireless providers), together the Telecom Service Providers (TSPs).

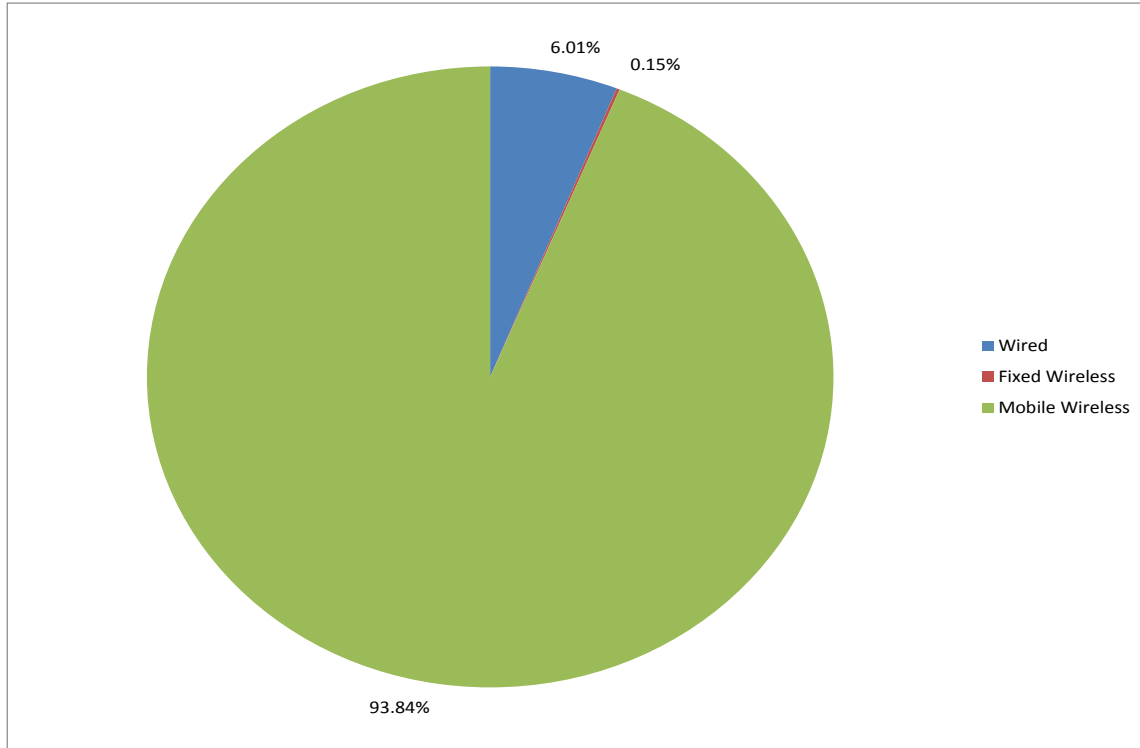
<sup>24</sup> TRAI, The Indian Telecom Services Performance Indicators, April – June 2015, November 23, 2015 (TRAI, Performance Indicators).

<sup>25</sup> TRAI, Performance Indicators, April – June 2015, p. ii.

<sup>26</sup> TRAI, Performance Indicators, April – June 2015, p. v.



**FIGURE 1:  
COMPOSITION OF INTERNET SUBSCRIPTIONS**



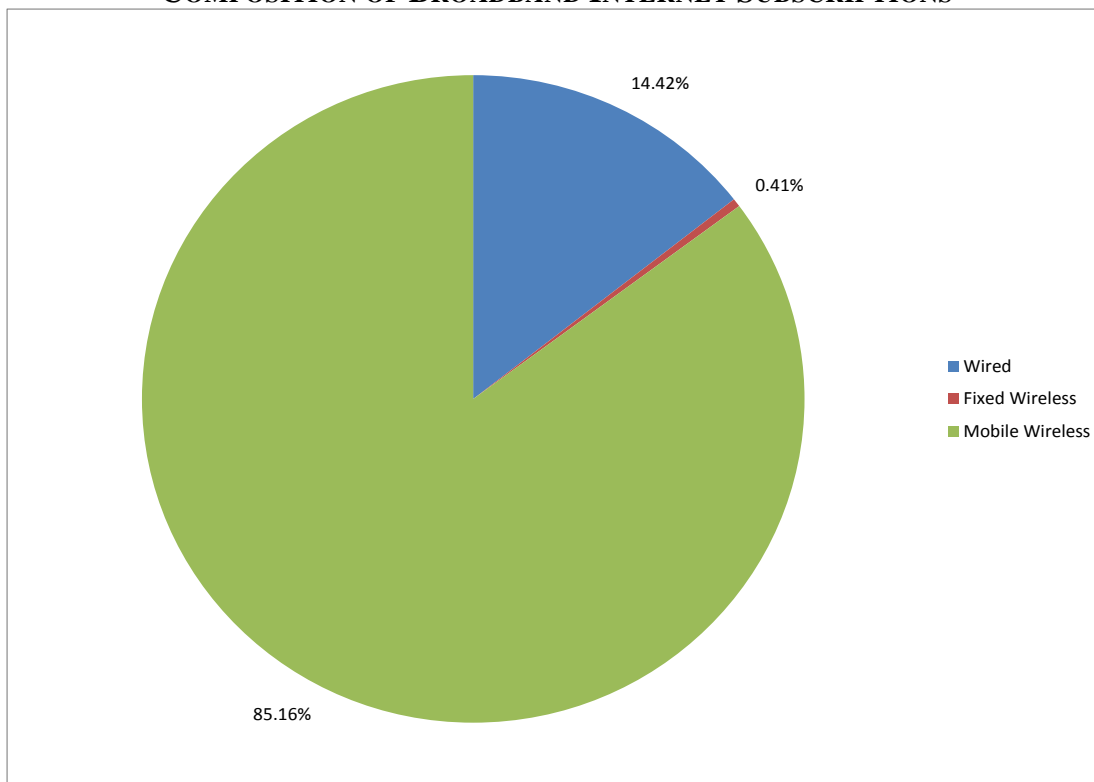
29. Of the 319.4 million Internet subscribers, 108.9 million, or 34 percent, were broadband subscribers.<sup>27</sup> As shown in Figure 2, broadband subscribers also access the Internet principally through mobile wireless, which accounted for a little over 85 percent of broadband subscribership as of June 2015.<sup>28</sup>

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<sup>27</sup> Broadband is defined as download speeds greater or equal to 512 Kbps. The first TRAI Performance Indicator report to do so is October – December 2013, prior to that broadband was defined as 256 Kbps. (TRAI, Performance Indicators, April – June 2015, p. 35; and October – December 2013, p. 25, ¶ 1.30.)

<sup>28</sup> TRAI, Performance Indicators, April – June 2015, p. 28.

**FIGURE 2:  
COMPOSITION OF BROADBAND INTERNET SUBSCRIPTIONS**



30. The principal providers of broadband Internet access are Bharti Airtel, Vodafone, Bharat Sanchar Nigam Ltd. (BSNL),<sup>29</sup> Idea Cellular, Reliance Communications, Tata, and Aircel. Of these, BSNL has a significant wired broadband presence, with wired broadband accounting for 54 percent of its 18.2 million broadband Internet subscribers.

31. The service areas of the major wireless providers as of June 2015 largely cover all of India,<sup>30</sup> as shown in Table 1.

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<sup>29</sup> BSNL is state owned. (TeleGeography, *GlobalComms Database*, India, p. 5 (accessed December 21, 2015).)

<sup>30</sup> Note that All India is variously defined as covering 22 and 23 licensed areas. (TRAI, *Performance Indicators*, April – June 2015, p. 10 and Annexure 1.1.)

**TABLE 1:  
WIRELESS SERVICE PROVIDER AREAS OF OPERATIONS**

<u>Wireless Service Provider</u>	<u>Area of Operations</u>
Bharti Airtel	All India
Vodafone	All India
Bharat Sanchar Nigam Ltd.	All India (except Delhi & Mumbai)
Idea Cellular	All India
Reliance Comm.	All India (except Assam & NE)
Tata	All India (except Assam, NE & J&K)
Aircel	All India

32. Data on the market shares of broadband providers show that, as of June 2015, there were seven broadband Internet providers with shares of three percent or greater, with the highest share (22.6 percent) held by Bharti Airtel, as shown on Table 2.<sup>31</sup> Even when the data is limited to wireless providers, the market is still relatively unconcentrated, with Bharti Airtel, Vodaphone and Idea Cellular serving 24.8, 23.7 and 17.9 percent of subscribers, respectively.<sup>32</sup> Thus, from a structural perspective, the Indian mobile wireless market is relatively unconcentrated. As one industry analyst firm describes it, “India is one of the most crowded mobile markets in the world, with a dozen active mobile Operators ... and, as such, many areas are served by ... eight or more mobile providers.”<sup>33</sup>

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<sup>31</sup> TRAI, Performance Indicators, April – June 2015, Annexure 1.6.

<sup>32</sup> TRAI, Performance Indicators, April – June 2015, p. 36, ¶ 1.51.

<sup>33</sup> TeleGeography, *GlobalComms Database*, India, p. 46 (accessed December 21, 2015).

**TABLE 2:  
FIXED AND WIRELESS BROADBAND INTERNET SUBSCRIBERS BY PROVIDER**

	Internet <u>Broadband</u>	Share of Internet <u>Broadband</u>
1 Bharti Airtel	24,559,552	22.6%
2 Vodafone	22,076,479	20.3%
3 Bharat Sanchar Nigam Ltd.	18,197,562	16.7%
4 Idea Cellular	16,671,982	15.3%
5 Reliance Comm.	9,740,900	8.9%
6 Tata	7,411,603	6.8%
7 Aircel	3,424,306	3.1%
8 Sistema Shyam	1,908,025	1.8%
9 Mahanagar Telephone Nigam	1,520,406	1.4%
10 Atria Convergence Tech.	721,439	0.7%
Subtotal	106,232,254	97.6%
Other	2,620,194	2.4%
Total	108,852,448	100.0%

33. Similarly, in 2013, the Organisation for Economic Co-operation and Development (OECD) found that “[t]he mobile market [in India] is among the most competitive with some 15 operators providing services and among the lowest prices globally.”<sup>34</sup> And in a recent report, the India Brand Equity Foundation (IBEF) described mobile wireless as facing “intense competition” due to the presence of “around 6 to 7 players in each region” and that “[c]ustomers’ low switching cost and price sensitivity are increasing competition among players.”<sup>35</sup>

34. Consistent with this vigorous competition, and with the competitive dynamics of Internet ecosystem markets as described in Section III, mobile wireless operators in India compete by offering a wide array of service plans and differentiated product offerings, including

<sup>34</sup> OECD, *Communications Outlook 2013*, p. 59.

<sup>35</sup> IBEF, *Telecommunication*, August 2015, p. 23.

both prepaid or postpaid contracts.<sup>36</sup> Most subscriptions are prepaid, accounting for about 95 percent of subscribers in June 2015, a share that is unchanged from December 2009.<sup>37</sup>

35. To understand the extent of service plan differentiation, I examined the pricing plans of several carriers, and refer to Bharti Airtel's offerings as an example. It offers two basic plans accompanied by numerous promotions (see Exhibit C). Basic tariff plans price local and long distance calls, SMS and data. Promotions for Bharti Airtel include, for example, the ability to separately purchase a Star Sports Pack bringing live cricketing action, to participate in "Exciting Offers on Airtel Money" that allow the booking of railway tickets with no data or SMS charges, or "Stay Online Throughout the Night" which offers the ability to check birthday notifications on Facebook or chat through the night on Whatsapp for fixed fee. Baharti Airtel also offers a Facebook Pack which allows for 15Mb of data over 5 days (for 5Rs) or 21Mb of data over 7 days (for 7Rs). In addition to offering promotions, Bharti Airtel introduced Airtel Zero in April 2015. Airtel Zero operates as an open platform offering toll-free mobile app data services with the data charges paid by the corporate participants.<sup>38</sup> Further evidence of the variety of tariffs and promotions being introduced is Bharti Airtel's announcement that as of December 29 Internet packs for its prepaid customers would no longer have a fixed period during which the data had to be consumed (i.e., the data packs will be "validity-free").<sup>39</sup>

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<sup>36</sup> As the Consultation notes: "The past few years have witnessed tremendous growth in data usage and quite a large number of data tariff offers are made available by TSPs." (TRAI Differential Pricing Consultation, ¶ 8.)

<sup>37</sup> Consists of a blended GSM and CDMA subscriber rate. (TRAI, Performance Indicators, October – December, 2009, pp. 34, 39; and April – June 2015, pp. 42, 50.)

<sup>38</sup> Bharti Airtel, Media Centre, *Airtel Launches 'Airtel Zero': A win-win platform for customers and marketers*, April 6, 2015.

<sup>39</sup> *Airtel introduces validity-free internet packs*, Business Standard, December 24, 2015.

36. Competition among mobile operators focuses to a significant extent on efforts to increase penetration and usage, including the offering of Internet applications. For example, Reliance Communications' Annual Report states:

We aim to expand our revenue streams through the expansion of our portfolio of service offerings and launching specific sales and marketing initiatives aimed at increasing our customer base. Such efforts include (i) offering a wider range of wireless and wireline services, such as video on demand, online gaming and video chat and conferencing; (ii) further expanding our distribution network of retail stores and developing them into one-stop shops for retail customers; and (iii) providing wireless broadband data services through both our CDMA and 3G mobile networks. In addition, we intend to focus on cross-selling and bundling of our products and services, including bundling of free social networking applications with data packages, through our various partnerships with device manufacturers and application developers. This enables us to introduce more attractive categories of tariffs and product combinations that can cater to different markets, demographics and customer needs, and in turn, benefit our customers from the greater value presented by our product offerings.<sup>40</sup>

37. Similar points are made by the other mobile operators. For example, Bharti Airtel whose "market research has shown that there are millions of customers across the country, who own an Internet-ready mobile device and are keen on getting online, but are apprehensive due to reasons like lack of know-how and fear of incurring heavy data charges" created a 'One Touch Internet' portal "for the 'uninitiated' to see, try and buy a host of popular services (including social networking, videos, online shopping and travel bookings)." These services include Facebook, YouTube, Twitter and Flipkart.<sup>41</sup> According to Bharti Airtel's Annual Report, One

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<sup>40</sup> Reliance Communications, *Annual Report*, 2014-15, p. 34.

<sup>41</sup> The OneTouch Internet FAQ page states that all trials except YouTube expire at midnight.

Touch has helped 2 million first time users experience the Internet.<sup>42</sup> Another operator, Idea Cellular reports that its expanded 3G network, reduced 3G handset prices “and availability of user friendly applications, has resulted in improved share of Data revenue in the [company’s] total revenue.”<sup>43</sup>

38. The high proportion of prepaid subscriptions in the Indian market is an important component of competition, as it allows most consumers to rapidly switch (i.e., “churn”) between mobile wireless services. Reliance Communications, in its Annual Report, describes it as follows:

The Indian mobile telecommunications industry has historically experienced a high rate of churn. This high churn rate has been a consequence of increasing competition and resultant promotional tariffs for new connections. Churn rates are especially high among pre-paid subscribers, who constitute a significant portion of the subscriber base of the Indian telecommunications industry.<sup>44</sup>

Monthly churn estimates range from 2.7 percent for Bharti Airtel<sup>45</sup> and 3.6 percent for Reliance Communications,<sup>46</sup> and have been reported to be as high as 4 to 6 percent, meaning that 32 to 72 percent of subscribers switch providers each year.<sup>47</sup>

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<sup>42</sup> Bharti Airtel Ltd., *Annual Report*, 2014-15, p. 16; Bharti Airtel, Media Centre, Airtel Launches ‘One Touch Internet’ – the simplest way for first time users to learn the internet, November 7, 2014; and OneTouch Inter FAQ (<http://one.airtel.in/ifb/faq.html>, accessed December 26, 2015).

<sup>43</sup> Idea Cellular Ltd., *Annual Report*, 2014-2015, pp. 41, 73. In addition to the “usual applications, Idea has launched several mobile applications aimed at improving information access and quality of life for non-urban communities across the country, which are often economically disadvantaged. These initiatives pertain to education and learning, mobile banking, agricultural information, health and safety, government schemes and employment generation.”

<sup>44</sup> Reliance Communications, *Annual Report*, 2014-15, p. 40.

<sup>45</sup> For fiscal year ending March 2015. (Bharti Airtel Ltd., *Annual Report*, 2014-15, p. 85.)

<sup>46</sup> For the second quarter 2015. (Reliance Communications, *Investors’ Presentation*, November 2015, slide 28.)

<sup>47</sup> *MNP fails to enthruse customers as only over two percent subscribers have opted*, December 4, 2011 (<http://www.telcoma.in/en/tag/telecom-regulatory-authority-of-india-trai/>) and P.S. Rajeswari & P. Ravilochanan, *Churn Analytics on Indian Prepaid Mobile Services*, Asian Social Science; Vol. 10, No. 13; 2014, p. 170.

39. Vigorous competition has resulted in rapid growth in mobile wireless uptake. For example, the number of wireless subscribers grew from 525 million in December 1999 to 981 million June 2015, or 87 percent, with rural wireless subscribers growing from 165 million to 418 million, or 154 percent, over this period. As a result, rural wireless teledensity increased from 20 percent to 48 percent.<sup>48</sup> Overall Internet broadband adoption grew by 97 percent from 55 million subscribers in December 2013 to 109 million in June 2015, and wireless broadband adoption grew even faster, growing by 130 percent from 40 million to 93 million.<sup>49</sup> During this period per subscriber data usage increased from 60 MB to 110 MB per month, an increase of 85 percent.<sup>50</sup>

40. TRAI itself has concluded that competition among TSPs has benefited consumers. In its Decadal Profile of the telecom sector, issued in June 2012,<sup>51</sup> TRAI's Chairman, Dr. J.S. Sarma, wrote:

Conducive regulatory environment through policies of the Government and regulatory measures put in place by the Telecom Regulatory Authority of India (TRAI) have contributed to a competitive environment for the service providers and accessibility to telecom services at affordable tariff, to the consumers.<sup>52</sup>

41. The evidence suggests that the market for online content and applications has been important to the growth of Internet subscribers. As TRAI's Consultation Paper on Delivering Broadband notes, "[f]or the demand side of the ecosystem, relevant, useful and

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<sup>48</sup> A subscriber may be counted more than once, for example, urban subscribers have a wireless teledensity of 144 percent in June 2015. (TRAI, Performance Indicators, October – December 2009, p. i and April – June 2015, p. i.)

<sup>49</sup> During this period broadband was defined has a speed greater or equal to 512 Kbps, prior to October-December 2013 broadband was defined as a speed greater or equal to 256 Kbps. (TRAI, Performance Indicators, October – December 2013, p. 26 and April – June 2015, p. 28.)

<sup>50</sup> TRAI, Performance Indicators, October – December 2013, p. ii and April – June 2015, p. ii.)

<sup>51</sup> TRAI, Telecom Sector in India: A Decadal Profile, 2012 (TRAI, Telecom Decadal Profile).

<sup>52</sup> TRAI, Telecom Decadal Profile, Foreword.



innovative advancements in services, applications, and content are important for encouraging adoption and use of broadband.”<sup>53</sup>

42. The Indian market for online content and applications also appears to be highly competitive. For example, the TRAI has noted that “[h]undreds of thousands of OTT apps have emerged due to the low cost base required to provide a service in the internet environment.”<sup>54</sup> The market for social networks is also competitive. According to 2015 data provided by WeAreSocial, major social networks present in India include Facebook, Google+, Twitter, LinkedIn, and Instagram. Moreover, the market is far from saturated: Only about 38 percent of active Internet users are social media users.<sup>55</sup> Nor is there any shortage of applications. According to WeAreSocial, the average smartphone user in India has 17 apps on the device. Of course, Internet users are not limited to social networks or other apps. The most searched terms in India in 2014 were the IRCTC (cricket), followed by Flipkart, SBI Online and Snapdeal.<sup>56</sup> Table 3 shows, for those looking online, the multiple sources used by Indian consumers to make a purchase decision.<sup>57</sup>

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<sup>53</sup> TRAI, Consultation Paper on Delivering Broadband Quickly: What do we need to do?, September 24, 2014, ¶ 5.16.

<sup>54</sup> TRAI, Regulatory Framework for Over-the-Top (OTT) Services, Consultation Paper No: 2/2015, March 27, 2015, ¶ 2.48.

<sup>55</sup> S. Kemp, Digital, *Social & Mobile in India in 2015*, August 27, 2015 (<http://wearesocial.net/blog/2015/08/digital-social-mobile-india-2015/>).

<sup>56</sup> *The top Google searches of 2014*, The Times of India, December 18, 2014.

<sup>57</sup> Consumer Barometer 2014/15 survey by Google (<https://www.consumerbarometer.com/en/>, accessed December 24, 2015).

**TABLE 3:  
ONLINE SOURCES USED TO MAKE A PURCHASE DECISION IN INDIA**

<u>Source</u>	<u>Use</u>
Search engine	44%
Online research: on brand websites	23%
Social networks	21%
Online research: on retailer websites	20%
Online video sites	20%
Price comparison sites	11%
Brand pages on social network sites	9%
Online magazines / news sites	9%
Advice sites/review sites/forums/blogs	8%
Email (e.g., offers, newsletters)	7%
Auction or classified sites	3%
Other online information source	5%
Sum	180%

43. In conclusion, the conditions that would make it likely (or even possible) for the types of differential pricing practices considered in the Consultation Paper to harm competition or consumers do not appear to be present in the relevant markets. Neither TSPs nor online content and applications providers has sufficient market power to foreclose entry by competitors.

#### **V. RESPONSES TO THE QUESTIONS POSED BY THE CONSULTATION**

44. In this section, I provide direct responses to the questions posed by the Consultation Paper.<sup>58</sup>

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<sup>58</sup> TRAI Differential Pricing Consultation, p. 9. I understand that TRAI scrutinizes tariff proposals against certain criteria, including: Non-Discriminatory; Transparency; Not Anti-competitive; Non-Predatory; Non-Ambiguous; and, Not Misleading. My opinions consider each of these criteria.

**A. Response to Question 1**

45. Question 1 reads: *“Should the TSPs be allowed to have differential pricing for data usage for accessing different websites, applications or platforms?”*

46. For the reasons discussed above, TRAI should not prohibit or proscribe differential pricing of data services by TSPs. In general, differential pricing is a means by which suppliers pass along to consumers the value created through economies of scale and scope. The benefits of differential pricing are enhanced by the particular characteristics of the market, including multi-sidedness and the “learning effect” new consumers experience from initial exposure to the Internet. As TRAI explained in its OTT consultation paper, “[t]ypically, once customers start using data plans ... they begin using increasing amounts of data as they get familiar with the various OTT smartphone application environments.”<sup>59</sup> This is a benefit, not a cost, of introducing consumers to the Internet.

**B. Response to Question 2**

47. Question 2 asks: *“If differential pricing for data usage is permitted, what measures should be adopted to ensure that the principles of non-discrimination, transparency, affordable internet access, competition and market entry and innovation are addressed?”*

48. As a general matter, differential pricing should be governed by the same regulatory principles as all other forms of business conduct.

49. As noted above, it is my understanding that the practices discussed in the Consultation Paper are non-discriminatory, in that they are available on equal terms to similarly situated consumers both upstream (content and applications providers) and downstream

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<sup>59</sup> TRAI, Regulatory Framework for Over-the-Top (OTT) Services, Consultation Paper No: 2/2015, March 27, 2015, ¶ 2.35.

(consumers).<sup>60</sup> However, even exclusive arrangements between TSPs and online content providers (if they were to occur) should not be banned per se. Rather, because differential pricing is often welfare enhancing, various practices should be assessed on a case-by-case basis under broad principles of competition doctrine.<sup>61</sup> Similarly, concerns about transparency or the potential for deceptive acts or practices related to differential pricing should be addressed under general consumer protection laws and regulations, and should be based on consideration of whether consumers acting reasonably in the circumstances would have been deceived by such practices and whether there is evidence of actual consumer harm.

50. With respect to the effects of differential pricing on affordable Internet access, the extension of affordable broadband service to a larger customer base is a generally acknowledged benefit of differential pricing, and one which should be given significant weight given the relatively low level of Internet penetration in India. Indeed, it seems generally agreed that the level of broadband Internet use in India needs to be increased.<sup>62</sup> According to the International Telecommunications Union (ITU),<sup>63</sup> only 18 percent of Indians used the Internet in 2014 and Cisco estimates that in India the average smartphone generated 299 MB of mobile data traffic per month compared to 819 MB globally in 2014.<sup>64</sup>

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<sup>60</sup> See Facebook Comments at 2.

<sup>61</sup> The “non-discrimination” principle obliges a TSP not to discriminate between subscribers of the same class in the application of tariffs. See Consultation Paper at ¶4.

<sup>62</sup> For example, according to the DoT, “the mobile broadband market has not taken off in comparison with other countries due to the comparatively high cost of devices as also the cost of data services.” (DoT Committee Report, Net Neutrality, May 2015, ¶ 6.9.)

<sup>63</sup> ITU, *ICT Facts and Figures 2015*, (<http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>) Individuals\_Internet\_2000-2014.xls.

<sup>64</sup> Cisco, *VNI Mobile Forecast Highlights, 2014-2019* ([http://www.cisco.com/assets/sol/sp/vni/forecast\\_highlights\\_mobile/index.html#~Country](http://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country)).

**C. Response to Question 3**

51. Question 3 asks, “*Are there alternative methods/technologies/business models, other than differentiated tariff plans, available to achieve the objective of providing free internet access to the consumers? If yes, please suggest/describe these methods/technologies/business models. Also, describe the potential benefits and disadvantages associated with such methods/technologies/business models?*”

52. Innovation and differentiation in pricing plans and service offerings are key elements of innovation in Internet ecosystem markets. For example, in recent years, the market for online music distribution has evolved from one based on downloads (e.g., iTunes) to one based on streaming (e.g, Pandora, Spotify). Few market observers predicted this development, which has fundamentally transformed the competitive landscape of the online music business while providing consumers with greater choice and superior services. Such innovation is part of the competitive dynamics of Internet ecosystem markets, which encourage suppliers constantly to experiment with new pricing schemes that enhance the size and scope of the market. Thus, if there are efficient alternatives to current differential pricing plans, it can be expected that they will develop organically through the competitive process. Conversely, given the complexity and dynamism of the markets at issue, it is unlikely that superior schemes will emerge as a result of an administrative process.

**D. Response to Question 4**

53. Question 4 asks, “*Is there any other issue that should be considered in the present consultation on differential pricing for data services?*”

54. I am aware that some have proposed that differential pricing plans be subject to *ex ante* approval under the TRAI's tariffing authority. For example, the DoT proposes that each proposed tariff "would need to be filed before TRAI within a reasonable period prior to the launch of the plan" and that the "TRAI would examine each such tariff filing carefully."<sup>65</sup> Such a process would create both significant delay and regulatory uncertainty. Indeed, even DoT Net Neutrality Committee concedes that

[T]here are [a] multitude of possibilities in designing tariff plans and it would not be possible to either pre-think all possibilities or determine its validity with respect to Net Neutrality principles. The Committee is of the opinion that a conclusion on whether the tariff plans specifically breach Net Neutrality would have to be seen in the context of the design of the tariff plan and the outcomes it generated, including its ability to distort consumer markets.<sup>66</sup>

55. Given the highly dynamic nature of Internet ecosystem markets, a prior approval regime would be tantamount to an outright prohibition of differential pricing schemes. Indeed, while consumers are the ultimate beneficiaries, such plans are adopted by suppliers for the purpose and with the intent of gaining a competitive advantage over other suppliers – a competitive advantage that would be reduced or eliminated if they were required to give prior notification. Given the *prima facie* beneficial nature of such innovation, regulatory impediments should be minimized whenever possible.

## VI. CONCLUSIONS

56. For the reasons explained above, it is my opinion that the differential pricing practices discussed in the Consultation Paper generate potential benefits far in excess of any potential costs, and that any negative consequences of such practices can best be identified and

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<sup>65</sup> DoT Committee Report, Net Neutrality, May 2015, ¶15.2.

<sup>66</sup> DoT Committee Report, Net Neutrality, May 2015, ¶12.6.

deterred through the enforcement of existing competition and consumer protection laws and regulations. Additional regulations which prohibit or unnecessarily proscribe or discourage adoption of such plans are likely to harm competition and consumers, with low-income consumers who would not be able to afford Internet access in the absence of differential pricing suffering the greatest harm.

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**Senior Vice President**  
**Co-Chair Communications, Media and Internet Practice**

Dr. Eisenach is a Senior Vice President and Co-Chair of NERA's Communications, Media, and Internet Practice. He is also an Adjunct Professor at George Mason University Law School, where he teaches Regulated Industries, and a Visiting Scholar at the American Enterprise Institute, where he directs the Center for Internet, Communications, and Technology Policy. Previously, Dr. Eisenach has served in senior policy positions at the US Federal Trade Commission and the White House Office of Management and Budget, and on the faculties of Harvard University's Kennedy School of Government and Virginia Polytechnic Institute and State University.

Dr. Eisenach's consulting practice focuses on economic analysis of competition, regulatory, intellectual property and consumer protection issues. He has submitted expert reports and testified in US federal court as well before the Federal Communications Commission, the Federal Trade Commission, several state public utility commissions, and courts and regulatory bodies in Australia, Canada, the Caribbean, and South America. He has also advised clients in some of the world's largest information technology sector mergers.

He has written or edited 19 books and monographs, including *Broadband Competition in the Internet Ecosystem* and *Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace*. His writings have also appeared in scholarly journals such as *The Review of Network Economics*, as well as in popular outlets like *Forbes*, *The New York Times*, and *The Wall Street Journal*.

Prior to joining NERA, Dr. Eisenach was a managing director and principal at Navigant Economics, and before that he served as Chairman of Empiris LLC, Criterion Economics, and CapAnalysis, LLC. Among his other previous affiliations, Dr. Eisenach has served as President and Senior Fellow at The Progress & Freedom Foundation; as a scholar at the American Enterprise Institute, the Heritage Foundation, and the Hudson Institute; as a consultant to the US Sentencing Commission (on corporate sentencing guidelines); and as a member of the 1980-81 Reagan-Bush Transition Team on the Federal Trade Commission, the 2000-2001 Bush-Cheney Transition Team on the Federal Communications Commission, the Virginia Governor's Commission on E-Communities, and the Virginia Attorney General's Task Force on Identity Theft.

Dr. Eisenach received his PhD in economics from the University of Virginia and his BA in economics from Claremont McKenna College.



## Education

1985 Ph.D. in Economics, University of Virginia  
1979 B.A. in Economics, Claremont McKenna College

## Professional Experience

Jan 2014-present Senior Vice President, NERA Economic Consulting  
Jan 2010-Jan 2014 Managing Director and Principal, Navigant Economics  
Sept 2008-Jan 2010 Chairman and Managing Partner, Empiris LLC  
June 2006-Sept 2008 Chairman, Criterion Economics, LLC  
July 2005-May 2006 Chairman, The CapAnalysis Group, LLC  
Feb 2003-July 2005 Executive Vice Chairman, The CapAnalysis Group, LLC  
June 1993-Jan 2003 President, The Progress & Freedom Foundation  
July 1991-May 1993 Executive Director, GOPAC  
Mar 1988-June 1991 President, Washington Policy Group, Inc.  
Sept 1986-Feb 1988 Director of Research, Pete du Pont for President, Inc.  
1985-1986 Executive Assistant to the Director, Office of Management and Budget  
1984-1985 Special Advisor for Economic Policy and Operations, Office of the Chairman, Federal Trade Commission  
1983-1984 Economist, Bureau of Economics, Federal Trade Commission  
1981 Special Assistant to James C. Miller III, Office of Management and Budget/Presidential Task Force on Regulatory Relief  
1979-1981 Research Associate, American Enterprise Institute  
1980 Consultant, Economic Impact Analysts, Inc.  
1978 Research Assistant, Potomac International Corporation

## Teaching Experience

2000-present Adjunct Professor, George Mason University School of Law, (Courses Taught: Regulated Industries; Perspectives on Government Regulation; The Law and Economics of the Digital Revolution)  
1995-1999 Adjunct Lecturer, Harvard University, John F. Kennedy School of Government, (Course Taught: The Role of Government in the 21st Century)  
1989 Adjunct Professor, George Mason University, (Course Taught: Principles of Economics)

1985, 1988	Adjunct Professor, Virginia Polytechnic Institute and State University, (Courses Taught: Graduate Industrial Organization, Principles of Economics)
1983-1984	Instructor, University of Virginia, (Courses Taught: Value Theory, Antitrust Policy)
1982-1983	Teaching Assistant, University of Virginia, (Courses Taught: Graduate Microeconomics, Undergraduate Macroeconomics)

### **Honors & Professional Activities**

2012-present	Visiting Scholar and Director, Center for Internet, Communications, and Technology Policy, American Enterprise Institute
2011-present	Member, Board of Directors, Information Technology & Innovation Foundation
2011-present	Vice President (Education) and Member of Audit Committee, Economic Club of Washington
2010-2011	Member, World Bank ICT Broadband Strategies Toolkit Advisory Group
2009-present	Member, Economic Club of Washington
2008-2009	Member, Board of Directors, PowerGrid Communications
2008-2012	Member, Board of Advisors, Washington Mutual Investors Fund
2002-2014	Member, Board of Advisors, Pew Project on the Internet and American Life
1993-2009	Member, Board of Directors, The Progress & Freedom Foundation
2002	Member, Attorney General's Identity Theft Task Force, Virginia
2002-2003	Member of the Board of Directors, Privacilla.com
2001-2004	Member, Executive Board of Advisors, George Mason University Tech Center
2001-2002	Contributing Editor, <i>American Spectator</i>
2001	Member, Bush-Cheney Transition Advisory Committee on the FCC
2000-2001	Member, Governor's Task Force on E-Communities, State of Virginia
1999-2001	Member, 2000-2001 Networked Economy Summit Advisory Committee
1998-2003	Member, Board of Directors, Internet Education Foundation
1998-2003	Member, Internet Caucus Advisory Committee
1996-2002	Member, American Assembly Leadership Advisory Committee
1995-2000	Member, Commission on America's National Interests
1988-1991	Adjunct Scholar, Hudson Institute
1988-1991	Visiting Fellow, Heritage Foundation

1981-1984	President's Fellowship, University of Virginia
1981-1983	Earhart Foundation Fellowship, University of Virginia
1981	Member, Reagan-Bush Transition Team on the Federal Trade Commission
1979	Henry Salvatori Award, Claremont Men's College
1978	Frank W. Taussig Award, Omicron Delta Epsilon

### **Testimony, Declarations and Expert Reports**

*In the Matter of the Joint Application of Frontier Communications Corporation, Verizon California Inc. (U 1002 C), Verizon Long Distance, LLC (U 5732 C), and Newco West Holdings LLC for Approval of Transfer of Control Over Verizon California Inc. and Related Approval of Transfer of Assets and Certifications, California Public Service Commission, Expert Declaration on Behalf of Verizon Communications (August 24, 2015)*

*Broadband Market Performance in Canada: Implications for Policy, Canadian Radio-Television and Telecommunications Commission Notice of Consultation 15-134, Expert Report on Behalf of Bell Canada (July 2015)*

*Analysis of Online Music Copyright Issues; Copyright Tribunal Proceeding CT 3 of 2013 – Reference by Phonographic Performance Company of Australia Ltd. Under s 154 of the Copyright Act of 1968, Third Expert Report on Behalf of Phonographic Performance Company of Australia Ltd. (February 26, 2015)*

*Analysis of the HoustonKemp Estimate of the Subscription Television License Fee; (Copyright Tribunal File No. 1 of 2012) – Reference by Phonographic Performance Company of Australia Limited Under s 154 of the Copyright Act 1968, Expert Report on Behalf of Phonographic Performance Company of Australia Ltd. (February 16, 2015)*

*Analysis of Online Music Copyright Issues; Copyright Tribunal Proceeding CT 3 of 2013 – Reference by Phonographic Performance Company of Australia Ltd. Under s 154 of the Copyright Act of 1968, Second Expert Report on Behalf of Phonographic Performance Company of Australia Ltd. (December 9, 2014)*

*Testimony on Open Internet Rules, Before the Committee on the Judiciary, United States Senate (September 17, 2014)*

*Review of Wholesale Mobile Wireless Services, Canadian Radio-Television and Telecommunications Commission Notice of Consultation CRTC 2014-76, Supplemental Expert Report on Behalf of TELUS Communications Company (August 20, 2014)*

*Analysis of Online Music Copyright Issues; Copyright Tribunal Proceeding CT 3 of 2013 – Reference by Phonographic Performance Company of Australia Ltd. Under s 154 of the Copyright Act of 1968, Expert Report on Behalf of Phonographic Performance Company of Australia Ltd. (August 5, 2014)*

*The Economics of Pick-and-Pay, Canadian Radio-Television and Telecommunications Commission Broadcasting Notice of Consultation CRTC 2014-190, Expert Report on Behalf of Bell Canada (June 27, 2014)*

*Review of Wholesale Mobile Wireless Services, Canadian Radio-Television and Telecommunications Commission Notice of Consultation CRTC 2014-76, Expert Report of Jeffrey A. Eisenach on Behalf of TELUS Communications Company (May 15, 2014)*

*In the Matter of Special Access for Price Cap Local Exchange Carriers, AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services, Federal Communications Commission, WC Docket No. 05-25, RM-10593 Expert Declaration (with Kevin W. Caves) on Behalf of Verizon Communications and Verizon Wireless (March 12, 2013)*

*In the Matter of Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Federal Communications Commission, Docket No. 12-268, Expert Reply Declaration on Behalf of the Expanding Opportunities for Broadcasters Coalition (March 10, 2013)*

*In the Matter of Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Federal Communications Commission, Docket No. 12-268, Expert Declaration on Behalf of the Expanding Opportunities for Broadcasters Coalition (January 24, 2013)*

*Testimony on the Digital Sound Performance Right, Before the Subcommittee on Intellectual Property, Competition and the Internet, Committee on the Judiciary, United States House of Representatives (November 28, 2012)*

*Response to Pre-Consultation Document PC12/03: Comments on Market Review Process (Part B), Before the Bermuda Telecommunications Regulatory Authority, Expert Report of Jeffrey A. Eisenach on Behalf of Bermuda Digital Communications Ltd. (November 21, 2012)*

*Order Instituting Rulemaking to Evaluate Telecommunications Corporations Service Quality Performance and Consider Modification to Service Quality Rules, Before the California Public Service Commission, Rulemaking 11-12-001, Reply Declaration of Jeffrey A. Eisenach on Behalf of Verizon Communications (March 1, 2012)*

*Order Instituting Rulemaking to Evaluate Telecommunications Corporations Service Quality Performance and Consider Modification to Service Quality Rules, Before the California Public Service Commission, Rulemaking 11-12-001, Expert Declaration of Jeffrey A. Eisenach on Behalf of Verizon Communications (January 31, 2012)*

*In the Matter of Howard Ferrer et al vs. Puerto Rico Telephone Company, Before the Telecommunications Regulatory Board of Puerto Rico, Case No. JRT: 2009-Q-0014, Expert Declaration of Jeffrey A. Eisenach on Behalf of the Puerto Rico Telephone Company (December 1, 2011)*

*Joint Declaration of Jeffrey A. Eisenach and Wayne A. Leighton before the Tribunal de Defensa de la Libre Competencia, Santiago, Chile, on behalf of Telefónica Chile S.A. (July 22, 2011)*

*In the Matter of Amendment of the Commission's Rules Related to Retransmission Consent, Federal Communications Commission, MB Docket No. 10-71, Expert Reply Declaration (with Kevin W. Caves) on Behalf of the National Association of Broadcasters (June 27, 2011)*

*In the Matter of an Application by Way of a Reference to the Federal Court of Appeal Pursuant to Sections 18.3(1) and 28(2) of the Federal Courts Act, R.S.C. 1985, C.F-7, Between: Cogeco Cable Inc. et al Applicants and Bell Canada et al Respondents, In the Supreme Court of Canada (on appeal from the Federal Court of Appeal), Affidavit and Expert Report on Behalf of Bell Media Inc. and V Interactions Inc. (May 27, 2011)*

*In the Matter of Amendment of the Commission's Rules Related to Retransmission Consent, Federal Communications Commission, MB Docket No. 10-71, Expert Declaration (with Kevin W. Caves) on Behalf of the National Association of Broadcasters (May 27, 2011)*

*In the Matter of Section 36 of the Public Utilities Commission Act, Proposal to Establish a New Interconnection Agreement Between Digicel and GT&T, Expert Oral Testimony on Behalf of Guyana Telephone and Telegraph Company, Guyana Public Utilities Commission (July 13, 2010)*

*In the Matter of International Comparison and Consumer Survey Requirements in the Broadband Data Improvement Act, Federal Communications Commission GN Docket No. 09-47, Supplemental Declaration Regarding the Berkman Center Study (NBP Public Notice 13) (with R. Crandall, E. Ehrlich and A. Ingraham), on Behalf of Verizon Communications (May 10, 2010)*

*Testimony on Deployment of Broadband Communications Networks, Before the Subcommittee on Communications, Technology and the Internet, Committee on Energy and Commerce, United States House of Representatives (April 21, 2010)*

*Net Neutrality: The Economic Evidence, Expert Declaration in the Matters of Preserving the Open Internet and Broadband Industry Practices, GN Docket No. 09-191 and WC Docket No. 07-52 (with Brito et al) (April 12, 2010)*

*In the Matter of the Constitution of the Co-Operative Republic of Guyana and In the Matter of the Application for Redress Under Article 153 for the Contravention of the Applicant's Fundamental Rights Guaranteed by Articles 20, 146, and 149D of the Constitution of the Republic of Guyana and In the Matter of the Telecommunications Act No. 27 of 1990, U-Mobile (Cellular) Inc., v. The Attorney General of Guyana, "International Exclusivity and the Guyanese Telecommunications Market: A Further Response to DotEcon," Expert Report on Behalf of Guyana Telephone and Telegraph Company (March 9, 2010)*

*Universal Service Subsidies to Areas Served by Cable Telephony: Supplemental Report, Expert Report Submitted to the Federal Communications Commission, on Behalf of the National Cable and Telecommunications Association (January 2010)*

*Policy Proceeding on a Group-Based Approach to the Licensing of Television Services and on Certain Issues Relating to Conventional Television, Canadian Radio-Television and Telecommunications Commission, Broadcasting Notice of Consultation CRTC 2009-411, Oral Testimony on Behalf of CTVgm (November 16, 2009)*

*In the Matter of International Comparison and Consumer Survey Requirements in the Broadband Data Improvement Act, Federal Communications Commission GN Docket No. 09-47, Declaration Regarding the Berkman Center Study (NBP Public Notice 13) (with R. Crandall and E. Ehrlich) on behalf of the National Cable and Telecommunications Association and the United States Telecom Association (November 16, 2009)*

*Universal Service Subsidies to Areas Served by Cable Telephony, Expert Report Submitted to the Federal Communications Commission, on behalf of the National Cable and Telecommunications Association (November 2009)*

*Policy Proceeding on a Group-based Approach to the Licensing of Television Services and on Certain Issues relating to Conventional Television, Canadian Radio-Television and Telecommunications Commission Broadcasting Notice of Consultation CRTC 2009-411, Expert Report on the Economics of Retransmission Consent Negotiations in the U.S. and Canada, (with S. Armstrong) on Behalf of CTVgm (September 19, 2009)*

*Virginia State Corporation Commission, Second Order for Notice and Hearing In Re: Revisions of Rules for Local Exchange Telecommunications Company Service Quality Standards, Comments on Behalf of Verizon Virginia (March 13, 2009)*

*In the Matter of Review of the Commission's Program Access Rules and Examination of Programming Tying Arrangements, Federal Communications Commission Docket MB 07-198, Supplemental Report on Behalf of the Walt Disney Company (December 11, 2008)*

*In re: Investigation of Rates of Virgin Islands Telephone Corporation d/b/a Innovative Communications, PSC Docket 578, Rebuttal Testimony on Behalf of Virgin Islands Telephone Corporation (October 31, 2008)*

*Evidence Relating to the ACCC's Draft Decision Denying Telstra's Exemption Application for the Optus HFC Footprint, Australian Consumer and Competition Commission, Expert Report on Behalf of Telstra Corporation Ltd. (October 13, 2008)*

*In re: Investigation of Rates of Virgin Islands Telephone Corporation d/b/a Innovative Communications, PSC Docket 578, Direct Testimony on Behalf of Virgin Islands Telephone Corporation (September 26, 2008)*

*In the Matter of the Appropriate Forms of Regulating Telephone Companies, Maryland Public Service Commission, Case No. 9133, Rebuttal Testimony on Behalf of Verizon Maryland (September 24, 2008)*

*Virginia State Corporation Commission, Proposed Service Quality Rules for Traditional Landline Telecommunications, Comments on Behalf of Verizon Virginia (August 21, 2008)*

*In re: Complaint and Request for Emergency Relief against Verizon Florida, LLC for Anticompetitive Behavior in Violation of Sections 364.01(4), 364.3381, and 364.10, F.S., and for Failure to Facilitate Transfer of Customers' Numbers to Bright House Networks Information Services (Florida), LLC, and its Affiliate, Bright House Networks, LLC, Florida Public Service Commission, Docket No. 070691-TP, Rebuttal Testimony on Behalf of Verizon Florida LLC (July 25, 2008)*

*In the Matter of the Appropriate Forms of Regulating Telephone Companies, Maryland Public Service Commission, Case No. 9133, Direct Testimony on Behalf of Verizon Maryland (July 8, 2008)*

*Comparative Analysis of Communications Markets as it Relates to the Economic Viability of Optus' HFC Network and Telstra's Proposed HFC Exemption, Australian Consumer and Competition Commission, Expert Report on Behalf of Telstra Corporation Ltd. (June 23, 2008)*

*In the Matter of the Constitution of the Co-Operative Republic of Guyana and In the Matter of the application for redress under Article 153 for the contravention of the Applicant's fundamental rights guaranteed by Articles 20, 146, and 149D of the Constitution of the Republic of Guyana and In the Matter of the Telecommunications Act No. 27 of 1990, U-Mobile (Cellular) Inc., v. The Attorney General of Guyana, Expert Report on Behalf of Guyana Telephone and Telegraph Company (June 19, 2008)*

*In the Matter of Bright House Networks LLC et al v. Verizon California et al, Federal Communications Commission File No. EB-08-MD-002, Expert Declaration on Behalf of Verizon Communications (February 29, 2008)*

*In the Matter of Review of the Commission's Program Access Rules and Examination of Programming Tying Arrangements, Federal Communications Commission Docket MB 07-198, Reply Report on Behalf of the Walt Disney Company (February 12, 2008)*

*In the Matter of Verizon's 2007 Price Cap Plan for the Provision of Local Telecommunications Services in the District Of Columbia, District of Columbia Public Service Commission, Formal Case No. 1057, Rebuttal Testimony on Behalf of Verizon (January 31, 2008)*

*In the Matter of Review of the Commission's Program Access Rules and Examination of Programming Tying Arrangements, Federal Communications Commission Docket MB 07-198, Expert Report on Behalf of the Walt Disney Company (January 4, 2008)*

*In the Matter of Verizon's 2007 Price Cap Plan for the Provision of Local Telecommunications Services in the District Of Columbia, District of Columbia Public Service Commission, Formal Case No. 1057, Direct Testimony on Behalf of Verizon (December 7, 2007)*

*In the Matter of the Commission's Investigation Into Verizon Maryland, Inc.'s Affiliate Relationships, Maryland Public Service Commission, Case No. 9120, Rebuttal Testimony on Behalf of Verizon (November 19, 2007)*

*On Petition for a Writ of Certiorari to the United States Court of Appeals for the Ninth Circuit, Pacific Bell Telephone Company d/b/a AT&T California, et al., Petitioners, v. Linkline Communications, Inc., et al., Respondents, Brief of Amici Curiae Professors and Scholars in Law and Economics in Support of the Petitioners (with R. Bork, G. Sidak, et al) (November 16, 2007)*

*In the Matter of the Commission's Investigation Into Verizon Maryland, Inc.'s Affiliate Relationships, Maryland Public Service Commission, Case No. 9120, Direct Testimony on Behalf of Verizon (October 29, 2007)*

*Application of Verizon Virginia, Inc. and Verizon South for a Determination that Retail Services Are Competitive and Deregulating and Detariffing of the Same, State Corporation Commission of Virginia, Case No. PUC-2007-00008, Rebuttal Report on Behalf of Verizon (July 16, 2007)*

*Testimony on Single Firm Conduct, "Understanding Single-Firm Behavior: Conduct as Related to Competition," United States Department of Justice and United States Federal Trade Commission, Sherman Act Section 2 Joint Hearing (May 8, 2007)*

*Testimony on Communications, Broadband and U.S. Competitiveness, Before the Committee on Commerce, Science and Transportation, United State Senate (April 24, 2007)*

*Application of Verizon Virginia, Inc. and Verizon South for a Determination that Retail Services Are Competitive and Deregulating and Detariffing of the Same, State Corporation Commission of Virginia, Case No. PUC-2007-00008, Expert Testimony and Report on Behalf of Verizon (January 17, 2007)*

*In re: ACLU v. Gonzales, Civil Action No. 98-CV-5591, E.D. Pa., Rebuttal Report on Behalf of the U.S. Department of Justice (July 6, 2006)*

*In re: ACLU v. Gonzales, Civil Action No. 98-CV-5591, E.D. Pa., Expert Report on Behalf of the U.S. Department of Justice (May 8, 2006)*

*In re: Emerging Communications Shareholder Litigation, "The Valuation of Emerging Communications: An Independent Assessment" (with J. Mrozek and L. Robinson), Court of Chancery for the State of Delaware (August 2, 2004)*

*In the Matter of Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers, WC Docket No. 03-173, Declaration of Jeffrey A. Eisenach and Janusz R. Mrozek, Federal Communications Commission (December 2003)*

*In the Matter of Disposition of Down Payments and Pending Applications Won During Auction No. 35 for Spectrum Formerly Licensed to NextWave Personal Communications, Inc., NextWave Power Partners, Inc. and Urban Comm – North Carolina, Inc., Federal Communications Commission, (October 11, 2002)*

*In the Matter of Echostar Communications Corporation, General Motors Corporation, and Hughes Electronics Corporation, Federal Communications Commission (February 4, 2002)*



*In the Matter of United States v. Microsoft Corp. and New York State v. Microsoft Corp., Proposed Final Judgment and Competitive Impact Statement* (with T. Lenard), U.S. Department of Justice, Civil Action No. 98-1232 and 98-1233 (January 28, 2002)

*In the Matter of Implementation of Section 11 of the Cable Television Consumer Protection and Competition Act of 1992* (with R. May), Federal Communications Commission (January 4, 2002)

*In the Matter of Request for Comments on Deployment of Broadband Networks and Advanced Telecommunications* (with R. May), National Telecommunications and Information Administration (December 19, 2001)

*In the Matter of Implementation of the Telecommunications Act of 1996, Telecommunications Carriers' Use of Customer Proprietary Network Information and Other Consumer Information; Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, As Amended* (with T. Lenard and J. Harper), Federal Communications Commission (November 16, 2001)

*In the Matter of Flexibility for Delivery of Communications by Mobile Satellite Service Providers* (with W. Adkinson), Federal Communications Commission (October 22, 2001)

*In the Matter of Deployment of Advanced Telecommunications Capability* (with R. May), Federal Communications Commission (October 5, 2001)

*In the Matter of Deployment of Advanced Telecommunications Capability* (with R. May), Federal Communications Commission (September 24, 2001)

*In the Matter of Nondiscrimination in Distribution of Interactive Television Services Over Cable* (with R. May), Federal Communications Commission (March 19, 2001)

*In the Matter of High-Speed Access to the Internet Over Cable and Other Facilities, Reply Comments* (with R. May), Federal Communications Commission (December 1, 2000)

*Testimony on Federal Communications Commission Reform*, Before the Committee on Government Reform, Subcommittee on Government Management, Information and Technology, United States House of Representatives (October 6, 2000)

*In the Matter of Public Interest Obligations of TV Broadcast Licensees* (with R. May), Federal Communications Commission (March 27, 2000)

*Testimony on Truth in Billing Legislation*, Before the Subcommittee on Telecommunications, Trade and Consumer Protection, Committee on Commerce, United States House of Representatives (March 9, 2000)

*In the Matter of GTE Corporation, Transferor and Bell Atlantic, Transferee for Consent to Transfer of Control*, (with R. May), Federal Communications Commission (February 15, 2000)

*Testimony on Reforming Telecommunications Taxes in Virginia*, Governor's Commission on Information Technology (October 26, 1999)

*Testimony on Telecommunications Taxes*, Advisory Commission on Electronic Commerce (September 14, 1999)

*In the Matter of GTE Corporation, Transferor and Bell Atlantic, Transferee for Consent to Transfer of Control*, Federal Communications Commission (December 23, 1998)

*In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996* (with C. Eldering), Federal Communications Commission (September 14, 1998)

*Testimony on Section 706 of the Telecommunications Act of 1996 and Related Bandwidth Issues*, Before the Subcommittee on Communications Committee on Commerce, Science, and Transportation, United States Senate (April 22, 1998)

*Testimony on the Impact of the Information Revolution on the Legislative Process and the Structure of Congress*, Before the Subcommittee on Rules and Organization of the House of the Committee on Rules, United States House of Representatives (May 24, 1996)

*Testimony on Efforts to Restructure the Federal Government*, Before the Committee on Governmental Affairs, United States Senate (May 18, 1995)

*Testimony on the Role of the Department of Housing and Urban Development and the Crisis in America's Cities*, Before the Committee on Banking and Financial Services, United States House of Representatives (April 6, 1995)

### **Academic Publications and White Papers**

*Broadband Market Performance in Canada: Implications for Policy*, NERA Economic Consulting, October 2015

“Looking Ahead: The FTC’s Role in Information Technology Markets” (with I.K. Gotts), *George Washington University Law Review*, forthcoming 2015

*Right-to-Work Laws: The Economic Evidence*, NERA Economic Consulting, June 18, 2015

*The Economics of Zero Rating*, NERA Economic Consulting, March 2015

“In Search of a Competition Doctrine for Information Technology Markets: Recent Antitrust Developments in the Online Sector” (with I. K. Gotts), in *Competition and Communications Law: Key Issues in the Telecoms, Media and Technology Sectors*, Kluwer Law International, 2014.

*Economic Effects of Imposing Third-Party Liability on Payment Processors*, NERA Economic Consulting, July 2014

*Delivering for Television Viewers: Retransmission Consent and the U.S. Market for Video Content*, NERA Economic Consulting, July 2014

*The ABCs of “Pick-and-Pay,”* NERA Economic Consulting, June 2014

“Mobile Wireless Performance in the EU and the US: Implications for Policy” (with E. Bohlin and C. Caves), *Communications and Strategies* 93, 2014

“The Sound Recording Performance Right at a Crossroads: Will Market Rates Prevail?”  
*Commlaw Conspectus* 22, 2013–2014

*An Empirical Analysis of the Value of Information Sharing in the Market for Online Content*  
(with H. Beales), Navigant Economics, February 2014

*The Equities and Economics of Property Interests in TV Spectrum Licenses*, Navigant Economics,  
January 2014

*Mobile Wireless Market Performance in Canada: Lessons from the EU and the US* (with  
E. Bohlin and C. Caves), Navigant Economics, September 2013

“Avoiding Rent-Seeking in Secondary Market Spectrum Transactions,” (with H. Singer),  
*Federal Communications Law Journal* 65;3, June 2013

*Understanding Webcaster Royalties*, Navigant Economics, June 2013

*Mobile Wireless Performance in the EU and the US* (with E. Bohlin and C. Caves), GSMA and  
Navigant Economics, May 2013

“The Long-Run Effects of Copper-Loop Unbundling and the Implications for Fiber” (with  
R. Crandall and A. Ingraham), *Telecommunications Policy* 37, 2013

*Putting Consumers First: A Functionality-Based Approach to Online Privacy* (with H. Beales),  
Navigant Economics, January 2013

“What Happens When Local Phone Service is Deregulated?” (with K. Caves), *Regulation*,  
September 2012

“Economic and Legal Aspects of FLSA Exemptions: A Case Study of Companion Care” (with  
K. Caves), *Labor Law Journal*, September 2012

*The Long-Run Impact of Copper Unbundling and the Implications for Fiber* (with R. Crandall  
and A. Ingraham), Navigant Economics, March 2012

*Estimating the Economic Impact of Repealing the FLSA Companion Care Exemption* (with  
K. Caves), Navigant Economics, March 2012

*The Impact of Liberalizing Price Controls on Local Telephone Service: An Empirical Analysis*  
(with K. Caves), Navigant Economics, February 2012

“Spectrum Reallocation and the National Broadband Plan,” *Federal Communications Law  
Journal* 64;1, December 2011

*The Rural Utilities Service Should Reassess its Reliance on Universal Service High-Cost Support to Leverage Broadband Loans*, Navigant Economics, September 2011

*The Effects of Regulation on Economies of Scale and Scope in TV Broadcasting*, Navigant Economics, June 2011

*Evaluating the Cost-Effectiveness of RUS Broadband Subsidies: Three Case Studies*, Navigant Economics, April 2011

*Revenues from a Possible Spectrum Incentive Auction: Why the CTIA/CEA Estimate is Not Reliable*, Navigant Economics, April 2011

*Competition in the New Jersey Communications Market: Implications for Reform*, Navigant Economics, March 2011

*The Role of Independent Contractors in the U.S. Economy*, Navigant Economics, December 2010

“Vertical Separation of Telecommunications Networks: Evidence from Five Countries” (with R. Crandall and R. Litan), *Federal Communications Law Journal* 62;3, June 2010

*Video Programming Costs and Cable TV Prices: A Reply to CRA*, (with K. Caves), Navigant Economics, June 2010

*Video Programming Costs and Cable TV Prices*, Navigant Economics, April 2010

*Retransmission Consent and Economic Welfare: A Reply to Compass Lexecon*, Navigant Economics, April 2010

*The Benefits and Costs of Implementing ‘Return-Free’ Tax Filing In the U.S.* (with R. Litan and C. Caves), Navigant Economics, March 2010

“The Impact of Regulation on Innovation and Choice in Wireless Communications” (with E. Ehrlich and W. Leighton), *Review of Network Economics* 9;1, 2010

*Uncollected Sales Taxes on Electronic Commerce* (with R. Litan), Empiris LLC, February 2010

*The Economics of ESPN360.com*, Empiris LLC, November 2009

“Net Neutrality versus Consumer Welfare,” in *The Consequences of Net Neutrality Regulations on Broadband Investment and Consumer Welfare: A Collection of Essays*, American Consumer Institute, November 2009

*The Economics of Retransmission Consent*, Empiris LLC, March 2009

*Economic Effects of Tax Incentives for Broadband Infrastructure Deployment* (with H. Singer and J. West), Empiris LLC, January 5, 2009

“An Event Analysis Study of the Economic Implications of the FCC’s UNE Decision: Backdrop For Current Network Sharing Proposals,” (with P. Lowengrub and J.C. Miller III), *Commlaw Conspectus* 17;1, 2008

“Broadband Policy: Does the U.S. Have It Right After All?” in *Telecommunications Policy & Regulation*, Practising Law Institute, December 2008

“Broadband in the U.S. – Myths and Facts,” in *Australia’s Broadband Future: Four Doors to Greater Competition*, Committee for Economic Development of Australia, 2008

*The Benefits and Costs of I-File*, (with R. Litan and K. Caves), Criterion Economics, LLC, April 14, 2008

“Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation?” (with Hal J. Singer), *AEI-Brookings Joint Center Related Publication 07-28*, December 2007

*Due Diligence: Risk Factors in the Frontline Proposal*, Criterion Economics, LLC, June 28, 2007

*The Effects of Providing Universal Service Subsidies to Wireless Carriers* (with K. Caves), Criterion Economics, LLC, June 13, 2007

*Assessing the Costs of the Family and Medical Leave Act*, Criterion Economics, LLC, February 16, 2007

*Improving Public Safety Communications: An Analysis of Alternative Approaches* (with P. Cramton, T. Dombrowsky, A. Ingraham, H. Singer) Criterion Economics, LLC, February 6, 2007

*Economic and Regulatory Implications of Unregulated Entry in the Canadian Mortgage Insurance Market*, Criterion Economics, LLC, June 20, 2006

*The FCC’s Further Report on A La Carte Pricing of Cable Television* (with R. Ludwick) The CapAnalysis Group, LLC, March 6, 2006

*The EX-IM Bank’s Proposal to Subsidize the Sale of Semiconductor Manufacturing Equipment to China: Updated Economic Impact Analysis* (with J.C. Miller III, R. Ludwick), The CapAnalysis Group, LLC, November 2005

*Retransmission Consent and Cable Television Prices* (with D. Trueheart), The CapAnalysis Group, LLC, March 2005

*The EX-IM Bank’s Proposal to Subsidize the Sale of Semiconductor Manufacturing Equipment to China: An Economic Impact Analysis* (with J.C. Miller III, R. Ludwick, O. Grawe), The CapAnalysis Group, LLC, January 2005.

*Peer-to-Peer Software Providers' Liability under Section 5 of the FTC Act* (with J.C. Miller III, L. Fales, C. Webb), The CapAnalysis Group, LLC and Howrey LLP, April 2004

*Mandatory Unbundling: Bad Policy for Prison Payphones* (with D. Trueheart, J. Mrozek), The CapAnalysis Group, LLC, March 2004

*UNE Rates Do Not Reflect Underlying Costs: A Rebuttal to Ekelund and Ford* (with J. Mrozek), The CapAnalysis Group, LLC, January 30, 2004

*Do UNE Rates Reflect Underlying Costs?* (with J. Mrozek), The CapAnalysis Group, LLC, December 2003

*Rising Cable TV Rates: Are Programming Costs the Villain?* (with D. Trueheart), The CapAnalysis Group, LLC, October 2003

*Economic Implications of the FCC's UNE Decision: An Event Analysis Study* (with J.C. Miller III, P. Lowengrub), The CapAnalysis Group, LLC, April 2003

"Telecom Deregulation and the Economy: The Impact of 'UNE-P' on Jobs, Investment and Growth" (with T. Lenard), *Progress on Point 10.3*, The Progress & Freedom Foundation, January 2003.

"The CLEC Experiment: Anatomy of a Meltdown" (with L. Darby and J. Kraemer) *Progress on Point 9.23*, The Progress & Freedom Foundation, September 2002

"The Debate Over Digital Online Content: Understanding the Issues" (with W. Adkinson, Jr.) *Progress on Point 9.14*, The Progress & Freedom Foundation, April 2002

"Electricity Deregulation after Enron," *Progress on Point 9.11*, The Progress & Freedom Foundation, April 2002

"Political Privacy: Is Less Information Really Better?" *Progress on Point 9.2*, The Progress & Freedom Foundation, January 2002

"*Communications Deregulation and FCC Reform: Finishing the Job*" (with R. May), in *Communications Deregulation and FCC Reform: What Comes Next?* (ed., with R. May) Kluwer Academic Publishers, 2001

"Does Government Belong in the Telecom Business?" *Progress on Point 8.1*, The Progress & Freedom Foundation, January 2001

"Critics Fear Surveillance of Web Surfers Compromising Personal Privacy," *Progress on Point 7.11*, The Progress & Freedom Foundation, July 2000

"Access Charges and The Internet: A Primer," *Progress on Point 7.9*, The Progress & Freedom Foundation, June 2000

“The Need for a Practical Theory of Modern Governance,” *Progress on Point 7.7*, The Progress & Freedom Foundation, May 2000

“The Microsoft Monopoly: The Facts, the Law and the Remedy” (with T. Lenard) *Progress on Point 7.4*. The Progress & Freedom Foundation, April 2000

“Regulatory Overkill: Pennsylvania’s Proposal to Breakup Bell Atlantic” (with C. Eldering, R. May) *Progress on Point 6.13*, The Progress & Freedom Foundation, December 1999

“Is There a Moore's Law for Bandwidth?” (with C. Eldering, M. Sylla), *IEEE Communications Magazine*, October 1999

“The High Cost of Taxing Telecom,” *Progress on Point 6.6*, The Progress & Freedom Foundation, September 1999

“Creating the Digital State: A Four Point Program,” *Progress on Point 6.4*, The Progress & Freedom Foundation, August 1999

“How to Recognize a Regulatory Wolf in Free Market Clothing: An Electricity Deregulation Scorecard,” (with T. Lenard) *Progress on Point 6.3*, The Progress & Freedom Foundation, July 1999

“Into the Fray: The Computer Industry Flexes Its Muscle on Bandwidth,” *Progress on Point 5.9*, The Progress & Freedom Foundation, December 1998

“Surprise: Even in Electricity, the Market Works,” The Progress & Freedom Foundation, Nov. 1998

“Finally! An ‘Electricity Deregulation’ Bill That Deregulates,” *Progress on Point 5.7*, The Progress & Freedom Foundation, October 1998

“Time to Walk the Walk on Telecom Policy,” *Progress on Point 4.3*, The Progress & Freedom Foundation, July 1997

“The FCC and the Telecommunications Act of 1996: Putting Competition on Hold?” (with G. Keyworth), *Progress on Point 2.1*, The Progress & Freedom Foundation, October 1996

“Forebearance, Self-Certification and Privatization” (with J. Gattuso, et al) *Future Insight No. 3.2*, The Progress & Freedom Foundation, May 1996

“Privatizing the Electromagnetic Spectrum” (with R. Crandall, et al) *Future Insight No. 3.1*, The Progress & Freedom Foundation, April 1996

“Broadcast Spectrum: Putting Principles First” (with R. Crandall et al) *Progress on Point 1.9*, The Progress & Freedom Foundation, January 1996

“How (Not) to Solve the Liability Crisis,” in P. McGuigan, ed., *Law, Economics & Civil Justice Reform: A Reform Agenda for the 1990's*, Free Congress Foundation, 1995

“The Future of Progress,” *Future Insight* 2.3, The Progress & Freedom Foundation, May 1995

“American Civilization and the Idea of Progress,” in D. Eberly, ed., *Building a Community of Citizens: Civil Society in the 21st Century*, University Press of America, 1994

“Fighting Drugs in Four Countries: Lessons for America?” *Backgrounders* 790, The Heritage Foundation, Washington, DC, September 24, 1990

“Drug Legalization: Myths vs. Reality,” *Heritage Backgrounders* 122, The Heritage Foundation, January 1990

“How to Ensure A Drug-Free Congressional Office,” The Heritage Foundation, January 1990

“A White House Strategy for Deregulation,” in *Mandate for Leadership III*, The Heritage Foundation, 1989

“From George Bush, A Convincing Declaration of War on Drugs,” *Executive Memorandum* No. 250, The Heritage Foundation, September 14, 1989

“Winning the Drug War: What the States Can Do,” *Heritage Backgrounders* 715/S, July 7, 1989

“Why America is Losing the Drug War,” *Heritage Backgrounders* 656, June 9, 1988

“Selectivity Bias and the Determinants of SAT Scores,” (with A. Behrendt and W. Johnson) *Economics of Education Review* 5;4, 1986

“Review of Banking Deregulation and the New Competition in the Financial Services Industry,” *Southern Economic Journal* 52;3, January 1986

“Warranties, Tie-ins, and Efficient Insurance Contracts: A Theory and Three Case Studies,” (with R. Higgins and W. Shughart II), *Research in Law and Economics* 6, 1984

“Regulatory Relief under Ronald Reagan,” (with James C. Miller III), in Wayne Valis, ed., *The Future Under President Reagan*, Arlington House, 1981

## **Books and Monographs**

*Broadband Competition in the Internet Ecosystem*, AEI Economic Studies, American Enterprise Institute for Public Policy Research, October 2012

*The Impact of State Employment Policies on Job Growth: A 50-State Review* (with David S. Baffa, et al), U.S. Chamber of Commerce, March 2011

*The Digital Economy Fact Book 2002*, (with W. Adkinson Jr. and T. Lenard) The Progress & Freedom Foundation, August 2002

*Privacy Online: A Report on the Information Practices and Policies of Commercial Web Sites*, (with W. Adkinson, Jr., T. Lenard) The Progress & Freedom Foundation, March 2002



*The Digital Economy Fact Book 2001*, (with T. Lenard, S. McGonegal) The Progress & Freedom Foundation, August 2001

*Communications Deregulation and FCC Reform: What Comes Next?* (ed., with R. May) Kluwer Academic Publishers, 2001

*The Digital Economy Fact Book 2000*, (with T. Lenard, S. McGonegal) The Progress & Freedom Foundation, August 2000

*Digital New Hampshire: An Economic Factbook*, (with R. Frommer, T. Lenard) The Progress & Freedom Foundation, December 1999

*The Digital Economy Fact Book*, (with A. Carmel and T. Lenard), The Progress & Freedom Foundation, August 1999

*Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace*, (ed., with T. Lenard), Kluwer Academic Publishers, 1999

*The People's Budget*, (with E. Dale, et al), Regnery Publishing, 1995

*The Telecom Revolution: An American Opportunity*, (with G. Keyworth, et al) The Progress & Freedom Foundation, 1995

*Readings in Renewing American Civilization*, (ed. with S. Hanser) McGraw-Hill, Inc., 1993

*America's Fiscal Future 1991: The Federal Budget's Brave New World*, Hudson Institute, 1991

*Winning the Drug War: New Challenges for the 1990's*, (ed.) The Heritage Foundation, Washington, DC, 1991

*Drug-Free Workplace Policies for Congressional Offices*, (ed.) The Heritage Foundation, Washington, DC, 1991

*America's Fiscal Future: Controlling the Federal Deficit in the 1990's*, Hudson Institute, 1990

*The Five-Year Budget Outlook*, Hudson Institute, 1988

*The Role of Collective Pricing in Auto Insurance*, Federal Trade Commission, Bureau of Economics Staff Study, 1985

### **Selected Short Articles and Op-Eds**

“Spectrum Favoritism is Bad Economics,” *Forbes*, April 28, 2015

“Competition is the Only Way to Preserve an Open Internet,” *Real Clear Markets*, December 18, 2014

“End the Internet Blackout on Airplanes,” *The Hill*, December 12, 2013

- “Trolling for a Patent Policy Fix,” *Roll Call*, September 19, 2013
- “A Good News Story: The Internet,” *AEIdeas*, May 31, 2013
- “Should You Let the IRS Do Your Taxes for You?” *The Daily Caller*, May 1, 2013
- “Net Neutrality as ‘Crony Capitalism,’” *AEIdeas*, November 2, 2012
- “Broadband Competition in the Internet Ecosystem: A Conflict of Visions,” *AEIdeas*, October 18, 2012
- “The Internet Doesn’t Need More Regulation,” *The American: The Journal of the American Enterprise Institute*, September 25, 2012
- “Follow Obama’s Lead on Wireless,” *The Australian*, February 7, 2011
- “The Radicalism of Net Neutrality,” *The Hill*, September 2, 2010
- “Net Neutrality Rules Threaten Telecom Détente,” *Law360.com*, August 10, 2010
- “Don’t Drag Broadband Into the Net Neutrality Morass,” *The Daily Caller*, July 13, 2010
- “Coase vs. the Neo-Progressives,” (with A. Thierer), *The American: The Journal of the American Enterprise Institute* (October 28, 2009)
- “The U.S. Abandons the Internet,” (with J. Rabkin), *The Wall Street Journal*, October 3, 2009
- “A La Carte Regulation of Pay TV: Good Intentions vs. Bad Economics,” (with A. Thierer) *Engage*, June 2008
- “A New Takings Challenge to Access Regulation,” American Bar Association, Section on Antitrust Law, *Communications Industry Committee Newsletter*, Spring 2007
- “Reagan’s Economic Policy Legacy,” (with J.C. Miller III), *The Washington Times*, August 8, 2004
- “Do Right by Minority Farmers,” *The Washington Times*, July 17, 2003
- “Pruning the Telecom Deadwood,” *The Washington Times*, November 1, 2002
- “The Real Telecom Scandal,” *The Wall Street Journal*, September 30, 2002
- “Ensuring Privacy’s Post-Attack Survival,” (with Peter P. Swire) *CNET News.com*, September 11, 2002
- “One Step Closer to 3G Nirvana,” *CNET News.com*, August 6, 2002
- “Reviving the Tech Sector,” *The Washington Times*, July 10, 2002

- “Broadband Chickens in Age of the Internet,” *The Washington Times*, March 11, 2002
- “Watching the Detectives,” *The American Spectator*, January/February 2002
- “Can Civil Liberties Survive in a Society Under Surveillance?” *Norfolk Virginian-Pilot*, November 18, 2001
- “Microsoft Case: There Are Still Antitrust Laws,” *Newport News Daily Press*, July 6, 2001
- “Dear Diary: There’s Still an Antitrust Law,” *Los Angeles Times*, June 29, 2001
- “Lost in Cyberspace? Does the Bush Administration Get the New Economy?” *The American Spectator*, June 2001
- “Local Loop: NASDAQ Noose, Al Gore’s Internet Socialism is Choking the Technology Sector,” *The American Spectator*, April 2001
- “Local Loop, High-Tech Noose,” *The American Spectator*, March 2001
- “Rescue Opportunity at the FCC,” *The Washington Times*, February 4, 2001
- “Economic Anxieties in High-Tech Sector,” *The Washington Times*, December 12, 2000
- “Nation’s Conservatives Should Support a Breakup of Microsoft,” *The Union Leader & New Hampshire Sunday News*, February 22, 2000
- “Benefits Riding on a Breakup,” *The Washington Times*, November 14, 1999
- “Still Wondering What Cyberspace is All About?” *Insight on the News*, Vol. 15, No. 11, March 22, 1999
- “Computer Industry Flexes Its Muscle,” *Intellectual Capital.com*, January 28, 1999
- “Ira Magaziner Targets the Internet,” *The Washington Times*, March 26, 1997
- “Revolution – or Kakumei” *Forbes ASAP*, December 1996
- “Digital Charity,” *Intellectual Capital.com*, November 28, 1996
- “Time to Junk the Telecom Act,” *Investor’s Business Daily*, July 23, 1998
- “Consumers Win in Mergers,” *Denver Post*, July 5, 1998
- “Microsoft’s Morality Play,” *News.com*, March 11, 1998
- “California Will Soon Be Eating Dust,” *Forbes Magazine*, August 1997
- “Watch Out for Internet Regulation,” *The Washington Times*, July 9, 1997

“Those GOP Blockheads Just Don’t Get It; Block Grants are Merely another Bogus Solution,” *The Washington Post*, September 3, 1995

“Replace, Don’t Reinvent, HUD,” *The Wall Street Journal*, May 11, 1995

“Poor Substitute,” (with P. du Pont), *National Review*, December 31, 1994

“Just Say No to More Drug Clinics,” *St. Louis Post-Dispatch*, June 14, 1991

“Drug Rehab Funding is No Panacea,” *Chicago Tribune*, June 7, 1991

“The Vision Thing, Conservatives Take Aim at the ‘90’s,” *Policy Review* 52, Spring 1990

“What States Can Do To Fight the Drug War,” *The Washington Times*, September 4, 1989

“Congress: Reform or Transform,” (with P. McGuigan), *Washington Times*, June 12, 1989

“How to Win the War on Drugs: Target the Users,” *USA Today*, January 1989

“Invest Social Security Surplus in Local Project Bonds,” *Wall Street Journal*, January 4, 1989

“The Government Juggernaut Rolls On,” *Wall Street Journal*, May 23, 1988

“Is Regulatory Relief Enough?” (with M. Kusters), *Regulation* 6, March/April 1982

“Price Competition on the NYSE,” (with J.C. Miller III), *Regulation* 4, Jan./Feb. 1981

### **Selected Presentations**

“Regulatory Benefit-Cost Analysis: Applications Under Dodd/Frank,” Second Annual Attorney General Public Policy Institute Conference on Financial Services Regulation, Law & Economics Center, George Mason University School of Law, June 4, 2012

“Exploring Developments in the Communications Sector,” National Regulatory Conference, May 17, 2012

“Platform Competition in the Internet Ecosystem: Implications for Regulation,” Mercatus Institute, November 8, 2011

“Competition in the Internet Ecosystem,” American Consumer Institute, June 30, 2011

“The Future of Mobile Broadband: Platform Competition in the Internet Ecosystem,” Informa Telecoms and Media North America Broadband Traffic Management Conference, June 21, 2011

“The Communications Sector and Economic Growth,” Innovation Policy Institute, March 2, 2011

“The Benefits and Costs of I-File,” Council for Electronic Revenue Communications Advancement, May 2008

“Sell Globally, Sue Locally: The Growing Perils of Global ‘Dominance,’” Antitrust Section, Ohio State Bar Association, October 27, 2006

“The Growing Global Perils of ‘Dominance,’” Aspen Summit Conference, August 21, 2006

“Telecoms in Turmoil: What We Know and (Mostly) Don’t Know About the Telecom Marketplace in 2006,” National Regulatory Conference, May 11, 2006

“Mandatory Unbundling in the U.S.: Lessons Learned the Hard Way,” Telstra Corporation, November 25, 2005

“The Fourth ‘S’: Digital Content and the Future of the IT Sector,” Federal Communications Bar Association, May 2, 2003

“Restoring IT Sector Growth: The Role of Spectrum Policy in Re-Invigorating ‘The Virtuous Circle,’” National Telecommunications and Information Administration Spectrum Summit, April 2, 2002

“Restoring IT Sector Growth-Why Broadband, Intellectual Property and Other E-Commerce Issues Are Key to a Robust Economy,” August 2001

“Remarks at the 2000 *Global Internet Summit*,” March 14, 2000

“The Digital State: Remarks on Telecommunications Taxes,” Address Before the Winter Meeting of the National Governors Association, February 21, 1999

“The Digital Economy,” Address at the George Mason University Conference on *The Old Dominion and the New Economy*, November 1998

“A Convergence Strategy for Telecommunications Deregulation,” Remarks at the United States Telephone Association’s *Large Company Meeting*, September 1998

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# The Economics of Zero Rating

By **Jeffrey A. Eisenach, Ph.D.**

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## Introduction

Zero Rating plans enable mobile wireless customers to download and upload online content without incurring data usage charges or having their usage counted against data usage limits. Zero Rating has become increasingly popular in both developed and developing countries, but plays a particularly important role in developing countries, where the costs of mobile data services are higher relative to per capita incomes.

The obvious benefits of Zero Rating include lower prices for consumers, especially those who might have difficulty affording mobile data plans, and expanding Internet adoption, which has been demonstrated to generate substantial economic and social benefits. However, some have expressed concerns about whether such plans violate net neutrality principles by discriminating in favor of some content over other content. Critics of Zero Rating worry that it could harm competition in markets related to Internet access and/or online content, or interfere with consumers' unfettered access to online information (i.e., diversity of expression).

In this context, this study presents an assessment of the benefits and costs of Zero Rating. It concludes that Zero Rating programs in general represent an economically efficient mechanism for increasing consumer welfare given the unique characteristics of information technology markets, which make it beneficial to offer lower prices and other incentives to expand the size of the market, especially in developing countries where incomes, and market penetration, are low. Further, the most common types of Zero Rating programs are the ones most likely to benefit consumers, not harm them, and the ones most likely to expand consumer choice, not limit it. With respect to diversity of expression and related concerns, it is difficult to construct a scenario under which increasing access to online information and adoption of digital communications services would be harmful to online speech. While regulatory authorities should remain vigilant in monitoring business practices, broad-based bans or restrictions on Zero Rating plans are far more likely to harm consumer welfare than improve it.

The remainder of this paper is organized as follows. Section II describes the state of play with respect to both the types of Zero Rating plans currently in the marketplace and efforts by regulators in some countries to limit or prohibit their availability. Section III presents a brief explanation of the economic characteristics (i.e., dynamism, modularity and demand-side effects) that distinguish information technology markets from markets for other types of goods, and which affect both market performance and the nature of the competitive process. Based on this framework, it outlines the primary issues involved in assessing the impact of Zero Rating plans on economic efficiency, competition, and overall economic welfare. Section IV presents an assessment of the two primary criticisms of Zero Rating, namely the asserted potential for anticompetitive market foreclosure and concerns about diversity of expression. It explains that the Zero Rating plans currently being offered almost certainly generate benefits well in excess of any costs. Section V provides a brief summary of conclusions.

## Zero Rating Plans: The State of Play

All Zero Rating plans share one characteristic: They allow mobile subscribers to access certain online content “for free” – that is, without having the associated data usage counted against their usage allowances under wireless service plans. The plans differ in two main respects: The types of content included, and the underlying business arrangements.

The type of content included in Zero Rating services varies widely, and includes access to online government and community service sites as well as access to popular services like Facebook, Google, Twitter and Wikipedia. In the U.S., T-Mobile offers its data plan subscribers zero-rated access to more than 25 online music services, including iHeartRadio, Pandora and Spotify. In some cases, carriers offer customized content designed specifically to be offered in conjunction with Zero Rating. For example, Facebook Zero and Internet.org provide customized content designed specifically for use on devices with limited capabilities or over networks with limited capacity.

Zero Rating business arrangements vary mainly according to the nature of the relationship between the access provider and the content provider. The most common form of Zero Rating plans are “carrier initiated” – that is, the mobile carrier simply chooses to zero-rate certain content as a means of attracting customers. “Sponsored data” plans represent a different model, under which content providers pay carriers to have their content zero rated. In some cases, carriers may choose to zero-rate their own content or content produced by affiliated companies, as was the case until recently with mobile TV plans offered by Canadian carriers Bell Mobility and Videotron.

Content-oriented applications like Facebook, Twitter and Wikipedia have been especially active in working with mobile operators to develop and promote Zero Rating plans in developing countries. Facebook Zero allows customers of participating mobile carriers to access Facebook’s standard mobile site content, send messages, update their status and engage in other typical activities on a zero-rated basis. (Facebook Zero users can also access additional Facebook content, such as photographs, but when they do so the resulting data usage counts as paid usage.) First launched in 2010, Facebook Zero has been implemented by more than 50 mobile operators in over 40 countries.<sup>1</sup> Facebook Zero is carrier initiated: Facebook does not pay carriers for participating in Facebook Zero.

Internet.org is a global partnership involving Facebook and other technology companies, local governments and NGOs which focuses on decreasing the cost of delivering data and expanding Internet access in underserved communities outside of the U.S. and Europe.<sup>2</sup> The internet.org app, which is offered in partnership with local mobile carriers, allows subscribers zero-rated access to customized content from multiple providers, including Facebook, Wikipedia and a variety of local content providers. First launched in Zambia in 2014, the internet.org app has expanded to Tanzania, Kenya, Columbia, Ghana and India, as shown in Table 1 below. As with Facebook Zero, internet.org does not pay ISPs to zero-rate its content.

Table 1. **Internet.org Deployments, 2014-2015**

<b>Country</b>	<b>Carrier</b>	<b>Launch Date</b>	<b>Free Services*</b>
Zambia	Airtel	July 31, 2014	16
Tanzania	Tigo	October 29, 2014	19
Kenya	Airtel	November 14, 2014	18
Colombia	Tigo	January 14, 2015	16
Ghana	Airtel	January 22, 2015	17
India	Reliance	February 10, 2015	38

Source: internet.org. \*Services listed are as of February 27, 2015

Despite its *prima facie* benefits, regulators in a handful of countries have taken steps to limit or ban Zero Rating programs.<sup>3</sup> For example, the government of Chile has found that Zero Rating plans violate the country’s net neutrality law;<sup>4</sup> regulators in the Netherlands have fined mobile carrier Vodafone for zero-rating HBO;<sup>5</sup> and, regulators in Slovenia have fined the country’s two largest mobile operators for zero-rating music and cloud storage services.<sup>6</sup> Canada’s CRTC recently banned offerings by mobile providers Bell Mobility and Videotron which offered differential pricing for the companies’ mobile TV services.<sup>7</sup> Regulators in other countries have either suggested that such programs are likely to violate neutrality rules (e.g., Norway),<sup>8</sup> or have initiated investigations (e.g., India).<sup>9</sup> In the U.S., Federal Communications Commission officials have indicated that Zero Rating plans will be evaluated on a case-by-case basis under the Commission’s new Open Internet Order.<sup>10</sup>

The analysis below explains why broad-based bans or restrictions on Zero Rating plans are likely to be counterproductive and harm consumer welfare.

## The Competitive Dynamics of Information Technology Markets

In general, the welfare effects of pricing schemes and other business practices depend on the characteristics of the markets in which they are deployed. Zero Rating programs are deployed in information technology (IT) markets, which are distinguished from more traditional “textbook” markets by three primary characteristics: *dynamism*; *modularity*; and *demand-side effects*.<sup>11</sup>

*Dynamism* refers to the significance of innovation as a measure of market performance: In dynamic markets, the ability of a firm to offer new and improved products plays at least as significant a role in its success (*i.e.*, its profitability) as the ability to produce and sell existing products at lower prices.<sup>12</sup>

Typically, firms create new products by making significant sunk cost investments (which may take the form of either “R&D” or capital expenditures in non-recoverable facilities). As a result, production benefits from economies of scale – *i.e.*, average total costs that decline at higher levels of production, but always exceed marginal costs. Producers are able to recoup their sunk cost investments because products are differentiated through innovation (Innovation can be thought of as simply product differentiation over time.), meaning that long-term prices in such markets are higher than marginal cost, notwithstanding the existence of robust competition. Under traditional antitrust doctrine, the ability to earn high margins might be mistaken for monopoly power (the ability to earn excess profits), but assuming low entry barriers, they are not only consistent with, but necessary for, robust competition and the maximization of consumer welfare in these types of dynamic markets. In this such markets, high accounting margins not only allow firms to recoup sunk cost investments, but also provide the incentive to take the risks inherent in innovation.<sup>13</sup>

A second characteristic that distinguishes IT markets is *modularity*, or what is sometimes referred to as “platform competition.” From an economic perspective, modularity is associated with strong complementarities in production or consumption: Operating systems are strong complements with personal computers; smart phones are strong complements with both communications networks and online content, such as mapping services, restaurant reviews, or social networks. Modularity also creates demand for compatibility or “interconnection.” Firms that produce complementary products (*e.g.*, Microsoft and Nokia, or Facebook and Bharti Airtel) may team up to create platforms (sets of compatible complements); in other cases (*e.g.*, Apple, Blackberry) firms choose to achieve compatibility through vertical integration. Competition in such markets takes place both within platforms (*e.g.*, between HTC and Samsung for share on the Android platform) and among them (*e.g.*, between the Android and iOS operating environments).

Finally – and importantly for assessing Zero Rating – IT markets are also characterized by significant *demand-side effects*, including economies of both scale and scope. Demand-side economies of scale, also known as network effects, imply that a product is more valuable to consumers as the number of users increases. The prototypical, if now somewhat dated, example is the fax machine. Demand-side economies of scope, by contrast, imply that a product’s value increases with the diversity (as opposed to simply the number) of users: The value of a credit card network to both consumers and merchants depends on the presence of the other *type* of participant. Markets characterized by demand-side economies of scope are referred to as “two-sided” or “multi-sided.”

The relationship between competition and consumer welfare in markets with demand-side effects is more complicated than in more traditional markets in several ways. For example, it is well established that the operator of a two-sided market has strong incentives to set efficient relative prices (*i.e.*, to engage in efficient price discrimination).<sup>14</sup>

## The Economic Foundations of Zero Rating

The discussion above provides a conceptual framework for assessing the effects of Zero Rating. This section applies this framework to assess the economic implications of Zero Rating for online content and applications, mobile access, and the Internet ecosystem overall. Specifically, it discusses: (a) the role of Zero Rating in capturing network externalities (demand side economies of scale); (b) Zero Rating as a form of efficient differential pricing; (c) Zero Rating as an efficient pricing mechanism in the two-sided market for mobile wireless services; and, (d) Zero Rating as a mechanism for competitive product differentiation on mobile wireless markets. In each of these respects, Zero Rating is a market-driven mechanism for achieving economically efficient (and socially desirable) outcomes.

### Zero Rating and Network Effects

Online content providers and mobile networks operate in markets that can have network effects, in that the value of the network to customers grows with the addition of other customers. As described below, the extent and type of network effect can vary significantly in particular cases. In some cases, expansion increases the value for all customers on the network. In others, the effects are limited to additions within smaller groups. And in others, benefits arise when different kinds of participants join a network.<sup>15</sup> Thus, it is often in the interests of current participants in a network to promote its growth in some form, and sometimes in the interests of society generally to promote universal participation. Governments often subsidize participation in industries with network effects through direct or indirect government subsidies (e.g., universal service for telephone and, more recently, broadband adoption).

One obvious and likely significant benefit of Zero Rating is to expand participation in zero-rated online content and applications, while also increasing mobile wireless penetration, especially in developing economies.<sup>16</sup> There is a substantial literature in support of the proposition that expanded Internet access, principally through higher mobile wireless adoption, has a variety of economic and societal benefits.<sup>17</sup>

It is also important to understand that the power of network effects is greatest within “communities of use.” That is, the value of adding an additional member is greater for members who are more closely connected with (*i.e.*, who value interactions with) existing members than those who are (in the same sense) further away. In this context, Zero Rating is appropriately understood as a mechanism for achieving increased participation within relatively small communities, including within lower-income populations in developing economies.<sup>18</sup>

By promoting the positive network effects of increased adoption, Zero Rating thus generates positive social as well as economic externalities.

## Zero Rating and Differential Pricing

Both online content providers and mobile broadband services are characterized by dynamic competition – that is, both industries make large, non-recoupable investments in R&D and physical infrastructure which are largely invariant to the number of users. As discussed above, in such industries, the average cost curve is declining over the relevant range of output: Simply put, it always costs less to produce an incremental unit of output than it costs, on average, to make the previous ones.

In such industries, consumer welfare can be increased if firms are able to identify and offer discounts to “marginal” customers, that is, those with lower willingness (or ability) to pay, thus expanding the size of the market and generating the additional revenues that can be used to defray the fixed costs of investment and innovation. It is widely agreed that such differential pricing – referred to by economists as – “competitive price discrimination” – is not only widespread, but generally improves economic efficiency and increases consumer welfare.<sup>19</sup>

In this context, zero rating of offerings like Wikipedia Zero, Facebook Zero and the internet.org app can be understood economically as a mechanism by which mobile carriers engage in efficient price discrimination through the bundling of two goods (mobile wireless service and content), thereby creating the ability for marginal consumers to pay a reduced price by choosing a differentiated product in the form of a “basic” form of online access.<sup>20</sup> In so doing, Zero Rating improves economic efficiency by supporting continuing investment and innovation in both networks and content while expanding Internet access to consumers who would otherwise be unserved.

## Zero Rating and Two-Sided Markets

The central economic challenge for an operator of a multi-sided platform is to set prices and other product characteristics in such a way as to attract the optimal mix of customers and thus maximize the value of the platform. Newspapers, for example, must run enough advertisements to defray costs, but not so many as to drive away customers.

The economics of multi-sided markets help to explain Zero Rating programs in at least two respects. First, thinking of mobile operators as the platform provider, Zero Rating is a means by which carriers create opportunities for distribution by content providers (by increasing the number of subscribers), while enhancing the value of the platform for subscribers (by increasing the amount of available content). To the extent content providers contribute financially to Zero Rating through sponsored data programs, they do so in reflection of the increased value (at least over the long run) of enhanced distribution. But carriers may (and do) choose to offer Zero Rating even without a financial payment from content providers simply because it increases the value of their platforms.

A second aspect of multi-sidedness relevant to Zero Rating relates to the dual nature of consumers in relation to platforms like Facebook, Twitter and Wikipedia, in which “consumers” are also content creators. Thus, by attracting additional participants onto the platforms of such services, Zero Rating increases *both* the number of content consumers and the amount of content available. This “double whammy” effect helps to explain why firms like Facebook are taking the lead in encouraging Zero Rating programs.<sup>21</sup>

### **Zero Rating and Competition in Mobile Wireless Markets**

Lastly, firms in dynamic industries are better able to defray their fixed costs to the extent they can differentiate their products and attract more consumers. Zero Rating programs are an instrument by which mobile wireless firms can differentiate themselves from competitors by offering access to customized content with their mobile wireless services. Product differentiation also can serve to intensify competition in such markets. In this context, it is notable that the most prominent examples of Zero Rating in the U.S. have involved MetroPCS, Sprint and T-Mobile, all of which have used zero-rate offerings in order to differentiate their products from larger competitors. Similarly, Zero Rating plays a significant role in product differentiation for Globe (Philippines), which has offered zero-rated access to Facebook and other applications as part of its marketing campaigns.<sup>22</sup> Thus, Zero Rating (like other types of innovative pricing plans) generally contributes to the competitiveness of mobile wireless markets.

## Addressing Concerns about Zero Rating

As noted above, some net neutrality advocates have challenged Zero Rating by asserting that it violates the principle of non-discrimination and hence (a) risks anticompetitive effects and (b) limits freedom of expression.<sup>23</sup> For the reasons explained immediately below, however, Zero Rating programs typically do not raise serious concerns with respect to anticompetitive effects. Further, as explained in the second subsection below, concerns about diversity of expression appear to be based more on speculation than empirical evidence, and to ignore the positive effects of Zero Rating in increasing access to online communications and information.

### Zero Rating and Competition

The types of Zero Rating programs currently observed in the marketplace do not appear to raise significant competition concerns.

First, as noted above, most Zero Rating programs are carrier initiated and do not involve payments to carriers by the providers of the zero-rated content. Particularly in the absence of payments, Zero Rating cannot plausibly be characterized as anticompetitive foreclosure by content providers. Rather, to the extent that carriers elect to include certain content providers in a Zero Rating plan, the decision reflects the carrier's unilateral determination that doing so improves the value of its platform.

Second, even in sponsored data programs where content providers are providing payments to carriers, there appears to be no evidence that such arrangements involve exclusivity: Rather, it appears that opportunities to participate are being held out to content providers of all kinds.<sup>24</sup> Without exclusivity – the inclusion of some participants and the exclusion of others – there is no foreclosure, and hence no anticompetitive concern.<sup>25</sup>

Third, there is no *prima facie* basis for concluding that Zero Rating programs involving exclusivity would be anti-competitive. Exclusivity arrangements are commonplace, and typically are justified by efficiency motivations, such as the desire to avoid “free riding” on brand-specific investments. Exclusivity raises competition concerns, on the other hand, only under limited conditions, including that the exclusive arrangement must be sufficiently widespread so as to foreclose entry (and expansion) by an otherwise equally efficient competitor (*i.e.*, by preventing such a competitor from achieving minimum efficient scale). The characteristics of the mobile wireless and online content markets suggest that exclusivity in Zero Rating programs, to the extent it occurs, is of the efficiency-enhancing variety.<sup>26</sup>



The case advanced by critics of Zero Rating amounts to a claim that any form of differentiated carriage necessarily advantages some firms over others, and thus has potential competitive effects, and that the “victims” of such discrimination are likely to be small, innovative firms that lack the financial wherewithal to engage in Zero Rating programs of their own.<sup>27</sup> There are powerful arguments against this view, including: (a) mobile broadband providers have incentives to maintain a diversity of actual and potential complementors (e.g., content providers) and thus are not likely to willingly participate in activities that might foreclose competition; (b) the most common Zero Rating programs are carrier initiated and do not require financial contributions from the content provider; (c) many small content providers engage in Zero Rating (e.g., Aquato, hipcricket, Syntonic)<sup>28</sup> and (as discussed above) Zero Rating is easily explained on efficiency grounds; and, (d) Zero Rating critics have not demonstrated any harm to competition or consumers from Zero Rating, or even shown that any individual competitors have been disadvantaged.<sup>29</sup>

### **Zero Rating and Freedom of Expression**

While freedom of expression concerns arguably invoke values that go beyond economic efficiency *per se*, economic analysis can nevertheless inform the debate around the key issues. First, as noted above, Zero Rating programs do not generally involve exclusivity. Thus, no one’s views are being foreclosed, or muzzled. Second, the firms engaging in Zero Rating are to a significant extent (e.g., Facebook, Twitter, Wikipedia) vehicles for the open expression of views by all participants, subject only to *de minimus* limitations. Increasing the number of Facebook (or Twitter or Wikipedia) users thus arguably enhances freedom of expression and the diversity of opinion in the public square – especially in developing countries, where such outlets have demonstrably enhanced freedom of political expression. Third, as an empirical matter, the diversity of content suppliers is growing rapidly; concerns about “a few media outlets controlling the news” seem increasingly anachronistic. Fourth, and finally, in order to argue that Zero Rating programs deprive subscribers of access to information (“the full and open Internet”), one needs to argue that nothing is better than something – that those who gain access to online content as a result of Zero Rating would be better off with no access than some access, an argument which seems difficult to sustain.

## **Conclusions**

Concerns about Zero Rating are misplaced. The Zero Rating programs that are observed in the marketplace are readily explained as market-driven mechanisms for capturing economic efficiencies associated with the characteristics of information technology markets. By expanding the reach of online content and distribution services, they generate economic social benefits. Concerns that Zero Rating could serve as a means of foreclosing competition, or limit freedom of expression, appear misplaced and lacking both theoretical and empirical support.

## Notes

- <sup>1</sup> See Matt Hicks, "Fast and Free Facebook Mobile Access with 0.facebook.com," May 18, 2010 (available at <https://www.facebook.com/notes/facebook/fast-and-free-facebook-mobile-access-with-0facebookcom/391295167130>).
- <sup>2</sup> See [internet.org/about](http://internet.org/about).
- <sup>3</sup> For an interesting discussion of issues associated with Zero Rating programs, see "Net Neutrality, Zero Rating, and Development: What's the Data?" *Internet Governance Forum* (September 3, 2014) (available at <http://www.intgovforum.org/cms/174-igf-2014/transcripts/1969-2014-09-03-ws208-net-neutrality-zero-rating-and-development-room-5>) (hereafter *IGF Transcript*).
- <sup>4</sup> See e.g., David Meyer, "In Chile, Mobile Carriers Can No Longer Offer free Twitter, Facebook or WhatsApp," *GigaOm* (May 28, 2014) (available at <https://gigaom.com/2014/05/28/in-chile-mobile-carriers-can-no-longer-offer-free-twitter-facebook-and-whatsapp/>) (hereafter, Meyer, Chile).
- <sup>5</sup> Authority for Consumers & Markets, "Fines Imposed on Dutch Telecom Companies KPN and Vodafone for Violation of Net Neutrality Regulations," (January 27, 2015) (available at <https://www.acm.nl/en/publications/publication/13765/Fines-imposed-on-Dutch-telecom-companies-KPN-and-Vodafone-for-violation-of-net-neutrality-regulations/>).
- <sup>6</sup> See "Mobile operators in Slovenia Fall Foul of Net Neutrality Rules," *MobileWorldLive.com* (January 26, 2015) (available at <http://www.mobileworldlive.com/mobile-operators-slovenia-fall-foul-net-neutrality-rules>).
- <sup>7</sup> See Canadian Radio-television and Telecommunications Commission, CRTC, Broadcasting and Telecom Decision 2015-26 (January 29, 2015) (available at <http://www.crtc.gc.ca/eng/archive/2015/2015-26.htm>).
- <sup>8</sup> See e.g., David Meyer, "Pro-Net Neutrality Norway Advises Carriers to Avoid Zero-Rating," *GigaOm* (November 18, 2014) (available at <https://gigaom.com/2014/11/18/pro-net-neutrality-norway-advises-carriers-to-avoid-zero-rating/>).
- <sup>9</sup> See e.g., "Net Neutrality Also an Issue in Emerging Markets Like India," *Business Monitor* (February 3, 2015) (available at <http://www.businessmonitor.com/news-and-views/net-neutrality-also-an-issue-in-emerging-markets-like-india>); see also Anandita Singh Mankotia, "Trai examining Bharti Airtel's special deals on Facebook and WhatsApp," *The Economic Times*, November 25, 2014 (available at [http://articles.economictimes.indiatimes.com/2014-11-25/news/56455517\\_1\\_net-neutrality-mobile-data-services-uninor](http://articles.economictimes.indiatimes.com/2014-11-25/news/56455517_1_net-neutrality-mobile-data-services-uninor)).
- <sup>10</sup> The FCC voted to approve a new Open Internet Order on February 26, 2015. See Federal Communications Commission, "FCC Adopts Strong, Sustainable Rules to Protect the Open Internet" (February 26, 2015). The text of the Order has not yet been released, but FCC officials have indicated they will evaluate Zero Rating plans on a case-by-case basis. See Lauren Walker, "Why the Net Neutrality Fight Isn't Over," *Newsweek* (February 6, 2015) (available at <http://www.newsweek.com/why-net-neutrality-fight-isnt-over-305060>).
- <sup>11</sup> This section relies in part on Jeffrey A. Eisenach and Ilene Knable Gotts, "In Search of a Competition Doctrine for Information Technology Markets: Recent Antitrust Developments in the Online Sector," in Fabrizio Cugia di Sant'Orsola, Rehman Noormohamed, and Denis Alves Guimarães, eds., *Communications and Competition Law: Key Issues in the Telecoms, Media and Technology Sectors* (Wolters Kluwer Law and Business, 2014) 69-90. For a more extensive discussion of these phenomena and their implications for competition analysis, see Jeffrey A. Eisenach, *Broadband Competition in the Internet Ecosystem* (American Enterprise Institute, 2012); see also Oz Shy, *The Economics of Network Industries* (Cambridge University Press, 2001).
- <sup>12</sup> See William J. Baumol, *The Free Market Innovation Machine: Analyzing the Growth Miracle of Capitalism* (Princeton University Press, 2002), at 4 ("Innovation has replaced price as the name of the game in a number of important industries. The computer industry is only the most obvious example, whose new and improved models appear constantly, each manufacturer battling to stay ahead of its rivals."); see also Joseph Schumpeter, *Capitalism, Socialism and Democracy* (1942).
- <sup>13</sup> Especially in dynamic markets with high rates of innovation, high margins as measured by accounting data do not necessarily equate to high profits from the perspective of economics or competition analysis. The seminal reference is Franklin M. Fisher and John J. McGowan, "On the Misuse of Accounting Rates of Return to Infer Monopoly Profits," *American Economic Review* 73:1 (March 1983) 82-97.
- <sup>14</sup> See, e.g., Julian Wright, "One-Sided Logic in Two-Sided Markets," *Review of Network Economics* 3(1) at 44 (2004).
- <sup>15</sup> The impact of network effects can depend on a variety of factors. For example, some of the network effects of increasing wireless penetration are shared among carriers thanks to the fact that carriers interconnect with one another (so subscribers to each network can call subscribers on other networks). Carriers may seek to capture some of these effects through programs ("friends and family" plans) that encourage in-network calling.

- <sup>16</sup> The empirical evidence on the impact of Zero Rating on wireless penetration and mobile content usage, though limited, suggests the effects may be substantial. For example, a 2010 program by Turk Cell involving Twitter resulted in a 340 percent increase in Twitter traffic. See *IGF Transcript*.
- <sup>17</sup> See e.g., *Value of Connectivity: Economic and Social Benefits of Expanding Internet Access* (Deloitte 2014 (available at [https://fbcdn-dragon-a.akamaihd.net/hphotos-ak-ash3/t39.2365/851546\\_1398036020459876\\_1878998841\\_n.pdf](https://fbcdn-dragon-a.akamaihd.net/hphotos-ak-ash3/t39.2365/851546_1398036020459876_1878998841_n.pdf)); see also Digital Entrepreneurship in Kenya 2014 (GSMA, 2014) (available at [http://www.gsmaentrepreneurshipkenya.com/GSMA\\_KENYA-AR2014-060214-WEB-SINGLE-PGS.pdf](http://www.gsmaentrepreneurshipkenya.com/GSMA_KENYA-AR2014-060214-WEB-SINGLE-PGS.pdf)).
- <sup>18</sup> Social networks like Facebook and Twitter have been shown to play a significant role in driving Internet adoption in developing countries, where the proportion of Internet users who use such applications is higher than in the U.S. See e.g., Lee Rainie and Jacob Poushter, "Emerging Nations Catching Up to U.S. on Technology Adoption, Especially Mobile and Social Media Use," Pew Research Center (February 13, 2014) (available at <http://www.pewresearch.org/fact-tank/2014/02/13/emerging-nations-catching-up-to-u-s-on-technology-adoption-especially-mobile-and-social-media-use/>).
- <sup>19</sup> See e.g., William J. Baumol and Daniel G. Swanson, "The New Economy and Ubiquitous Competitive Price Discrimination: Identifying Defensible Criteria of Market Power," *Antitrust Law Journal* 70 (2003) 661-685 at 665; see also See, e.g., Hal R. Varian, "Differential Pricing and Efficiency," *First Monday* 1;2 (August 1996) at 2 ("[M]any important industries involve technologies that exhibit increasing returns to scale, large fixed and sunk costs, and significant economies of scope. Two important examples of such industries are telecommunications services and information services. In each of these cases the relevant technologies involve high fixed costs, significant joint costs and low, or even zero, marginal costs. Setting prices equal to marginal cost will generally not recoup sufficient revenue to cover the fixed costs and the standard economic recommendation of 'price at marginal cost' is not economically viable. Some other mechanism for achieving efficient allocation of resources must be found.").
- <sup>20</sup> Facebook and its partners in Internet.org have made extensive investments to understand the realities of Internet access in the developing world and to use this knowledge to develop ways to expand Internet access in such countries.
- <sup>21</sup> Relatedly, to the extent Zero Rating ultimately increases the audience for mobile content services, it also implicates yet another "side" of the multi-sided mobile wireless ecosystem – advertisers. I understand that Facebook Zero does not depend on advertising, but the same is not true for other firms participating in Zero Rating programs, such as Google and Pandora.
- <sup>22</sup> See "Globe Telecom Expands Mobile Data Business with Free Facebook, Free Viber Offer," *Adobo Magazine* (January 8, 2015) (available at <http://www.adobomagazine.com/philippine-news/globe-telecom-expands-mobile-data-business-free-facebook-free-viber-offer>).
- <sup>23</sup> See e.g., Susan Crawford, "Zero for Conduct," *Medium.com* (January 7, 2015) (available at <https://medium.com/backchannel/less-than-zero-199bcb05a868>, viewed February 6, 2015).
- <sup>24</sup> See, "AT&T Introduces Sponsored Data for Mobile Data Subscribers and Businesses," (January 6, 2014) (available at [http://www.att.com/gen/press-room?pid=25183&cdv n=news&newsarticleid=37366&mapcode=consumer\[mobile-devices\]](http://www.att.com/gen/press-room?pid=25183&cdv n=news&newsarticleid=37366&mapcode=consumer[mobile-devices])).
- <sup>25</sup> The fact that some content providers *choose* not to participate in zero rating does not mean they are "foreclosed" in any sense of the word, since they had the opportunity to do so.
- <sup>26</sup> For example, it is worth recalling that each mobile network is not a distinct market, but rather that all mobile networks in a given geographic area compete in the same relevant product market. Hence, an exclusive arrangement with a single carrier does not foreclose competition in the entire market.
- <sup>27</sup> See e.g., Crawford (2015).
- <sup>28</sup> See AT&T, "Our Sponsored Data Providers" (available at <http://www.att.com/att/sponsoreddata/en/index.html#fbid=PYLLaU9knHP>, viewed February 8, 2015).
- <sup>29</sup> The antitrust laws properly focus on protecting competition, not individual competitors. It is also noteworthy that the firms identified by Zero Rating's critics as potential "victims" tend to be established firms like Netflix and Skype (Microsoft), not startups and new entrants. See e.g., New American Foundation, Center for Media Justice, Media Access Project, *Notice of Ex Parte Presentation: GN Docket No. 09-191 (Preserving the Open Internet); WC Docket No. 07-52 (Broadband Industry Practices)* (January 10, 2011) (available at [http://newamerica.net/publications/resources/2011/notice\\_of\\_ex\\_parte\\_presentation\\_gn\\_docket\\_no\\_09\\_191\\_preserving\\_the\\_open\\_](http://newamerica.net/publications/resources/2011/notice_of_ex_parte_presentation_gn_docket_no_09_191_preserving_the_open_)).

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