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**ECONOMIC ANALYSIS OF THE IMPACT OF  
THE COMCAST/TIME WARNER CABLE TRANSACTION  
ON INTERNET ACCESS TO ONLINE VIDEO DISTRIBUTORS**

**David S. Evans**

**August 25, 2014**

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### **I. Introduction**

1. My name is David S. Evans and I am an economist. This Introduction summarizes my qualifications, my assignment, and my principal findings to date.

#### **A. Qualifications**

2. I am the Chairman of Global Economics Group, LLC and based in its Boston office. I am also the Executive Director of the Jevons Institute for Competition Law and Economics and Visiting Professor at the University College London, and Lecturer at the University of Chicago Law School. I have BA, MA, and Ph.D. degrees in economics, all from the University of Chicago, where I specialized in industrial organization and econometrics. My curriculum vita is attached as Appendix A.
3. As an economist, I specialize in the field of industrial organization, which concerns the behavior of firms and their interactions, and in antitrust economics, which is the portion of industrial organization that concerns the analysis of business practices that could limit competition and harm consumers. I have a particular expertise in the study of multi-sided platforms that serve as intermediaries between several groups of customers.
4. I have written five major books and more than 100 scholarly articles, many of which concern industrial organization and antitrust. My work has been widely

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read and cited.<sup>1</sup> Over the last 25 years, I have taught classes on antitrust economics at Fordham University Law School, University College London Faculty of Laws, and the University of Chicago Law School. In addition, I have served on the faculty for the American Bar Association Annual Antitrust Meetings on three occasions. I have also taught various aspects of antitrust economics to judges in China and the European Union.<sup>2</sup> At their request, I have given lectures on antitrust at several competition authorities and sectoral regulators around the world, including the Federal Trade Commission.

5. I have provided expert consulting on antitrust and related regulatory matters since 1975 beginning with *U.S. v. IBM* on behalf of IBM and *U.S. v. AT&T* on behalf of the U.S. Department of Justice. I have testified, or submitted testimony, to courts and regulatory authorities, in the United States as well as Australia, Brazil, China, the European Union, Singapore, and Thailand. In addition, I have testified before several committees of the U.S. Congress

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<sup>1</sup> I am ranked among the top 3 percent of economists according to quality-weighted citations by IDEAS/Repec, which tracks publications and citations by economists worldwide. Many of my publications and citation rankings are available at <http://ideas.repec.org/e/pev9.html>. Like many social scientists, I post much of my work on the Social Science Research Network (SSRN). As of August 5, 2014, based on quality-weighted citations, I ranked 181 out of the top 30,000 social scientists globally that SSRN reports citation data for, 85 out of the top 8,000 economics professors globally that SSRN reports citation data for, and 5 out of the top 3,000 law professors globally that SSRN reports citation data for. My SSRN publications are available at [http://papers.ssrn.com/sol3/cf\\_dev/AbsByAuth.cfm?per\\_id=268756](http://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=268756).

<sup>2</sup> In 2009 and 2010, I taught classes for judges, including basic economic principles and intellectual property, in the European Union for a program sponsored jointly by the University College London and the Toulouse School of Economics. At the request of the Chinese State Ministry of Industry and Information Technology (MIIT), in 2013 and 2014, I taught certain aspects of antitrust economics, including Internet-based and platform-based industries, to judges from the Chinese Supreme People's Court and provincial appeal courts.

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including the Senate Banking Committee, the House Financial Services Committee, and the House Oversight Committee.

6. I have conducted research, published, or submitted testimony on industries that are relevant to the proposed merger of Comcast Corporation and Time Warner Cable, Inc. (the “Transaction”), including the cable television industry, the media industry, Internet-based industries, and the telecommunications industries. I have been invited to lecture on Internet-based industries by OfCom in the United Kingdom, by the MIIT in China, and by the InfoComm Development Authority in Singapore. I made a presentation to the Organisation for Economic Co-operation and Development (OECD) Hearing on Network Neutrality in June 2011 at the request of the OECD.
7. I have personal experience with the businesses at issue in this matter. I have been a Comcast subscriber, in the Boston area, since 1991 and a Netflix subscriber, and user of its streaming video service, since 2007.

**B. Assignment**

8. Counsel for Netflix asked me to evaluate the effects of the proposed Transaction on competition in the provision of broadband services to providers and to consumers of online video and to competition in the distribution of video content generally.<sup>3</sup> My research into this issue is ongoing and this declaration

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<sup>3</sup> My declaration responds in part to a declaration submitted on behalf of Comcast by Dr. Mark Israel. *See* Mark A. Israel, Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition (April 8, 2014) (“Israel Declaration”). Dr. Israel focuses on the impact of the Transaction on “edge providers” that provide products and services to Internet users. My declaration focuses on a particular kind of edge provider—online video

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reports my findings to date. Counsel for Netflix has asked me to address two specific issues for this declaration.

9. (1) Counsel for Netflix asked me to examine the ability of broadband subscribers of Comcast and Time Warner Cable to switch to alternative broadband providers for the purpose of consuming online video and the ability of online video distributors (OVDs) to find alternative ways to deliver online video to those subscribers. Counsel also asked me address the evidence presented by Comcast and its economist, Dr. Mark Israel, that consumers have many choices of broadband providers.
10. (2) Counsel for Netflix also asked me to examine whether and to what extent Comcast has the incentive and the ability to limit the access of OVDs and Comcast subscribers to each other, and whether and to what extent, the proposed Transaction would increase Comcast's incentive and ability to limit that access. For the purpose of this declaration, Counsel asked me to address in particular:
  - a. The economic implications of evidence that Comcast degraded the quality of the connections between its subscribers and Netflix regarding whether Comcast has the incentive and ability to "hold-up" or otherwise exercise significant bargaining leverage over OVDs that seek access to its subscribers.
  - b. The impact of the proposed Transaction on the degree of bargaining leverage that Comcast would have over OVDs and Comcast's ability to engage in hold-up, foreclosure, and other strategies that could harm providers and consumers of online video.

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distributors (OVDs), which stream video to consumers over the Internet. When I respond to Dr. Israel's claims concerning edge providers, I refer specifically to OVDs; it should therefore be understood that, when I say that Dr. Israel made a claim concerning the impact on an OVD, he is usually making that claim about the broader class of edge providers.

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- c. Whether the “bargaining theory” relied on by Comcast’s economist, Dr. Israel, provides a reliable basis for dismissing concerns that the Transaction could result in OVDs paying higher terminating access fees.
- d. Whether the theoretical and empirical arguments presented by Dr. Israel as to why the Transaction could not create any public harms are a reliable basis for dismissing concerns that that the Transaction could create public harm.
- e. Whether the Transaction would likely harm competition and consumers.

**C. Principal Findings**

11. The following summarizes my principal findings.

**1. Broadband Competition**

12. My understanding is that households require fast broadband connections to stream television shows and movies at the video quality level, and with minimal interruptions such as delays and rebuffering, that they have come to expect from other video choices in their residences. The average American household has 2.64 members.<sup>4</sup> A typical household with a couple and a child will find that members are sometimes downloading Internet content simultaneously. A household usually requires advertised maximum broadband speeds of at least 10 Mbps to do so, as a result of the increased demand for video streaming for television and movies, video games, and video chat and as a result of technological improvements that increase the quality of streaming. The data show that, increasingly, households are choosing plans with faster advertised

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<sup>4</sup> U.S. Census Bureau, *America’s Families and Living Arrangements: 2012*, at 4 (Aug. 2013), available at <http://www.census.gov/prod/2013pubs/p20-570.pdf>.



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maximum speeds when available. Many are switching from DSL to cable and fiber for this reason.

13. Consumers of long-form online video content such as television shows and movies primarily use wired broadband connections to stream content.<sup>5</sup> Netflix data confirms this. {{

}}<sup>6</sup>

Mobile wireless and satellite Internet Service Providers (ISPs) are not reasonable substitutes for consumers to stream movies and television shows for a variety of reasons, including speed and cost.

14. The primary competitive constraint on Comcast and Time Warner Cable, as providers of wired broadband to households, therefore comes from other wired broadband providers that households seeking access to long-form online video content could choose as alternatives to Comcast and Time Warner Cable. I have used data on the availability of broadband providers to households in Census blocks served by each of these two cable systems. The Census block is the narrowest geographic area for which data are available and usually consists of less than a hundred households.

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<sup>5</sup> The remainder of my declaration focuses entirely on OVDs that stream television shows, movies, and other long-form content that is ordinarily viewed by consumers on television sets. I do not consider OVDs that stream short clips, such as YouTube, that consumers commonly view on mobile devices often using broadband provided as part of their mobile wireless plans.

<sup>6</sup> Information provided by Netflix.

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15. My data analysis finds that subscribers of Comcast and Time Warner Cable typically have no more than one wired broadband alternative to Comcast and Time Warner Cable. In many instances, households have no high-speed wired broadband alternative to these cable providers at all. On average, residential customers in Comcast's footprint only have 1.42 wired broadband alternatives to Comcast, 0.97 wired broadband alternatives with advertised maximum speeds of 10 Mbps or more, and 0.42 wired broadband alternatives with advertised maximum speeds of 25 Mbps or more. The data show similar results for Time Warner Cable, for the combined company, and for the combined company after divestitures.<sup>7</sup> Actual sustained speeds are typically less than advertised speeds, particularly for DSL.
16. A key issue I address in this declaration is whether Comcast has the ability and incentive to degrade the quality of video streaming service by an OVD and thereby partially or completely foreclose that OVD from access to Comcast's subscribers. Comcast and its economist, Dr. Israel, claim that Comcast could not and would not do that because its subscribers would switch to another broadband provider (so Comcast is not able to foreclose), and Comcast would lose revenue from those subscribers (so Comcast has no incentive to foreclose). The data show that, in fact, Comcast and Time Warner Cable subscribers have few, if any, alternatives.

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<sup>7</sup> Calculation based on National Telecommunications and Information Administration's (NTIA) State Data Initiative (2014), National Broadband Map, December 31, 2013, *available at* <http://www.broadbandmap.gov/data-download>; U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcdc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>.

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17. The data that Comcast and Dr. Israel have presented on the availability of broadband alternatives to consumers are not reliable or credible. To begin with, Comcast and Dr. Israel count mobile wireless and satellite broadband providers. But, households, in fact, do not and cannot use these alternatives much for streaming television shows and movies. Comcast and Dr. Israel also count, as “available,” wired broadband companies that are present in broad geographic areas—such as designated market areas (DMAs)—that are not available to most households with residences in those areas. The result is that Comcast and Dr. Israel vastly overstate the number of alternatives available to households in the footprints of the parties to the Transaction by an order of magnitude.
18. Their data show, for example, that I personally have available up to 17 ISPs in the Boston area for wired broadband service.<sup>8</sup> In fact, I only have two wired broadband providers available at my residence. One of those is Comcast, with high-speed broadband, and the other is Verizon DSL, with slow speed. To get any of the other wired alternatives identified by Comcast, I would have to move my residence to a location that receives one of these alternatives. The Census

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<sup>8</sup> Comcast and Time Warner Cable claim that the Boston MSA has 20 broadband competitors other than them with download speeds of at least 3 Mbps. Of these 20, only 5 provided wireless broadband. Thus, according to the Applicants, I have 17 wired providers (20 minus the 5 wireless-only providers, plus Comcast and Time Warner, both of which are active in the Boston MSA). Applications of Comcast Corp. and Time Warner Cable Inc. for Consent to Transfer Control of Licenses and Authorizations, *Applications and Public Interest Statement*, MB Docket No. 14-57, at 142 (filed Apr. 8, 2014) (“*Public Interest Statement*”).

The *Public Interest Statement* did not indicate which providers were included in this count. I have attempted to replicate their count using the same data they reference. The resulting count includes broadband resellers as well as providers that only serve governmental and/or business customers. Excluding these providers would leave the count well under the 20 providers reported by Comcast and Time Warner Cable.

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block data show most Comcast and Time Warner Cable subscribers are in the same situation.

19. The Comcast and Time Warner Cable subscribers who do have a choice of wired-broadband providers are not likely to switch wired broadband providers because (1) it is costly to do so; (2) their alternative(s) are likely to have slower broadband speeds; and (3) they face considerable uncertainty as to why their OVD service is slow and whether an available alternative would be any better. Few American households, in fact, switch wired broadband providers, except when they move their residences; many of the households that switch without changing residences are migrating from a slow DSL provider to a faster cable broadband or fiber provider.
20. There are significant barriers to entry to providing broadband service at the level of quality that consumers demand for streaming television shows and movies. It is therefore unlikely that, in the next few years, Comcast and Time Warner Cable subscribers will have significantly more alternatives available that offer them broadband speeds at least as high as those offered by Comcast and Time Warner Cable.
21. Based on these findings, I conclude that there are no significant competitive constraints, nor are there likely to be in the foreseeable future, on the ability of Comcast and Time Warner Cable to degrade the quality of streaming video to their subscribers and to thereby partially or fully foreclose OVDs from access to the subscribers of the merged firm. Their subscribers are captive because they have no reasonable alternative or one that they could switch to easily.

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22. Section II presents my analysis in more detail. In the remainder of this Declaration, the term ISP refers to a wired ISP unless noted otherwise.

**2. Competitive Effects**

23. I examine whether the Transaction could harm the public by significantly increasing Comcast's ability and incentive to harm OVD providers and OVD consumers. I conclude that it could harm the public and that, based on the evidence that I have reviewed and my economic analysis, the Federal Communications Commission (FCC) should not approve the Transaction. My conclusion is based on the following specific findings.
24. (1) The theoretical and empirical evidence presented by Comcast and its economist, Dr. Israel, does not support their conclusion that the Transaction could not reduce competition and harm the public. Their conclusion is based on the following propositions. First, that the provision of broadband services to American households is highly competitive. Second, that Comcast does not have the ability to harm an OVD through degrading quality because it would lose a significant amount of other Internet content for its subscribers. Third, that Comcast does not have the incentive to foreclose an OVD because it would lose subscriber revenue; this proposition is based largely on the first proposition concerning the ability of its subscribers to find other broadband alternatives.
25. The first proposition is wrong, as I have explained above. The second and third propositions are wrong as well, given that Comcast, in fact, did reduce significantly the quality of streaming services that its subscribers could obtain from Netflix. What Comcast *did do* trumps speculation on what Comcast *would*

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*do* according to economic theories based on various unsupported assumptions.

The basis for my conclusion is as follows.

26. In order to pressure Netflix to agree to a terminating access fee, during the course of 2013, Comcast chose not to make available uncongested settlement-free ports necessary for its subscribers to obtain consistently high quality streaming videos from Netflix. By late 2013, this decision resulted in a dramatic decrease in the quality of streaming video for Netflix subscribers who were streaming video over Comcast broadband connections. That situation continued until February 2014. At that point, Netflix agreed to pay Comcast to interconnect directly with Netflix while {{

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The video quality obtained by Netflix subscribers improved almost immediately after the agreement was executed. Therefore, Comcast likely had the ability to provide Comcast subscribers with high quality streaming of Netflix video content before the agreement was executed.

27. (2) A large ISP has the ability to impose significant harm on OVDs through foreclosing access, partially or fully, to its subscribers who have few if any wired broadband alternatives, thereby causing OVDs to lose the revenue and profit from the subscribers of the large ISP. That loss is more severe to the extent that OVDs have fixed costs that they cannot reduce in the near term. Some OVDs, {{

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Since it is not possible to reduce these fixed costs,

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the loss of revenue from partial or full foreclosure to the ISP's subscribers can have a dramatic effect on profitability. A large ISP therefore has the ability to harm an OVD by degrading quality and thereby reducing the acquisition and retention of customers necessary to cover the OVD's fixed and sunk content costs.

28. Larger ISPs have a greater ability to impose harm because they can destroy a greater portion of an OVD's revenue and profit. Empirical evidence based on Netflix's experience demonstrates that:

- a. virtually all ISPs charge zero for terminating access;
- b. only the very largest ISPs charge for terminating access and have typically done so following the implementation of a hold-up strategy;  
and
- c. among the very largest ISPs, {{  
  
}}

29. Comcast, the largest ISP, can use its ability to impose harm on OVDs in a variety of ways. For example, it could use this ability to engage in a "hold-up" strategy to extract higher payments from an OVD for access to the OVD's customers, who are also Comcast subscribers. Comcast, in fact, engaged in this hold-up strategy with Netflix. Netflix had no viable economic choice but to agree to pay Comcast directly or indirectly. Comcast could also use this ability to foreclose OVDs from access to its subscribers in order to limit competition by one or more OVDs with its own profitable video distribution business.

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30. Comcast, in fact, used this ability to foreclose access to its network to “break zero.” ISPs generally do not charge content providers—directly or indirectly through transit providers and Content Delivery Networks (“CDNs”)—for access to their networks. This “zero-price equilibrium” has prevailed over the history of the Internet and holds true for all but the largest ISPs. Comcast succeeded in breaking this equilibrium through a series of efforts to raise prices to transit providers and CDNs that carried to its network and ultimately to Netflix itself. By “breaking zero” Comcast has set a precedent for charging content providers. Having set this precedent and with the scrutiny arising from the proposed Transaction behind it, Comcast will have greater ability to raise prices significantly to OVDs.<sup>9</sup>
31. (3) The Transaction would significantly increase Comcast’s ability to impose harm on OVDs by increasing the number of subscribers to whom Comcast could significantly reduce the quality of streaming services and thereby impose either potentially debilitating losses of revenue on OVDs, or dramatically higher terminating access costs, with similar effect. The Transaction would increase the percentage of American broadband subscribers that subscribe to Comcast broadband from {{                      }} to 35.5 percent after accounting for divestitures.<sup>10</sup> Post-Transaction, Comcast would have the ability to foreclose

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<sup>9</sup> As I will explain below, I believe it is likely that Comcast has chosen not to fully exercise its substantial market power over OVDs in establishing terminating access fees.

<sup>10</sup> Here, I follow the method used by Comcast and its economists. *See* Letter from Francis M. Bruno, Counsel, Comcast, to Marlene H. Dortch, Secretary, Federal Communications



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OVDs from about {{ }} more subscribers than it would have absent the Transaction. These figures understate the likely effects of the Transaction. Comcast's share of American subscribers with broadband connections with maximum advertised speeds of 10 Mbps or more would increase from {{ }} percent to {{ }}.<sup>11</sup>

32. (4) The Transaction would have unilateral price effects arising from the increase in bargaining power. Specifically, the terminating access fee for Time Warner Cable customers would {{  
}}, and the level charged by Comcast would also increase substantially. It is unlikely that Comcast would pass much, if any, of these revenues back to its subscribers in the form of lower prices. As a result, the total price for connection paid by OVDs and their customers that are captive Comcast subscribers would increase.
33. (5) Dr. Israel's finding that the Transaction would not increase Comcast's bargaining power and would not increase broadband access prices is based on an economic theory that is not supported by the evidence in this matter, yields predictions that are inconsistent with common experience, and relies on implausible assumptions. It is enough to observe that if his theory were true, smaller ISPs—including the 99 percent that charge nothing for broadband

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Commission, MB Docket No. 14-57 (June 27, 2014) ("June 27 Letter"); Supplemental Data to June 27 Letter, MB Docket No. 14-57 (June 27, 2014) ("Supplemental Data").

<sup>11</sup> Supplemental Data to June 27 Letter, MB Docket No. 14-57 (June 27, 2014); Industry Analysis and Technology Division, Wireline Competition Bureau Federal Communications Commission, Internet Access Services: Status as of June 2013 (June 2014), *available at* [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-327829A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-327829A1.pdf).

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connection—would, contrary to the facts, be charging as much as the very large ISPs now charge, and those smaller ISPs might even charge more than the very large ISPs. In other words, his theory implies that smaller ISPs have as much, if not more, bargaining power than very large ISPs.

34. (6) The Transaction would significantly increase Comcast’s ability to foreclose OVDs in order to maintain Comcast’s substantial market power over households in the geographic areas that it serves. The OVD industry has developed video delivery methods and business models that many consumers find very appealing. Comcast faces a long-term threat from the development of OVDs, whose services might reduce the willingness of its subscribers to pay for its profitable cable television service and increase the number of its subscribers that “cut the cord” on cable-TV. This strategy would also buy Comcast time. While engaging in this strategy, Comcast could use its considerable assets to expand its own OVD business and thereby provide its subscribers with its own OVD alternative. Moreover, the development of a robust OVD industry would increase the risk of high-speed broadband entry in the very long term, and give Comcast a further incentive to use its increased ability to foreclose OVDs to suppress the development of the industry.

35. Section III discusses my findings in more detail.

**D. Supplemental Work and Issues Not Covered**

36. My declaration is focused on the specific issues of broadband competition and certain competitive effects of the proposed Transaction. I reserve the right to

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supplement my findings on these issues and address additional issues in further declarations, as permitted.

37. The reader should not assume that I agree with any of the findings reached by Comcast's economists in the declarations they have filed in this proceeding because I have not responded to all of them. In fact, I have found that their substantive claims concerning market definition, competitive effects, and efficiencies from the merger are not supported by the economic analysis and evidence they present.<sup>12</sup>

**E. Economic Background**

38. Before proceeding, it is useful to describe the basic economics of the business for a wired ISP. An ISP is an intermediary that provides Internet connection between Internet users and Internet content providers. Internet content providers

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<sup>12</sup> Comcast's economists, for example, base their conclusion that the Transaction would result in increased efficiency on the proposition that the amount of investment and innovation by a firm increases more than in proportion to its size. *See, Applications, Public Interest Statement* at 23-24; Rosston and Topper Declaration. ¶¶ 44-57; Israel Declaration. ¶¶ 107-109. They provide no empirical support in the economic literature for this proposition nor do they provide any meaningful evidence that the rate of investment and innovation by Comcast has increased more than in proportion to its size as it has grown over the last decade. The relationship between firm size and innovation is an extremely well-trod subject in economics. There is certainly no consensus among economists that the rate of innovation increases more than proportionately with firm size. *See* Wesley M. Cohen (2010), *Fifty Years of Empirical Studies of Innovative Activity and Performance*, in 1 HANDBOOK OF THE ECONOMICS OF INNOVATION 129-213 (Bronwyn H. Hall & Nathan Rosenberg ed. 2010). There is an extensive business and management literature that identifies and offers remedies for precisely the opposite problem: that larger firms have trouble innovating. *See, for example, CLAYTON M. CHRISTENSEN, THE INNOVATOR'S DILEMMA: THE REVOLUTIONARY BOOK THAT WILL CHANGE THE WAY YOU DO BUSINESS* (Harv. Bus. School Press 1997). Although I am not expressing any opinion on the efficiency of the Transaction, I do not believe that the conclusion by Comcast's economists that the Transaction would necessarily generate efficiencies is based on credible economic theory or empirical evidence.

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are sometimes called edge providers. From an economic standpoint, an ISP is a two-sided platform.<sup>13</sup> ISPs enable users to download content from and upload content to the Internet, and they enable edge providers to deliver content to and receive content from users. ISPs typically use transit providers and CDNs to facilitate sending and receiving content over the Internet.

39. Multi-sided platforms have the ability to impose charges on both sets of economic agents that use their platforms. Economists have shown that multi-sided platforms may set prices below incremental cost, at zero, or below zero to maximize their profits; it may make sense to price one side low to provide value and earn profits from the other side. Many multi-sided platforms, in fact, do so, including shopping malls (shoppers get in for free), physical newspapers (often distributed at less than the cost of printing and distributing), and many Internet-based platforms (search platforms do not charge websites and searchers, typically). A price of zero is a common equilibrium for one side of the platform.
40. Most ISPs in the United States and other countries charge edge providers a price of zero (that is, they do not charge a fee) and make their profit from end users. The controversy over Net Neutrality relates to a desire on the part of very large ISPs to charge positive and differential prices to edge providers. I am not taking

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<sup>13</sup> See ROCHET & TIROLE for the classic article. JEAN-CHARLES ROCHET & JEAN TIROLE, *Platform Competition in Two-Sided Markets*, 1 JOURNAL OF THE EUROPEAN ECONOMIC ASSOCIATION 990, 990-1029 (2003). For a recent survey with applications to antitrust David S. Evans & Richard Schmalensee, *in The Antitrust Analysis of Multisided Platform Businesses*, OXFORD HANDBOOK ON INTERNATIONAL ANTITRUST ECONOMICS (Roger Blair and Daniel Sokol eds., Oxford University Press, forthcoming), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2185373](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2185373).

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any position on this controversy in this declaration. I focus only on the issue of whether the Transaction would make this price higher or lead to other competitive distortions.

41. Economists have found that one of the key determinants of competitive constraints for multi-sided platforms is the extent to which platform users can use several platforms at the same time (multi-home) or use only one platform at the same time (single-home). For much Internet content, end users can now multi-home using their residential broadband provider, their work broadband provider, their mobile wireless broadband provider, and broadband providers to numerous Wi-Fi networks such as at Starbucks and at airports.<sup>14</sup> The Internet content providers can multi-home as well.

42. As I describe below, however, for streaming television shows and movies, end users typically single-home on their wired broadband provider at home. As a result, OVDs must single-home on that broadband provider to reach that household. The wired broadband provider is therefore a monopoly bottleneck. Conversely, consumers can and do multi-home on several OVDs and they can easily switch between them.

43. Wired broadband providers are part of multi-product firms that offer multi-channel video programming distribution (MVPD) as well as Voice-over-IP

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<sup>14</sup> The extent to which that multi-homing would act as a competitive constraint on, for example, the residential broadband provider would depend on the extent to which consumers were willing to forgo broadband access at home and rely on the alternative means of Internet access.

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(VoIP). They typically provide bundles of these three products—ISP services, MVPD services, and VoIP services—to households. They engage in price discrimination by adjusting the prices of these bundles, and their components, to compete for consumers with different price sensitivities and alternatives for the separate components.

### **II. Competitive Constraints on Comcast and Time Warner Cable for the Provision of Broadband Services to Consumers and OVDs**

#### **A. Alternative Methods of Streaming Video**

44. Many OVDs stream, and consumers receive, television shows, movies, and other long-form content over the Internet. The quality of these online videos for consumers depends on the device on which they receive the video and the quality of the connection to that device. Households stream most online video of movies, television shows, and other long-form content over wired broadband.
45. Consumers typically do not use mobile devices connected to mobile wireless broadband networks to consume online video content for several reasons. First, the communication providers for mobile wireless devices usually have data caps that make it expensive or impossible to view content when individuals have to rely on that communication provider. Second, the broadband speeds typically offered by the mobile wireless provider are much slower than those offered by wired providers; the slower speed can reduce the quality of the video streaming experience obtained by the consumer. In addition, the size of the screen is not ideal for watching long-form video content especially when several individuals are watching the content together, and mobile devices are not useful for

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households with multiple viewers who are streaming different content at the same time.

46. Satellite broadband is also not suitable for households that expect to stream a significant amount of video or engage in other bandwidth intensive activities because of data caps and because connection speeds tend to be slower. For example, Dish explicitly cautions potential subscribers that it is not a good substitute for wired broadband.<sup>15</sup> It advertises its service as primarily suitable for under-served locations without access to high-speed Internet.<sup>16</sup> Dish also explicitly warns potential customers that its service is not appropriate for

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<sup>15</sup> See *DISHNET SATELLITE – NEED TO KNOW & FAQs*, DISH, <http://www.dish.com/entertainment/internet-phone/satellite-internet/> (last visited Aug. 25, 2014) (Q: “The Internet provider at my current location is cable/fiber (FiOS, U-Verse, Comcast, Time Warner, Charter, Cox, AT&T or Verizon. Is dishNET Satellite a good solution for me?” A: “NO, As a satellite-based service, dishNET Satellite Internet has monthly data allowance limits which are much lower than cable and fiber-based Internet providers. Additionally, with satellite-based systems signal latency (delay) occurs, which may negatively affect some activities such as realtime gaming and VoIP.”).

<sup>16</sup> *Id.* (“Q: I don't live in a metropolitan area, and my Internet options are limited to dialup and very slow DSL/cable. Is dishNET Satellite a good solution for me? A: YES, dishNET Satellite Internet was specifically designed for under-served locations without access to high-speed Internet. If you live in rural areas or even recently constructed home developments, dishNET Satellite provides Internet access that is up to 150 times faster than dial-up access.”).

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streaming television shows or movies.<sup>17</sup> DirecTV offers similar warning to potential subscribers of its Exede Internet service.<sup>18</sup>

47. {{

}} Table 1 reports the share of Netflix viewing hours accounted for by wired broadband, mobile wireless broadband, and satellite as of May 2014.

{{

}} Approximately 56 percent of American adults have Internet access through plans from their mobile network operators that enable them to use their cell phones to access the Internet.<sup>19</sup> Yet

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<sup>17</sup> *Id.* (“Q: I enjoy watching TV shows and movies online. Is dishNET Satellite a good solution for me? A: NO, While dishNET Satellite will support video streaming, it is best to limit these activities to short video clips like those found on YouTube® or rich content sites operated by ESPN, CNN, and the like. Streaming video uses a large amount of data. If you use dishNET Satellite to stream video from services like Netflix® or Hulu® you will quickly consume your monthly data allowance, resulting in your speed being reduced to approximately 128 Kbps.”).

<sup>18</sup> *Satellite Internet Packages and Pricing*, Excede, <http://www.exede.com/what-is-exede> (last visited Aug. 25, 2014) (“Is Exede right for you? ...Most typical Internet users will enjoy our service tremendously — but it’s not right for everyone. For example: Gamers: The performance of some games over the Internet is very poor and some games may not work at all...Heavy downloaders: Some folks these days rely on their Internet connection to stream and download all of their movies and television. If that’s you, or if you have some other reason to do a lot of uploading or downloading of large files, Exede’s data allowance caps may not work for you.”). Excede offers data caps of 10Gb, 15Gb and 25 Gb, with unmetered usage during late night hours (midnight to 5 am or 3 am to 8 am, local time, depending on the plan). See *The Free Zone*, Excede, <http://www.exede.com/internet-packages-pricing/service-availability> and <http://www.exede.com/internet-packages-pricing/free-zones> (last visited Aug. 25, 2014).

<sup>19</sup> Mave Duggan and Aaron Smith, *Cell Internet Use 2013*, Pew Research Center’s Internet & American Life Project (Sept. 16, 2013), available at



only {{ }} of Netflix viewing hours were consumed using this type of Internet connection.

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**B. Alternative Technologies for Providing Wired Broadband**

48. A single HD-video stream requires a sustained speed of 5 Mbps by itself. Higher levels of video quality require faster speeds.<sup>20</sup> The average American household has 2.64 members and 39 percent of households have three or more members.<sup>21</sup> A household that wants the ability to, for example, have two different members stream different HD videos or other bandwidth intensive tasks such as video chat at the same time therefore needs a broadband connection of a minimum of 10 Mbps.<sup>22</sup>

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[http://www.pewinternet.org/~media/Files/Reports/2013/PIP\\_CellInternetUse2013.pdf](http://www.pewinternet.org/~media/Files/Reports/2013/PIP_CellInternetUse2013.pdf). Note that this does not include users who access the Internet through a tablet.

<sup>20</sup> See *Internet Connection Speed Recommendations*, Netflix, <https://help.netflix.com/en/node/306> (last visited Aug. 17, 2014) (“5.0 Megabits per second - Recommended for HD quality”); *Streaming Movies to My TV: Frequently Asked Questions*, Amazon, <http://www.amazon.com/gp/feature.html?ie=UTF8&docId=1000578641> (last visited Aug. 25, 2014) (“What do I need to connect my TV, set-top box, or game console to the Internet? A wired connection requires the following: A broadband Internet connection (with modem provided by your ISP), with a minimum data speed of 5 Mbps.”)

<sup>21</sup> U.S. Census Bureau, *America’s Families and Living Arrangements: 2012*, at 4 (2013), available at <http://www.census.gov/prod/2013pubs/p20-570.pdf>.

<sup>22</sup> *Netflix Streaming Bandwidth: Use a Speed Test to Optimize*, Bandwidth Place, <http://www.bandwidthplace.com/netflix-streaming-bandwidth-use-a-speed-test-to-optimize-article/> (last visited Aug. 25, 2014) (“You should probably look into getting at least 10 Mbps download speeds or higher at your home if you want to video stream. Even better is 20

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49. It is common for modern families to need fast broadband speeds, particularly during the evening. As long as a family wants to be able to engage in such activities some of the time, it will need a broadband connection sufficiently fast for those times.<sup>23</sup> Households may also require speeds of 20 Mbps or more, especially as higher quality video streams, such as Netflix's Ultra HD stream, become more prevalent.<sup>24</sup> The FCC has suggested that download speeds of more than 15 Mbps are currently necessary for households with three or more

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Mbps or higher, but then you're adding more cost to your monthly bill. Getting in between 10 Mbps and 20 Mbps is probably ideal."); Federal Communications Commission, "Household Broadband Guide," available at: <http://www.fcc.gov/guides/household-broadband-guide>; Federal Communications Commission, *Broadband Speed Guide*, <http://www.fcc.gov/guides/household-broadband-guide>; David Salway, *How Much Broadband Speed Do You Need?*, available at <http://broadband.about.com/b/2011/10/01/broadbandspeedtable.htm>; Stephanie Crawford, *How Fast Should My Internet Connection Be to Watch Streaming HD Movies?*, HowStuffWorks, available at <http://entertainment.howstuffworks.com/fast-internet-connection-for-streaming-hd-movies.htm>.

<sup>23</sup> Robert Kenny and Tom Boughton, *Domestic Demand for Bandwidth: An Approach to Forecasting Requirements for the Period 2013-2023*, at 10 (2013), available at: <http://www.broadbanduk.org/wp-content/uploads/2013/11/BSG-Domestic-demand-for-bandwidth.pdf> ("Bandwidth demand is obviously driven by peaks, not average speed required..."). As this report suggests, a reasonable broadband speed is one that is sufficient for virtually all of a household's peak usage time. This report goes on to model this requirement, and in the base case assumes that ISPs need to provide enough bandwidth to cover a household's fifth busiest minute of each day, even when that minute occurs during the peak usage time and bandwidth is at its most scarce. See *Id.*, at 10, 53. Other models of broadband demand use different approaches to capacity planning, e.g., assuming that capacity needs to be four times average expected load in order to accommodate household demand when it is at its highest. See AdTran, *Defining Broadband Speeds: Deriving Required Capacity in Access Networks* (2009), available at <http://www.pexx.net/pdfs/whitepapers/adtran/DerivingRequiredCapacity.pdf>.

<sup>24</sup> See *Interpreting Speed Test Results*, Geek Squad, <http://www.geeksquad.com/do-it-yourself/tech-tips/interpreting-speed-test-results.aspx> (last visited Aug. 25, 2014) ("If you have a number of devices connected to your network and want to use them at the same time without delays, [15-50 Mbps] may be the speed for you....Multiple simultaneous connections will require this level of service.")

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simultaneous users or devices running more than one high demand application running at the same time, and that even faster speeds will become necessary more advanced broadband applications develop.<sup>25</sup>

50. For these reasons, most ISPs, including the Applicants, recommend speeds significantly greater than even 10 Mbps for seamless streaming of video or Internet gaming—and even more for homes with more than one Internet-connected device.<sup>26</sup> Time Warner Cable, for example, suggests at least 20 Mbps if you want to “stream video,” 30 Mbps for gaming, and 50 Mbps “if you have multiple people on multiple devices in your home.”<sup>27</sup> In contrast, Time Warner Cable advertises its 3 Mbps package as only sufficient to “[s]urf the web,

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<sup>25</sup> 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, as Amended by the Broadband Data Improvement Act, *Tenth Broadband Progress Notice of Inquiry*, GN Docket No. 14-126, 6-10 ¶¶ 11-15, 13 ¶ 23 (2014), available at [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2014/db0805/FCC-14-113A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0805/FCC-14-113A1.pdf) (“Tenth Broadband Progress Notice of Inquiry”). The FCC cited broadband demand modeling for the United Kingdom, which suggested that by 2023, the median household will require 19 Mbps, a high-use household will require 25 Mbps, and a household in the top 1% will require 35-39 Mbps (and possibly as high as 50 Mbps under certain robustness-checking scenarios). See *id.* n.38 (citing Robert Kenny and Tom Boughton, *Domestic Demand for Bandwidth: An Approach to Forecasting Requirements for the Period 2013-2023*, at 3-4 Broadband Stakeholder Group (Nov. 5, 2013), available at <http://www.broadbanduk.org/wp-content/uploads/2013/11/BSG-Domestic-demand-for-bandwidth.pdf>).

<sup>26</sup> See, e.g., *AT&T High-Speed Internet Plans – Comparison*, AT&T, <http://www.att-services.net/att-high-speed-internet-comparison.html#.U-J1ePldV8E> (last visited Aug. 25, 2014) (recommending packages offering speeds of 12 Mbps and up for customers who stream video clips and engage in teleconferencing, and speeds of 18 Mbps and up for customers who stream full-length videos and play interactive online games).

<sup>27</sup> See *High Speed Internet Plans and Packages*, Time Warner Cable, available at <http://www.timewarnercable.com/en/internet/internet-service-plans.html> (last visited Aug. 25, 2014).

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connect with friends and family through Facebook, send email, and download medium-sized files.”<sup>28</sup>

51. OVD subscribers are able to watch streaming online video on lower speed broadband connections in part because OVDs adjust the picture quality to account for the lower speeds. However, as consumers’ demand for higher definition video quality increases and as the need to simultaneously support multiple devices on a single connection increases, consumers are choosing to move increasingly toward higher speed broadband connections. As I discuss below, that transition is already well under way.
52. Three major technologies in the United States provide wired broadband: cable, fiber, and DSL. The quality of video streaming for the household depends primarily on the download speed of the broadband connection for the household. DSL stands for “direct subscriber line” on the local telephone network; it is offered only by telecommunications companies. Based on December 2013 data from the National Telecommunications and Information Administration (NTIA), approximately 85 percent of the population in the United States had cable or fiber and 83 percent had DSL available.<sup>29</sup>
53. Cable and fiber providers offer fast connections to most of the households in the areas they serve. Based on December 2013 NTIA data, across all cable and

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<sup>28</sup> *Id.*

<sup>29</sup> Calculations based on National Telecommunications and Information Administration’s State Data Initiative (2014), National Broadband Map, December 31, 2013, *available at*: <http://www.broadbandmap.gov/data-download>; U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcdc.missouri.edu/cgi-bin/uexplore??pub/data/sf12010>.

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fiber providers, cable and fiber speeds of 25 Mbps and above were available to 93 percent of people in Census blocks where cable and fiber were offered and speeds of 10 Mbps and above were available to 99 percent.<sup>30</sup> Comcast and Time Warner Cable offer maximum advertised speeds of 25 Mbps or more to 99 percent and 86 percent of the population in their respective footprints and to 100 percent of the population for speeds of 10 Mbps or more.<sup>31</sup>

54. The situation is much different for DSL. Overall, across all DSL providers, only 13 percent of people in Census blocks where DSL was offered could obtain maximum advertised speeds of at least 25 Mbps. Only 60 percent could obtain speeds of at least 10 Mbps.<sup>32</sup> Verizon, for example, did not offer a maximum

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<sup>30</sup> Calculations based on National Telecommunications and Information Administration's State Data Initiative (2014), National Broadband Map, December 31, 2013, *available at*: <http://www.broadbandmap.gov/data-download>; U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcdc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>. From the NTIA data, I obtained for each Census block the highest maximum advertised download speed of any cable or fiber provider, excluding resellers and those that served only business and/or governmental customers. From the Census, I obtained the population of each Census block. For each person in a block with at least one cable or fiber provider, I counted whether the highest available cable or fiber speed was at least 10 or 25 Mbps.

<sup>31</sup> Calculations based on National Telecommunications and Information Administration's State Data Initiative (2014), National Broadband Map, December 31, 2013, *available at* <http://www.broadbandmap.gov/data-download>; U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcdc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>. From the NTIA data, I obtained as list of census blocks where the companies offered download speeds of at least 25 Mbps to residential customers. I used the 2010 Census for the population estimate for each block (the most recent data available at the Census block level).

<sup>32</sup> Calculations based on National Telecommunications and Information Administration's State Data Initiative (2014), National Broadband Map, June 30, 2013, *available at* <http://www.broadbandmap.gov/data-download>; U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcdc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>. From the NTIA data, I obtained for each Census block the highest maximum advertised download speed of any DSL provider, excluding resellers and those that served only business and/or governmental customers. From the Census, I obtained the population of each Census block.

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advertised speed of 10 Mbps or more to any of its DSL customers. AT&T, which has developed its U-verse broadband service using faster versions of DSL technology, did not offer service of 25 Mbps or more to any of its DSL customers until July 2013, and only to 7 percent of the population in its footprint in December 2013.<sup>33</sup>

55. Consumers who stream videos can encounter periods in which the stream is delayed—the rotating gears that we see when our Internet connections are waiting to download—which reduces the quality of the viewing experience. To minimize this delay, consumers require both a fast broadband connection and a connection that can sustain throughput during the time they are watching a show or movie. Consumers that have broadband connections with maximum advertised speeds of 10 Mbps or more, or even 25 Mbps or more, may still encounter interruptions in streaming resulting from declines in the speed and throughput of their broadband provider.

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For each person in a block with at least one DSL provider, I counted whether the highest available DSL speed was at least 10 or 25 Mbps.

<sup>33</sup> Calculations based on National Telecommunications and Information Administration's State Data Initiative (2014), National Broadband Map, December 31, 2013, *available at* <http://www.broadbandmap.gov/data-download>. I looked at all of AT&T's wired broadband offerings to residential customers nationwide. In July 2013, AT&T began offering a new tier with 45 Mbps download speeds in select cities, an improvement over its previous top tier of 24 Mbps downloads. *California and Nevada AT&T U-Verse Customers Connect Faster with New 45 Mbps Internet Service*, AT&T (Jul. 29, 2013), *available at* <http://www.att.com/gen/press-room?pid=24568&cdvn=news&newsarticleid=36772&mapcode=U-verse>; Jeff Baumgartner, *AT&T U-Verse Expands Speed Upgrade*, Multichannel News (Aug. 26, 2013), *available at* <http://multichannel.com/news/distribution/att-u-verse-expands-speed-upgrade/261341>.

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56. DSL subscribers are more likely than cable and fiber subscribers to have actual speeds that are considerably lower than the maximum advertised speeds.<sup>34</sup> The FCC has examined the relationship between actual and advertised broadband speeds. It calculated the minimum percent of the advertised speed obtained by 80 percent of the consumers 80 percent of the time, which it refers to as the “consistent speed.” Figure 1 shows the results.<sup>35</sup> The red bars show the average speed received by subscribers to these systems. The blue bars show a measure of the speed that subscribers can more or less count on. The blue bars report the minimum percent of advertised speed received by 80 percent of the consumers 80 percent of the time. The results show that most subscribers encounter significant periods of time during which they have lower speeds.

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<sup>34</sup> Marguerite Reardon, *DSL Subscribers More Likely To Get Cheated On Broadband, Says FCC*, CNET (June 18, 2014), available at <http://www.cnet.com/news/dsl-subscribers-more-likely-to-get-cheated-on-broadband/>.

<sup>35</sup> Federal Communications Commission, *2014 Measuring Broadband America Fixed Broadband Report*, Chart 7 (2014), available at <http://data.fcc.gov/download/measuring-broadband-america/2014/2014-Fixed-Measuring-Broadband-America-Report.pdf>.

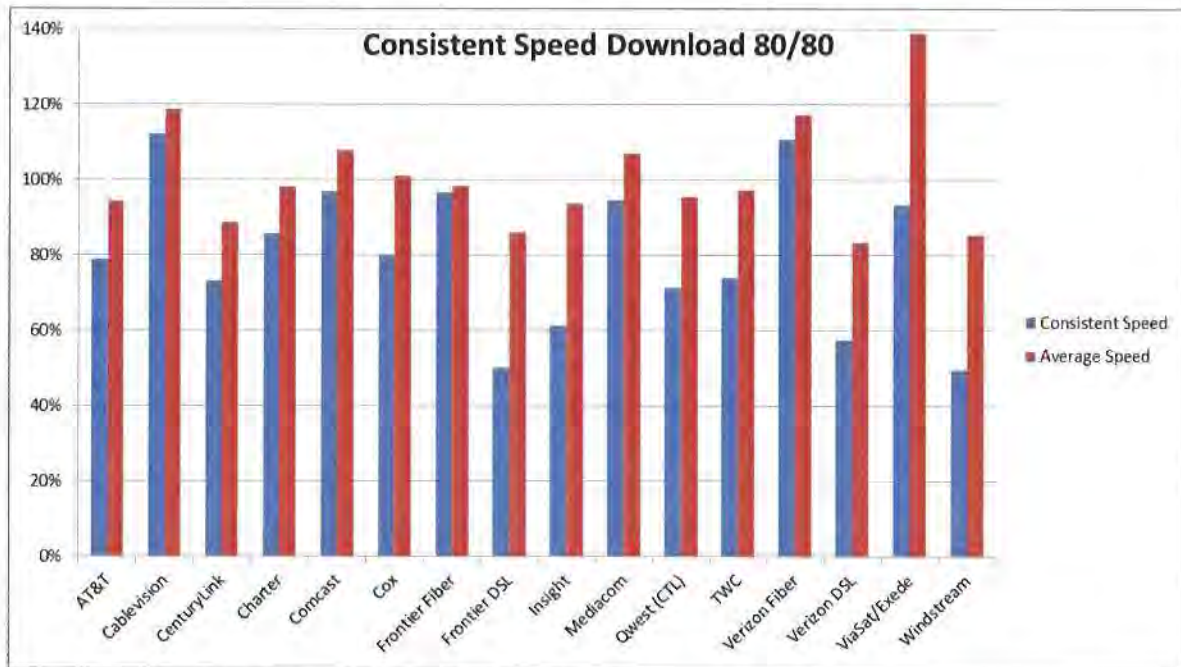


Figure 1: Consistent Speed Download 80/80

57. The results show that the DSL speeds that subscribers can count on are a much smaller fraction of maximum advertised speeds than is the case for cable and fiber subscribers. For example, the consistent speed experienced by Verizon’s DSL customers was less than 60 percent of the advertised speed. By contrast, the consistent speed experienced by Verizon’s fiber was well over 100 percent of the advertised speed. Using this ratio of consistent to the average speed, AT&T, CenturyLink and Qwest (CTL) are under 80 percent, and Frontier DSL and Windstream are under 60 percent. By contrast, the cable-based and fiber-based ISPs perform much better. CableVision is above 100 percent, Charter, Comcast, Cox, Frontier Fiber, and Mediacom are above 80 percent, with only



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Insight and Time Warner Cable under 80 percent (although still above 60 percent).<sup>36</sup>

58. The data reported above show that the maximum advertised speeds for DSL subscribers are significantly lower than for cable and fiber subscribers, and that the speeds that DSL subscribers get consistently are even lower. Given the limitations of DSL, with increasing demand for faster Internet for various reasons, including online video streaming, American households are shifting from DSL to cable and fiber.
59. According to the Leichtman Research Group, telco broadband subscribers (excluding AT&T U-Verse and Verizon FiOS) declined by 2.76 million in 2012 and 2.82 million in 2013.<sup>37</sup> Those losses are significant: they account for more than 10 percent of the total broadband subscriber base of these telcos, 25.82 million, at year-end 2013.<sup>38</sup>

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<sup>36</sup> Viasat/Exede, which offers satellite based broadband was between 80 and 100 percent based on this metric.

<sup>37</sup> The figures reported elsewhere in this report on broadband subscribers are based on subscribers meeting the speed thresholds used by Dr. Israel. The data reported by Leichtman Research Group do not provide this level of detail.

<sup>38</sup> Leichtman Research Group, *3 Million Added Broadband from Top Cable and Telephone Companies in 2011* (Mar. 16, 2012), available at <http://www.leichtmanresearch.com/press/031412release.html>; Leichtman Research Group, *2.7 Million Added Broadband From Top Cable and Telephone Companies in 2012* (Mar. 19, 2013), available at <http://www.leichtmanresearch.com/press/031913release.html>; Leichtman Research Group, *2.6 Million Added Broadband from Top Cable and Telephone Companies in 2013* (Mar. 17, 2014), available at <http://www.leichtmanresearch.com/press/031714release.html>. Note that this category (total telecommunications wired broadband, less U-Verse and FiOS) consists primarily of traditional DSL, but also includes a small proportion of other technologies, such as CenturyLink's fiber-to-the-home.

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60. AT&T and Verizon experienced similar declines in DSL subscribers. According to AT&T's annual reports, its non-U-Verse broadband subscriber base declined by more than a third from 4.06 million in 2012 and 2.67 million in 2013.<sup>39</sup> That 1.39 million decline compares to a non-U-Verse subscriber base of 12.75 million at the end of 2011. According to Verizon's annual reports, its non-FiOS broadband subscriber base declined by 482,000 in 2012, and by 428,000 in 2013. That compares to a non-FiOS broadband subscriber base of around 3.9 million at the end of 2011. Between 2008 and 2013, Verizon reports its non-FiOS broadband subscribers declined by 2.36 million.<sup>40</sup> Consistent with this shift, shipments of DSL port equipment declined 22 percent in 2013 according to the market analysis firm Broadbandtrends LLC.<sup>41</sup>
61. Comcast's internal documents confirm the shift from DSL to cable. They show that Comcast's broadband penetration share of occupied households {{  
}}, while the broadband penetration share for

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<sup>39</sup> AT&T, Annual Report (Form 10-K for period ending 12/31/2012) (Feb. 22, 2013), *available at* <http://www.att.com/gen/investor-relations?pid=9186>; AT&T, Annual Report (Form 10-K for Period Ending 12/31/2013) (Feb. 21, 2014), *available at* <http://www.att.com/gen/investor-relations?pid=9186>.

<sup>40</sup> Verizon, Annual Report (Form 10-K for Period Ending 12/31/2011) (Feb. 24, 2012), *available at* <http://www.verizon.com/investor/secfiling.htm>; Verizon, Annual Report (Form 10-K for Period Ending 12/31/2012) (Feb. 26, 2013), *available at* <http://www.verizon.com/investor/secfiling.htm>; Verizon, Annual Report (Form 10-K for Period Ending 12/31/2013) (Feb. 27, 2014), *available at* <http://www.verizon.com/investor/secfiling.htm>.

<sup>41</sup> Teresa Mastrangelo, *2013 & 4Q13 Market Share Report Summary – DSL*, Broadbandtrends (Feb. 18, 2014), *available at* [http://broadbandtrends.com/yahoo\\_site\\_admin/assets/docs/BBT\\_2013DSLmktShare\\_141050\\_TOC.49120105.pdf](http://broadbandtrends.com/yahoo_site_admin/assets/docs/BBT_2013DSLmktShare_141050_TOC.49120105.pdf).

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DSL alternatives {{ }}, from the fourth quarter of 2010 to the third quarter of 2013.<sup>42</sup>

62. To persuade households to switch from available DSL alternatives to Comcast, Comcast airs commercials that emphasize its speed advantages over DSL. For example, it has a long-running series of television commercials featuring a family of turtles called the Slowskys, which insinuates that DSL speeds are adequate only for those who like things very slow.<sup>43</sup> Some examples include:

Comcast high-speed internet is fast no matter where you are, but with DSL, the farther you are from the hub or central office, the slower your connection.<sup>44</sup>

Now that Comcast has increased its speeds, our [the Slowskys'] DSL from the phone company seems slower than ever.<sup>45</sup>

63. Below, I report the availability of ISPs that provide maximum advertised download speeds of 10 Mbps or more and 25 Mbps or more to account for the increasing demand for high-speed wired broadband by households.<sup>46</sup>

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<sup>43</sup> Emma Bazilian, *The Slowskys Are Back, and This Time They Mean Business: Comcast's Turtles Leave the House*, Adweek (Oct. 10, 2013), available at <http://www.adweek.com/news/advertising-branding/ad-day-slowskys-are-back-and-time-they-mean-business-153042>.

<sup>44</sup> *Watch COMCAST - The Slowskys turtle commercials - Push It*, YouTube (Nov. 6, 2013), <https://www.youtube.com/watch?v=YVCwVF0zb18>.

<sup>45</sup> *Watch COMCAST - The Slowskys Turtle commercial - Slow Band Wagon*, YouTube (Nov. 6, 2013), <https://www.youtube.com/watch?v=ei4ZzF0p100>.

<sup>46</sup> See Tenth Broadband Progress Notice of Inquiry (The FCC is currently seeking comments on raising the threshold for broadband to be considered adequate from 4 Mbps downstream to 10, 15, or 25 Mbps downstream).

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**C. Alternative Wired Broadband Choices Available to Households**

64. Data on the availability of ISPs are generally collected and reported for various geographic areas. The fact that an ISP is available in a particular geographic area means that an ISP serves at least one household in that area. That ISP may or may not serve other households in that geographic area. Therefore, data on the availability of ISPs for any geographic area larger than a household location can overstate the availability of ISPs to a particular household in that geographic area. The overstatement increases for broader geographic areas, as I explain in more detail below.
65. To determine how many wired ISP alternatives are available to Comcast and Time Warner Cable subscribers, I used data on the number of ISPs available within a geographic area known as a “Census block.” A Census block is the smallest geographic area for which data is publicly available on the choices of ISPs that American households have. A Census block is a geographic area used by the U.S. Bureau of the Census for purposes of collecting decennial Census data. On average, it consists of 50 people or roughly 19 households.<sup>47</sup> A Census block is part of a Census tract, which has an average of 4,256 people or roughly 1,609 households. A Census tract is part of a county, with on average 97,011 people and roughly 36,673 households. A 5-digit zip code has an

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<sup>47</sup> The figures of the average population in different geographic areas reported in this paragraph (such as census block or census tract) exclude geographic areas with zero population. Note that these figures include geographic areas with zero households but positive population, which occurs in cases where all of the geography’s population resides in non-household units (such as prisons, military barracks, or college dormitories).

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average of 9,475 people or roughly 3,582 households. The top 20 DMAs have between 1.3 million and 7.5 million TV households.<sup>48</sup> Given its small size, it is likely that if a household in a Census block has access to an ISP, then the other households do as well; that becomes less and less true as the geographic area expands.

66. I used data from the NTIA called the National Broadband Map, which contains data on ISP availability by Census block for December 2013. This data is maintained by the NTIA in cooperation with the FCC and the 50 states, the District of Columbia, and 5 territories.<sup>49</sup> For each Census block, this dataset contains a list of the providers offering service in that block, and the maximum advertised download speed. The dataset allows me to identify resellers, and to distinguish between providers offering service to residential, business, and/or governmental customers. These data report the number of ISPs available in a Census block for several categories of “maximum advertised speed.”
67. The FCC has described this dataset as “the best data available” for analyzing broadband availability, and as “the most comprehensive and geographically

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<sup>48</sup> Calculations based on U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcdc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>; Nielsen, *Market Population and Rankings 2014*, at 24-29, *available at* [http://www.nielsen.com/content/dam/corporate/us/en/docs/nielsen-audio/market\\_populations\\_and\\_rankings\\_2014.pdf](http://www.nielsen.com/content/dam/corporate/us/en/docs/nielsen-audio/market_populations_and_rankings_2014.pdf).

<sup>49</sup> For the purposes of this report, I have limited attention to those areas covered in U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcdc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>. These are the 50 states, the District of Columbia, and the territory of Puerto Rico.

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granular deployment data publicly available.”<sup>50</sup> The FCC is working to modernize its Form 477 broadband data by incorporating many of the features of the NTIA data.<sup>51</sup>

68. I proceeded as follows for Comcast:
- a. I identified the Census blocks in which Comcast was identified as being one of the ISPs that served at least one household in that Census block.
  - b. I obtained population data from the Census decennial survey for 2010 to determine the number of people living in that Census block.
  - c. I identified the number of wired ISPs, in addition to Comcast, broken down into three speed categories: all ISPs, ISPs with maximum advertised speed of 10 Mbps or more, and ISPs with maximum advertised speed of 25 Mbps or more.
  - d. I calculated the average number of wired ISPs available across all Census blocks in the Comcast service area weighted by the population in each block.

I followed a similar procedure for Time Warner Cable. Appendix B describes the data and my calculations in more detail.

69. Table 2 shows the results of these calculations. The figures are all based on the number of ISPs *in addition to Comcast* or *in addition to Time Warner Cable*. The average Census block served by Comcast has 1.42 alternative ISPs, 0.97 alternative ISPs with maximum advertised speeds of 10 Mbps or more, and 0.42

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<sup>50</sup> *Seventh Broadband Progress Report and Order on Reconsideration*, GN Docket No. 10-159, at ¶ 1 (2011), available at [https://apps.fcc.gov/edocs\\_public/attachmatch/FCC-11-78A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/FCC-11-78A1.pdf); *Eighth Broadband Progress Report*, GN Docket No. 11-121, at ¶¶ 17, 28, 30 (2012), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-12-90A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-90A1.pdf).

<sup>51</sup> In the Matter of Modernizing the FCC Form 477 Data Program, *Report and Order*, WC Docket No. 11-10, at ¶¶ 2-3 (2013), available at [https://apps.fcc.gov/edocs\\_public/attachmatch/FCC-13-87A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/FCC-13-87A1.pdf).

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alternative ISPs with speeds of 25 Mbps or more. The results for Time Warner Cable are similar, as are the results for the Census blocks served by either Comcast or Time Warner Cable.

70. A large portion of the population in the Comcast and Time Warner Cable footprints do not have access to fast broadband alternatives. For the combined footprint about 27 percent of the population does not have access to a wired alternative with speed of 10 Mbps or faster and about 64 percent does not have access to a wired alternative with speed of 25 Mbps or faster.<sup>52</sup>
71. These general results also hold true for the combined entity (with and without the planned divestitures) as shown in the last two columns of the table.

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<sup>52</sup> For these calculations, in the small number of census blocks where Comcast and Time Warner offered maximum download speeds of less than 10 Mbps (or 25 Mbps), I treated ISPs with maximum download speeds equal to or greater than Comcast and Time Warner Cable as if they had speeds of 10 Mbps (or 25 Mbps).

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Table 2: Wired Broadband Alternatives to Comcast and Time Warner Cable

<i>Metric</i>	<i>Comcast Footprint</i>	<i>Time Warner Cable Footprint</i>	<i>Combined Footprint</i>	<i>Combined Footprint, Accounting for Divestitures</i>
Average number of wired alternatives, population-weighted	1.42	1.09	1.29	{{ }}
Percentage of population with no wired alternative	2.5%	7.3%	4.3%	{{ }}
Average number of wired alternatives >= 10 Mbps, population-weighted	0.97	0.78	0.90	{{ }}
Percentage of population with no wired alternatives >= 10 Mbps	23.5%	31.7%	26.6%	{{ }}
Average number of wired alternatives >= 25 Mbps, population-weighted	0.42	0.39	0.41	{{ }}
Percentage of population with no wired alternatives >= 25 Mbps	62.9%	64.0%	63.4%	{{ }}
Average number of wired alternatives with equal or greater download speed, population-weighted	0.08	0.31	0.16	{{ }}
Percentage of population with no wired alternatives with equal or greater download speed	92.3%	72.5%	84.8%	{{ }}

Sources: National Telecommunications and Information Administration's State Data Initiative (2014), National Broadband Map, December 31, 2013, *available at* <http://www.broadbandmap.gov/data-download>; U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://medc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>; Letter from



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Kathryn A. Zachem, Comcast, et al, to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-57 (July 11, 2014) (“*July 11 Letter*”), Appendix B.1 and Appendix C.1; Letter from Francis M. Bruno, Comcast, to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-57 (July 28, 2014) (“*July 28 Letter*”), Appendix A.2, Appendix A.4, and Revised Appendix A to July 11 Letter.

**D. Comparison to ISP Availability Statistics Reported by Comcast and Dr. Israel**

72. Comcast and Dr. Israel have reported various statistics on the availability of wired ISPs for various broad geographic areas ranging up to the DMA level. These statistics overstate the actual availability of wired ISPs to households in service areas for Comcast and Time Warner Cable. (As noted above, mobile wireless and satellite ISPs are not reasonable substitutes for households that want to stream television shows and movies, and therefore they should not be counted at all.)
73. To understand the nature of the overstatement, I will use myself as an example. I have a residence in Boston in Census block 25025-0201.01-4002. The NTIA data show that for wired ISPs, I have access to Comcast (which offers high-speed cable to my home) and Verizon (which offers slow-speed DSL to my home).<sup>53</sup> There is one additional ISP available—RCN—in the zip code (02114) and county (Suffolk) in which I live. However, I could not obtain service from RCN at my current place of residence as I verified by checking their website.

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<sup>53</sup> For this example, I have used the NTIA data from June 30, 2013, rather than the most recent data from December 31, 2013. I do this in order to make these ISP counts comparable to those in Comcast and Time Warner’s *Public Interest Statement*. At the time the Statement was filed, the June 2013 data were the most recent data available. The results would be similar for December 2013.

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74. There are even more wired ISPs available to households in my Core Based Statistical Area<sup>54</sup> (14460, Boston-Cambridge-Quincy, MA-NH): Bidford Internet, BELD Broadband, TDS Telecom, Time Warner Cable, Norwood Light Broadband, and Granite State Telephone. But none of these ISPs are actually available at my current residence. Finally, 14 wired ISPs serve the Boston DMA; of these, only Comcast and Verizon are actually available to provide the residence where my family currently lives with wired broadband service. The remaining 12 ISPs are not relevant at all to me because, unless I move my residence, I cannot in fact obtain wired broadband service from them.
75. The Comcast service available to me is much faster, with maximum advertised download speeds of up to 105 Mbps, whereas Verizon only offers download speed of up to 3 Mbps. The Verizon package available for my residence does not offer TV directly; instead Verizon offers to bundle DirecTV with its ISP service. Verizon is slightly less expensive than Comcast. Tables 3 and 4 show the offers available to me from both of these wired providers. As a heavy user of the Internet, Verizon would not be a feasible option for my household, even if it were much cheaper.

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<sup>54</sup> Core Based Statistical Areas “consist of the county or counties or equivalent entities associated with at least one core (urbanized area or urban cluster) of at least 10,000 population, plus adjacent counties having a high degree of social and economic integration with the core as measured through commuting ties with the counties associated with the core.” United States Census Bureau Geographic Terms and Concepts – Core Based Statistical Areas and Related Areas, *available at* [http://www.census.gov/geo/reference/gtc/gtc\\_cbsa.html](http://www.census.gov/geo/reference/gtc/gtc_cbsa.html).

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**Table 3: Comcast Triple Play Offers (New Residential Customers at my Address in Boston)**

<i>\$/Month (first year)</i>	<i>\$/Month (second year)</i>	<i>\$/Month (thereafter)</i>	<i>Channels</i>	<i>Mbps</i>	<i>Phone</i>	<i>Agreement</i>	<i>Bonus</i>
79.99	124.99	146.99 to 147.99	140	25	Unlimited Nationwide Talk & Text	Two years	\$100 Visa Prepaid Card
89.99	125.99	146.99 to 147.99	140	105	Unlimited Nationwide Talk & Text	Two years	\$100 Visa Prepaid Card
99.00	126.99	146.99 to 147.99	140	25	Unlimited Nationwide Talk & Text	None	
139.99	144.99	154.99	230	105	Unlimited Nationwide Talk & Text	Two years	\$100 Visa Prepaid Card
149.99	174.99	174.99	230	105	Unlimited Nationwide Talk & Text	None	
159.99	159.99	174.99	260	105	Unlimited Nationwide Talk & Text	Two years	\$250 Visa Prepaid Card
159.99	184.99	184.99	260	105	Unlimited Nationwide Talk & Text	None	DVR Service Included
199.99	204.99	214.99	260	105	Unlimited Nationwide Talk & Text	Two years	\$250 Visa Prepaid Card
199.99	224.99	224.99	260	105	Unlimited Nationwide Talk & Text	None	DVR Service Included
129.99	154.99	154.99	220	25	Unlimited Nationwide Talk & Text	None	

Source: *XFINITY Triple Play by Comcast*, Comcast, <http://www.comcast.com/Corporate/Learn/Bundles/bundles.html>(last visited Aug. 5, 2014).

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**Table 4: Verizon Plus DirecTV Bundles (New Residential Customers at my Address in Boston)**

<i>\$/Month (first two years)</i>	<i>\$/Month (thereafter)</i>	<i>Channels</i>	<i>Mbps</i>	<i>Phone</i>	<i>Term</i>	<i>Bonus</i>
69.99	74.99	DirecTV 205	0.5 to 1	Regional Calling	Two Years (TV)	NFL Sunday Ticket 2014; Free HBO, Starz, Showtime, and Cinemax for 3 months
79.99	84.99	DirecTV 205	1.1 to 3	Regional Calling	Two Years (TV)	NFL Sunday Ticket 2014; Free HBO, Starz, Showtime, and Cinemax for 3 months; Wireless router; activation fees waived
94.99	99.99	DirecTV 225	1.1 to 3	Unlimited Calling	Two Years (TV)	NFL Sunday Ticket 2014; Free HBO, Starz, Showtime, and Cinemax for 3 months; Wireless router; activation fees waived

Source: *Shop Verizon Deals and Compare*, Verizon,  
<http://www.verizon.com/home/shop/shopping.htm> (last visited Aug. 5, 2014).

76. Based on the data I have presented, the situation of my household is similar to many households that use Comcast as their ISP. Like my household, most of those households have about one alternative and the preponderance of households do not have any alternative that is fast enough for a household with several active Internet users or users that want to avail themselves of the highest quality video streaming now available. The same statement is true for Time Warner Cable, for the combined footprints, and for the combined companies after the planned divestitures.

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77. I therefore recommend that the FCC not rely on the ISP availability data submitted by Comcast and Dr. Israel.<sup>55</sup> Their data do not provide any meaningful information on the availability of broadband service to Comcast or Time Warner Cable subscribers or the state of competition in the delivery of broadband service. The numbers presented by Comcast and Dr. Israel vastly overstate the number of broadband services available to most Comcast and Time Warner Cable ISP subscribers. The flawed data they provided undergird many of their substantive claims, as I discuss in Section III, and therefore make those claims dubious as well just for that reason.

**E. Competitive Constraints on Comcast and Time Warner Cable**

78. With this background, I now examine whether Comcast or Time Warner Cable face significant competitive constraints on their ability to reduce the quality of streaming service received by their subscribers from an OVD. Specifically, I examine whether it is likely that a significant number of subscribers would switch to an alternative cable provider if Comcast or Time Warner Cable imposed a significant reduction in the quality of streaming services from an OVD and thereby render that degradation unprofitable to these cable providers.<sup>56</sup>

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<sup>55</sup> *Public Interest Statement*, at 141-142.

<sup>56</sup> In analyzing competitive constraints here I am adopting a test for significant market power that is weaker (in the sense of favoring the Applicants) than a traditional SSNIP test. I am basically asking whether the Applicants could foreclose an OVD without suffering a significant reduction in profits.

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79. The typical household that wants broadband for the purpose of streaming online video content has limited choices, according to the data reported above. The typical household would require download speed of 25 Mbps or more to provide high quality online video streaming for the OVD services available in the next few years. The typical household has no more than one alternative, and often less. Around 64 percent of households in the Comcast and Time Warner cable service areas only have DSL as an alternative. Therefore, households that subscribe to Comcast or Time Warner Cable typically have few if any relevant substitutes for receiving adequate ISP service for streaming from OVDs.
80. These alternative ISP providers impose weak competitive constraints on Comcast and Time Warner Cable because the cost of switching to an alternative is relatively high. These costs include:
- Time and inconvenience cost of cancelling service. Customers typically need to call to cancel service, including talking to customer service representatives who have financial incentives to dissuade the customer from cancelling.<sup>57</sup> Customers also need to return their equipment, often incurring the effort of waiting in line at a service center.
  - Set-up and installation fees for new service. Customers may need to pay fees to set up new broadband service.<sup>58</sup>

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<sup>57</sup> Danielle Muoio, *That Comcast Customer Service Rep Wasn't Going Rogue*, Businessweek (July 18, 2014), available at <http://www.businessweek.com/articles/2014-07-18/that-comcast-customer-service-rep-wasnt-going-rogue>.

<sup>58</sup> In an FCC survey of consumer broadband purchasing behavior, 50 percent of consumers who had considered switching broadband providers but who did not switch indicated that paying setup or installation fees for new service was a major factor. See FCC, *Broadband decisions: What drives consumers to switch – or stick with – their broadband Internet provider*, Working Paper, December 2010, Table 3.

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- Time and inconvenience costs of getting new service established to residence. Customers need to get the new broadband service set up and connected, which often involves waiting for a service call at home.<sup>59</sup>
- Having to change the bundle of services, including potential loss of bundled discounts. A customer who also subscribes to television and/or telephone service from her broadband provider would need to either also switch those services, incurring further switching costs, or potentially lose discounts associated with purchasing a bundle of services from the broadband provider.<sup>60</sup>
- Cancellation fees for service. Customers who have signed contracts may be subject to early termination fees.<sup>61</sup>

81. In fact, American households seldom switch their ISPs except when they move residences and have to incur these switching costs anyway. An FCC study examined switching in 2010 and found that, after excluding people who moved, 11.6 percent of American households switched their ISP provider during a year.<sup>62</sup>

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<sup>59</sup> In an FCC survey of consumer broadband purchasing behavior, 40 percent of consumers who had considered switching broadband providers but who did not switch indicated that the hassle of getting new service installed was a major factor. *Id.*

<sup>60</sup> *See Id.* In an FCC survey of consumer broadband purchasing behavior, 44 percent of consumers who had considered switching broadband providers but who did not switch indicated that having to change the current bundle of services was a major factor. *See FCC, "Broadband decisions: What drives consumers to switch – or stick with – their broadband Internet provider," Working Paper, December 2010, Table 3.* An economic study found that bundling did reduce customer switching. *See also, Jeffrey Prince and Shane Greenstein, Does Service Bundling Reduce Churn?, Working Paper, April 2013, available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1966221](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1966221).*

<sup>61</sup> In an FCC survey of consumer broadband purchasing behavior, 47 percent of consumers who had considered switching broadband providers but who did not switch indicated that terminations fees were a major factor. *See FCC, Broadband decisions: What drives consumers to switch – or stick with – their broadband Internet provider, Working Paper, December 2010, Table 3.*

<sup>62</sup> *Id.* at 5-6. (The study reported that “roughly 17% switch ISPs in a given year, with roughly 7% have switched and changed their residence at the same time.” The study also noted that “of those who moved, 50% also changed their Internet service provider.”) If 50 percent of

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82. A considerable portion of the 11.6 percent that did switch, despite not having changed residences, switched from DSL to cable or fiber. According to the FCC, “faster or higher performance Internet connection” is the top reason that households who did not move changed their broadband provider.<sup>63</sup> We also know that those who switched must include many households switching from DSL to cable given the data reported above on the sharp decline in the number of DSL subscribers.<sup>64</sup> Therefore, the fraction of households that are switching from a broadband provider to another alternative is likely much lower than 11.6 percent, and the fraction of households that are switching from a DSL provider to a cable provider is likely to be much higher. Given that DSL is the most common alternative to Comcast and Time Warner Cable subscribers, I would expect that the switching rate for customers of these cable providers is very low.
83. Comcast and Time Warner Cable subscribers also face uncertainty in switching ISP providers for the purpose of obtaining higher quality online video streaming. They have no real way to know whether any decline in quality of online video

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the respondents that changed residences switched ISPs and 7 percent of respondents switch ISPs and changed residences in a given year, then 14 percent of respondents changed residences. And 10 percent of respondents switched ISPs without moving out of the 86 percent of respondents that did not change residences over the year. The proportion of respondents that did not change residences and did switch ISPs is 10/86 or about 11.6 percent.

<sup>63</sup> *Id.* at 9.

<sup>64</sup> *See id.* In the FCC study, the first and third cited reasons for switching among those that switched ISPs without changing residences was “Getting a faster or higher performance Internet connection” (cited by 55 percent) and “Getting a bundle of Internet, TV and phone services from a single company” (cited by 44 percent). Both of the reasons are likely to be applicable to those switching from traditional DSL, as it is slower and cannot provide television services. The second reason cited was “Getting a better price for Internet service” (cited by 54 percent), which could apply generally for switching from all types of providers.



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streaming they are receiving is caused by their ISP or by their OVD. They then face uncertainty over the quality of online video streaming they will receive from the alternative ISP that is available to them. The most common wired ISP alternatives for Comcast and Time Warner Cable subscribers are DSL service from AT&T and Verizon.<sup>65</sup>

84. For many consumers, the value provided by a particular OVD is likely to be small relative to the overall value provided by the ISP. ISPs provide access to all Internet content, including other OVDs. They also typically provide bundles that include extensive video programming, VoIP, as well as broadband. Consumers can easily switch to other OVDs or the cable channels and Video-on-Demand services provided by the MVPD. Comcast and Time Warner Cable both offer significant amounts of television, movies, and other long-form content that substitute for OVD content. The decline in the overall value of the

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<sup>65</sup> The overlap between the wired footprints of the combined Comcast/Time Warner Cable company (accounting for the divestiture transactions) and AT&T contains 51 percent of the population of the combined company ({{ }} percent after accounting for the divestiture transactions). The comparable figures for Verizon are 24 percent ({{ }} percent after accounting for the divestiture transactions). No other wired ISP has an overlap that accounts for more than 15 percent of the population of the combined company's footprint ({{ }}). Calculation is based on National Telecommunications and Information Administration's State Data Initiative (2014), National Broadband Map, December 31, 2013, *available at* <http://www.broadbandmap.gov/data-download>; U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcde.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>; Letter from Kathryn A. Zachem, Comcast, et al, to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-57 (July 11, 2014) ("*July 11 Letter*"), Appendix B.1 and Appendix C.1; Letter from Francis M. Bruno, Comcast, to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-57 (July 28, 2014) ("*July 28 Letter*"), Appendix A.2, Appendix A.4, and Revised Appendix A to July 11 Letter.

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service provided by Comcast or Time Warner Cable, as a result of one of these ISPs reducing the quality of streaming for a particular OVD, is therefore likely to be quite small. For these reasons alone, it is likely that the demand for ISP service from Comcast and Time Warner Cable is highly inelastic with respect to a change in the quality of streaming for a particular OVD.

85. There are also high barriers to entry into providing wired broadband service to a geographic area and to households within a geographic area that a provider does not currently serve. Wired ISPs invest in making wires available to households in areas where they have regulatory approval to provide service. Over relatively long periods of time, the availability of wired service to a residence is predetermined by decisions made by regulators and providers. Obtaining approvals to provide wired service in a geographic area is generally difficult and time consuming.<sup>66</sup>
86. Incumbent cable providers lobby against the approval of municipal broadband projects directly or through proxies.<sup>67</sup> For example, a lobbying group with

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<sup>66</sup> Arthur Harding and Paul W. Jamieson (1999), *Dismantling the Final Regulatory Entry Barriers: A Call for the FCC to Assert its Preemptive Authority*, 12 Harvard J. of Law and Tech., 3; Kevin J. Martin (FCC Commissioner), “*Framework for Broadband Deployment*, Remarks Prepared for the National Summit on Broadband Deployment, October 26, 2001, available at <http://transition.fcc.gov/Speeches/Martin/2001/spkjm101.txt>; Robert Hahn and Scott Wallsten (2006), *The Economics of Net Neutrality*, 3 Economists’ Voice 6; Berin Szoka, Matthew Starr, and John Henke (2013), “Don’t Blame Big Cable – It’s Local Governments That Choke Broadband Competition,” *Wired* (July 16, 2013), available at <http://www.wired.com/2013/07/we-need-to-stop-focusing-on-just-cable-companies-and-blame-local-government-for-dismal-broadband-competition/>.

<sup>67</sup> Brian Fung, *Big Cable may have felled Seattle’s mayor, but it couldn’t stop this Colo. Project*, *Washington Post*, Nov. 6, 2013, available at <http://www.washingtonpost.com/blogs/the-switch/wp/2013/11/06/big-cable-helped-defeat->

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members including Comcast and Time Warner Cable wrote proposed legislation that “would make it almost impossible for cities and towns to offer broadband services to residents and would perhaps even outlaw public-private partnerships like the one that brought Google Fiber to Kansas City.”<sup>68</sup> In California, restrictive regulations have led Google decline to provide Google Fiber in California to date.<sup>69</sup> Google Fiber temporarily abandoned efforts in Overland Park, Kansas for nine months because of difficulties in obtaining approvals.<sup>70</sup>

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seattles-mayor-mcginn-but-they-couldnt-stop-this-colorado-project/ (“Across the United States, cable lobbyists have helped erect legal barriers to stifle competition from public utilities. Industry groups have repeatedly filed lawsuits to block city attempts to roll out fiber service. And they have also opposed public referendums to allow cities to build their own networks.”).

<sup>68</sup> Jon Brodtkin, *Who wants competition? Big cable tries outlawing municipal broadband in Kansas*, Arstechnica (Jan. 31, 2014), available at <http://arstechnica.com/tech-policy/2014/01/who-wants-competition-big-cable-tries-outlawing-municipal-broadband-in-kansas/>. When Comcast was asked if it had any input in writing the bill, it stated that it “has less than 5 percent of the subscribers in the state,” and that Cox and Eagle are the dominant players in Kansas.” See also Emily Badger, *How the Telecom Lobby is Killing Municipal Broadband—Companies like Comcast are spending big bucks to prevent competition from local governments*, CityLab (Nov. 4, 2011), available at <http://www.citylab.com/tech/2011/11/telecom-lobby-killing-municipal-broadband/420/>.

<sup>69</sup> Steve Blum, *Nimby Laws Will Keep Google Fiber Out of Its Own Backyard*, Tellus Venture Associates (June 8, 2014), available at <http://www.tellusventure.com/blog/nimby-laws-will-keep-google-fiber-backyard/>; Walter Russel Mead and Staff, *Google Fiber Skips Over California’s Red Tape*, American Interest (Apr. 11, 2013), available at <http://www.the-american-interest.com/blog/2013/04/11/google-fiber-skips-over-californias-red-tape/>; Alyson Raletz, *Google Fiber Skips California in Favor of Gigabit-Friendly Locals*, Kansas City Business Journal (May 29, 2013), available at <http://www.bizjournals.com/kansascity/blog/2013/05/google-fiber-california-network.html?page=all>.

<sup>70</sup> Angela Moscaritolo, *Google Fiber Get Greenlight in Overland Park, Kansas*, PC Magazine (July 8, 2014), available at <http://www.pcmag.com/article2/0,2817,2460601,00.asp>.

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87. Even when it is possible to obtain approvals, it takes time to build the network and it is very costly to do so.<sup>71</sup> For example, it took Google Fiber almost twenty months to lay enough fiber to pass (but not connect) 149,000 households in Kansas City.<sup>72</sup> One estimate placed the cost to pass the 149,000 household at \$84 million, or \$564 per household passed, with additional costs of \$464 to connect a household for broadband and \$794 to connect a household for broadband and pay television.<sup>73</sup> In December 2013, almost four years after announcing its efforts, Google Fiber's coverage area only includes 0.005 percent of the U.S. population.<sup>74</sup> That is, Google Fiber reaches only five out of 100,000 people. That makes it one of the smaller wired broadband providers in the country.
88. A system may have decided not to wire a particular neighborhood even if it has permission to do so. In that case, a household in that neighborhood could not obtain service. Recognizing this, some ISPs such as Comcast provide information on their websites that inform households whether service is available or not at their precise address. There are therefore barriers to entry

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<sup>71</sup> Peter Cohen, *Will Google Fiber Waste \$28 Billion?*, Forbes (Aug. 21, 2012), available at <http://www.forbes.com/sites/petercohan/2012/08/21/will-google-fiber-waste-28-billion/>; Ingrid Lunden, *Analyst: Google Will Spend \$84M Building Out KC's Fiber Network to 149K Homes; \$11B If It Went Nationwide*, TechCrunch (Apr. 8, 2013), available at <http://techcrunch.com/2013/04/08/google-fiber-cost-estimate/>.

<sup>72</sup> *Id.*

<sup>73</sup> *Id.*

<sup>74</sup> Calculation based on National Telecommunications and Information Administration's State Data Initiative (2014), National Broadband Map, December 31, 2013, available at <http://www.broadbandmap.gov/data-download>; U.S. Census Bureau, 2010 Census, Summary File 1, available at <http://mcdc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>.

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both into the geographic footprint served by the ISP and to particular households in that footprint.

89. Given the lack of reasonable substitutes, inelastic demand, the high cost of switching, and entry barriers, I conclude that there are extremely weak competitive constraints on the ability of Comcast or Time Warner Cable to reduce the quality of streaming service received by its subscribers from a particular OVD. For all intents and purposes, the Applicants' subscribers have nowhere else to turn, and OVDs have nowhere else to turn to reach those subscribers.

**III. Competitive Effects of the Transaction**

90. I now turn to the competitive effects of the Transaction.

**A. Comcast's Ability and Incentive to Foreclose OVDs**

91. Based on my review of data from Netflix, conversations with Netflix executives, and review of third-party data, I have concluded that Comcast has the ability and incentive to degrade significantly the quality of service that its subscribers obtain from an OVD. It has the ability since it has in fact done so, and it has the incentive because, by revealed preference, it has chosen to do so.

92. Time Warner Cable also has the ability and incentive to foreclose OVDs. However, it would have a greater ability and incentive if it were part of Comcast. Comcast would have a greater ability and incentive to foreclose OVDs if it controlled access to more subscribers as a result of its acquisition of Time Warner Cable.

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93. The evidence and economic analysis I discuss below shows that the Transaction would result in a significant increase in Comcast's already substantial market power, and that Comcast would likely use that enhanced market power to harm providers and consumers of online video.

**1. Comcast's Ability to Foreclose OVDs**

94. Comcast is able to foreclose OVDs partially or fully as a result of the following factors.<sup>75</sup>

95. Comcast controls all of the entry points into its network. Through its control of these entry points Comcast can determine whether and how its subscribers receive the content delivered by a CDN, transit provider, or any other entity that wants to access its subscribers through its network. Most importantly, it can also determine the quality of the connections by limiting the amount of content that flows between these entry points and the subscriber and, thereby, the speed and quality of delivery of that content.

96. Comcast, like a handful of other very large ISPs, is directly connected to a large portion of the Internet, such as through direct peering agreements with other large ISPs. It does not rely on transit providers the way smaller ISPs do to access the rest of the Internet. Unlike smaller ISPS, Comcast can allow the paths used by transit providers to congest without the same impact on the ability of its subscribers to access the Internet.

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<sup>75</sup> My discussion in this section is based on conversations I have had with Netflix business people and on Mr. Florance's declaration. Declaration of Ken Florance, August 25, 2014 ("Florance Declaration").

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97. ISPs typically allocate ports across traffic sources to accommodate the traffic demanded by their subscribers and increase the number of ports when necessary. Adding a port is generally easy and relatively inexpensive. ISPs do not typically degrade the quality of service obtained by their subscribers by failing to make the necessary number of ports available.
98. Like other ISPs, Comcast has the ability to increase or decrease the amount of capacity available to a CDN or transit provider by increasing or decreasing the number of ports on the routes used by the CDN or transit provider. It is my understanding that the contracts entered into between OVDs, CDNs, and transit providers with Comcast to increase the quality of connections primarily involve the number of ports (or amount of port capacity) made available, with certain service quality commitments relating to the percent of packets lost and latency.
99. Netflix's experience in delivering content to Comcast's subscribers demonstrates that Comcast has the technical ability to foreclose OVDs from obtaining access to Comcast's subscribers. Further, Comcast can do that without losing significant other Internet content that its subscribers want, contrary to what Dr. Israel claims.<sup>76</sup> In particular, it can allow its connections with transit providers to become congested without significantly affecting access to the Internet for its subscribers. As I show next, Comcast made business and technical decisions that prevented some Comcast subscribers from viewing Netflix content and degraded the viewing experience for others. After Netflix

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<sup>76</sup> Israel Declaration ¶¶ 34, 70, 83-84.

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entered into a contract with Comcast, in which it agreed to allocate additional port capacity to support Netflix's traffic, the quality of service returned to normal almost immediately.

**2. Comcast's Efforts to Prevent CDNs and Transit Providers from Carrying Netflix**

100. In 2009-2010, as part of its strategy to break the zero price equilibrium then prevailing, Comcast undertook efforts to limit Netflix's access to Comcast subscribers other than through paths on which Comcast collected a termination fee.<sup>77</sup> These efforts demonstrate that Comcast has the ability and incentive to partially or fully foreclose OVDs and other edge providers, since it has done so to both Netflix and to transit providers and CDNs that Netflix has used.
101. First, not long after Netflix started using Akamai for its CDN services, Comcast did not allocate sufficient ports to its routes with Akamai, thereby causing Netflix's connection with Akamai to congest. Netflix's understanding is that Comcast demanded a terminating access fee from Akamai in order to allocate additional ports to Akamai and that Akamai acquiesced.<sup>78</sup>
102. A similar pattern occurred with Netflix's use of Limelight's CDN service. At first, Comcast would allocate additional capacity as needed for Limelight.<sup>79</sup> Then, around August of 2010, Comcast demanded a terminating access fee from

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<sup>77</sup> My discussion in this section is based on conversations I have had with Netflix business people and on Mr. Florance's declaration.

<sup>78</sup> Florance Declaration ¶ 32.

<sup>79</sup> *Id.*



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Limelight to interconnect.<sup>80</sup> Limelight experienced significant congestion in its connections with Comcast when it refused to pay. Netflix's understanding is that Limelight acquiesced to Comcast's demand for a terminating access fee by October 2010.<sup>81</sup>

103. In November 2010, Netflix reached an agreement to use Level 3 as a CDN, because Level 3 had a long-standing settlement-free peering agreement with Comcast.<sup>82</sup> About a week after the agreement went into effect, Comcast demanded a new terminating access fee from Level 3.<sup>83</sup> After three days of heavy congestion of Level 3's connections to Comcast, Level 3 agreed to the pay the new terminating access fee.<sup>84</sup>
104. Netflix could have entered into deals with those transit providers or CDNs that had agreed to pay Comcast terminating access fees. However, in addition to bearing the cost of those fees (which were passed on by transit providers and CDNs to Netflix), Netflix would then expose itself to future, unpredictable, and financially risky increases in the terminating access fees charged by Comcast to those transit providers and CDNs.<sup>85</sup> Comcast could, at any point, engage in the hold-up strategy that I have outlined to increase those fees by congesting the transit providers and CDNs that carried Netflix, unless they paid higher fees.

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<sup>80</sup> *Id.* ¶ 34.

<sup>81</sup> *Id.* ¶ 35.

<sup>82</sup> *Id.* ¶ 36.

<sup>83</sup> *Id.* ¶ 37.

<sup>84</sup> *Id.* ¶ 38.

<sup>85</sup> *Id.* ¶ 39.

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Therefore, Netflix continued to attempt to find routes into Comcast that were not subject to terminating access fees. Ultimately, Netflix purchased transit from all of the six transit providers that operate in the United States and did not pay Comcast a terminating access fee.<sup>86</sup> Comcast failed to allocate sufficient ports to these transit providers and allowed all of the routes used by those transit providers to congest, with the exception of one transit provider, {{ }}.<sup>87</sup>  
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105. In each of these cases, Comcast made business and technical decisions that resulted in congestion and the likely degradation of the quality of Comcast's service to its own subscribers.

**3. The Quality of Service Received by Comcast Subscribers Who Use Netflix**

106. Comcast's decision not to allocate sufficient ports to transit providers limited the ability of Netflix to connect with Comcast subscribers and Comcast subscribers to connect with Netflix. All of the paths available to Netflix to deliver content to its subscribers using Comcast as an ISP—on which Comcast did not collect a

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<sup>86</sup> *Id.* ¶ 48.

<sup>87</sup> As is discussed in Mr. Florance's declaration, of those six transit providers—Cogent, Level 3, NTT, TeliaSonera, Tata and XO—Cogent, Level 3, and Tata interconnected directly with Comcast, while NTT, Telia and XO connected to Comcast through settlement-free routes with Cogent and Tata. Level 3 peered with Comcast under an arrangement that was settlement free up to a certain ratio of traffic between the two networks and Level 3 paid Comcast for any traffic above that threshold. *Id.*

<sup>88</sup> *Id.* ¶ 49.

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terminating access fee—were or became congested over the course of 2013.

The only uncongested paths potentially available to Netflix were through CDNs, which had acquiesced to paying Comcast a terminating access fee, or through providers such as Verizon and AT&T that sought to extract their own terminating access fees.

107. The quality of the video transmission received by Comcast's wired broadband subscribers who used Netflix declined over the course of 2013 as a result of Comcast limiting the ability of Netflix to reach these subscribers. As I will show below, the decline in these quality measures was gradual during most of 2013. By late 2013, however, Comcast's business and technical decisions resulted in significant congestion that caused a precipitous drop in the quality of the video transmission received by Comcast subscribers when they tried to stream Netflix. This phenomenon is similar to traffic congestion that we experience as drivers. As traffic increases, but the number of lanes available for that traffic does not, traffic slows down. Eventually that results in traffic jams that lead to a precipitous drop in the average speed of drivers.

108. I examined the hours-weighted average bitrate (measured in Mbps) for prime-time transmissions based on data Netflix made available to me. I used prime time because a disproportionate share of Netflix viewing takes place during prime-time hours and this period is most likely to be affected by congestion.<sup>89</sup>

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<sup>89</sup> As of July 2014, Netflix determines which hours constitute prime time separately for each combination of DMA, ISP, and date, defining prime time to be the three hours with the highest viewership. Prior to July 2014, prime time was determined separately for each DMA

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The hours-weighted average takes into account the speeds actually experienced by subscribers while they are watching. This measure may overstate speeds for systems with substantial congestion, as subscribers with the worst experiences may limit their viewing or stop altogether. Nevertheless, this measure provides an indicator of the overall performance of an ISP.

109. I compared Comcast to two other large cable systems that did not undertake attempts to degrade quality during this period, Cablevision and Charter. Netflix reaches Cablevision subscribers by providing Cablevision with Netflix's Open Connect appliances, which are caches of Netflix's content that are installed inside Cablevision's network. Netflix reaches Charter through transit providers. The fact that Netflix subscribers on Comcast received significantly worse performance than either of these two systems indicates that, absent the deliberate creation of scarce ports, we would not expect to see the congestion that took place on Comcast, regardless of whether Open Connect appliances or transit providers were used.

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and ISP, and was defined as the three hours with the highest viewership averaged across the month.

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111. [[

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<sup>90</sup> Netflix ISP Speed Index. This data is publicly available on Netflix's website starting in October 2013. *See USA ISP Speed Index*, Netflix, available at <http://ispspeedindex.netflix.com/usa>. For prior periods, Netflix has publicly reported only the overall average bitrates, which include both prime-time and non-prime-time streaming. For this report, Netflix provided me with a consistent series of the prime-time average bitrates going back to January 2012.

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[[ ]]

112. The Netflix experience demonstrates that Comcast has the technical ability to foreclose OVDs from accessing its subscribers and to prevent its subscribers from accessing OVDs. It degraded the video streams that its subscribers were able to obtain from Netflix for a period of approximately 13 months with increasing intensity. This ultimately resulted in the quality of the Netflix signal

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to some customers deteriorating to the point where the service became unusable.<sup>91</sup>

113. Time Warner Cable is able to foreclose OVDs, but to a lesser extent than Comcast. Because Time Warner Cable relies more than Comcast on transit providers to reach the rest of the Internet, if it allows its transit paths to congest, that would have a greater impact on its subscribers than is the case for Comcast. After an acquisition by Comcast, however, it is my understanding that the combined company would have access to the peering relationships that Comcast currently has, so that the combined company would be significantly less dependent on transit providers than Time Warner Cable currently is to reach the current Time Warner Cable subscribers.<sup>92</sup>

**B. Comcast's Incentives to Foreclose OVDs**

114. As part of its effort to "break zero," Comcast made the business decision to deviate from normal industry practice and not allocate ports to accommodate the traffic demanded by Comcast's ISP subscribers who wanted to stream video from Netflix. Not allocating ports could, in a competitive market for broadband, have imposed costs on Comcast. It could have harmed Comcast's reputation with its subscribers and induced enough subscribers to switch ISPs to significantly reduce Comcast's future expected profits.

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<sup>91</sup> Florance Decl. ¶ 52.

<sup>92</sup> Florance Decl. ¶ 63.

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115. Comcast, however, as a profit maximizing company, presumably made the business decision that the present discounted value of benefits that it would receive as a result of degrading the quality of the Netflix video stream to Comcast subscribers<sup>93</sup> was greater than the present discounted value of the costs it incurred as a result of degrading the quality of the Netflix video stream to its subscribers. It presumably concluded that, on net, it was profitable to degrade the quality of the Netflix video stream that Netflix could send and its subscribers could receive. It is therefore evident that Comcast had an incentive to reduce the quality of video transmission that OVDs send to its subscribers to the point of effectively foreclosing completely OVD access to some of its subscribers, because, in fact, it did so.

116. There are a number of economic reasons why Comcast could have had incentives to foreclose OVDs from access to its subscribers. I describe those in further detail below. For now, I focus on its incentives to impose and raise terminating access fees for OVDs. The equilibrium price for accessing ISPs was zero for many years, as I noted above. ISPs did not charge content providers, CDNs, or transit providers for connecting to their networks. Comcast started undertaking efforts to break this “zero-price equilibrium” at least as early as 2009. With respect to Netflix, it appears that Comcast degraded quality, to the point of making it almost impossible for many of its subscribers to watch

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<sup>93</sup> In principle, these benefits could include the avoided cost of allocating more ports for Comcast subscribers to stream Netflix; in practice, it is my understanding that Comcast likely incurred minimal costs since it could have reallocated ports or installed, at a relatively small cost, additional ports.



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Netflix, as part of a strategy to break the zero-price equilibrium with a major content provider.

117. Comcast and Dr. Israel claim that Comcast does not have an incentive to foreclose OVDs. They say that Comcast would not engage in such behavior because it would harm its own subscribers who would then switch to other alternative providers.<sup>94</sup> That is obviously not true since Comcast did in fact foreclose a significant OVD to secure bargaining leverage in its pricing negotiations. Comcast's incentives to foreclose OVDs are heightened by the fact that its subscribers are unlikely to switch to alternative broadband providers, as I showed above, and by the fact that its subscribers are likely to increase their viewing of Comcast video content if they cannot view content from OVDs.
118. Time Warner Cable can also realize benefits by foreclosing OVDs as part of a strategy, for example, to secure higher terminating access fees. As I noted above, Time Warner Cable is more reliant on transit providers than Comcast and therefore has less ability than Comcast to congest its transit paths without

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<sup>94</sup> *Public Interest Statement* at 157 (“Therefore, any action that the combined firm might undertake to harm edge providers would degrade its broadband service and reduce the profits it could earn. For example, if Comcast were to impair its customers’ access to popular content such as online video, it would quickly pay a steep price – both economically in terms of lost subscribers or reduced demand for broadband services, and in the court of public opinion.” (internal citations omitted)); Israel Declaration, ¶ 36 (“Given the importance of high-quality edge provider services to broadband demand, any action that the combined firm might undertake to harm edge providers would degrade the value of its broadband service to consumers and thus potentially reduce the profits it could earn. Any strategy that reduces the availability or attractiveness of edge services would reduce demand for the combined firm’s broadband services, potentially causing customers to switch to rival broadband providers or to reduce their overall consumption of broadband services, either of which would harm the combined firm’s profits.” (internal cross-references and citations omitted)).

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degrading Internet access for its subscribers. If Time Warner Cable became part of Comcast it would have access to Comcast's many connections to the Internet. Post-Transaction it would therefore not lose access to significant Internet content by limiting particular transit providers that carry an OVD. Since Time Warner Cable's costs of foreclosing an OVD would be lower post-Transaction, its incentives to do so would be higher.

**C. The Economics of the OVD Business**

119. The OVD business is a nascent industry. A number of companies provided streaming video content in the 2000s. However, these companies primarily targeted consumers—often young ones—who were willing to watch online video on their computers. Several companies including Netflix started streaming long-form video content in the late 2000s. They were targeting mainstream American households that wanted to watch video on their television sets. This method of distribution started becoming available in the late 2000s as more households had television sets or set-top boxes that, with increasingly fast Internet connections, could provide a quality video stream on those television sets. By 2010, 24 percent of American households had at least one television set connected to the Internet. By 2014, that had increased to 49 percent.<sup>95</sup>

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<sup>95</sup> Leichtman Research Group, *49% of U.S. Households Have a TV Connected to the Internet*, June 6, 2014, available at <http://www.leichtmanresearch.com/press/060614release.html>.

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120. The OVD industry has attracted a number of entrants. The early ones were Amazon, Hulu, Netflix and YouTube.<sup>96</sup> The rapid increase in broadband speeds and Internet-ready television sets together with the success of the early entrants has attracted more entrants such as Blockbuster, Crackle, and Veoh. Many OVDs with different backgrounds and approaches provide streaming video content today. These include traditional broadcast networks such as ABC and CBS, paid content networks such as A&E and Lifetime, sports leagues such as Major League Baseball and the National Basketball Association, movie services such as Crackle and Vudu, and many other OVDs.<sup>97</sup> A variety of firms are considering entry strategies. Apple offers video content on its iTunes store, sells

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<sup>96</sup> YouTube has historically specialized in short videos, although it has recently moved towards having more long-form content. Janko Roettgers, *More Than a Third of All YouTube Viewing Comes from Long-Form Content*, Gigaom (Nov. 12, 2013), available at <http://gigaom.com/2013/11/12/more-than-a-third-of-all-youtube-viewing-comes-from-longform-content/>. Amazon shifted to a subscription model in 2011. *Amazon Prime Members Now Get Unlimited, Commercial-free, Instant Streaming of More Than 5,000 Movies and TV Shows at No Additional Cost*, Amazon (Feb. 22, 2011), available at <http://phx.corporate-ir.net/phoenix.zhtml?c=176060&p=irol-newsArticle&ID=1531234&highlight>.

<sup>97</sup> The FCC has classified OVDs based on their vertical structure: programmers and content producers/owners such as ABC, NBC, CBS, Hulu, Crackle, MLB, NHL, and MLS; affiliates of online services such as Yahoo! and Facebook; affiliates of other business such as Netflix, Amazon, Apple, Google, Microsoft, Wal-Mart, and Best Buy; MVPD-affiliated OVDs such as DIRECTV, DISH, and Redbox Instant (a joint venture of Verizon and Coinstar); and OVD aggregators such as Roku and Boxee. Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, *Fifteenth Report*, 28 FCC Rcd. 10496, 10619-23 ¶¶ 223-242 (“*Fifteenth Video Competition Report*”). See also Roku, <http://www.roku.com/channels/#!/browse/movies-and-tv/by-popular> (last visited Aug. 25, 2014) and Apple, <https://www.apple.com/appletv/whats-on/> (last visited Aug. 25, 2014). Some of these OVDs that offer content channels through MVPDs may restrict certain content to subscribers of those services.

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the AppleTV streaming device, and is considering various options for providing a streaming video service.<sup>98</sup>

121. In addition to these new entrants, established MVPDs have also entered the OVD business or are planning to do so. Comcast operates its StreamPix service, which is currently offered only to Comcast subscribers.<sup>99</sup> Dish offers its DishWorld service to U.S. customers interested in international television programming and sports.<sup>100</sup>
122. OVDs and content providers typically enter into contracts that provide the OVD with the exclusive right to stream the content over some period of time on a national basis.<sup>101</sup> If an agreement is exclusive, then the OVD is the only provider allowed to stream that content in that country during the course of the contract. OVDs compete with each other and with other distributors for the right to stream video. Amazon and HBO, for example, recently entered into a

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<sup>98</sup> Shalini Ramachandran et al., “*Apple in Talks With Comcast About Streaming-TV Service—Companies Discuss Service That Would Try to Bypass Web Congestion*,” Wall Street Journal (March 23, 2014), available at <http://online.wsj.com/news/articles/SB10001424052702303949704579457554242014552>.

<sup>99</sup> Mario Aguilar, *Streampix: Comcast's Answer to Its Netflix Problem?* Gizmodo (Feb. 21, 2012), available at <http://gizmodo.com/5886977/streampix-comcasts-answer-to-its-netflix-problem>.

<sup>100</sup> See DishWorld, *About Us*, available at <http://www.dishworld.com/mission>.

<sup>101</sup> Netflix described to investors how content licensing deals work: “In general, content is bid for and licensed on a country-by-country basis (in some instances, licensing occurs on a regional basis in Latin America). See Netflix Inc., *Top Investor Questions*, available at <http://ir.netflix.com/faq.cfm#Question31057>.

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contract that gave Amazon the exclusive right to distribute some HBO content on Amazon.<sup>102</sup>

123. OVDs typically enter into contracts with content providers that involve the payment of some combination of fixed and variable fees. The OVD may pay the content provider a fixed fee for exclusive rights regardless of the number of households that view that content (perhaps up to some limit, after which there may be an additional charge). It may also pay a variable fee based on the number of households that subscribe and/or view the content. Or, it may pay a combination of fixed and variable fees. In part, these fee structures allocate risk between the OVD and the content provider.
124. The OVDs that have entered to date have followed one or more of three business models to make money from the content they provide. (1) They charge a periodic subscription fee for access to all of the content and earn revenue based on the number of subscribers. (2) They sell advertising and earn revenue based on the number of people who view that advertising. (3) They charge for viewing individual content and earn revenue based on the number of times content is viewed.
125. The economics of the OVD business implies that they must receive a “critical mass” or “minimum viable scale” to operate profitably.<sup>103</sup> An OVD must have

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<sup>102</sup> *Amazon and HBO Ink Exclusive Multi-Year Deal to bring Award-Winning HBO Programming to Prime Members*, Amazon, (Apr. 23, 2014), available at <http://phx.corporate-ir.net/phoenix.zhtml?c=176060&p=irol-newsArticle&ID=1921211&highlight>.

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access to enough content to attract repeat viewers. Someone who finishes one television series must be able to find other content to keep them interested in the OVD. An OVD, however, must expect enough viewers to make competitive bids for content.

126. The economics of the OVD business also implies that there is a “virtuous circle” between viewers and content. More content enables an OVD to obtain more viewers; more viewers enable an OVD to secure more content. Although these positive feedback effects may diminish with size, they tend to drive growth at least in the early years of an OVD. The reverse is true as well. A decline in viewers limits the ability to secure content. Less content results in fewer viewers.

127. OVD profits depend largely on the amount of viewing the content generates. Subscription revenue ultimately depends on whether an existing or potential subscriber believes the household will engage in enough viewing to justify the monthly subscription charge. The revenue for advertising is directly proportional to the amount of viewing by consumers. The revenue for pay-for-view is directly proportional to the number of people who purchase particular content, but that in turn depends on the amount of viewing the consumers do. The OVD may incur costs that depend on viewing as well. In particular, OVDs

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<sup>103</sup> See, e.g., Carl Shapiro. *Exclusivity in Network Industries*, 7 GEO. MASON L. REV. 673 (1999); David S. Evans (2009), “How Catalysts Ignite: The Economics of Platform-Based Start-Ups,” in Annabelle Gawer (ed.), *Platforms, Markets and Innovation*, Edward Elgar Publishing, 99-130; and, David S. Evans and Richard Schmalensee, Failure to Launch: Critical Mass in Platforms Businesses, 9 Review of Network Economics 4 (2010).

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that have entered into content contracts with variable fees will incur costs from additional viewing (depending on whether the fees vary with subscribers and/or views).

**D. The Ability of ISPs to Harm OVDs**

128. I now examine the extent to which ISPs could harm OVDs by foreclosing access to their subscribers. My analysis is based on empirical evidence that is available for Netflix. I would expect similar conclusions to apply to other OVDs, although OVDs are most vulnerable when they have long-term fixed price licenses for content.

**1. The Role of Fixed Costs for Content**

129. Netflix enters into contracts to license content for periods of 6 months to five years; most contracts are for several years.<sup>104</sup> It typically pays a fixed fee to license that content and does not pay variable fees based on the number of views or the number of subscribers. It depreciates the cost of these contracts on a straight-line basis to account for its experience that content becomes less valuable with age, in part, because most the subscribers who are interested in that content will have watched it.

130. Taking this depreciation into account, Netflix's fixed payments for content accounted for 68.1 percent of Netflix's streaming operating costs in 2013 and

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<sup>104</sup> *10-K for Period Ending 12/31/2013*, Netflix 29, available at <http://files.shareholder.com/downloads/NFLX/3390381218x0xS1065280-14-6/1065280/filing.pdf>.

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74.2 percent in 2012. Table 5 shows the breakdown of streaming operating costs for 2012-2013.

**Table 5: Operating Expenses for Netflix's Domestic and International Streaming Segments, 2012-2013**

<i>Operating Expense (Streaming)</i>	<i>2012</i>	<i>2013</i>
Content Costs	74.2%	68.1%
Marketing Costs	22.3%	16.1%
Other Costs of Revenue	3.5%	15.8%

Sources: *10-K for Period Ending 12/31/2013*, Netflix, available at <http://files.shareholder.com/downloads/NFLX/3390381218x0xS1065280-14-6/1065280/filing.pdf>; Netflix, Inc., *10-K for Period Ending 12/31/2012*, Netflix, available at <http://files.shareholder.com/downloads/NFLX/3390381218x0xS1065280-13-8/1065280/filing.pdf>.

## **2. The Impact of Loss of Subscribers on Profits**

131. In 2013, Netflix had an operating profit margin of 22.6 percent for its domestic streaming segment, based on revenue from 31.7 million paid domestic streaming subscribers.<sup>105</sup> {{

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<sup>105</sup> *10-K for Period Ending 12/31/2013*, Netflix, available at <http://files.shareholder.com/downloads/NFLX/3390381218x0xS1065280-14-6/1065280/filing.pdf>. Note that in Netflix's financial statements, technology and development costs are counted as an operating expense for the company as a whole, but are not counted as an operating expense for any of its operating segments. If technology and development costs were to be allocated to the operating segments, it would reduce the reported operating margin for the domestic streaming segment (as well as for the other operating segments – international streaming and domestic DVD).



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}} Over time, Netflix would be able to mitigate these losses by reducing its future licensing of content as deals expire; however, as a result of positive feedback effects working in reverse, it would see further decreases in subscribers who would respond to having less content available.

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<sup>106</sup> Following Netflix's financial reporting, in these counterfactuals, the overall operating margin includes costs for both technology and development and general and administrative, but the domestic streaming operating margin does not include the allocated amounts for these costs. The allocation of these costs is only used in these calculations for the purpose of determining how much these expenses decline when the number of domestic streaming subscribers falls.

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134. {{

}} OVDs with variable fee structures would reduce some of their costs as revenue fell thereby reducing the amount of profit lost. I would expect, however, that these OVDs would either lose out on future content deals or have to make fixed-price guarantees since content providers would recognize that the fees they could expect would be smaller.

**E. The Economic Relationship between ISP Size, Bargaining Leverage and, the Price for Terminating Access**

135. I show that larger ISPs have more bargaining leverage and can therefore likely demand and receive higher prices for terminating access. I then report empirical evidence concerning the payments that Netflix has paid ISPs that confirms this conclusion.

**1. Bargaining Leverage and ISP Size**

136. Suppose that an ISP seeks payments from an OVD for access to the ISP's subscribers. The OVD will consider the economic impact on its business of failing to reach an agreement. It will know that the ISP can fully or partially foreclose access and thereby impose economic costs on the OVD. A failure to reach an agreement with an ISP that accounts for a very small portion of the OVD's customers would not have significant effects on the financial situation of the OVD. A failure to reach an agreement with an ISP that accounts for a very large portion of the OVD's customers could have a devastating effect on the financial situation of the OVD.

137. Most ISPs are not large enough to use their ability to foreclose access to their subscribers as bargaining leverage. There are more than 400 ISPs in the United States. I report the estimated share of subscribers for 14 of the largest wired ISPs. I report shares based on each ISP's share of broadband subscribers with plans with maximum advertised download speeds of at least 3 Mbps and upload

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speeds of at least 768 Kbps—the cutoff used by Dr. Israel.<sup>107</sup> On this basis, the top 14 ISPs accounted for roughly {{ }} of ISP subscribers in the United States in 2013. The smallest of these 14, Cincinnati Bell, accounted for {{ }} of wired broadband subscribers. Three medium-sized ISPs (Cox, Bright House Networks, and RCN) do not have their subscriber base separately reported in this data, but account for less than {{ }} of wire broadband subscribers

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<sup>107</sup> Israel Declaration, ¶ 42. All calculations are based on the estimated number of wired broadband subscribers with maximum advertised speeds of at least 3 Mbps down and 768 Kbps up as of June 30, 2013. For Comcast and Time Warner Cable, the number of subscribers meeting these conditions is taken from the Form 477 data included in Letter from Francis M. Bruno, Counsel, Comcast, to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-57 (June 27, 2014) (“*June 27 Letter*”) and Supplemental Data to June 27 Letter, MB Docket No. 14-57 (June 27, 2014). For the other ISPs, the data on the total number of subscribers is taken from Leichtman Research Group, *About 295,000 Add Broadband in the Second Quarter of 2013*, Aug. 20, 2013, available at <http://www.leichtmanresearch.com/press/082013release.html>. Note that this data source excludes three large ISPs (Cox, Bright House, and RCN) and many minor ISPs. It reports that Cox, Bright House, and RCN together account for less than 6.7 million subscribers. Other sources have estimated the Cox has about 4.6 million broadband subscribers, Bright House has about 2.4 million broadband subscribers, and RCN has about 300,000. See <http://blog.actiontec.com/broadband-numbers/>; Shalini Ramachandran, “Bright House to Build Ultrafast Broadband Network,” *Wall Street Journal* (March 12, 2014), available at <http://online.wsj.com/news/articles/SB10001424052702303546204579435592919358008>. For the ISPS other than Comcast and Time Warner Cable, I estimated the share of these subscribers that meet the speed threshold (3 Mbps down / 768 Kbps up). For the cable ISPs included in the table, I assumed that the percentage of subscribers meeting this threshold was the same as the weighted average for Comcast and Time Warner Cable. For all other ISPs, I assumed that the percentage of subscribers meeting this threshold was such that the overall average of the share of subscribers meeting this threshold, across all ISPs, was equal to the overall average reported by the FCC. See *2014 Internet Access Services Report*. The denominator for the shares is taken to be the number of broadband subscribers with maximum advertised speeds of at least 3 Mbps down / 768 Kbps up, as reported in that FCC report.



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fraction of Netflix's margin that each one of these cable systems could eliminate if it foreclosed Netflix from access to its subscribers. They range from {{  
}} for CenturyLink to {{  
}} for Comcast. The ability of these very large ISPs to threaten to impose harms on OVDs increases dramatically as they increase in size.

141. All else being equal, I would expect that ISPs with greater bargaining leverage, owing to their ability to foreclose an OVD from reaching a larger portion of wired broadband subscribers and thereby deny profits from those subscribers, would be able to demand and receive higher prices for reaching each of their subscribers. This result is based on my experience as an economist and familiarity with the relationship between the size of negotiating parties and the prices they negotiate for a number of businesses in several industries that I have analyzed, in a confidential capacity, over the years.<sup>108</sup> As I show next, this expectation is confirmed by the terminating network access fees that ISPs have demanded and received from Netflix.

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<sup>108</sup> It is possible to identify some assumptions under which economic theory would show a different result as Dr. Israel has done. As I discuss in detail below, however, there is significant empirical evidence that is consistent with my conclusion and inconsistent with Dr. Israel's.

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**2. Netflix Payments for Access to ISPs**

142. It is my understanding, based on interviews with Netflix employees, including Ken Florance, my review of the declaration submitted by Mr. Florance in these proceedings, and my detailed analysis of Netflix’s interconnection agreements with large ISPs, that {{

}} In particular:

- a. Excluding the largest four ISPS, ISPs have not been able to impose terminating access fees on Netflix. Smaller ISPs have been unable to demand and receive payment. They continue to adhere to the zero price equilibrium.
- b. Some of the largest ISPs began seeking compensation around 2010. In several cases these ISPs, like Comcast, made business and technical decisions that resulted in the ISP’s subscribers experiencing significant reductions in the quality of streaming video from Netflix. These very large ISPs included AT&T and Verizon.

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143. Netflix began negotiating over terminating access fees with these large ISPs because of the impact that these large ISPs could have on Netflix's business. Netflix anticipated, based on its business experience, {{

}} In some cases, particularly for Comcast and Verizon, the degradation of quality became so severe that Netflix believed that an increasing number of its customers who used those ISPs would not be able to watch Netflix videos at all at least during prime time.

144. In February 2014, Netflix entered into an agreement with Comcast concerning allocating port capacity and making other business and technical arrangements that would ensure that Comcast subscribers would receive sufficiently high quality video streams.

145. Other very large ISPs also engaged in a similar bargaining strategy. My understanding is that some of those ISPs, like Comcast, allowed congestion to degrade the speed of Netflix traffic for their broadband subscribers. They also sought payment for uncongested access to their respective networks. After reaching the agreement with Comcast, Netflix entered into subsequent agreements with the other extremely large wired broadband ISPs: Verizon, AT&T and Time Warner Cable.

146. Based on these agreements, {{



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147. {{ }} The other issue involves the extent to which an ISP can degrade Netflix's traffic without degrading significantly access to other Internet content that its subscribers need. My understanding is that AT&T, CenturyLink, Comcast, and Verizon have peering relationships that enable them to degrade Netflix traffic without substantially degrading other traffic to and from the broader Internet. For these ISPs, the cost of degradation is relatively low. CenturyLink therefore, has substantially more bargaining leverage than does Charter, even though they have roughly similar numbers of subscribers.

148. These results confirm that among the largest ISPs, {{ }} I would therefore expect that, post-Transaction, Comcast would be able to demand and receive higher terminating access fees from OVDs than it would be able to demand and receive absent the consolidation with Time Warn Warner.

**F. The Economic Analysis of Public Harms from the Transaction**

149. I now summarize the key findings, each of which is based on significant empirical evidence, I have reached to this point:

- a. Comcast and Time Warner Cable each have essentially monopoly bottlenecks for the provision of wired broadband to their subscribers, given that consumers have limited alternatives to these cable broadband

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providers and the cost of switching to an alternative provider, if available, is very high.

- b. Comcast has the ability to partially or fully foreclose access by an OVD to its subscribers as a result of its extensive connections to the Internet. Comcast could make these connections available to Time Warner Cable.
- c. Comcast has the ability to impose significant harm on an OVD as a result of partial or full foreclosure. The merged firm would have greater ability both because of its increased size and because of its ability to congest transit paths at relatively low cost to itself.
- d. The merged firm would have significantly more bargaining power over OVDs than Comcast or Time Warner Cable have individually.
- e. Comcast does not risk losing meaningful profits as a result of subscribers switching to other ISPs when Comcast degrades the quality of an OVDs streaming service to its subscribers.

150. These findings contradict the underpinnings of the analysis that Comcast's economist, Dr. Israel, has presented in support of the proposition that the Transaction could not reduce competition and thereby cause public harm. Therefore, I recommend that the FCC reject their findings that the Transaction could not result in public harm. Comcast and Dr. Israel have provided no credible economic or empirical evidence to support that conclusion.

151. In the remainder of my declaration, I describe two plausible scenarios under which the Transaction could reduce competition and thereby cause public harm. Both scenarios are consistent with the empirical findings that I have reported above.

**1. Raising Terminating Access Prices**

152. The Transaction would likely result in a unilateral price increase resulting entirely from the increased market power that Comcast would have as a result of

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the Transaction. Comcast would likely use its increased bargaining leverage to demand and receive higher terminating access fees from OVDs than the fees it would demand and receive in the absence of the Transaction. Based on figures for June 2013, Comcast controls wired broadband access to approximately {{ }} households accounting for {{ }} of all households with wired broadband. If Comcast also owned Time Warner Cable (and accounting for the divestiture) it would control wired broadband access to approximately {{ }} households, accounting for 35.5 percent of all households with wired broadband access. As a result, the number and share of households for which it would control wired broadband access would increase by about {{ }}.<sup>109</sup>

153. These estimates likely understate the likely effect of the Transaction on Comcast's terminating access fees. I showed earlier that consumers are moving

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<sup>109</sup> I follow the methodology used by Comcast and Dr. Israel. Israel Declaration, ¶ 42; June 27 Letter; Supplemental Data. All calculations are based on the estimated number of wired broadband subscribers with maximum advertised speeds of at least 3 Mbps down and 768 Kbps up as of June 30, 2013. The number of pre-merger subscribers meeting these speed thresholds is taken from the Form 477 data included in the Supplemental Data. The post-merger shares need to account for the divestitures. To do so, I scale the number of Time Warner Cable divestitures down by the ratio of Time Warner Cable subscribers meeting the speed thresholds in the states where the divestitures occur. Next, I scale the number of Comcast divestitures down by the ratio of Comcast subscribers meeting the speed thresholds, and I scale the number of Charter subscribers received by Comcast down by the ratio of Charter subscribers meeting the speed threshold in the states reported in the Supplemental Data. Note that I have followed Comcast and Dr. Israel in using the number of video subscribers transferred in the divestiture transactions as if it were the number of broadband subscribers to be transferred. It may be more appropriate to use the number of broadband subscribers being transferred, in which case the post-divestiture market share of the combined firm would be slightly larger. The denominator for the shares is taken to be the number of broadband subscribers with maximum advertised speeds of at least 3 Mbps down / 768 Kbps up. See *2014 Internet Access Services Report*.

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rapidly away from DSL to cable and fiber. DSL is therefore becoming a less relevant alternative for consumers that want to use many of the broadband-intensive features including video chat, online video, and games. Comcast and Time Warner Cable would account for {{ }} percent of broadband subscribers, exclusive of DSL other than U-Verse, post-Transaction after accounting for divestitures. That is an increase from {{ }} percent as of June 30, 2013.<sup>110</sup>

154. {{

}} I would therefore expect that Comcast would be able to demand and receive higher prices given the Transaction than it would be able to demand and receive without the Transaction. The higher prices of course would apply for access to Comcast subscribers in Comcast's current local markets, but also to Comcast subscribers in Time Warner Cable's current local markets. As part of Comcast, the terminating access fee for Time Warner Cable would

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<sup>110</sup> The number of subscribers for Comcast and Time Warner and the net number of subscribers to be divested is taken from the the data included in Letter from Francis M. Bruno, Comcast, to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-57 (June 27, 2014) ("June 27 Letter") and Supplemental Data to June 27 Letter, MB Docket No. 14-57 (June 27, 2014). For the total number of broadband subscribers, I start from the number of non-wireless, non-DSL connections reported by the FCC. Federal Communications Commission (2014), "Internet Access Services: Status as of June 30, 2013," available at [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-327829A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-327829A1.pdf). Since this number excludes non-FTTP U-Verse subscribers, I add the total number of U-Verse subscribers reported by AT&T in its quarterly report. AT&T Inc., "10-Q for the Period Ending June 30, 2013," available at [http://phx.corporate-ir.net/phoenix.zhtml?c=113088&p=irol-sec&control\\_selectgroup=Quarterly%20Filings](http://phx.corporate-ir.net/phoenix.zhtml?c=113088&p=irol-sec&control_selectgroup=Quarterly%20Filings). This is conservative, since it double counts the FTTP U-Verse subscribers.

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increase to the level charged by Comcast, and the level charged by Comcast would increase as a result of its increased bargaining power.

155. Comcast has engaged in a strategy of brinksmanship with Netflix and other transit providers and CDNs that Netflix has relied on to break the zero-equilibrium price for access to its subscribers. That effort has been very controversial because it has gone against long-standing industry practice. Now that Comcast has broken that equilibrium, and set a precedent of charging OVDs, CDNs, and transit providers for access to its subscribers, Comcast can fully exploit its ability to foreclose OVDs from access to its subscribers and secure a significant portion of the incremental profits that OVDs earn from those subscribers.

156. Comcast, like other ISPs, is a two-sided platform that connects providers of online videos and consumers of online videos. The total price that this platform charges for a connection between providers and consumers equals the sum of the prices it charges both sides. I have already concluded that if the Transaction were approved, the merged entity would likely be able to raise prices significantly to OVDs. It is possible that Comcast could pass through some of the revenue received from OVDs in the form of lower prices to its subscribers some of whom consume online videos. Given the significant market power that Comcast has over its subscribers, it is unlikely that it would pass on enough of

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that revenue to offset the price increase to OVDs<sup>111</sup> Therefore, it is likely that Comcast would raise the total price of connection significantly if the Transaction were approved. Again, the total price for Time Warner Cable would increase to the Comcast level once it is part of Comcast, and the Comcast level would increase as a result of its increased bargaining power.

**2. Bargaining Model Relied on by Dr. Israel**

157. Comcast's economist, Dr. Israel, claims, contrary to the conclusion I have just reached, that the Transaction would not increase Comcast's bargaining power, and therefore there is no concern that Comcast would increase prices to OVDs.<sup>112</sup> I show that his analysis is not supported by evidence, theory, or common experience.
158. Dr. Israel relies on a simple theoretical model of bargaining to argue that if the per-user profit for an OVD increases with the number of subscribers, a merger of ISPs would actually improve the bargaining position of an OVD with respect

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<sup>111</sup> Firms that are not operating in highly competitive markets typically do not pass on anything close to 100 percent of cost reductions. *See*, survey of the empirical pass-through literature in David S. Evans and Abel Mateus (2011), "How Changes in Payment Card Interchange Fees Affect Consumers Fees and Merchant Prices: An Economic Analysis with Applications to the European Union," Working Paper, *available at* [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1878735](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1878735). In testimony before the House Judiciary Committee, Comcast Executive Vice President David Cohen was asked "What can be done to help lower prices?" Mr. Cohen said he did not have an answer for that question and offered only that the deal "has the potential to slow the increase in prices." *See*, Amy Schatz, *Lawmakers to Comcast and Time Warner: Your Cable Deal Helps Consumers How?* *re/code* (May 8, 2014), *available at* <http://recode.net/2014/05/08/lawmakers-ask-how-comcast-time-warner-cable-deal-helps-consumers/>. Note that even if Comcast did pass on any of the revenue gains from OVDs to consumers, the consumers may face additional charges from the OVDs as a result of their higher costs.

<sup>112</sup> Israel Declaration ¶¶ 89-105.

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to access to subscribers of the merged entity, not worsen it. Before I go into the details of the model of bargaining that Dr. Israel references, it is important to note two fundamental flaws in his analysis.

159. First, Dr. Israel's position is fundamentally at odds with the fact that larger firms generally receive better pricing terms.<sup>113</sup> Most importantly, facts concerning OVD payments to ISPs are not consistent with his model. As I discussed above, the evidence here is that small ISPs receive no payments from OVDs while larger ISPs receive significant payments. Facts trump theory.
160. Second, the economic model that Dr. Israel considers does not, in fact, attempt to address how bargaining power changes with firm size, despite Dr. Israel's assertion to the contrary. Dr. Israel claims that the literature he relies on "demonstrates that mergers between firms that are not horizontal competitors with each other will increase the parties' bargaining power only under specific,

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<sup>113</sup> Tasneem Chipty and Christopher M. Snyder, *The Role of Firm Size in Bilateral Bargaining: A Study of the Cable Television Industry*, 81 *The Review of Economics and Statistics*, 326, 326 (1999) ("The Cable Television's industry's trade press often claims that large, horizontally integrated cable operators, some involving hundreds of local systems, are able to bargain for lower prices in their negotiations with suppliers of program services. This claim is not unique to cable; for many industries, the received wisdom in the business press is that buyer size confers a bargaining advantage." (internal citations omitted)). *See also*, F.M. Scherer and David Ross, *Industrial Market Structure and Economic Performance*, Boston: Houghton Mifflin, at 533-535 (1990); Ute Schumacher (1991), *Buyer Structure and Seller Performance in U.S. Manufacturing Industries*, 73 *Review of Economics and Statistics* 277, 277-284; Yungsan Kim, *Big Customers, Selling Expenses, and Profit Margin*, 1 *Journal of Economic Research* 311, 311-326 (1996); Rajeev K. Tyagi (2001), *Why Do Suppliers Charge Larger Buyers Lower Prices?* 49 *Journal of Industrial Economics* 45, 45 ("The popular press and many academic studies point out the phenomenon of upstream suppliers charging their larger downstream buyer firms, relative to smaller downstream buying firms, lower prices.").

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restrictive assumptions and that the effects may well go the other way.”<sup>114</sup> As I discuss further below, the literature he relies on *assumes* that the buyer and seller split the gains from trade evenly, 50/50, regardless of the size or strategic position of the buyer or seller.<sup>115</sup> The split that a buyer or seller gets is the measure of bargaining power from the standpoint of economics—a higher split corresponds to more bargaining power. Therefore, the economic models do not consider at all whether larger firms may have more bargaining power. The model assumes an invariant 50/50 split and considers only the extent to which the gains from trade may vary by firm size.

161. Dr. Israel relies primarily on a paper published in 1999 by Chipty and Snyder in which the authors develop a simple theoretical model of negotiations and apply this model to negotiations between MVPDs and program providers.<sup>116</sup> They consider the situation in which two types of firms enter into a negotiation over something of value that they create as a result of engaging in exchange. Through the negotiation, they will decide how to split the value between them. Suppose the size of a firm is measured by the quantity that it buys or sells. The

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<sup>114</sup> Israel Declaration ¶ 101.

<sup>115</sup> As I discuss further below, Dr. Israel does reference a paper by Adilov and Alexander in which they make the point that the other papers relied on by Dr. Israel fail to consider changes in bargaining power. Dr. Israel’s only response to this is to argue that the illustrative reasons provided by Adilov and Alexander for why bargaining power may vary depending on firm size are not relevant in this case. I discuss below why Dr. Israel’s claim is wrong.

<sup>116</sup> Israel Declaration ¶ 101 (citing Tasneem Chipty and Christopher M. Snyder, *The Role of Firm Size in Bilateral Bargaining: A Study of the Cable Television Industry*, 81 *Review of Economics and Statistics* 326, 326-340 (1999)).



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authors consider the impact on an increase in size of one of the firms on the share of the value they get.

162. The Chipty-Snyder model assumes that each party negotiates as if it is the marginal party with which the other side is negotiating and that it receives one half of the surplus that results from an agreement, with the counter-party receiving the other half.<sup>117</sup> Again, this assumption is that the bargaining power is invariant to firm size and is purely an assumption of the model rather than something that the model is used to prove. Under these assumptions, the Chipty and Snyder model shows that if one of the firms in the negotiation becomes larger it will get a larger payment if the value they have to split increases at a diminishing rate with the size of that firm.<sup>118</sup> (In this case the function that relates value and size is “concave.”) That result accords with intuition and experience—bigger firms do better in negotiations.
163. Their model shows, however, that if a firm becomes larger, it will get a smaller payment if the value the parties have to split increases at an increasing rate with the size of that firm.<sup>119</sup> (In this case the function that relates value and size is “convex.”) That result, of course, is surprising since it says that smaller firms do better in negotiations.

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<sup>117</sup> For simplicity and because Dr. Israel focuses on the division of the seller’s profit, I assume that there is no profit directly generated by the buyer as a result of the agreement between the parties.

<sup>118</sup> Alternatively, if the direction of payment flows from the firm that is getting larger, then the payment it makes will be smaller. In any event, it will be advantaged.

<sup>119</sup> Alternatively, if the direction of payment flows from the firm that is getting larger, then the payment it makes will be larger. In any event, it will be disadvantaged.

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164. Dr. Israel applies this analysis to the relationship between ISP size and access prices to OVDs. To explain how the Chipty-Snyder model applies in this context, consider a simple example. Suppose the profit to the OVD from the last subscriber is \$10, the profit from the second-to-last subscriber is \$9, and the profit from the third-to-last subscriber is \$8. An ISP with only one subscriber would generate a per-subscriber profit of \$10 for the OVD as a result of reaching an agreement and assuming that that buyer is the marginal (last) agreement reached. The ISP would receive half of that \$10 profit, or \$5, per subscriber. An ISP with two subscribers would generate a per-subscriber profit of \$9.50 (average of \$10 and \$9) for the OVD as a result of reaching an agreement and assuming that that ISP is the marginal (last) agreement reached. The ISP would receive half of that \$9.50 profit, or \$4.75, per subscriber. Similarly, an ISP with three subscribers would generate a per-subscriber profit of \$9 (average of \$10, \$9 and \$8) for the OVD as a result of reaching an agreement and assuming that that ISP is the marginal (last) agreement reached. The ISP would receive half of that \$9 profit, or \$4.50, per subscriber. Thus, the smallest ISP in this example receives \$5 per subscriber, while the largest receives \$4.50 per subscriber.
165. Dr. Israel argues that there is no reason to believe that the profit per subscriber decreases in the number of subscribers. If profit per subscriber increased with the number of subscribers—the convex case—his analysis would imply that smaller ISPs would be able to charge OVDs higher prices, as in the above example. Profit per subscriber could increase with the number of subscribers,

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for example, if there were scale economies in OVD costs. If profit per subscriber was constant, regardless of the number of subscribers—the linear case which is the dividing line between convex and concave—his analysis would imply that ISPs would charge OVDs the same price regardless of ISP size. Dr. Israel concludes from this analysis that there is no reason to believe that the merged Comcast-Time Warner Cable entity would have greater bargaining power over OVDs.<sup>120</sup> The conclusion that smaller ISPs could charge higher prices in the presence of scale economies is counterintuitive and inconsistent with common experience that larger firms can demand better deals for themselves.

166. Not surprisingly, his conclusion, for which he offers no empirical support, is wrong as a matter of fact. As we have seen, most ISPs, covering a wide size range, charge zero. Only very large ISPs charge positive fees. {{  
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167. It is useful to understand how the Chitty-Snyder model leads to a theoretical result that is so implausible. Most critically, as I have noted, the model assumes that the bargaining position of all sellers is the same with respect to all buyers. It assumes that all sellers and buyers will split profits 50/50 regardless of the size of the seller or buyer. That is, the split that a buyer receives—that is, its bargaining power—is assumed to be invariant with the size of the buyer. (To be consistent with Dr. Israel's discussion, I adopt the convention he uses that the

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<sup>120</sup> Israel Declaration ¶ 102.

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ISPs are “buyers” and the OVDs are “sellers,” even though the payment flows from the OVDs to the ISPs.) The model therefore assumes that Comcast, with 20.6 million subscribers would receive the same 50/50 split as Cincinnati Bell, which has only 268,400 subscribers, and the same 50/50 split as an extremely small ISP that might have only 30,000 subscribers.<sup>121</sup> Given that the Chipty-Snyder model does not address how bargaining power varies by size of seller (ISP) and is inconsistent with the empirical evidence, it is not relevant for analyzing the effects of the proposed Transaction.

168. In later work, Adilov and Alexander (2006) address the failure of Chipty and Snyder (1999) to allow for differences in bargaining position across firms and, in particular, for changes in bargaining position post merger.<sup>122</sup> They find that:

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<sup>121</sup> The only factor determining whether a buyer receives better or worse pricing in the Chipty-Snyder model is whether its contribution to the seller’s profits are higher or lower on a per-subscriber basis, when viewed as the marginal buyer. It is also likely that the marginal buyer assumption is not satisfied in real-world negotiations. This assumption says that with, for example, a seller with significant scale economies such that the marginal subscriber is significantly more profitable than initial subscribers, a tiny buyer would be able to go to the seller and negotiate based on the profitability of that marginal subscriber and would be able to obtain better terms than a much larger buyer.

<sup>122</sup> Nodir Adilov and Peter J. Alexander, *Horizontal Merger: Pivotal Buyers and Bargaining Power*, 91 *Economics Letters* 307, 307-311 (2006). Subsequent work after Adilov and Alexander (2006) provide further reasons to believe that the assumption in Chipty and Snyder (1999) that bargaining power does not vary across buyers is flawed. Caprice (2007) finds that even if sellers’ cost functions are concave, larger firms can receive better pricing if their size puts them in a sufficiently better position if they fail to reach an agreement with one of the sellers and seek to renegotiate with the other sellers. Stéphane Caprice (2007), *Upstream Competition and Buyer Mergers*, Working Paper, available at <https://www.diw.de/sixcms/detail.php/86150>. Smith and Thanassoulis find that even when sellers’ profit functions are concave, if there is sufficient uncertainty in whether deals among buyers and sellers are reached, the largest buyer will receive the most favorable pricing because the scale it is providing—which becomes certain if a deal is reached—becomes more valuable under uncertainty. See Howard Smith and John Thanassoulis (2012), *Upstream*

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Chipty and Snyder (1999) assume that bargaining power will be unaffected by merger and argue that the shape of supplier's gross surplus function provides sufficient guidance for regulatory purposes....We show that if there are asymmetries in bargaining power, these results may not hold. On the contrary, the newly merged pivotal firm may find its bargaining position significantly enhanced by merger. This result may be of interest to antitrust and regulatory agencies, in particular the Justice Department and the Federal Communications Commission.<sup>123</sup>

169. Dr. Israel references the Adilov-Alexander model, although not the conclusions cited above. He attempts to argue that the reasons they give why the merged entity may have greater bargaining power do not apply in this case. I note that the reasons in question were only examples of factors that Adilov and Alexander believed might allow a merged firm to have greater bargaining power, rather than an exhaustive list of factors. The factors, as cited by Dr. Israel, were the following: “(i) the merger may give the buyers more information about prices and other contractual terms; (ii) the merger may result in retaining a more skilled bargaining team (e.g., the best negotiators from each merging party); and

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*Uncertainty and Countervailing Power*, 30 International Journal of Industrial Organization 483, 487 (2012).

<sup>123</sup> Adilov and Alexander (2006), at p. 311. Adilov and Alexander (2006) also address a “pivotal buyer” model of bargaining. Dr. Israel references this model in his declaration: “Raskovich (2003) extended the model of Chipty and Snyder (1999) to show that if a merger leads a buyer to become “pivotal”—i.e., sufficiently large to impact the production decision of the seller—it is actually disadvantaged in its negotiations relative to a non-pivotal buyer because it internalizes some of the seller’s costs.” See Israel Declaration, ¶ 101, referencing Alexander Raskovich (2003), “Pivotal Buyers and Bargaining Position,” *The Journal of Industrial Economics*, LI(4): 405-426. Dr. Israel notes that he does not believe that the merged entity would be pivotal to any negotiating partner. And while I noted above that not having access to the merged entity’s subscribers would have an extremely large effect on Netflix’s profitability, I am not saying that Netflix would not be able to operate at all if it could not come to terms with the merged entity. In any event, Adilov and Alexander (2006) also consider the Raskovich (2003) model and reach the same conclusions as with respect to Chipty and Snyder (1999), in that the model fails to capture changes in bargaining position as a result of the merger.

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(iii) firm size and outside options may be positively correlated (larger firms may have a better fallback position irrespective of whether they are “buyers” or “sellers”).”<sup>124</sup>

170. Dr. Israel dismisses each of these without factual support. As to the first two reasons, while I do not have access to the internal data and documents of the merging parties, I note that if Comcast and Time Warner Cable negotiated significantly different terms and if those differences resulted from asymmetries between the parties in the informational and bargaining skill advantages noted in the first two factors, that is something I would expect would be easily and directly remedied post-merger.

171. Dr. Israel also dismisses the third factor, arguing that “with or without the merger, the content provided by edge providers is important to consumers (and thus to the demand for an ISP’s broadband business), and the loss of such content (due to failure to reach a deal with an edge provider or a CDN or transit provider) would be harmful to the end users who can no longer access that content and thus to the ISP’s broadband business. There is no basis to conclude that bringing together two ISPs with distinct footprints lessens the harm from loss of that content for any particular end user in a given area.”<sup>125</sup>

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<sup>124</sup> Israel Declaration ¶ 101.

<sup>125</sup> Israel Declaration ¶ 102. He also argues, with no factual support, that “[i]n fact, to the extent that edge providers are offering content that is attractive to consumers, the harm from degrading that content may increase with the size of the buyer as a large ISP may have more reputational assets to protect. For example, problems anywhere in the network (e.g., a

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172. Dr. Israel does not consider the fact that larger ISPs may be more likely to have greater bargaining power because they are more likely to vertically integrate and have better options in the absence of being able to reach an agreement. In the case of Comcast, it is an owner of content and benefits to the extent that decreased use of OVDs leads to greater consumption of its content. Comcast has also made greater investments than other ISPs in streaming video. Absent a merger, Time Warner Cable does not experience the same benefits as Comcast. After the merger, the combined entity would benefit from these factors with respect to the former Time Warner Cable subscribers.

173. In his attempted dismissal of Adilov and Alexander, Dr. Israel also ignores their finding that “[u]ltimately, the relationship between firm size and bargaining power is empirical, which implies a need for careful case-by-case studies of merger applications.”<sup>126</sup> {{

}} Dr. Israel points only to what he notes as a “limited” empirical literature, citing a finding in Chipty and Snyder that “empirical analysis of a related industry (bargaining between MVPDS and content providers) indicates that bargaining effects can, go the other way, with a merger leading to reduced bargaining power.”<sup>127</sup> In particular, he quotes Chipty

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particular congested link) might harm Comcast’s reputation everywhere—meaning that a larger ISP may have a stronger incentive to protect quality throughout the entire network).”

<sup>126</sup> Adilov and Alexander (2006), p.310.

<sup>127</sup> Israel Declaration ¶ 104.

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and Snyder as finding that “large buyers do not benefit from positive bargaining effects in the cable television industry.”<sup>128</sup>

174. The empirical analysis conducted by Chipty and Snyder was not of rates paid by cable companies to content providers. Rather, it was an attempt to estimate the profit function of content providers. Chipty and Snyder concluded that the profit function was convex, so that (giving the full quote, rather than the excerpt selected by Dr. Israel):

The result emerging consistently from the alternative methodologies is that the surplus function of program-service suppliers is convex. Under the maintained assumptions of the theoretical model, this result implies that large buyers do not benefit from positive bargaining effects in the cable television industry.<sup>129</sup>

175. That is, Chipty and Snyder did not undertake an empirical analysis that validated the results of the model (which ignored differences in bargaining power across buyers). Rather, they undertook an empirical analysis of sellers’ profit functions, which under the assumptions of their model was determinative as to the prices that buyers paid. They then noted that if the assumptions of their theoretical model were correct, that would imply that larger buyers do not receive better terms from content providers. Their analysis provides no empirical support for their model or for Dr. Israel’s reliance on it.

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<sup>128</sup> Israel Declaration ¶ 104, n.134 (citing Chipty and Snyder at 326).

<sup>129</sup> *Chipty and Snyder* at 326.



### 3. Comcast Strategies to Suppress Competition With MVPD Services

176. The expansion of OVDs provides consumers with alternatives to video programming typically provided by MVPDs. Some people, including particularly younger ones, who are not that interested in MVPD programming, can “cut the cord” and rely mainly on OVDs and other sources of content. Presently, the number of people who are cutting the cord is relatively small. The number is likely to increase as the number and offerings of OVDs expand, as more programming providers offer programming “over the top,” and as the population ages.<sup>130</sup> This loss of video programming subscribers puts Comcast’s MVPD business at risk. Although there could be offsetting factors, Comcast has an incentive to protect that business and the associated profits.<sup>131</sup>
177. The Transaction would significantly increase Comcast’s ability to suppress the development of a robust OVD industry to protect its MVPD profits. Comcast could increase terminating access fees to OVDs as part of a raising rivals cost strategy to reduce the supply of competing video programming. Comcast could also disrupt OVDs through congestion strategies as it deployed against Netflix to raise their costs of competing. It could also foreclose OVDs completely from

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<sup>130</sup> As reported by Bloomberg, 21<sup>st</sup> Century Fox President Chase Carey stated that cord nevers are a “legitimate concern,” and that “[i]t remains to be seen what happens as this generation ages, but, what is clear is that this is an issue that will play out over the next 10-plus years, not the next three.” Ian King, *How ‘Cord Never’ Generation Poses Sales Drag for Pay TV*, Bloomberg (Sept. 18, 2013), available at <http://www.bloomberg.com/news/2013-09-18/how-cord-never-generation-poses-sales-drag-for-pay-tv.html>.

<sup>131</sup> MPVD and broadband services are not consumed in fixed proportion and as a result the Chicago single-monopoly profit theorem does not necessarily hold

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securing access to its subscribers and thereby prevent them from achieving or maintaining critical mass.

178. By engaging in raising rivals cost or foreclosure strategies to retard the development of OVDs Comcast would buy itself some time. While suppressing the development of competing OVDs, it could use its considerable assets to expand its own OVD business and thereby provide its subscribers with its own OVD alternative.
179. The development of a robust supply of OVD offerings could help solve a chicken-and-egg problem that deters long-run broadband entry. Despite the very high barriers to entry, over the *long-term*, which I take as 10-20 years, Comcast could face significant potential threats to its substantial market power as a provider of wired broadband and video programming as a result of changes that could make entry more attractive and feasible. If Comcast's current video subscribers become increasingly comfortable dropping cable in favor of some combination of OVD offerings, demand for standalone broadband would increase such that it could make entry in that market more attractive in the long run. That would place all of Comcast's profits associated with its substantial market power as an integrated ISP and MVPD in jeopardy.<sup>132</sup> Even if the

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<sup>132</sup> In addition to offering high quality programming, an OVD would also likely need to offer a broad array of programming to be a successful competitor to current MVPD offerings. *See, e.g.,* John Martin, CFO Time Warner, noted at a Morgan Stanley investor conference in November 2013, when asked about Comcast's offer of a cable bundle that included a limited number of channels, HBO, and broadband: "[T]here may be somewhat limited demand for a product like that because I don't think there is a tremendous amount that demonstrated example where U.S. households want a smaller video package I mean they could get that

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development of a robust OVD industry resulted in a small incremental risk of high-speed broadband into Comcast's footprint in the next decade or two, Comcast would have an additional incentive to suppress the development of that industry since OVD competition plus high-speed broadband competition could eliminate much of its profits.

180. Comcast's strategies to suppress OVD competition would complement similar strategies that other very large ISPs also have the ability and incentive to engage in. As I noted above, after the Transaction, just three ISPs—Comcast (including Time Warner Cable and accounting for proposed divestitures), AT&T, and Verizon—would account for {{ }} of wired broadband subscribers at the end of 2013.<sup>133</sup> Their combined efforts could prevent some OVDs from becoming viable because of the lack of national scale and help protect the incumbent very large MVPD/ISPs from OVD competition.
181. The Transaction would enhance these effects significantly by increasing substantially the bargaining leverage that Comcast would have and its ability to foreclose OVDs from a significant portion of American households. This effect

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today a lot of the distributors offer low end packages and they're not terribly successful and that's a reason why we estimate the average revenue per household for in the U.S. is about \$80 I mean you could probably pay \$20, \$30 but this is not that attractive because culturally Americans just watch a tremendous amount of television." Time Warner Management Presents at Morgan Stanley 2013 Technology Media & Telecom Conference, transcript, Nov. 21, 2013, *available at* <http://seekingalpha.com/article/1855121-time-warner-management-presents-at-morgan-stanley-2013-technology-media-and-telecom-conference-transcript>.

<sup>133</sup> The methodology for this calculation is described above. Calculations based on Supplemental Data; Leichtman Research Group, *About 295,000 Add Broadband in the Second Quarter of 2013*, August 20, 2013, *available at* <http://www.leichtmanresearch.com/press/082013release.html>; *2014 Internet Access Services Report*.

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is merger-specific. I noted earlier that OVDs require a critical mass of subscribers to operate and have positive feedback effects that can accelerate growth or decline. Post-Transaction Comcast, acting with another large ISP or coalition of ISPs, would be able to foreclose a greater portion of an OVD's subscribers than it would be able to foreclose absent the Transaction, acting with that same large ISP or coalition of ISPs.

**IV. Conclusion**

182. I have reached two principal conclusions.

183. The economic evidence and reasoning relied on by Comcast and Dr. Israel to conclude that it is not possible that the Transaction could harm competition and consumers are not reliable. Their conclusion rests on flawed data that wrongly shows that consumers have many broadband alternatives and on the assertion that Comcast does not have the ability or incentive to foreclose OVDs when it plainly did foreclose Netflix.

184. The Transaction poses considerable risk to competition and consumers because it would increase Comcast's already substantial market power over OVDs and their customers significantly. In particular, the Transaction could harm competition and consumers in two ways. The economic evidence and empirical analysis that I have presented shows that the Transaction would likely increase the terminating access fees that Comcast would demand and receive from OVDs significantly over the fees that Comcast would demand and receive absent the Transaction. It could also enable Comcast to retard the development of OVDs

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thereby reducing OVD competition and innovation and perpetuating Comcast's substantial market power as a broadband and video programming provider.

\* \* \*

## Appendix A: Curriculum Vita

**David S. Evans**  
**Chairman**  
**Global Economics Group**

### CONTACT DETAILS

Address: Global Economics Group  
18 Tremont St.  
Boston, Mass 02108

Mobile: 1 (617) 320 8933

Skype: david.s.evans

Email: [devans@globaleconomicsgroup.com](mailto:devans@globaleconomicsgroup.com)

### OVERVIEW

David S. Evans is the Chairman of the Global Economics Group in the firm's Boston office and has broad experience in the economics of antitrust, intellectual property, and financial regulation. Dr. Evans has an international practice and has worked on matters in the United States, the European Union, China, Brazil, Australia, and other jurisdictions. He has provided economic advice on a wide range of industries but has special expertise in financial services, internet-based media, and information-technology based businesses. He is one of the world's leading authorities on multi-sided platforms (also known as two-sided markets).

Dr. Evans currently teaches economics at the University of Chicago Law School, where he is a Lecturer, and at the University College London, where he is a Visiting Professor. He is the Founder and Publisher of *Competition Policy International* and is on the editorial boards of *Concurrences* and *The Review of Network Economics*.

From 2004 to 2011, Dr. Evans was a Managing Director of LECG, where he was the head of its global antitrust practice and Vice Chairman of LECG Europe. Previously, he was Senior Vice President at NERA (1989-2004) where he was also a member of the management committee and board of directors. He received his Ph.D. in Economics from the University of Chicago in 1983 and subsequently taught at the Department of Economics and the Law School at Fordham University in New York.

### EDUCATION

1979-1983

University of Chicago

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Ph.D. and MA in 1983

Specialized in econometrics, industrial organization, and labor economics

1972-1975

University of Chicago

BA in Economics in 1975

Completed first year of graduate program

**EMPLOYMENT HISTORY**

2011-

Global Economics Group

Chairman

2004-

Market Platform Dynamics

Founder and Managing Director

2004-

Competition Policy International

Founder and Publisher

2006-

University of Chicago Law School

Lecturer, teaching various advanced courses in antitrust

2004-

University College London

Visiting Professor in the Faculty of Laws, teaching economics of antitrust

Executive Director, Jevons Institute for Competition Law and Economics

2004-2011

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LECG, LLC

Vice Chairman, LECG Europe

Head, Global Competition Policy Practice

Member of the boards of directors of various subsidiaries

1988-2004

NERA Economic Consulting

Senior Vice President

Member of the Management Committee

Member of the Board of Directors

1983-1995

Professor of Law, Fordham University Law School (1985-1995)

Associate Professor of Economics (1983-1989) (tenure as of 1988)

### APPEARANCES AND TESTIMONY

Dr. Evans has testified before arbitrators and Federal courts in the United States, and the General Court of the European Union. He has made personal appearances before or presented written testimony to the Australian Competition and Consumer Commission, European Commission, Federal Trade Commission, the U.S. Department of Justice, and the Securities and Exchange Commission. He has also testified before the House Financial Services Committee, the House Oversight Committee, and the Senate Banking Committee.

Examples of Dr. Evans's clients for whom he has made public submissions and appearances include Bloomberg, Google, Michael Tyson, Microsoft, Organization for Economic Co-operation and Development, and Visa.

### REPRESENTATIVE MATTERS

#### *Antitrust and Intellectual Property*

Dr. Evans has worked on mergers, monopolization and abuse of dominance, and joint venture cases in multiple jurisdictions. A number of his matters have involved the intersection of antitrust and intellectual property and the antitrust of information technology/on-line businesses. Representative matters include:

- *United States v. Microsoft* on trial and remand regarding remedies and *Microsoft v. Commission of the European Communities* on tying and interoperability on behalf of



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- Microsoft;
- Monster's acquisition of Yahoo! HotJobs before the Federal Trade Commission;
- WPP's acquisition of Taylor Nelson Sofres before the European Commission;
- Google's acquisition of DoubleClick for various third-party intervenors before the Federal Trade Commission, European Commission and Australian Competition and Consumer Commission;
- Investigation of VisaNet and Redecard by the Central Bank of Brazil and other regulatory authorities concerning certain exclusivity agreements and practices in the payment card industry;
- In *Twombly v. Bell Atlantic*, chief author of amicus brief by economists submitted to the United States Supreme Court in support of a grant of a writ of certiorari and in support of reversal; and
- In *Qihoo v. Tencent*, submitted reports to The Supreme People's Court, The High People's Court of Guangdong Province, People's Republic of China, on behalf of Tencent regarding Qihoo's market definition and abuse of dominance claims against Tencent.

### ***Financial Regulation***

Dr. Evans has worked on regulatory matters involving payment systems, consumer financial protection, derivatives regulation, and the regulation of exchanges. Representative matters include:

- Analysis of Consumer Financial Protection Bureau regulations for various financial institutions;
- Debit card regulatory proceedings before the Federal Reserve Board on behalf of various financial institutions;
- Regulation of the OTC commodity derivatives for the Government of Singapore;
- Analysis of Security Exchange Commission orders concerning pricing of market data submitted reports and presentations to the SEC on behalf of Bloomberg; and
- Assistance in creating educational programs for House Financial Services Committee members concerning the recent financial crisis.

### **HONORS AND RANKINGS**

- Winner of the Business, Management & Accounting category in the 2006 Professional/Scholarly Publishing Annual Awards presented by the Association of American Publishers, Inc. for *Invisible Engines: How Software Platforms Drive Innovation and Transform Industries*.
- The International Who's Who of Competition Lawyers & Economists 2011.
- Named among the "Top 25 Competition & Antitrust Practitioners" by Best of the Best USA, Legal Media Group.

### **PUBLICATIONS**

Dr. Evans' publications since 2000 are largely available online at Evans' SSRN Page and his

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publications before 2000 are mostly available at Evans' IDEAS Page.

### Books

*Platform Economics: Essays on Multi-Sided Businesses*, (Boston, Competition Policy International, 2011), with R. Schmalensee, M. Noel, H. Chang, and D. Garcia-Swartz.

*Interchange Fees: The Economics and Regulation of What Merchants Pay for Cards*, (Boston, Competition Policy International, 2011), with R. Schmalensee, R. Litan, D. Garcia-Swartz, H. Chang, M. Weichert, A. Mateus.

*Trustbusters: Competition Authorities Speak Out* (Boston: Competition Policy International, 2009), co-editor with F. Jenny.

*Catalyst Code: The Strategies of the World's Most Dynamic Companies* (Massachusetts: Harvard Business School Press, 2007), with R. Schmalensee.

*Invisible Engines: How Software Platforms Drive Innovation and Transform Industries*, (Massachusetts: MIT Press, 2006), with A. Hagiu and R. Schmalensee.

*Paying with Plastic* (Massachusetts: MIT Press, first edition 1999, second edition 2005), with R. Schmalensee.

*Microsoft, Antitrust and the New Economy: Selected Essays* (New York: Kluwer Academic Publishers, 2002), editor.

*The Economics of Small Businesses: Their Role and Regulation in the U.S. Economy* (New York: Holmes and Meier, 1986), with W. Brock.

*Breaking Up Bell: Essays on Industrial Organization and Regulation* (New York: North Holland, 1983), editor and co-author of eight of ten chapters.

### Articles and Book Chapters

"The Antitrust Analysis of Multi-Sided Platform Businesses," (with R. Schmalensee), in *Oxford Handbook on International Antitrust Economics*, R. Blair and D. Sokol, eds., Oxford: Oxford University Press, forthcoming.

"The Impact of the U.S. Debit Card Interchange Fee Caps on Consumer Welfare: An Event Study Analysis," (with H. Chang and S. Joyce), University of Chicago Coase-Sandor Institute for Law & Economics Research Paper No. 658, 2013.

"Market Definition Analysis in Latin America with Applications to Internet-Based Industries," (with E. Mariscal), Working Paper (University of Chicago Law School and Centro de Investigacion y Docencia Economica), 2013.

"Paying with Cash: A Multi-Country Analysis of the Past and Future Use of Cash for Payments by Consumers," (with K. Webster, G. Colgan, and S. Murray), Working Paper (University of

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“The Consensus Among Economists on Multisided Platforms and Its Implications for Excluding Evidence that Ignores It,” *CPI Antitrust Chronicle*, 2013, 6(1).

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## TESTIMONY

### Trial Testimony 2002-2013

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*Presidential Emergency Board No. 243*, National Mediation Board, Case Nos. A-13569, A-13570, A-13572, A-13573, A-13574, A-13575, and A-13592. Testified in support of the National Railway Labor Conference concerning wages, benefits, and work rules for railroad workers. (October 2012).

Case T-201/04, *Microsoft v. Commission of the European Communities*. Testified in support of Microsoft before the Court of the First Instance of the European Union concerning the Commission's determination that Microsoft had abused its dominant position by refusing to license certain information regarding its operating system and by tying a media player to its Windows operating system. (April 2006).

Case T-201/04, *Microsoft v. Commission of the European Communities*. Testified before the Court of the First Instance of the European Union in support of Microsoft's application for a suspension of remedies during its appeal of a Commission decision. (October 2004).

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### **Deposition Testimony 2002-2013**

*MarchBanks Truck Service, Inc., et al. v. Comdata Network, Inc., et al.*, Case No. 07-1078-JKG. Testified for defendant concerning allegations of anticompetitive behavior with respect to Comdata's agreements with certain truck stop chains. (August 2013).

*Meredith Corporation et al. v. SESAC*, Case No. 09 Civ. 9177 (PAE). Testified for defendant concerning allegations of anticompetitive behavior with respect to the blanket licensing of local television music performance rights. (May 2013).

*South Atlanta Motor Sales, Inc. v. Southeast Toyota Distributors, LLC*, Case No. 30-114-Y-00229-07. Testified for the defendant in an arbitration concerning a racial discrimination claim. (November 2007).

*Mitchell v. Metropolitan Life Insurance Company*, No. 01-civ-2112 (S.D.N.Y.). Testified for the defendant concerning statistical analysis of wages and promotions by gender. (February 2003).

*Rodolico et al. v. Unisys Corporation*, CV-95-3653 (E.D.N.Y.). Testified for the defendant concerning statistical analysis of allegations of age discrimination in a layoff determination. (March 2002).

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## Appendix B: Calculations Using the NTIA's National Broadband Map

1. This appendix describes the methodology I used when performing calculations using the NTIA's National Broadband Map. The primary focus is on the results reported in Table 2. My other calculations using this dataset generally employ the same procedures, except as noted in this Appendix.
2. Start with the NTIA data for December 31, 2013.<sup>134</sup> Limit the data to Census blocks whose populations are reported in the 2010 Census Summary File 1.<sup>135</sup> This excludes America Samoa, Northern Mariana Islands, Guam, and the U.S. Virgin Islands, and includes the fifty states, the District of Columbia, and Puerto Rico.
3. Unless otherwise stated, use both of the two wired broadband provider datasets (the one for large Census blocks and the one for small Census blocks), and exclude the wireless broadband provider dataset. Unless otherwise stated, exclude resellers (Provider\_Type equals 2) and providers serving only enterprise or governmental customers (End\_User\_Category equals 2, 3, or 4).
4. Use the holding company name (Hoconame) to identify distinct providers. Note that this is conservative, since there are a small number of instances where a given holding company has multiple spellings of its name in the dataset.

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<sup>134</sup> National Broadband Map, December 31, 2013, *available at* <http://www.broadbandmap.gov/data-download>.

<sup>135</sup> U.S. Census Bureau, 2010 Census, Summary File 1, *available at* <http://mcdc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>.

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5. To account for the divestiture transactions, use the following lists of census blocks and tracts:
- a. The census tracts being transferred from Charter to Comcast listed in the Revised Appendix A.1 to the July 11 Letter, which is included with the July 28 Letter.<sup>136</sup>
  - b. The Census blocks being transferred from Charter to Comcast that are part of Census tracts, which are only being partially transferred and are listed in Appendix A.2 to the July 28 Letter.<sup>137</sup>
  - c. The Census blocks being transferred from Time Warner Cable to Charter listed in Appendix B.1 to the July 11 Letter.<sup>138</sup>
  - d. The Census blocks being transferred from Comcast to SpinCo listed in Appendix C.1 to the July 11 Letter.<sup>139</sup>
  - e. The Census blocks being transferred from Comcast to SpinCo that are part of Census tracts only being partially transferred and are listed in Appendix A.4 to the July 28 Letter.<sup>140</sup>

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<sup>136</sup> Letter from Francis M. Bruno, Counsel, Comcast, to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-57 (July 28, 2014) (“July 28 Letter”), Revised Appendix A.1 to July 11 Letter.

<sup>137</sup> July 28 Letter, Appendix A.2.

<sup>138</sup> Letter from Kathryn A. Zachem, Comcast, et al., to Marlene H. Dortch, Secretary, Federal Communications Commission, MB Docket No. 14-57 (July 11, 2014) (“July 11 Letter”), Appendix B.1

<sup>139</sup> July 11 Letter, Appendix C.1.

<sup>140</sup> July 28 Letter, Appendix A.4.



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6. Use these lists to identify holding company-block combinations where the holding company will change as part of the divestiture, and set the new holding company equal to the post-divestiture holding company.
7. In each block, find the highest maximum advertised speed for each holding company offering service in that block.<sup>141</sup> For calculations involving the pre- or post-divestiture holding company, this will require taking the maximum over both Comcast and Time Warner Cable in the rare cases where both companies offered residential broadband service in the same Census block.
8. For each block, get the population from the 2010 Census Summary File 1.
9. For each block, count the number of broadband providers other than Comcast or Time Warner Cable, that provide service with a maximum advertised download speed meeting the appropriate threshold (e.g., 10 Mbps or 25 Mbps). If a competing provider has a download speed at least as great as that of Comcast or Time Warner Cable in that block, count it as meeting the speed threshold, even if it does not. Set a flag indicating whether the number of such competitors in that block is zero.
10. Then, aggregate over blocks. Specifically, calculate the population-weighted average number of alternative wired alternatives meeting the speed threshold, and count the total population in blocks where the number of such competitors

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<sup>141</sup> Some calculations in my report do this slightly differently. For example, when I report that cable and fiber speeds of 25 Mbps and above were available to 93 percent of people in Census blocks where cable and fiber were offered and speeds of 10 Mbps and above were available to 99 percent, I take the maximum speed for each technology in each block, rather than the maximum speed for each holding company.

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equals zero. Limit the sample to blocks where the company of interest (Comcast, Time Warner Cable, the pre-divestiture combined company or the post-divestiture combined company) is present.

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The foregoing declaration has been prepared using facts of which I have personal knowledge or based upon information provided to me. I declare under penalty of perjury that the foregoing is true and correct to the best of my information, knowledge, and belief.

Executed on August 25, 2014

A handwritten signature in black ink, appearing to read "DSE", written over a horizontal line.

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David S. Evans  
Chairman  
Global Economics Group, LLC