

COMMENTS OF INCOMPAS, WC DOCKET NO. 17-108 (JULY 17, 2017)
LIST OF EXHIBITS

No.	Description
1	David S. Evans, Economic Analysis of the Impact of the Comcast/Time Warner Cable Transaction on Internet Access to Online Video Distributors, attached to Petition to Deny of Netflix, Inc., MB Docket No. 14-57 (Aug. 27, 2014)
2	David Sappington, Reply Declaration, attached to Reply Of DISH Network Corp., MB Docket No. 14-57 (Dec. 22, 2014)
3	Richard Schmalensee, Economic Analysis of the Impact of the Comcast/Time Warner Cable Transaction on Set-Top Box Competition and Video Programming Costs, attached to COMPTTEL's Reply to Comcast's Opposition to Petition to Deny, MB Docket No. 14-57 (Dec. 23, 2014)
4	David S. Evans, Economic Analysis of the Impact of the Comcast/Time Warner Cable Transaction on Internet Access to Online Video Distributors: Response to Opposition to Petitions to Deny and Response to Comments, attached to Reply of Netflix, Inc., MB Docket No. 14-57 (Dec. 23, 2014)
5	David S. Evans, White Paper: Contrary to Professor Carlton's Theory, Comcast Has a Strong Incentive to Engage in Vertical Foreclosure, attached to Ex Parte Letter of Netflix, Inc., MB Docket No. 14-57 (Mar. 18, 2015)
6	David S. Evans, Comcast's Acquisition of Time Warner Cable Would Result in an Economically Significant Increase in the Magnitude of Terminating Access Fees for Online Video Distributors, attached to Ex Parte Letter of Netflix, Inc., MB Docket No. 14-57 (Apr. 6, 2015)
7	Fiona Scott Morton, Public Interest Statement Concerning the Merger of Charter, Bright House, and Time Warner Cable, attached to Joint Application of Charter Communications, Inc. and Advance/Newhouse Partnership, MB Docket No. 15-149 (June 24, 2015)
8	David S. Evans, Economic Analysis of the Impact of the Proposed Merger of Charter, Time Warner Cable, and Bright House Networks on Broadband Entry and Competition, attached to Ex Parte Letter of INCOMPAS, MB Docket No. 15-149 (Jan. 15, 2016)

EXHIBIT 1

**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

read and cited.¹ 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.² 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

¹ 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.

² 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.

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.³ My research into this issue is ongoing and this declaration

³ 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

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.

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.

- 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.⁴ 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

⁴ 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>.

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.⁵ Netflix data confirms this. {{

}}⁶

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.

⁵ 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.

⁶ Information provided by Netflix.

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.⁷ 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.

⁷ 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://mcidc.missouri.edu/cgi-bin/uexplore?pub/data/sf12010>.

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.⁸ 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

⁸ 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.

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.

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*

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 {{

}} 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, {{

}} Since it is not possible to reduce these fixed costs,

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.

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.⁹

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.¹⁰ Post-Transaction, Comcast would have the ability to foreclose

⁹ 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.

¹⁰ 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

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 {{ }}.¹¹

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

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”).

¹¹ 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.

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

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.¹²

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

¹² 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.

are sometimes called edge providers. From an economic standpoint, an ISP is a two-sided platform.¹³ 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

¹³ 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.

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.¹⁴ 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

¹⁴ 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.

(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

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.¹⁵ It advertises its service as primarily suitable for under-served locations without access to high-speed Internet.¹⁶ Dish also explicitly warns potential customers that its service is not appropriate for

¹⁵ 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.”).

¹⁶ *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.”).

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

47. {{

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

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}} 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.¹⁹ Yet

¹⁷ *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.”).

¹⁸ *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).

¹⁹ 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.

<p>{{</p>	
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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.²⁰ The average American household has 2.64 members and 39 percent of households have three or more members.²¹ 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.²²

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.

²⁰ 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.”)

²¹ 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>.

²² *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

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.²³ 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.²⁴ The FCC has suggested that download speeds of more than 15 Mbps are currently necessary for households with three or more

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>.

²³ 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>.

²⁴ *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.”)

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.²⁵

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.²⁶ 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.”²⁷ In contrast, Time Warner Cable advertises its 3 Mbps package as only sufficient to “[s]urf the web,

²⁵ 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 (“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>).

²⁶ *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).

²⁷ *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).

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

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.²⁹
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

²⁸ *Id.*

²⁹ 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://mcidc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>.

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.³⁰ 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.³¹

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.³² Verizon, for example, did not offer a maximum

³⁰ 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.

³¹ 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).

³² 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.

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 2013.³³

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.

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.

³³ 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>.

56. DSL subscribers are more likely than cable and fiber subscribers to have actual speeds that are considerably lower than the maximum advertised speeds.³⁴ 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.³⁵ 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.

³⁴ 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/>.

³⁵ 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>.

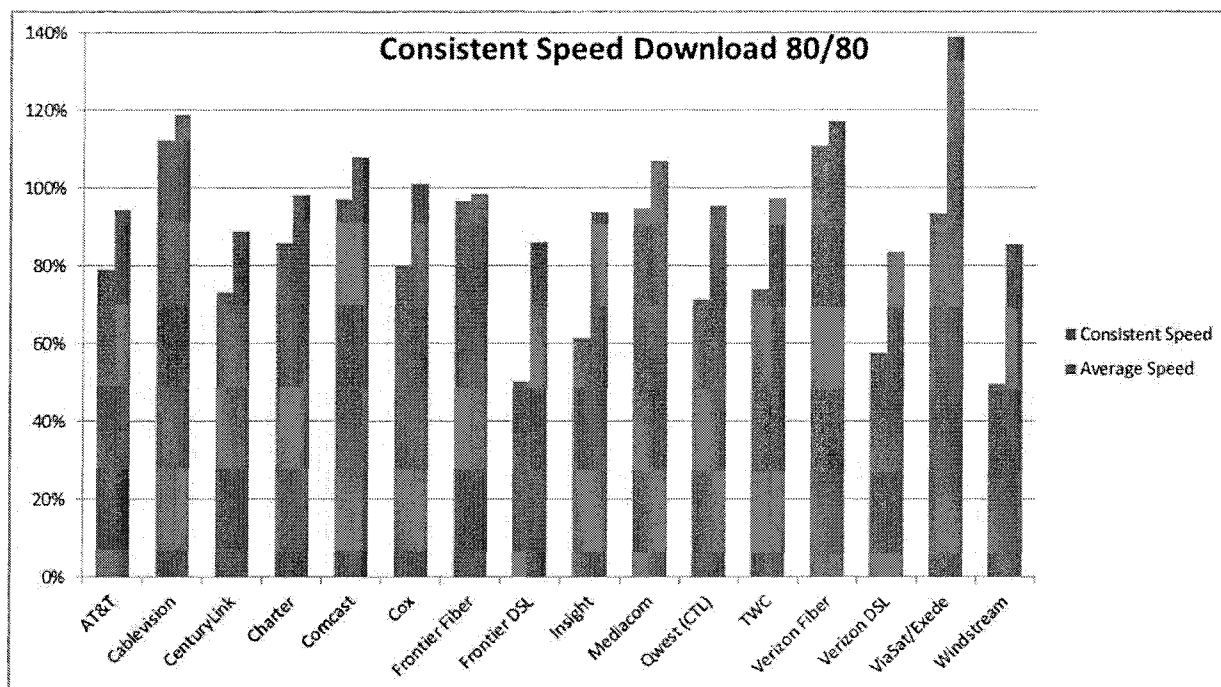


Figure 1: Consistent Speed Download 80/80

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

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

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 2013.³⁷ 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 2013.³⁸

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

³⁷ 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.

³⁸ 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.

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 2013.³⁹ 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.⁴⁰ Consistent with this shift, shipments of DSL port equipment declined 22 percent in 2013 according to the market analysis firm Broadbandtrends LLC.⁴¹
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

³⁹ 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>.

⁴⁰ 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>.

⁴¹ 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.

DSL alternatives {{ }}, from the fourth quarter of 2010 to the third quarter of 2013.⁴²

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.⁴³ 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.⁴⁴

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

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.⁴⁶

⁴² {{ }}

⁴³ 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>.

⁴⁴ *Watch COMCAST - The Slowskys turtle commercials - Push It*, YouTube (Nov. 6, 2013), <https://www.youtube.com/watch?v=YVCwVF0zbI8>.

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

⁴⁶ 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).

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.⁴⁷ 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

⁴⁷ 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).

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.⁴⁸ 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.⁴⁹ 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

⁴⁸ 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.

⁴⁹ 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.

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

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

⁵⁰ *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; *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.

⁵¹ 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.

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.⁵²
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.

⁵² 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).

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://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.

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).⁵³ 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.

⁵³ 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.

74. There are even more wired ISPs available to households in my Core Based Statistical Area⁵⁴ (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.

⁵⁴ 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.

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).

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.

77. I therefore recommend that the FCC not rely on the ISP availability data submitted by Comcast and Dr. Israel.⁵⁵ 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.⁵⁶

⁵⁵ *Public Interest Statement*, at 141-142.

⁵⁶ 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.

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.⁵⁷ 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.⁵⁸

⁵⁷ 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>.

⁵⁸ 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.

- 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.⁵⁹
- 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.⁶⁰
- Cancellation fees for service. Customers who have signed contracts may be subject to early termination fees.⁶¹

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.⁶²

⁵⁹ 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.*

⁶⁰ *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.*

⁶¹ 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.*

⁶² *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

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.⁶³ 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.⁶⁴ 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

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.

⁶³ *Id.* at 9.

⁶⁴ *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.

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.⁶⁵

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

⁶⁵ 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.

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.⁶⁶

86. Incumbent cable providers lobby against the approval of municipal broadband projects directly or through proxies.⁶⁷ For example, a lobbying group with

⁶⁶ 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/>.

⁶⁷ 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->

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.”⁶⁸ In California, restrictive regulations have led Google decline to provide Google Fiber in California to date.⁶⁹ Google Fiber temporarily abandoned efforts in Overland Park, Kansas for nine months because of difficulties in obtaining approvals.⁷⁰

seattles-mayor-mcginns-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.”).

⁶⁸ 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/>.

⁶⁹ 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>.

⁷⁰ 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>.

87. Even when it is possible to obtain approvals, it takes time to build the network and it is very costly to do so.⁷¹ For example, it took Google Fiber almost twenty months to lay enough fiber to pass (but not connect) 149,000 households in Kansas City.⁷² 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.⁷³ 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.⁷⁴ 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

⁷¹ 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/>.

⁷² *Id.*

⁷³ *Id.*

⁷⁴ 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://mcidc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>.

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.

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.⁷⁵
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.

⁷⁵ 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").

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.⁷⁶ 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

⁷⁶ Israel Declaration ¶¶ 34, 70, 83-84.

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.⁷⁷ 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.⁷⁸

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.⁷⁹ Then, around August of 2010, Comcast demanded a terminating access fee from

⁷⁷ My discussion in this section is based on conversations I have had with Netflix business people and on Mr. Florance’s declaration.

⁷⁸ Florance Declaration ¶ 32.

⁷⁹ *Id.*

Limelight to interconnect.⁸⁰ 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 2010.⁸¹

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.⁸² About a week after the agreement went into effect, Comcast demanded a new terminating access fee from Level 3.⁸³ After three days of heavy congestion of Level 3's connections to Comcast, Level 3 agreed to the pay the new terminating access fee.⁸⁴

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.⁸⁵ 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.

⁸⁰ *Id.* ¶ 34.

⁸¹ *Id.* ¶ 35.

⁸² *Id.* ¶ 36.

⁸³ *Id.* ¶ 37.

⁸⁴ *Id.* ¶ 38.

⁸⁵ *Id.* ¶ 39.

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.⁸⁶ 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, {{ }}.⁸⁷ {{

}}⁸⁸

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

⁸⁶ *Id.* ¶ 48.

⁸⁷ 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.*

⁸⁸ *Id.* ¶ 49.

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.⁸⁹

⁸⁹ 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

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. [[

⁹⁰ 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

to some customers deteriorating to the point where the service became unusable.⁹¹

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.⁹²

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.

⁹¹ Florance Decl. ¶ 52.

⁹² Florance Decl. ¶ 63.

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 subscribers⁹³ 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

⁹³ 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.

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.⁹⁴ 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

⁹⁴ *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)).

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.⁹⁵

⁹⁵ 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>.

120. The OVD industry has attracted a number of entrants. The early ones were Amazon, Hulu, Netflix and YouTube.⁹⁶ 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.⁹⁷ A variety of firms are considering entry strategies. Apple offers video content on its iTunes store, sells

⁹⁶ 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>.

⁹⁷ 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.

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

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.⁹⁹ Dish offers its DishWorld service to U.S. customers interested in international television programming and sports.¹⁰⁰
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.¹⁰¹ 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

⁹⁸ 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>.

⁹⁹ 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>.

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

¹⁰¹ 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>.

contract that gave Amazon the exclusive right to distribute some HBO content on Amazon.¹⁰²

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.¹⁰³ An OVD must have

¹⁰² *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>.

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

¹⁰³ 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).

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.¹⁰⁴ 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

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

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.¹⁰⁵ {{

¹⁰⁵ *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.

¹⁰⁶ 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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}} 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

speeds of at least 768 Kbps—the cutoff used by Dr. Israel.¹⁰⁷ 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

¹⁰⁷ 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.

138. The more than 380 other ISPs each have shares below {{ }}. An OVD would therefore face minimal financial consequences if one of these small ISPs foreclosed access to its subscribers. None of these small ISPs can make a credible threat that it will impose serious harm on the OVD by foreclosing access to its subscribers.

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140. At the other end of the size spectrum, there are six ISPs that each account for more than {{ }} of wired broadband subscribers and together account for {{ }} of wired broadband subscribers. They are Comcast, AT&T, Time Warner Cable, Verizon, Charter, and CenturyLink. Table 7 shows the

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.¹⁰⁸ As I show next, this expectation is confirmed by the terminating network access fees that ISPs have demanded and received from Netflix.

¹⁰⁸ 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.

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

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

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 {{ }}.¹⁰⁹

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

¹⁰⁹ 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*.

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, 2013.¹¹⁰

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

¹¹⁰ 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. 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. This is conservative, since it double counts the FTTP U-Verse subscribers.

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

that revenue to offset the price increase to OVDs¹¹¹ 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.¹¹² 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

¹¹¹ 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. 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.

¹¹² Israel Declaration ¶¶ 89-105.

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.¹¹³ 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,

¹¹³ 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.").

restrictive assumptions and that the effects may well go the other way.”¹¹⁴ 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.¹¹⁵ 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.¹¹⁶ 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

¹¹⁴ Israel Declaration ¶ 101.

¹¹⁵ 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.

¹¹⁶ 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)).

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

162. The Chitty-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.¹¹⁷ 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 Chitty 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.¹¹⁸ (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.¹¹⁹ (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.

¹¹⁷ 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.

¹¹⁸ 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.

¹¹⁹ 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.

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,

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.¹²⁰ 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. {{

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

¹²⁰ Israel Declaration ¶ 102.

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.¹²¹ 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.¹²² They find that:

¹²¹ 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.

¹²² 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*

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.¹²³

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

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

¹²³ 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.

(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”).”¹²⁴

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.”¹²⁵

¹²⁴ Israel Declaration ¶ 101.

¹²⁵ 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

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.”¹²⁶ {{

}} 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.”¹²⁷ In particular, he quotes Chipty

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).”

¹²⁶ Adilov and Alexander (2006), p.310.

¹²⁷ Israel Declaration ¶ 104.

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

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.¹²⁹

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.

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

¹²⁹ *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.¹³⁰ 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.¹³¹
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

¹³⁰ As reported by Bloomberg, 21st 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>.

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

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.¹³² Even if the

¹³² 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

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 2013.¹³³ 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

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>.

¹³³ 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*.

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

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

* * *

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, 2013.¹³⁴ Limit the data to Census blocks whose populations are reported in the 2010 Census Summary File 1.¹³⁵ 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.

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

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

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.¹³⁶
 - 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.¹³⁷
 - c. The Census blocks being transferred from Time Warner Cable to Charter listed in Appendix B.1 to the July 11 Letter.¹³⁸
 - d. The Census blocks being transferred from Comcast to SpinCo listed in Appendix C.1 to the July 11 Letter.¹³⁹
 - 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.¹⁴⁰

¹³⁶ 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.

¹³⁷ July 28 Letter, Appendix A.2.

¹³⁸ 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

¹³⁹ July 11 Letter, Appendix C.1.

¹⁴⁰ July 28 Letter, Appendix A.4.

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.¹⁴¹ 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

¹⁴¹ 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.

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.

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.

David S. Evans
Chairman
Global Economics Group, LLC

EXHIBIT 2

EXHIBIT B:

REPLY DECLARATION OF PROFESSOR DAVID SAPPINGTON

Professor David Sappington

DECEMBER 22, 2014

REPLY DECLARATION OF PROFESSOR DAVID SAPPINGTON

I, David Sappington, being over 18 years of age, swear and affirm as follows:

I. INTRODUCTION

Qualifications

1. My name is David Sappington. I hold the titles of Eminent Scholar in the Department of Economics and Director of the Robert F. Lanzillotti Public Policy Research Center, both at the University of Florida.
2. Since earning my Ph.D. in economics from Princeton University, I have served on the faculties of the University of Michigan and the University of Pennsylvania and on the technical staff of Bell Communications Research. I have also served as the Chief Economist for the Federal Communications Commission and as the President of the Industrial Organization Society. I presently hold positions on the editorial boards of six major journals, including the *Journal of Regulatory Economics*, the *Rand Journal of Economics*, the *Review of Network Economics*, and the *Journal of Economics and Management Strategy*.
3. My research focuses on the optimal design of incentive structures, with particular emphasis on the design and implementation of regulatory policy. I have published more than one hundred and fifty articles in leading journals in the profession and have coauthored a book on *Designing Incentive Regulation for the Telecommunications Industry*.

Purpose of this reply declaration

4. The primary purpose of this reply declaration is to address five of the major deficiencies in the reports of the economic experts in the Applicants' *Opposition to Petitions to Deny and Response to Comments*.¹ This declaration also provides a case study that reflects the experience of DISH Network Corporation ("DISH") with over-the-top ("OTT") services, including the foreign-language *DISH World* service and the new domestic OTT service that DISH hopes to

¹ Comcast Corporation and Time Warner Cable Inc. ("the Applicants"), *Opposition to Petitions to Deny and Response to Comments*, In the Matter of Applications of Comcast Corp., Time Warner Cable Inc., Charter Communications, Inc., and SpinCo For Consent To Assign or Transfer Control of Licenses and Authorizations, MB Docket No. 14-57, September 23, 2014 ("Applicants' Response").

launch in the near future. The case study helps to illustrate how the proposed merger of Comcast Corporation (“Comcast”) and Time Warner Cable (“TWC”) would threaten innovation by online video distributors (“OVDs”), and thereby harm consumers of OTT services.

5. The first and most striking deficiency in the reports of the economic experts is the absence of any analysis of the Applicants’ own subscriber churn data. In retrospect, it is not difficult to understand why this analysis was not conducted (or at least not reported). The analysis fatally undermines the Applicants’ repeated claim that they have no incentive to sabotage the operations of OVDs.² The analysis demonstrates that Comcast experienced {{ during or after the period in which Netflix’s traffic was slowed on Comcast’s network. Consequently, the Applicant’s repeated claim that they have no incentive to sabotage OVDs because such sabotage would substantially increase the churn of their broadband subscribers is without merit.

6. The second deficiency in the experts’ reports is the failure to acknowledge the substantial consumer harm that can arise when an internet service provider (“ISP”) secures substantial leverage over OVDs, even if the leverage is not employed to foreclose OVDs.³ The experts assert that there are conditions under which even an ISP that controls access to a large share of the nation’s high-speed broadband subscribers will eventually forge an agreement to provide the access that is vital to an OVD’s success. This observation fails to consider the chilling effect on innovation and the associated consumer harm that can arise when the ISP employs its dominant position to extract the lion’s share of the surplus created by the OVD’s product.

7. The third deficiency in the reports of the economic experts is their narrow view of the relevant geographic market and their associated claim that the high proportion of the nation’s high-speed broadband subscribers that the Applicants serve is irrelevant in this proceeding. This fraction is highly relevant because it provides a useful measure of the leverage that the combined

² Sabotage can be viewed as a deliberate attempt to degrade the quality of an OVD’s video service, as perceived by the broadband subscriber. See David Sappington, “The Anticompetitive Effects of the Proposed Merger of Comcast and Time Warner Cable,” Exhibit B in *Petition to Deny of DISH Network Corporation*, MB Docket No. 14-57, Filed August 25, 2014 (“Sappington Declaration”).

³ The experts also improperly dismiss the possibility that a combined Comcast-TWC might foreclose an OVD and supply an OTT service itself. In addition, the experts assert without proof that the prospect of selling NBCUniversal programming to OVDs will deter Comcast-TWC from foreclosing OVDs.

Comcast–TWC would hold over OVDs due to the new company’s substantial control over access to broadband subscribers.

8. The fourth deficiency in the experts’ reports is the questionable interpretation of evidence to support an argument that DSL and high-speed cable broadband service belong in the same relevant product market. In fact, the experts have failed to demonstrate that the independent supply of DSL constrains the pricing of high-speed cable broadband service.

9. The fifth deficiency in the experts’ reports is the suggestion that, absent the proposed merger, Comcast and TWC are unlikely to serve as competing suppliers of OTT services in the near future. Basic economic considerations suggest that Comcast and TWC would likely serve as independent, competing suppliers of OTT services if the merger is denied. Consequently, the merger likely would reduce future competition in the supply of OTT services.

10. The case study based on DISH’s OTT experience illustrates the dire economic straits an OVD would face if it were unable to secure access to both Comcast’s and TWC’s high-speed broadband subscribers. The case study thereby helps to demonstrate how the proposed merger would limit innovation by OVDs and so would harm consumers of OTT services. The case study also provides evidence that there is a relevant national geographic market. In particular, access to Comcast’s high-speed broadband subscribers and access to TWC’s high-speed broadband subscribers are substitutes for OVDs that seek to reach viewers nationwide. Consequently, the case study helps to explain why a complete analysis of the potential harms from the proposed merger of Comcast and TWC requires an assessment of the share of the nation’s high-speed broadband subscribers that each of these ISPs serves.

11. The discussion of this case study and the five deficiencies in the reports of the Applicants’ economic experts proceeds as follows. Section II demonstrates that Comcast’s churn data fatally undermine the Applicants’ assertion that they have no incentive to sabotage OVDs. Section III reviews the consumer harm that can arise even if a powerful ISP chooses not to foreclose OVDs. Section IV further explains the value of analyzing the shares of the nation’s broadband subscribers that Comcast, TWC, and other ISPs serve. Section V explains why the experts’ claims that DSL and high-speed cable broadband belong in the same relevant product markets are, at best, not compelling. Section VI explains why the proposed merger likely would reduce future competition in the supply of OTT services. Section VII presents a case study of a

nascent OVD service reflecting DISH's experience with its foreign language service, DISH World, and DISH's planning for its domestic OTT service. Section VIII concludes.

II. Slowed OVD Traffic Has {{ }} Comcast's Customer Churn.

12. Comcast has contended throughout this proceeding that it has no incentive to sabotage OVDs. Comcast argues that such sabotage would cause its high-speed data ("HSD") customers to discontinue their broadband service with Comcast, and thereby reduce Comcast's profit.⁴

13. If Comcast's contention had merit, it would seem that Comcast could readily prove its claim by documenting a substantial increase in the churn of its HSD customers during the period when Netflix's traffic was slowed on Comcast's network. Yet Comcast documents only an increase in customer calls to its service centers during this period. Comcast is strangely silent on the question of whether these angry customers actually terminated their HSD service with Comcast.

14. Comcast's silence on this important question seems surprising, given that Comcast has ready access to the data that can answer this question. Now that these data have been made available to others, though, the reason for Comcast's silence is apparent. The data provide no support whatsoever for Comcast's claim. To the contrary, the data provide strong evidence that Comcast can sabotage OVDs with virtual impunity. The data reveal that Comcast experienced {{ }} during or after the period in which Netflix's traffic was slowed on Comcast's network. Thus, the best available empirical evidence makes it clear that Comcast's persistent claim that it has no incentive to sabotage OVDs is without merit.⁵

⁴ To illustrate, Dr. Israel asserts that "if ... Comcast attempted and managed to degrade edge provider access significantly, customers would react in a wide range of ways that would impose substantial costs on Comcast" (Mark Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," Exhibit 1 in Applicants' Response ("Israel Reply"), ¶57). The alleged reactions include switching to "alternative high-speed, wireline ISPs" and "downgrad[ing] or even cancel[ing] broadband service altogether" (Israel Reply, ¶62).

⁵ The ensuing discussion of this empirical evidence summarizes extensive analysis performed by the Brattle Group. This analysis employs data that Comcast has provided in response to the Commission's data request.

15. The complete lack of support for Comcast's claim can be demonstrated very simply. Figure 1 presents the churn rates for Comcast's HSD {{ }} customers⁶ between July 2013 and June 2014,⁷ and compares these rates with the corresponding rates one year earlier.⁸ If Comcast truly faced any serious risk that its customers would discontinue their HSD subscriptions in response to its sabotage of OVDs, {{

}}.

16. Thus, Figure 1 indicates that churn rates generally were {{ }} in 2014 than in 2013 {{

⁶ Comcast's HSD {{ }} customers include all of Comcast's {{

}}. As of June 2014, Comcast served approximately {{ }}. {{ }} may often have a greater choice among HSD suppliers than {{ }}, so the ensuing analysis will focus on the churn rates of Comcast's {{ }} customers. However, all of the qualitative conclusions drawn below persist if the churn rates of {{ }} are considered. The appendix provides information on the churn rates of Comcast's {{ }} customers.

⁷ The monthly churn rate is the ratio of the number of relevant customers who disconnect from Comcast (i.e., discontinue their customer relationship with Comcast) in the specified month to the total number of relevant customers that Comcast serves that month.

⁸ Comcast's customer churn data exhibits {{ }} (see Figure A1 in the appendix to this declaration). {{ }}

⁹ The average speed of Netflix's traffic on Comcast's network is presented in Figure A2 in the appendix to this declaration. This data is derived from <http://ispspeedindex.netflix.com/usa>.

}}. During the periods when Netflix's traffic was slowed considerably, the 2014 churn rates were {{ }} to the corresponding 2013 churn rates.¹⁰
{{

}}

17. In summary, Figure 1 provides {{

}}.

¹⁰ Note also that churn rates {{ }}. Thus, there is {{ }} that Comcast's customers discontinued their HSD subscriptions in the months following the slowing of Netflix's traffic on Comcast's network.

18. Econometric analysis similarly provides $\{C_t\}$. This more general conclusion is readily illustrated by considering a relatively simple regression. In this regression, the dependent variable is C_t , the rate of churn of Comcast's HSD $\{C_t\}$ customers in month t . The explanatory variables are: (i) C_{t-12} , the corresponding churn rate twelve months earlier; (ii) a constant; (iii) a time trend; and (iv) a "sabotage" variable. The time trend, T_t , takes the value 1 in the first month in the sample and increases by 1 in each successive month. This variable is introduced to control for trends in Comcast's churn rates $\{C_t\}$.

19. The sabotage variable, S_t , is a dummy variable that indicates whether Netflix's average speed on Comcast's network was less than 2 Mbps during month t . S_t takes on the value 1 in November 2013 through February 2014, and is 0 in all other months in the sample.¹¹ The resulting regression equation is:¹²

$$\{C_t\} = \alpha + \beta C_{t-12} + \gamma T_t + \delta S_t + \epsilon_t$$

20. Equation (1) provides $\{C_t\}$. In fact, $\{C_t\}$ indicates that, after accounting for overall trends and $\{C_{t-12}\}$ in the data, the churn of Comcast's HSD customers $\{C_t\}$ during the period in which Netflix's traffic was slowed on Comcast's network.¹³ Thus, even when "Comcast experienced a surge in Netflix-

¹¹ The sample period $\{C_t\}$ is the period for which Comcast has supplied customer churn data.

¹² p values appear below the coefficient estimates in equation (1) (and in equations (2) and (3) below). The R^2 for this regression is $\{R^2\}$.

¹³ $\{C_t\}$ the work of Comcast's customer service representatives may warrant consideration in this regard. When customers called Comcast's customer service centers to complain about the slow speed of Netflix's traffic, Comcast's service representatives may have been able to convince customers that Comcast was not responsible for the slow speed. Conceivably, the representatives might also have employed the customer contact as an opportunity to encourage customers to renew, extend, or upgrade their contracts with Comcast.

related customer-service calls with customers complaining about Comcast's broadband service,"¹⁴ few {{ }} of these angry customers left Comcast.

21. {{ }} in those geographic regions where many of Comcast's customers can obtain broadband internet access from AT&T or Verizon, two leading alternative suppliers of broadband service.¹⁵ Figure 2 compares the monthly churn rates for Comcast's HSD primary residential customers in: (i) all of the {{ }} zip codes in which Comcast serves HSD customers; (ii) the {{ }} of these zip codes in which AT&T and/or Verizon offer DSL or FTTP broadband service; and (iii) the {{ }} of these zip codes in which AT&T and/or Verizon offer FTTP broadband service.¹⁶ Figure 2 reveals that the churn rates in these "competitive" regions – where many consumers who were dissatisfied with Comcast's service could conceivably secure broadband service from AT&T or Verizon¹⁷ – are {{ }} the churn rates throughout Comcast's operating territory.¹⁸ Most importantly, {{ }} during the period when Netflix traffic was slowed on Comcast's network.

¹⁴ Israel Reply, ¶56.

¹⁵ In its reply to the Commission's data request, Comcast reports customer churn by zip code, and specifies whether AT&T or Verizon supplies DSL or fiber-to-the-premise (FTTP) broadband service in each zip code.

¹⁶ Verizon provides FTTP broadband service in {{ }} of these zip codes. AT&T provides FTTP broadband service in {{ }} of these zip codes.

¹⁷ The fact that a company provides broadband service in a zip code does not imply that the service is available to every household in the zip code.

¹⁸ It is interesting to note that Comcast's customer churn rates typically {{ }} in zip codes where AT&T and/or Verizon offer FTTP broadband service in Comcast's operating territory.

{{

}}

22. Econometric analysis confirms that Comcast {{

}} due to the reduced speed of Netflix traffic on Comcast's network even in those zip codes where AT&T and/or Verizon provide broadband service. Equation (2) is the counterpart to equation (1) when the sample only includes Comcast customers in the {{ }} zip codes where AT&T and/or Verizon supply broadband service in Comcast's operating territory. Equation (3) is the counterpart to equation (1) when the sample only includes Comcast's

customers in the {{ }} zip codes where AT&T and/or Verizon supply FTTP broadband service in Comcast's operating territory.¹⁹

{{

}}

23. Equations (2) and (3) suggest that, even in those regions where many of Comcast's customers can obtain broadband internet access from AT&T and/or Verizon, Comcast {{ }} due to the reduced speed of Netflix traffic on Comcast's network. To the contrary, {{ }} on the coefficient of the sabotage variable, S_t , indicates that, after accounting for overall trends and {{ }} in the data, the churn of Comcast's HSD customers in these competitive regions {{ }} during the period in which Netflix's traffic was slowed on Comcast's network. Thus, the available data fatally undermine Comcast's claim that it would experience a significant increase in customer churn if it sabotaged OVDs, even if attention is restricted to regions in which such increased churn seems particularly likely to arise.

24. The presumed relationship between OVD sabotage and customer churn that underlies equations (1) – (3) is not the only plausible such relationship. Alternative formulations of this relationship are reviewed in the appendix to this declaration. Importantly, none of these formulations support Comcast's contention that it risks a significant increase in customer churn if it sabotages OVDs. Therefore, it is reasonable to conclude that, for the reasons explained in detail in my original declaration, Comcast does indeed have substantial incentive and ability to sabotage OVDs. Furthermore, the proposed merger would increase Comcast's incentive and ability to sabotage OVDs and thereby stifle industry innovation and harm consumers.²⁰

¹⁹ The R^2 for the regression in equation (2) is {{ }}. The R^2 for the regression in equation (3) is {{ }}.

²⁰ Sappington Declaration, ¶¶26-79.

25. This striking empirical evidence also undermines the credibility of the survey information that Comcast cites in an attempt to argue that it has no incentive to sabotage OVDs.²¹ Regardless of the actions that consumers report they might pursue if Comcast sabotages OVDs, the evidence is clear: in fact, few {{ }} customers appear to leave Comcast in response to impaired OVD performance.

III. An Absence of Foreclosure Does Not Imply an Absence of Consumer Harm.

26. Professor Carlton observes that there are conditions under which an “Internet service provider (ISP) and [an] edge provider have an incentive to negotiate terms that split the surplus that their interaction generates in a way that makes both better off.”²² This observation has little relevance for the present proceeding for at least two reasons.

27. First, the conditions in question are highly unlikely to be met in the present instance.²³ Among other things, the conditions require an absence of contracting frictions. Yet such frictions prevail in practice. Contracting frictions include the transactions costs that are associated with virtually all forms of bargaining and negotiation. Contracting frictions also can arise from limited and asymmetric information about how highly consumers value an OVD’s service, for example.

28. Second, even if the conditions noted by Professor Carlton were met, the proposed merger of Comcast and TWC could still impose substantial harm on consumers. The harm would stem from the substantial leverage the merger likely would afford the combined Comcast–TWC in its interactions with OVDs. Comcast–TWC could employ this leverage to systematically secure a

²¹ Dr. Israel refers to the results of a survey conducted for Comcast as “empirical evidence that, faced with a reduction in the quality of broadband service, customers would, in fact, switch to ... alternatives – including lower speed, DSL, and wireless options – in large numbers, thus imposing substantial costs on Comcast” (Israel Reply, ¶66). The actual empirical evidence presented here demonstrates just how unreliable this survey information is.

²² Declaration of Dennis W. Carlton, Exhibit 3 in Applicants’ Response, September 22, 2014 (“Carlton Declaration”), ¶12. Dr. Israel offers related observations (Israel Reply, ¶¶122-124).

²³ Because the conditions noted by Professor Carlton typically will not prevail in practice, Comcast may well find it profitable to foreclose OVDs and supply a substitute OTT service itself. Comcast and its experts dismiss this potential outcome improperly (Compass Lexecon Supplemental Responses on Broadband Prices, Customer Lifetime Value Calculations, and Alternative Theories of Foreclosure, ¶19 (Attachment to Letter from Francis Buono, Comcast Corporation, to Marlene Dortch, FCC, MB Docket No. 14-57 (Dec. 3, 2014)) (“Comcast December 3 Response”). The flaws in the arguments of Comcast and its experts are discussed in Section VI below.

disproportionate share of the available surplus in its interactions with OVDs. Doing so would limit innovation by OVDs and thereby harm consumers of video services.

29. When it decides how much costly innovative activity to pursue, an OVD will naturally consider the likely financial return to its activity. If the OVD's projected return is minimal because Comcast-TWC is likely to usurp the lion's share of the total return, the OVD will rationally undertake little innovative activity (and may even decide to terminate its operations altogether). Consumers are harmed when industry innovation is stifled in this manner. Thus, even in the absence of a concern about whether a powerful ISP will reach an agreement with an OVD, substantial concern remains regarding the likely terms of the agreement.

30. The concern here is even more pronounced than the long-standing concern with the fraction of the nation's cable subscribers that a single cable company can serve. The concern in the cable industry is that a cable company that controls access to a sufficiently large number of viewers will be able to extract very favorable terms from programmers. In doing so, the cable company will reduce the financial gain a programmer anticipates from creating even particularly innovative, high-quality programming. Consequently, the incentives to create such programming are diminished, to the detriment of viewers.

31. Notice, though, that a cable company must acquire high-quality programming in order to attract subscribers. Therefore, even a cable company that enjoys substantial leverage in its interactions with programmers will tend to offer contract terms that ensure programmers will deliver the programming that is vital to the cable company's success. In contrast, a broadband supplier that is also a cable supplier may have less incentive to negotiate mutually agreeable terms with an OVD. This is the case because the broadband supplier can benefit even when it fails to reach an agreement with the supplier of an OTT video service that competes with the broadband supplier's cable video services. The benefit is the reduced competition the broadband supplier faces for its cable video services.

32. Comcast and TWC have carefully structured their proposed merger to ensure that the combined company will not serve more than 30 percent of cable subscribers nationwide. Yet the parties acknowledge that they will serve 40 percent of subscribers to wireline broadband service with downstream speeds of at least 10 Mbps. The parties will serve an even larger fraction of

subscribers to wireline broadband service with downstream speeds of at least 25 Mbps.²⁴ Because a broadband supplier may have less incentive than a cable company to facilitate access to its subscribers, the large fraction of high-speed broadband subscribers that Comcast-TWC would serve post-merger raises serious concerns.

33. In summary, Professor Carlton has merely asserted that, in theory, there are conditions under which an ISP and an OVD will reach a mutually advantageous agreement. This observation by no means implies that the proposed merger of Comcast and TWC is unlikely to harm OVDs – and therefore is unlikely to harm consumers of video services – for at least two reasons. First, the conditions to which Professor Carlton alludes are highly unlikely to be satisfied in the present instance. Second, even if the combined Comcast–TWC often would reach agreements with OVDs, the substantial leverage that the merger is likely to bestow upon the combined entity could enable it to usurp much of the surplus created by the innovative activities of OVDs.²⁵ When they anticipate limited financial returns from costly innovative activity, OVDs will rationally curtail such activity, to the detriment of consumers of OTT video services.

34. It should also be noted that the Applicants’ experts implausibly dismiss the possibility that Comcast-TWC might foreclose an OVD and supply a corresponding OTT service itself.²⁶

²⁴ See, for example, Sappington Declaration, and Mark Cooper, “Buyer and Bottleneck Market Power Make the Comcast-Time Warner Merger ‘Unapprovable’,” Consumer Federation of America Report, April 8, 2014 ([http:// www. consumerfed.org/pdfs/CFA-Comcast-TW-Merger-Analysis.pdf](http://www.consumerfed.org/pdfs/CFA-Comcast-TW-Merger-Analysis.pdf)).

²⁵ Professor Carlton and Dr. Israel both suggest that Comcast’s recent contract with Netflix indicates that Comcast has limited leverage in its interactions with OVDs (Carlton Declaration, ¶¶14-15; Israel Reply, ¶¶118-119). This suggestion ignores at least two relevant facts. First, the merger is likely to endow the combined Comcast–TWC with more leverage than Comcast presently enjoys. Second, Comcast has been well aware for some time that overly-aggressive behavior in its interactions with OVDs could limit the chances that the Commission and the Department of Justice would view the proposed merger of Comcast and TWC favorably. Consequently, the contract terms to which Comcast has agreed pre-merger may be entirely unrepresentative of the terms it would insist upon post-merger.

²⁶ Comcast also reports that “OVDs have also become significant purchasers of NBCUniversal content” and asserts that “[t]his creates a significant and growing *disincentive* for Comcast to harm or degrade the performance or viability of OVDs” (Letter from Kathryn A. Zachem, Comcast Corporation, to Marlene H. Dortch, Federal Communications Commission, Re: *Applications of Comcast Corp., Time Warner Cable Inc., Charter Communications, Inc. and SpinCo for Consent to Assign or Transfer Control of Licenses and Authorizations*, MB Docket No. 14-57, November 26, 2014, Response to Question 1, at 17). This argument is unconvincing for the reasons set forth in Section VII of DISH’s Reply.

For the reasons identified in Section VI below, such foreclosure could well be profitable for Comcast-TWC.

IV. Nationwide Shares of Broadband Subscribers Are Highly Relevant for this Proceeding.

35. Dr. Israel asserts that commenters have failed “to establish the existence of a national broadband market in which [national market] shares would be relevant.”²⁷ In his attempt to support this assertion, Dr. Israel focuses on the choices of individual broadband subscribers, noting that the broadband subscriptions offered by Comcast and the broadband subscriptions offered by TWC are not substitutes for consumers because Comcast and TWC serve distinct geographic regions.

36. Dr. Israel’s analysis ignores the fact that access to Comcast’s high-speed broadband subscribers and access to TWC’s high-speed broadband subscribers are substitutes for an OVD attempting to secure nationwide distribution of its OTT service. As the analysis in Section VII below demonstrates, an OTT service may be viable if it can secure access to Comcast’s customers or if it can secure access to TWC’s customers. However, the OTT service may well be unprofitable without access to the high-speed broadband customers of both Comcast and TWC. Consequently, the merger of Comcast and TWC would enable a single entity to control the supply of two services (access to high-speed broadband subscribers) that presently are important substitutes for OVDs.²⁸

37. OVDs require access to broadband subscribers in order to successfully market their products. Comcast, TWC, and other ISPs control this access. An ISP’s refusal to admit uncompromised access to its broadband subscribers will reduce an OVD’s potential earnings, as demonstrated in Section VII below. The reduction in earnings that an OVD suffers when it is unable to secure uncompromised access to an ISP’s broadband subscribers increases as the number of customers the ISP serves increases. Therefore, the number of customers an ISP serves – as proxied by the ISP’s share of nationwide broadband subscribers – is a relevant measure of

²⁷ Israel Reply, ¶17.

²⁸ The fact that OVDs usually (but, of late, not always) do not pay ISPs directly for access to their broadband subscribers does not affect this conclusion. ISPs secure payments from subscribers that defray the costs of supplying access to OVDs.

the ISP's ability to harm an OVD by unilaterally impeding the OVD's access to the ISP's broadband subscribers.

38. Just as market shares are an imperfect measure of market power in any relevant antitrust market, the share of nationwide broadband subscribers that an ISP serves may not provide a perfect measure of the harm that the ISP can impose on an OVD or of the leverage that the ISP can exercise over an OVD. However, national market shares constitute informative proxies for this leverage, and so are useful to consider in assessing the extent to which the proposed merger of Comcast and TWC could harm OVDs (and thereby stifle industry innovation and harm consumers of OTT services) by increasing the combined leverage of Comcast and TWC over OVDs.

39. The Commission has long relied on national market shares to assess whether a particular cable supplier might have excessive leverage in its interaction with programmers. This is the case even though cable suppliers typically have not engaged in direct (horizontal) competition for retail customers with one another. Thus, the consideration of national market shares in the present analysis of vertical concerns raised by the proposed merger of Comcast and TWC has precedent and reflects sound economic principles.²⁹

V. The Experts' Product Market Assertions are Not Compelling.

40. In attempting to argue that DSL belongs in the same product market as high-speed cable broadband service, Dr. Israel downplays the substantial price differences between the two services.³⁰ In doing so, Dr. Israel cites the work of Werden and Froeb ("the Werden-Froeb analysis"),³¹ which reviews the hazards of relying upon any single, simple rule to assess whether two services belong in the same relevant product market.

²⁹ The calculation and the interpretation of the national market shares by merger opponents in the present proceeding avoid the key criticisms of the Commission's corresponding calculations. In particular, the present calculations include subscribers of all relevant broadband services, not simply subscribers to cable broadband services. Furthermore, the national market shares have been employed to assess the potential unilateral (as opposed to coordinated) behavior of relevant industry suppliers.

³⁰ Israel Reply, ¶78.

³¹ Gregory Werden and Luke Froeb, "Correlation, Causality, and All that Jazz: The Inherent Shortcomings of Price Tests for Antitrust Market Delineation," *Review of Industrial Organization*, 8(3), June 1993, 329-353.

41. The Werden-Froeb analysis does not suggest that price differences – such as the substantial differences in the prices of DSL and high-speed cable broadband service that commonly prevail – are irrelevant in delineating the boundaries of relevant antitrust markets. The analysis simply notes that such significant price differences alone do not permit one to conclude with certainty that DSL and high-speed cable broadband service are not in the same relevant product market, and so additional evidence warrants consideration.

42. Dr. Israel's observation that some Comcast subscribers have historically switched to DSL service³² does not constitute compelling additional evidence in this regard. There are many reasons why some former Comcast subscribers might switch to DSL even if DSL and high-speed cable broadband service are not in the same relevant product market. For instance, the customers who switched to DSL might have subscribed to Comcast's slower-speed broadband services. In this event, their observed switch to DSL provides no information whatsoever about the extent to which consumers view DSL and high-speed cable broadband service to be reasonable substitutes.

43. Alternatively, customers may have signed up for Comcast's high-speed broadband service on a trial basis in response to a low introductory price. After trying the service, the customers may have discovered that they seldom consumed the particular internet video products (e.g., streaming video) that are best viewed with high-speed cable broadband service. Consequently, these customers may have concluded that it was uneconomical to pay the substantial premium required to continue to access Comcast's high-speed broadband service. Their switch to DSL provides little information about whether consumers who subscribe to high-speed cable broadband service primarily to view streaming video consider DSL to be a reasonable substitute for their preferred service.

44. Dr. Israel's discussion of survey results³³ similarly provides little, if any, useful information about whether the independent supply of DSL constrains the pricing of high-speed cable broadband service. It is well known that actual customer behavior can differ substantially

³² Israel Reply, ¶81.

³³ *id.*, ¶¶89-93.

from the behavior predicted by surveys.³⁴ Indeed, one should expect actual behavior to diverge from predicted behavior in the present instance. A customer's claim that she will leave Comcast for another broadband supplier if Comcast impedes access to valued websites is a simple, costless way for the customer to express her preference for uncompromised access to these websites. Perhaps the most surprising survey finding is that some customers effectively invited Comcast to selectively slow internet traffic by admitting that they are unlikely to switch suppliers even when Comcast intentionally slows the traffic of "uncooperative" OVDs.³⁵

45. The information that Comcast provides to its customers likely provides more useful information about whether DSL is capable of constraining Comcast's pricing of its high-speed broadband service than does survey data. Comcast informs customers through its *Xfinity* website that only services with downstream speeds of at least 25 Mbps are appropriate for streaming video.³⁶ The services with slower downstream speeds that Comcast advertises are only recommended for email, social networking, surfing the web, sharing photos, and downloading music. Thus, assuming that Comcast provides accurate information to its customers, broadband customers who wish to view streaming video regularly are unlikely to find that broadband services with download speeds considerably below 25 Mbps will satisfy their needs. Consequently, if a large portion of Comcast's high-speed broadband subscribers purchase the service in order to stream video, the independent supply of DSL with relatively slow speeds is unlikely to constrain Comcast's pricing of its high-speed broadband services.

46. Dr. Israel's attempt to place wireless broadband service in the same product market as high-speed cable broadband service³⁷ is also unconvincing. Dr. Israel's call for a "forward-

³⁴ See, for example: (i) Norbert Schwartz, "Self-Reports: How the Questions Shape the Answers," *American Psychologist*, 54(2), February 1999, 93-105; and (ii) Norbert Schwartz and Daphna Oyserman, "Asking Questions About Behavior: Cognition, Communication, and Questionnaire Construction," *American Journal of Evaluation*, 22(2), June 2001, 127-160.

³⁵ In fact, as documented in Section II above, Comcast's HSD customers exhibited {{
}} to discontinue their service with Comcast during or after the period in which Netflix's traffic was slowed on Comcast's network.

³⁶ Comcast, XFINITY Internet (http://www.comcast.com/internet-service.html?CMP=KNC-IQ_ID_64318266-VQ2-g-VQ3--VQ6-40631332186-VQ16-c-pkw-comcast-pmt-e&iq_id=69132979&NUM=3), visited October 15, 2014.

³⁷ Israel Reply, ¶¶82-88.

looking” industry assessment³⁸ is appropriate. However, it is not appropriate to base irreversible policy decisions on speculative forecasts about possible long-term industry developments. The assertions that some industry observers “recognize the growing importance of video over wireless,”³⁹ that “gains in wireless capacity and reductions in cost will make wireless broadband an increasingly relevant alternative over time,”⁴⁰ and that “[n]ew wireless technologies are further increasing their competitive relevance”⁴¹ merit consideration in ongoing studies of future industry developments. However, these assertions do not imply that the independent supply of wireless broadband services presently constrains the pricing of high-speed broadband cable service, particularly in light of the data caps that typically prevail in wireless broadband plans. Dr. Israel’s assertions also do not imply that the independent supply of wireless broadband services is likely to constrain the pricing of high-speed broadband cable service in the near future.

VI. The Merger Likely Would Reduce Future Competition Between Comcast and TWC.

47. The Applicants argue that their merger would not limit future competition between them because neither of them presently plans to provide an out-of-region OTT service.⁴² However, incumbent multi-channel video programming distributors (“MVPDs”) like Comcast and TWC tend to be well positioned to serve as particularly effective OTT competitors. Consequently, the merger of Comcast and TWC could well reduce future competition in the supply of OTT services.

48. Incumbent MVPDs are well-situated to serve as effective OTT competitors for at least four reasons. First, due to their tenure in the industry, incumbent MVPDs have substantial industry expertise and knowledge, including a deep understanding of consumers’ viewing habits

³⁸ *id.*, ¶82.

³⁹ *id.*

⁴⁰ *id.*, ¶85.

⁴¹ *id.*, ¶86.

⁴² Dr. Israel claims that “Comcast has no plans to offer online video offerings outside its footprint” (Israel Reply, ¶127).

and preferences.⁴³ Incumbent MVPDs can employ their expertise and knowledge to design OTT services that consumers value particularly highly.⁴⁴

49. Second, incumbent MVPDs typically have well-established, well-functioning relationships with content suppliers. These relationships and the incumbents' status as major content buyers can help them secure reliable and relatively low-cost access to valuable content for OTT services.⁴⁵ Furthermore, Comcast's ownership of NBCUniversal ensures that Comcast typically will have access to NBCUniversal programming at lower cost than OTT rivals, which provides Comcast with an important competitive advantage.

50. Third, Comcast's *Infinity* service is an OTT service that Comcast has operated successfully for several years. The incremental cost that Comcast would incur to export this service beyond the boundaries of its current footprint likely would be relatively small.⁴⁶

⁴³ Mr. Roger Lynch, Executive Vice President of the Advanced Technologies and International Group for DISH Network, observes that Comcast's ownership of *FreeWheel* provides Comcast with particularly detailed and comprehensive knowledge of consumers' preferences (Reply Declaration of Roger J. Lynch ("Lynch Reply"), ¶20).

⁴⁴ The ability of incumbent MVPDs to design OTT services that consumers value particularly highly reduces the risk of introducing unpopular, and thus unprofitable, OTT services. Consequently, the rationale for Comcast's claim that "Choosing to self-supply an OVD service ... is both highly costly and risky to Comcast" is not apparent (Comcast December 3 Response, ¶19). The launch of a new service inevitably entails risk. However, the risk associated with a new OTT service may well be less pronounced for incumbent MVPDs with considerable industry expertise than for new, independent OVDs.

⁴⁵ The Applicants suggest that the elimination of OVDs is likely to be undesirable because it would shift to Comcast-TWC the burden of reaching favorable agreements with content providers ("foreclosing a particular OVD would likely just shift Comcast's negotiation from one third party (the OVD) to another (e.g., other OVDs, studios and other programmers). Such a strategy would not likely be profitable, as Comcast would simply find itself more dependent on the remaining, smaller set of third-party content providers") (footnote omitted) (Comcast December 3 Response, ¶19). The rationale for this suggestion is far from apparent in light of the long-standing relationships that Comcast and TWC have with content providers and the increased leverage the combined Comcast-TWC likely would wield in negotiations with content providers.

⁴⁶ Mr. Roger Lynch observes that "Comcast and TWC have both independently developed or are developing Internet-delivered service offerings that are or will become available. After the OTT service is developed, it is only a small leap from the investment in such a service to the incremental relatively minor investment needed to export it outside each cable operator's footprint, in large part because there is no substantial additional physical infrastructure to be deployed for an OTT service" (Lynch Reply, ¶30).

51. Fourth, incumbent MVPDs like Comcast and TWC that provide high-speed broadband service have in place the infrastructure required to deliver OTT services to their subscribers. Consequently, such incumbent MVPDs typically face lower incremental in-region distribution costs than rival OVDs face. This cost advantage can help to make incumbent MVPDs particularly strong OTT competitors.

52. In summary, there are several reasons why Comcast and TWC – the nation’s two largest cable operators – are likely to be particularly effective OTT competitors in the future. The two companies may not offer out-of-region OTT services presently in part because doing so would make more apparent yet another detrimental, anti-competitive effect of the proposed merger. However, once the fate of the proposed merger has been determined, there is every reason to believe that Comcast and TWC will supply out-of-region OTT services. Consequently, by terminating the independent operation of Comcast and TWC, merger approval likely would reduce future competition in the supply of OTT services.

VII. The Merger Could Threaten the Viability of DISH’s New OTT Service.

53. I understand that DISH plans to launch a new domestic OTT service in the near future. In assessing the likely returns from this new service, DISH prepared projections of the revenues a new OTT service would generate and the associated costs of supplying the service.⁴⁷ I understand that these projections were informed by DISH’s experience with its foreign language OTT service, *DISH World*.

54. These projections are employed here to demonstrate that if the proposed merger were to occur, access to the high-speed broadband subscribers of the combined Comcast-TWC is likely to be essential for the viability of a new OTT service. The projections indicate that a new OTT service could be viable without access to TWC’s current subscribers. The service could even be viable without access to Comcast’s current subscribers. However, without access to the high-speed broadband subscribers of the combined Comcast-TWC, the potential returns from the service would be diminished so severely that the new service likely would be unviable, and so would not be offered.

⁴⁷ These projections are set forth and explained in detail in the Lynch Reply. The projections are replicated in Table 1 below.

55. Because the combined Comcast-TWC could unilaterally control the viability of a new OTT service, the combined company would enjoy pronounced leverage in its interaction with OVDs, which it could employ to extract from OVDs much of the surplus generated by their new services. Such surplus extraction would limit the incentives of OVDs to create innovative, high-quality OTT services, and thereby harm consumers of those services.

56. I understand that in order to determine whether to undertake a new project, DISH typically employs its revenue and cost projections to estimate the annual pre-tax cash flow (or “profit”) the project will generate for {{ }}. Furthermore, DISH typically will only pursue a project if the net present value (“NPV”) of the profit it is expected to generate during the {{ }} of its operation is positive.⁴⁸ The financial projections presented in Tables 1 – 3 permit an assessment of the {{ }} NPV of the profit a new domestic OTT service is likely to generate, depending on the access it can secure to the nation’s high-speed broadband subscribers.

57. Table 1 summarizes DISH’s financial projections for the case where the new OTT service has uncompromised access to all U.S. broadband subscribers with downstream speeds of at least 25 Mbps. As explained in the Lynch Reply, the first six rows of data in Table 1 pertain to the projected number of subscribers for the new OTT service. The “total variable contribution” reported in the eighth row of data in Table 1 represents the total revenue the new OTT service is expected to receive from its subscribers. The “total subscriber acquisition costs” that appear in the tenth row of data reflect the estimated total cost of acquiring subscribers. The “total additional operational costs” in the twelfth row of data represent the projected additional costs of serving subscribers. The “pre-tax cash flow” reported in the last row of data in Table 1 is the

⁴⁸ The NPV of a series of future profits is the value today of the future stream of profits. Positive profits that arrive earlier are more valuable than profits that arrive later because the former are received sooner and so can be put to use (e.g., invested) sooner. Thus, in calculating the NPV of a series of profits, more distant profits are “discounted.” Formally, let π_t denote the profit that will arrive at the end of year t , for $t = 1, \dots, T$. Also let r denote the relevant annual discount rate. Then the NPV of this stream of profit is $\sum_{t=1}^T \left(\frac{1}{1+r}\right)^t \pi_t$.

profit the new service is expected to generate. This profit is the difference between total revenue and the sum of total subscriber acquisition costs and total additional operational costs.⁴⁹

⁴⁹ Costs and negative numbers are denoted by parentheses (“(•)”) in Tables 1 – 3.

{{

}}

58. As Table 1 indicates, the new OTT service is expected to {{
}} years of operation. The service is expected to produce {{
}} in subsequent years. Using a {{
}},⁵⁰ the NPV of the identified {{
}} series of financial losses and financial gains is {{
}}. Because this {{
}} NPV of expected profit is positive, DISH would proceed with an OTT service of this sort if it anticipated uncompromised access to all relevant U.S. broadband subscribers.

59. The prospects for an OTT service become less attractive when it is unable to secure uncompromised access to a substantial fraction of relevant broadband subscribers. Table 2 estimates the changes that would arise if the OTT service in question were unable to secure access (only) to Comcast's broadband subscribers. Table 3 reports the corresponding changes that would arise if the OTT service were denied access to both Comcast's and TWC's broadband subscribers.

60. The entries in Tables 2 and 3 employ the market share calculations in the Sappington Declaration. These calculations are derived from publicly available data, assuming that the ratio of broadband connections with downstream speeds of at least 25 Mbps ("25M broadband connections") to all broadband connections that a cable company supplies is the same for all cable companies. The calculations reveal that Comcast and TWC together would supply approximately 50% of residential 25M broadband connections in the U.S. after the proposed merger and after the planned divestiture of subscribers. The calculations reported in Tables 2 and 3 further assume that Comcast supplies twice the number of broadband connections that TWC supplies.⁵¹

⁵⁰ The {{
}} discount rate reflects the standard weighted average cost of capital that DISH employs in its financial projections for new services. A higher discount rate (which would reduce the calculated NPV of the identified stream of cash flows) might arguably better capture the risk and uncertainty inherent in many new product offerings.

⁵¹ Comcast served 19.7 million residential broadband customers as of March 31, 2014. TWC served 11.4 million residential broadband customers as of April 17, 2014. (Kathryn A. Zachem et al.'s *Letter to FCC Secretary Marlene H. Dortch*, MB Docket No. 14-57, June 27, 2014, <http://apps.fcc.gov/ecfs/document/view?id=7521351426>).

61. In this setting, if the new OTT service were unable to reach (only) Comcast's broadband subscribers, it would lack access to one-third of the customers to whom it is assumed to have access in Table 1. This reduction in the addressable market represents two-thirds (Comcast's share) of the estimated 50 percent of U.S. residential 25M broadband connections that the combined Comcast-TWC would supply post-merger.

62. Table 2 documents the impact of this diminished access to potential customers. For simplicity, variable per-subscriber contribution margins, per-subscriber acquisition costs, and the annual rate of increase in additional operational costs are assumed to be unaffected by the reduced customer access. The lack of access to one-third of relevant potential customers is assumed only to reduce by one-third the number of new subscribers ("gross additions") that the service attracts each year.⁵²

63. The resulting decline in the subscriber base for the new domestic OTT service reduces the earnings the service generates. However, the {{ }} NPV of expected profit remains positive {{ }} even when the service is unable to secure access to Comcast's high-speed broadband subscribers.⁵³

64. In contrast, the {{ }} NPV of profit from the new service is negative when it is unable to access the relevant broadband subscribers of both Comcast and TWC, as would be the case if Comcast-TWC blocked access to its broadband subscribers following the merger. Table 3 presents the financial impact of being unable to access the 50 percent of relevant broadband subscribers that Comcast and TWC together are estimated to supply post- merger.⁵⁴ In this case, the new OTT service would incur substantial losses in each of the {{ }} years of its operation. These pronounced losses cause the {{ }} NPV of expected profit from the

⁵² As explained in the Lynch Reply, {{ }} of initial ("beginning of year") subscribers and {{ }} of new subscribers ("gross additions") are projected to discontinue their subscriptions each year. Therefore, the estimated reduction in the number of new subscribers has a corresponding impact on the number of subscribers that are expected to discontinue their subscriptions each year ("disconnects").

⁵³ The {{ }} NPV of expected profit for the service is also positive {{ }} when the service is denied access (only) to TWC's high-speed broadband subscribers.

⁵⁴ Again, for simplicity, the calculations in Table 3 assume that the only impact of the inability to reach one-half of relevant viewers is a 50 percent reduction in the number of new subscribers ("gross additions") the service attracts each year.

service to be {{ }}. Faced with such a negative {{ }} NPV of profit, DISH typically would decide not to pursue a new OTT service like this one.

65. This case study illustrates the more general conclusion that the proposed merger of Comcast and TWC would endow the combined firm with the ability to unilaterally determine the fate of promising OTT services. The associated leverage that Comcast-TWC would enjoy in its interaction with OVDs would enable the combined company to extract from OVDs much of the surplus generated by their innovative activities. Such surplus extraction would limit the incentives of OVDs to create high-quality OTT services, and thereby harm consumers of those services.

{{

}}

{{

}}

VIII. Conclusions.

66. The preceding analysis supports the following six conclusions. First, Comcast {{
}} in the churn of its broadband subscribers during or after the period when Netflix's traffic was slowed on Comcast's network. Therefore, the Applicants' repeated claim that they have no incentive to sabotage OVDs because the sabotage would substantially increase customer churn is without merit.
67. Second, substantial customer harm can arise even in (hypothetical) settings where ISPs never foreclose OVDs. The harm arises when powerful ISPs usurp the lion's share of the surplus created by OVDs, thereby limiting incentives for innovation by OVDs.
68. Third, access to the combined subscriber base of Comcast and TWC is essential for the viability of OTT services like DISH's new domestic OTT service. Consequently, the proposed merger would endow Comcast-TWC with leverage over DISH and other OVDs that could seriously diminish industry innovation and thereby harm consumers of OTT services.
69. Fourth, the evidence that has been presented to support the contention that DSL and high-speed cable broadband service belong in the same relevant product market is not compelling. The Applicants have not demonstrated that the independent supply of DSL constrains the pricing of high-speed cable broadband services.
70. Fifth, the merger of Comcast and TWC likely would reduce future competition in the supply of OTT services.
71. Sixth, it is important to consider the relevant national geographic market and assess the nationwide supply of access to high-speed broadband subscribers in order to fully assess the impact of the proposed merger of Comcast and TWC. The access that these ISPs presently supply to OVDs are substitutes, and the merger would allow a single entity to control the supply of these substitute services and thereby harm consumers of OTT services.

APPENDIX

72. This appendix provides additional evidence that Comcast's HSD customers {{
}} during or after the period in which Netflix's traffic was slowed on Comcast's network. Additional graphic evidence is provided in Section A.II. Additional econometric analysis appears in Section A.III. First, though Section A.I presents some preliminary information that underlies the ensuing analysis.

A.I. Preliminary Analysis.

73. Figure A1 illustrates the aforementioned {{
}} in the churn of Comcast's HSD {{
}} customers. This churn tends to be most pronounced during {{
}} and least pronounced during {{
}}.

}}

74. Figure A2 presents the average speed of Netflix’s traffic on Comcast’s network between November 2012 and June 2014.⁵⁵ The solid line represents speeds for July 2013 – June 2014, a year in which Netflix’s traffic was slowed on Comcast’s network. The dashed line presents speeds for the portion of the preceding year in which this data is available.

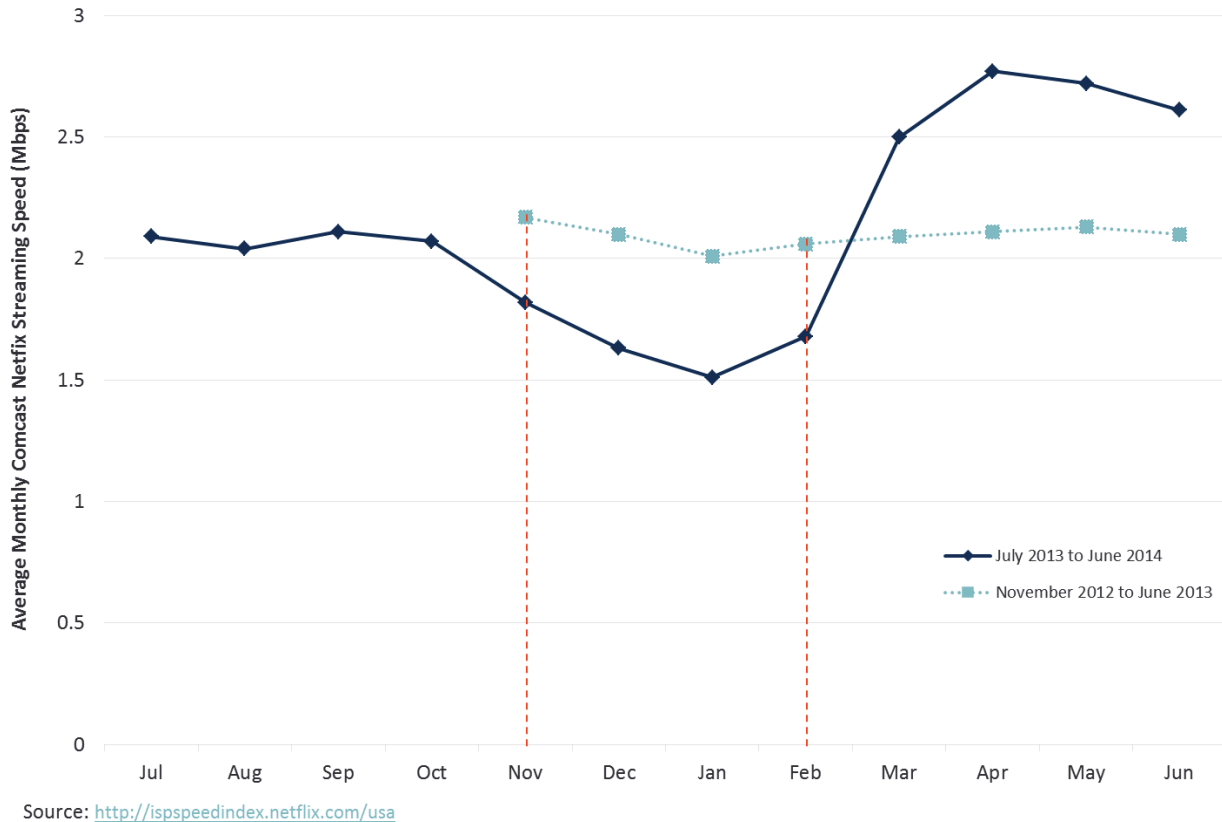


Figure A2. Average Speed of Netflix’s Traffic on Comcast’s Network.

A.II. Additional Graphic Analysis.

75. Figure A3 adds to Figure 1 the churn rate for Comcast’s HSD {{ }} customers in 2011 – 2012. Figure A3 makes it clear that churn rates in 2012 – 2013 were {{ }}. Therefore, the comparison of churn rates in 2013 – 2014

⁵⁵ This data is derived from <http://ispspeedindex.netflix.com/usa>. November 2012 is the first month for which this data is reported.

with the corresponding churn rates one year earlier {{

}}

{{

}}

76. Figure A4 presents churn rates for Comcast's {{ subscribers. These are {{

}}. Figure A4 makes it clear that, {{
}}, Comcast's {{

}}

during or after the period in which Netflix's traffic was slowed on Comcast's network.

{{

}}

77. Figure A5 presents churn rates for Comcast's {{ }} customers. These are customers who {{ }}. Figure A5 demonstrates that the central churn patterns identified in Figure 1 also prevail for Comcast's {{ }} customers. Therefore, the key qualitative conclusions drawn above are the same whether churn rates are calculated for {{ }} customers or for {{ }} customers.

{{

}}

78. Figure A6 illustrates that the key qualitative features of Figure 1 persist when the definition of “churn” is expanded to include both Comcast subscribers who discontinue their customer relationship with Comcast and Comcast subscribers who {{

}}.⁵⁶

{{

}}

⁵⁶ For two important reasons, the data that Comcast has provided do not permit ready calculation of the most relevant measure of {{ }} for the present purposes. First, the data do not distinguish among {{ }}. Second, the data do not readily distinguish among the different possible types of {{ }}. In particular, the data do not distinguish between {{

}}

Together, Figures A3 – A6 provide additional strong visual evidence that Comcast’s HSD customers {{ }} during or after the period in which Netflix’s traffic was slowed on Comcast’s network.

A.III. Additional Econometric Analysis.

79. Additional econometric analysis provides further evidence that Comcast’s HSD customers {{ }} during or after the period in which Netflix’s traffic was slowed on Comcast’s network. To illustrate, first suppose the regression that underlies equation (1) is modified to incorporate a slightly different measure of OVD sabotage. In particular, suppose the S_t variable is replaced by \hat{S}_t , which is a dummy variable that takes on the value 1 in December 2013 and January 2014 (when the reduction in the speed of Netflix’s traffic was most pronounced) and is 0 in all other months in the sample. The resulting regression equation is:⁵⁷

{{

}}

indicates once again that, after controlling for overall trends and {{ }} in the data, the reduced speed of Netflix’s traffic on Comcast’s network is associated with {{ }} in the churn of Comcast’s HSD customers.

80. Equation (A2) considers a related modification of the regression that underlies equation (1). In this modified regression, the dichotomous S_t variable is replaced by the continuous variable, \tilde{S}_t , which reflects the average speed of Netflix’s traffic on Comcast’s network in month t . The resulting regression equation is:⁵⁸

{{

}}

⁵⁷ p values appear below the coefficient estimates in equation (A1) and in all subsequent equations. The R^2 for this regression is {{ }}.

⁵⁸ The sample period for this regression is {{ }}, reflecting the availability of data regarding Netflix’s speed on Comcast’s network. The R^2 for this regression is {{ }}.

The coefficient on the \tilde{S}_t variable in equation (A2) is $\{\{ \quad \}\}$, indicating that the speed of Netflix's traffic $\{\{ \quad \}\}$.

81. Equation (A3) modifies the regression that underlies equation (1) to account for the possibility that, even though Comcast's customers do not discontinue their HSD service immediately in response to the slowing of Netflix's traffic, they might discontinue their service with a lag. To capture this potential lagged reaction, the contemporaneous "sabotage" variable (S_t) is replaced by the corresponding variable in the preceding month (S_{t-1}). The resulting regression equation is:⁵⁹

$\{\{ \quad \}$

$\}\}$ shows once again that the data provide no evidence of $\{\{ \quad \}$

$\}\}$

82. Alternative regression formulations support this same conclusion. The conclusion is supported, for example, by formulations in which the dependent variable is the difference in the rate of churn of Comcast's HSD $\{\{ \quad \}$ customers in month t and the corresponding churn rate one year earlier. The same conclusion also arises when the analysis is applied only to Comcast's $\{\{ \quad \}$ subscribers or to $\{\{ \quad \}$. The conclusion is also robust to formulations with no explicit time trend variable, to formulations with different measures of "sabotage," and to different lags of the sabotage variable, for example.

83. The central, consistent message provided by both the graphical and econometric analysis of Comcast's data is that $\{\{ \quad \}$ in response to the slowing of Netflix's traffic on Comcast's network. Therefore, Comcast's own data provide $\{\{ \quad \}$

⁵⁹ The R^2 for this regression is $\{\{ \quad \}$. Results very similar to those in equation (A3) arise if a two-month lag in customer reaction is considered (so the S_{t-1} variable in equation (A3) is replaced by S_{t-2}).

}}. Instead,
the data suggest that Comcast can sabotage OVDs with virtual impunity, and so Comcast has
substantial incentive to do so.

REDACTED - FOR PUBLIC INSPECTION

* * *

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 December 22, 2014.

A handwritten signature in black ink, appearing to read 'DS', is written over a horizontal line.

David Sappington
Eminent Scholar, Department of Economics
Director, Robert F. Lanzillotti Public Policy Research Center
University of Florida

EXHIBIT 3

**ECONOMIC ANALYSIS OF THE IMPACT OF
THE COMCAST/TIME WARNER CABLE TRANSACTION
ON SET-TOP BOX COMPETITION AND VIDEO PROGRAMMING COSTS**

Richard Schmalensee

December 23, 2014

I. Introduction

1. My name is Richard Schmalensee. I am the Howard W. Johnson Professor of Economics and Management Emeritus at the Massachusetts Institute of Technology (MIT). I have taught at MIT since 1977, except for 1989-1991 when I was a member of the President's Council of Economic Advisers. I served as the John C Head III Dean of the MIT Sloan School of Management from July 1998 until I stepped down at the end of June 2007. I am also a Director at Global Economics Group, an economic consulting firm.

2. During my career, I have been author or co-author of 11 books and more than 120 articles on industrial organization and other areas of economics. I was the co-editor of Volumes I and II of the *Handbook of Industrial Organization*, a standard reference in the field, and I wrote the entry on Industrial Organization in the first edition of *The New Palgrave*, an authoritative encyclopedia of economics. I am the 2012 Distinguished Fellow of the Industrial Organization Society. I was the Editor-In-Chief of *Competition Policy International*, a leading journal for antitrust practitioners, from 2005 through 2008, and have been Chairman of its Editorial Board since then.

3. Over the years, both the U.S. Federal Trade Commission and the U.S. Department of Justice have asked me to consult on antitrust issues. For example, I was one of two economists outside the government with whom the Department of Justice consulted in preparing the 1992 *Horizontal Merger Guidelines*. I have testified in U.S. federal courts and before Congress on numerous economic issues. My curriculum vitae is provided as Attachment 1.

4. Counsel for COMPTEL has asked me to review the proposed acquisition of Time Warner Cable by Comcast Corporation ("Transaction"). In this declaration, I focus on two main topics. First, I address the potential impact of this Transaction on competition for set-top

boxes that are used in the viewing of programming from multichannel video programming distributors (“MVPDs”). Second, I address the potential impact of this Transaction in increasing the advantage that Comcast and Time Warner Cable have in the cost of video programming over smaller MVPDs, including new entrants, which would decrease competition among MVPDs and among broadband providers.

5. I find that there are competitive concerns with respect to both issues. First, the Transaction may restrict the access of third-party set-top box providers to Comcast and Time Warner Cable’s customers and thereby reduce competition in set-top boxes, resulting in decreased innovation in set-top boxes. The Transaction may also allow Comcast to reduce the access of third-parties content providers, such as online-video distributors (“OVDs”), to placement on set-top boxes using the X1 platform controlled by Comcast, which could become a de facto standard. Second, the Transaction may increase the gap between what Comcast and Time Warner Cable pay for video programming versus what smaller MVPDs pay, thereby leading to decreased competition among MVPDs and among broadband providers in ways that, on net, harm MVPD and broadband consumers.

6. For the reasons I set out below I would encourage the Federal Communications Commission staff to investigate these issues carefully. I reserve the right to supplement this declaration. In particular, as of this submission I have only started my review of the millions of documents, adding up to roughly three terabytes of data, provided by the merging parties only recently. Assuming that access to video programming confidential information (“VPCI”) is permitted under a protective order, I also expect to undertake a review of the VPCI.

II. Set-Top Box Competition

A. Background

7. Consumers use set-top boxes to access video programming from MVPDs. Historically, the only significant function of set-top boxes was to allow consumers to watch linear programming on their televisions. In recent years, with developments in technology, MVPD set-top boxes can be used to record and playback linear programming, to access video-on-demand (“VOD”), to access Internet content including programming from OVDs, to play video games and to access or provide other functionality.

8. MVPDs commonly provide set-top boxes to their subscribers for a monthly fee or as part of a bundle of video programming services. The two leading manufacturers of set-top box hardware are Arris (formerly Motorola) and Cisco (formerly Scientific Atlanta). Recent efforts to provide greater functionality have taken place at the user interface (software) level. Some MVPDs have developed their own software, such as Comcast with its X1 platform. MVPDs also use software from third-party firms, such as Rovi’s Passport Guide.

9. Third-party firms also develop and sell set-top boxes, which may be used for viewing MVPD content and/or other content such as from OVDs. The main barrier to third-party set-top boxes providing access to MVPD content is that the MVPD has to authorize such access. CableCARDs currently allow third-party set-top boxes, such as TiVo set-top boxes, to access a cable MVPD’s linear programming.¹ My understanding is that MVPDs have been required by

¹ Comcast agreed to allow TiVo access to its VOD programming as part of a successor agreement to an initial agreement between those parties that contemplated Comcast using TiVo software on its set-top boxes and that provided a covenant by TiVo not to assert its DVR patents against Comcast. *See* TiVo, Inc., 2009 Annual Report (Form 10-K), at 85-86 (Mar. 31, 2010); *see generally* TiVo, Inc., (Form 8-K) (May 9, 2011). TiVo has filed patent infringement suits against other MVPDs and set-top box manufacturers, including Time Warner

the FCC in the past to provide subscribers with CableCARDs they can use in third-party set-top boxes to enable those boxes to access the MVPD's linear programming, but that there is at least some uncertainty regarding this requirement following the *EchoStar* decision.² My understanding is that the next generation of set-top boxes are likely to abandon the use of CableCARDs in favor of software-based solutions. Such schemes are already starting to be implemented.³

10. Other set-top boxes do not currently provide access to MVPD linear or VOD content.⁴ For example, the Apple TV allows consumers to access a range of over-the-top video programming from providers including Apple, Netflix, Hulu, HBO, Major League Baseball, Disney Channel, ABC, and many other sources. There are currently 50 such "channels" offered on the Apple TV.⁵ In some cases, such as for ABC and HBO, a consumer needs to have a subscription for that channel from an MVPD in order to have access to that channel on the Apple TV. The Apple TV also provides a range of other functionality, such as streaming audiovisual content in the home and being able to display content from an iPad or iPhone.

Cable, and received settlements totaling nearly \$1.5 billion. *See* TiVo Inc., 2013 Annual Report (Form 10-K), at 12 (Mar. 14, 2014).

² *EchoStar Satellite v. FCC*, 704 F.3d 992 (D.C. Cir. 2013).

³ The STELA Reauthorization Act of 2014 provided for the sunset of the integration ban that prohibited cable MVPDs from integrating decryption technology into set-top boxes and provided for a Downloadable Security Technical Advisory Committee ("DSTAC") to "to identify, report, and recommend performance objectives, technical capabilities, and technical standards of a not unduly burdensome, uniform, and technology- and platform-neutral software-based downloadable security system" to promote the competitive availability of navigation devices (e.g., set-top boxes and MVPD-compatible television sets) in furtherance of Section 629 of the Communications Act." STELA Reauthorization Act of 2014, H.R. 5728, 113th Cong., § 106 (2014) ("STELAR"). The FCC is in the process of establishing DSTAC. *See* Public Notice, FCC Seeks Nominations for Membership for the Downloadable Security Technical Advisory Committee, DA 14-1762 (rel. Dec. 4, 2014).

⁴ As I discuss below, some of these set-top boxes that are starting to provide access to MVPD linear and VOD content with the cooperation of MVPDs.

⁵ *See What's on Apple TV*, Apple, <https://www.apple.com/appletv/whats-on/> (last visited Dec. 23, 2014).

11. Other firms selling set-top boxes or devices include Roku, Google, Amazon, Fan TV, Microsoft, and Sony. In some cases, the set-top box functionality is integrated into a television, as with Samsung's Smart TVs. These set-top boxes are starting to include access to MVPD content. As noted, such access is subject to the control of the MVPD, as MVPDs are not currently required to provide any access other than via CableCARD (subject to the resolution of the impact of the *EchoStar* decision), which provides access only to linear programming and is not expected to be an important access scheme in the future. Getting full-featured access to an MVPD's content, including VOD, requires approval by the MVPD. As I note below, Time Warner Cable has been a leader in allowing full-featured access by these third-party set-top boxes. Time Warner Cable subscribers are able to view Time Warner Cable linear and VOD content on Roku devices, Xbox 360s, Samsung Smart TVs and Fan TV boxes.⁶

B. Potential Impact of Transaction on Set-Top Box Competition

12. Comcast and Time Warner Cable are, by far, the two leading cable MVPDs, with approximately 40 percent and 21 percent respectively of all U.S. cable MVPD subscribers. They are two available anchor tenants for a set-top box platform. The remaining cable MVPDs account for about 39 percent, with the next largest system at about 8 percent. Given the significant fixed costs involved, the incentives for a third-party firm to invest in developing and enhancing set-top boxes are greater if they expect to have access to the subscribers of one or both of the merging parties.⁷ If the set-top box provider does not reach agreement with at least

⁶ Time Warner Cable offers up to 300 live linear channels as well as VOD access on these devices. *See TWC TV App*, Time Warner Cable, <http://www.timewarnercable.com/en/tv/features/twc-tv.html> (follow "Options in Your Home") (explaining that the services are available on "Computer, iPad, Xbox, Kindle Fire HD & HDX, Android, Samsung Smart TV, iPhone, Roku, [and] Fan TV.").

⁷ I use "set-top box" here to include the entirety of the set-top box including the software user interface.

one of the two merging parties, there is a limited and fragmented amount of scale left among the remaining cable MVPDs.

13. There are at least two potential significant consequences of the Transaction for set-top box competition. First, the Transaction reduces the number of large, marquee partners for third-party set-top box providers from two to one. If a set-top box provider does not expect to gain access to that merged entity's subscribers, that limits its incentive to invest in developing a set-top box that integrates MVPD programming. Moreover, it prevents the possibility of the two marquee players aligning themselves with different set-top box platform, which would thereby provide for less dynamic competition in this area.

14. It would be significantly more complicated for the set-top box provider to attempt to combine scale from the remaining smaller cable MVPDs. Moreover, if it did not expect to have access to the subscribers of the merged entity then it would not have access to 61 percent of all cable subscribers.⁸ By contrast, if in the absence of the merger, a set-top box provider reached a deal with either Comcast or Time Warner Cable, it might be able to use the success of the product to attract the other firm, as well as attract smaller cable MVPDs.

15. The second potential impact of the Transaction arises if Time Warner Cable is significantly more receptive to set-top box innovation by third-parties than Comcast. If so, then given that merged entity would be the only large cable MVPD post-Transaction, the Transaction eliminates the only large cable MVPD that is likely to facilitate set-top box

⁸ Direct-broadcast satellite ("DBS") and telco MVPD subscribers also use set-top boxes to view content. DBS providers are likely less desirable partners for third-party set-top boxes because DBS providers do not control wired broadband access and because many DBS subscribers have slower DSL service for broadband. The telco MVPD providers are also less attractive partners as they have significantly smaller numbers of subscribers than Comcast and Time Warner Cable and, in the case of AT&T, transmit video using IPTV. This is not to say that they could not play a role in set-top box development, but they are significantly less attractive alternatives.

competition and innovation. While my review of the documents produced by the Comcast and Time Warner Cable is at only a preliminary stage, the available information at this time suggests that this is a plausible concern.⁹

16. Comcast has developed its own X1 platform. The X1 set-top box that Comcast subscribers can use to access Comcast content provides for enhanced features such as advanced search and integration with a voice control smartphone app.¹⁰ The X1 platform is a central part of Comcast's competitive strategy going forward. My understanding is that Comcast plans on offering its X1 platform to other cable MVPDs and already has a trial agreement with Cox. Comcast has also stated that it intends to use X1 in the former Time Warner Cable footprint if the Transaction is approved.

17. By contrast, Time Warner Cable has not made the same type of investments in a proprietary set-top box platform. As a result, Time Warner Cable is likely to be significantly more receptive to working with third-party set-top box manufacturers/developers. Indeed, in terms of currently available set-top boxes using non-CableCARD solutions for enabling access, Time Warner Cable allows its linear and VOD programming to be accessed on Roku devices, Xbox 360, Samsung Smart TVs and Fan TV boxes while Comcast does not provide similar access.¹¹

⁹ My understanding is that a substantial amount of document production, amounting to millions of pages, was made available only on or about December 10, 2014 and that the documents produced include relevant documents on set-top boxes.

¹⁰ See Comcast, "The X1 Platform by Xfinity," <http://www.comcast.com/x1clouduser>.

¹¹ Time Warner Cable offers up to 300 live linear channels as well as VOD access on these devices. *See TWC TV App*, Time Warner Cable, <http://www.timewarnercable.com/en/tv/features/twc-tv.html> (follow "Options in Your Home") (explaining that the services is available on "Computer, iPad, Xbox, Kindle Fire HD & HDX, Android, Samsung Smart TV, iPhone, Roku, [and] Fan TV."). Comcast allows access to VOD, but not linear programming, on the Xbox 360. *See FAQs: Xbox 360*, Comcast Xfinity, <http://xbox.comcast.net/faqs.html> ("We do not have plans to deliver live, linear channels on the Xbox 360 at this time."). The other devices listed in the

18. More generally, it appears that Time Warner Cable has been more interested in consumer owned and managed (“COAM”) devices as a matter of company strategy than Comcast has. A Time Warner Cable {{

{{

}}

19. Given Comcast’s significant investment in its X1 platform, Comcast would be expected to encourage its subscribers to engage with the X1 platform rather than third-party STBs. {{

text cannot be used to access Comcast’s linear or VOD programming. *See Xfinity TV Go App with Download Feature Frequently Asked Questions*, Comcast Xfinity, <http://customer.comcast.com/help-and-support/xfinity-apps/xtv-go-app-download-feature-faqs> (listing compatible devices, which are limited to iPhone, iPod Touch, iPad, Android smartphones or tables, and Kindle Fire products).

In Comcast’s recent responses to the FCC’s questions on this issue, Comcast noted that it had made its app that allows access to certain Comcast content available on a variety of smartphones and tablets (as has Time Warner Cable). None of the devices were set-top boxes. Comcast noted that it was in discussion with {{
}} to support its apps on those platforms and that Comcast believed {{

}} *See* Letter from Kathryn Zachem, Comcast Corporation, to Marlene Dortch, FCC, MB Docket No. 14-57, Response to Question 4 at 2-3 (Nov. 26, 2014). It is also worth noting that Comcast reports that makes available “more than 60” linear channels in contrast to up to 300 from Time Warner Cable. *Id.* at 2.

¹² Time Warner Cable, Inc., Responses to the Commission’s Information and Data Request, MB Docket No. 14-57 (Oct. 14, 2014) (“Time Warner Cable Responses to Commission”) {{

}}

}}¹³

20. The Transaction therefore not only reduces the number of potential large cable MVPD partners for a set-top box competitor from two to one, but the one partner that is being removed by the transaction is the one that has been significantly more interested in partnering with set-top box providers.

C. Potential Impact of Loss of Set-Top Box Competition

21. The immediate impact of the possible loss of set-top box competition is that consumers face reduced and/or slower innovation by third-party set-top box providers. As I noted above, Comcast plans to use its X1 platform in the former Time Warner Cable territories if the Transaction is approved. Comcast also plans to attract other cable MVPDs to use the X1 platform and set-top box and is in a trial with Cox. Comcast, Time Warner Cable and Cox would account for about 69 percent of all cable MVPD subscribers. The transaction would greatly increase the scale on the X1 platform thereby limiting the scale available to other set-top box competitors.

22. Post-Transaction, Comcast would exercise greater control over the ability of other set-top box platforms to succeed. Comcast could choose not to cooperate with such platforms, which would greatly limit their chances of developing a commercially viable product. If Comcast did cooperate, it could extract terms and conditions to serve its interests, such as, for example by disadvantaging OVDs in terms of access to the set-top box. This could result in harm not only in innovation in set-top boxes, but also more broadly to competition from OVDs

¹³ Time Warner Cable Responses to Commission, {{
}}

in the distribution of video to consumers. In the long-run, OVDs could develop to the point that a broadband provider would not need to also offer MVPD services, which would increase the likelihood of broadband entry by overbuilders in Comcast's territory. Limiting the ability of OVDs to compete through control of the set-top box would therefore decrease the likelihood of broadband entry in the long run.

23. If Comcast chooses to limit cooperation with third-party set-top boxes, its X1 platform may become the de facto standard for cable set-top boxes given the reduced incentives for third-party providers to innovate.¹⁴ Comcast would then exercise significant control over the functionality of set-top boxes in the future. It could limit access of other firms, OVDs or other edge providers, to the X1 platform, or extract terms and conditions that serve Comcast's interests.

24. Comcast has, of course, innovated, just as the old AT&T brought out new telephones from time to time when it was the only supplier of them to most of the nation. When AT&T's legal monopoly on telephones was ended, however, the pace of innovation increased dramatically. A multitude of competing, innovative firms introduced high-quality telephones with a variety of new features at what seemed to be amazingly low prices. The moral of this story and others like it is that competition in innovation, as in production and distribution, is

¹⁴ Comcast has stated that it has committed to making available a non-cableCARD authentication method for accessing its linear and VOD content. *See* Letter from Jordan Goldstein, Comcast, and Matthew Zinn, TiVo, to Marlene Dortch, FCC, CS Docket No. 97-80, MB Docket No. 10-91, at 1 (July 14, 2014). Whether this authentication method is made available quickly, whether the solution is technically satisfactory to third-party set-top box providers, and whether Comcast's licensing terms and conditions are reasonable remains to be seen. Given that Time Warner Cable has already made its linear and VOD content available on third-party set-top boxes, it is questionable whether Comcast's commitment to provide a means of doing so in the future is a satisfactory replacement for the potential loss of Time Warner Cable's demonstrated willingness to do so in the present.

generally an important and powerful source of consumer benefits—particularly in consumer electronics.

III. Programming Costs

25. The second issue I discuss in this declaration is the potential impact of this Transaction in increasing the advantage that Comcast and Time Warner Cable now have with respect to the acquisition of video programming over smaller MVPDs, including new entrants. Assuming that access to VPCI is permitted under a protective order, I expect to undertake a review of the VPCI.

26. My understanding from talking to industry participants is that it is a widespread belief that the largest MVPDs, such as Comcast and Time Warner Cable, pay significantly less than smaller MVPDs do for video programming. Comcast also acknowledges that it expects significant cost savings from transitioning from the rates paid by Time Warner Cable to those paid by Comcast.¹⁵ The fact that Comcast now pays lower rates than Time Warner Cable suggests that the merged firm would pay even lower rates than Comcast alone does now.

¹⁵ Dr. Israel argues that the savings in programming costs expected from the Transaction “are quite small in total, amounting to only {{ }} per year.” Mark A. Israel, Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters, MB Docket No. 14-57, ¶ 158 (Sept. 22, 2014) (attached as Exhibit 1 to Comcast Corporation and Time Warner Cable Inc., Opposition to Petitions to Deny and Response to Comments, MB Docket No. 14-57 (Sept. 23, 2014)). Without access to the underlying contracts in the VPCI it is difficult to assess this claim. In particular, the savings over the longer run may be significantly greater when all of Time Warner Cable’s contracts have expired. The declaration cited by Dr. Israel for this estimate noted that Comcast expected the savings “to the extent and at such time as more favorable rates and terms of some of Comcast’s programming agreements supersede some of TWC’s existing contracts.” See Michael J. Angelakis, Angelakis Declaration, MB Docket No. 14-57, ¶ 7 (Apr. 7, 2014) (attached as Exhibit 4 to 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 (Apr. 8, 2014)). Even taking the {{ }} a year as a lower bound, the savings are significant. As a rough estimate, the {{ }} is about {{ }} of Time Warner Cable’s video programming costs of revenue in 2013 reported. See Time Warner Cable Inc., 2013 Annual Report (Form 10-K), at 42 (Feb. 18, 2014). It is also important to note that based on the description of Comcast’s estimate, it does not appear that further decreases in the rates that Comcast pays for programming as a result of the Transaction, relative to what it would pay in the absence of the Transaction, are included in the analysis.

27. If the Transaction increases the differential between Comcast and Time Warner Cable's video programming costs and those of smaller MVPDs, it will decrease competition among MVPDs. The attractiveness of overbuilder entry and expansion will decrease if the disadvantage they face in terms of costs of programming increases. This will also decrease competition among broadband providers.

28. My understanding is that broadband providers believe they need to offer MVPD services in addition to broadband to be competitive. Offering bundled broadband and video packages is important to persuading consumers to switch. Entry as a broadband provider is already complicated and expensive. A further increase in the cost disadvantage in video programming faced by smaller broadband providers would decrease the profitability of entry and thereby decrease the likelihood of broadband entry and expansion.

29. In much of the country, there is limited broadband competition at the moment. If the Transaction inhibits broadband entry, that would impose harm on consumers. For example, Google Fiber's entry or planned entry in selected locations appears to have resulted in significant competitive responses from incumbents.

30. {{

}}¹⁶ {{

¹⁶ Time Warner Cable Responses to Commission, {{
}}

}}¹⁷ {{

}}¹⁸ The type of benefits that consumers received from higher quality and lower prices in these regions would be lost if broadband entry were reduced.

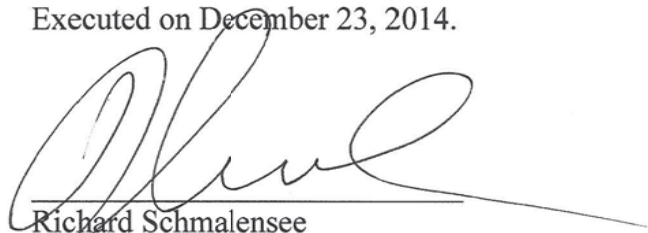
¹⁷ *Id.*

¹⁸ *Id.*

* * *

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 December 23, 2014.

A handwritten signature in black ink, appearing to read 'Richard Schmalensee', is written over a horizontal line.

Richard Schmalensee
Director
Global Economics Group

EXHIBIT 4

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

**RESPONSE TO OPPOSITION TO PETITIONS
TO DENY AND RESPONSE TO COMMENTS**

EVANS DECLARATION II

David S. Evans

December 23, 2014

Executive Summary

The Antitrust Issues Raised by the Transaction and Why It Should Be Blocked¹

Comcast is proposing to merge the first and third largest wired Internet Service Providers (ISP) in America and is doing so under a theory, supported by its economists, that the merger of non-overlapping wired ISPs poses no competitive concern whatsoever. Under this theory, Comcast could consolidate the remaining non-overlapping cable ISPs into a monopoly bottleneck that would stand between edge providers and more than {{ }} of American households with wired broadband connections. Given the migration of DSL subscribers to cable, and the slowdown in fiber investment, that monopoly bottleneck would control access to more than {{ }} of households with wired broadband connections in 2019.

This Transaction poses a fundamental question concerning the market structure of the wired broadband providers that play a critical role in the distribution of Internet content. How that question is answered could have enormous practical consequences for households that want to consume Internet-based content and edge providers that want to provide that content. Based on my economic analysis, I recommend that the Federal Communications Commission (FCC) block this Transaction and reject a theory that could lead to the consolidation of wired ISPs into a massive national monopoly bottleneck between households and edge providers.

This Transaction, by itself, would tend to create a monopoly and substantially lessen competition in the provision of wired broadband connections between households and edge providers. It would do so as a result of horizontal and vertical competitive effects. The further

¹ The support for the statements in this section is provided in the body of this declaration.

consolidation that could be allowed under the permissive theory advanced by Comcast would exacerbate those effects and cause considerable public harm.

A. Horizontal Unilateral Effects

The horizontal combination of the first and third largest wired ISPs would result in a significant increase in Comcast's already substantial market power over edge providers and enable Comcast to increase significantly the terminating access fees that it charges edge providers for transporting content from the edge of its closed network to the subscriber households that request that content. Comcast and the three other very large wired ISPs charge "terminating access fees" for transporting content from the edge of their closed networks, across their closed networks, over the "last mile," to a subscriber that has requested that content. Comcast would be able to demand even larger terminating access fees than it does now if it also controlled access to the Time Warner Cable subscribers. Those horizontal unilateral effects are demonstrable.

Substantial and consistent empirical evidence, generated from the "natural experiments" of negotiations between wired ISPs and edge providers, shows that larger wired ISPs charge significantly higher terminating access fees. Most of the more than 400 wired ISPs in the United States cannot charge terminating access fees at all because the edge providers can do without any one of these small wired ISPs. It is much harder for edge providers to walk away from large ISPs and becomes even harder the larger the ISP. The negotiations between edge providers and the largest wired ISPs bear this out. Comcast, for example, charges Netflix {{
}} as high a terminating access fee as Time Warner Cable charges Netflix. Comcast is able to secure such high fees mainly because it controls access to 77 percent more subscribers than Time Warner Cable does.

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The empirical evidence generated by these natural experiments shows that it is likely that Comcast would charge a significantly higher price for access to edge providers following the merger. The combined firm would likely charge a price for access that would be significantly higher than the separate firms charge now. The Comcast terminating access fees would increase, for example, by {{ }} and the Time Warner Cable terminating access fees would increase by {{ }} for a weighted average price increase of {{ }}, based on the relationship between terminating access fees paid by Netflix and the share of Netflix hours {{ }}.

This price increase would result from Comcast increasing its market power over distribution substantially. It would be able to threaten to disrupt a greater portion of the customer relationships for edge providers and, in the extreme case, block edge providers from a greater portion of the market. Comcast would secure, through merger, the ability to prevent edge providers from accessing {{ }} of households with wired broadband right after the merger compared with {{ }} today. As noted above, if Comcast is allowed to further consolidate all of the remaining non-overlapping cable ISPs, it would account for {{ }} of wired broadband households, and a greater percent over time, rising to more than {{ }} by 2019, based on projections I have done.

Comcast's increased monopoly power results from the fact that edge providers would have fewer choices for constructing their networks and therefore more difficulty walking away from the consolidated firm. Edge providers compete nationally with each other and also need scale given their fixed costs. It is easier to walk away from a wired ISP that has {{ }} of wired broadband households, as Comcast does pre-merger, or {{ }} of wired broadband households, as Time Warner Cable does pre-merger, than to walk away from a

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wired ISP that has {{ }} of wired broadband households, as Comcast would have post-merger.

The merger reduces the choices that edge providers have in building their networks. Today, an edge provider can get access to {{ }} of households with wired broadband readily from the more than 400 wired ISPs that do not charge for access. Then it has four other wired ISPs that it can add to its network. After the merger, these options disappear. AT&T and Verizon are together much smaller than post-merger Comcast would be. As a result, the options described above for playing Comcast off against the other large wired ISPs drop from three (Time Warner Cable plus Verizon; Time Warner Cable plus AT&T; and Verizon plus AT&T) to zero. The loss of Time Warner Cable as a separate actor may limit an Online Video Distributor's (OVD) ability to bargain with AT&T and Verizon as well. After the merger an edge provider that needs to reach more than {{ }} of American wired broadband households to have a compelling business model for itself and investors would have no choice but to deal with Comcast.

B. Vertical Effects

The Transaction will also help Comcast maintain its significant market power in the provision of linear programming and video-on-demand and in the provision of broadband services. Comcast is the largest Multichannel Video Programming Distributor (MVPD) in the country; Time Warner Cable is the second largest, excluding satellite providers, and fourth largest overall. Comcast and Time Warner Cable are also the first and third largest wired broadband ISPs. Their joint control over access to subscriber households has resulted in both earning a stream of profits that makes them both highly valuable companies. Combined, these two companies have a market value of \$186 billion, which would make the merged firm the

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17th most valuable American firm. That is remarkable because Comcast and Time Warner Cable earn virtually all of their profits in only a small portion of the United States — covering only 21 percent (Time Warner Cable) and 35 percent (Comcast) of the United States population.

The emerging OVD industry threatens those profits because it diverts consumers from MVPDs. As the supply of OVD content expands, consumers will increasingly end their subscriptions to MVPDs or downgrade their MVPD packages. Comcast, and other MVPDs, in the face of this shift in demand, will lose revenue from having fewer customers and from being forced to charge lower prices to retain consumers. Comcast faces a serious risk that in the long term its customers will be able to get most linear programming and video on demand, a la carte, from OVD or other Over-the-Top (OTT) providers that make content available over the Internet.

Comcast cannot replace those MVPD profits by increasing broadband prices. Comcast likely earns significant profits from its use of extensive price discrimination based on its video programming packages. It will lose that ability as OVDs replace MVPDs for an increasing share of most programming. Comcast would also likely face significant regulatory obstacles if it sought to replace its MVPD profits by drastically increasing its broadband prices. Furthermore, such large price increases would likely prompt municipalities and states to remove regulatory barriers to entry to providing competing broadband services. Comcast's internal business documents show that it recognized the gravity of this threat and the need to develop strategies to blunt the development of OVDs. {{

}}²

Control over access to subscribers enables Comcast to slow and reduce competition by OVDs. Most people, for example, watch OVDs on television sets and do so in addition to watching linear programming and video on demand from their MVPD. Comcast has significant control over the set top box that households must use to access its content.

Comcast can preserve more of its profits from its MVPD business by slowing and reducing the growth of the OVD industry; by disadvantaging OVDs that are particular threats by virtue of their size and impact on viewing Comcast's own content; and by making it more difficult for OVDs to reach Comcast households. Comcast has numerous tools at its disposal to carry out these strategies including, raising terminating access fees; degrading the quality of service; refusing to provide upgrades to its network necessary for supporting innovation in OVD delivery; imposing data caps that weigh more heavily on OVDs than its own content; insisting that programmers keep programming out of the hands of OVDs that pose the most serious threat; and using its set-top boxes to make consuming OVD content inconvenient.

Comcast can also preserve more of its profits from its ISP business by slowing and reducing the growth of the OVD industry and making OVDs less competitive with its own MVPD offerings. The expansion of the OVD industry would significantly lower barriers into providing broadband in local areas. Entrants face two related challenges in competing with existing wired ISPs that offer both broadband and video programming bundles: they must

² See {{

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invest in developing competitive video-programming packages; and they face a significant disadvantage in doing that compared with much larger incumbents such as Comcast, which can secure much lower license fees from program providers. A thriving OVD industry that provides consumers with substitutes for much MVPD content drastically reduces those barriers to entry.

The Transaction increases Comcast's ability and incentive to engage in tactics to preserve its significant market power as an MVPD and wired ISP. Comcast, for example, would be able to foreclose OVDs from a larger portion of American households by increasing the portion of households to which it controls access by 40 percent. Comcast would realize the benefits of these tactics to restrain the growth of the OVD industry over a larger base.

* * *

I recommend that the FCC block this Transaction. The Transaction would create a massive monopoly bottleneck that would stand between edge providers and households. It would enable Comcast to raise terminating access fees for edge providers significantly and would help Comcast maintain its significant market power as an MVPD and broadband provider. Accepting the theories Comcast has presented would enable Comcast to acquire even more non-overlapping cable ISPs, thereby achieving control over {{ }} of American broadband wired broadband households initially and more than {{ }} in a few years as cable's share of broadband expands.

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I. Introduction and Overview of Reply Declaration

1. My name is David S. Evans and I am an economist. At the request of Counsel for Netflix, I have previously submitted a declaration (“Evans Declaration I”) concerning the proposed acquisition of Time Warner Cable by Comcast Corporation (“Transaction”).³
2. In my previous declaration, I concluded that the Transaction would harm competition and consumers by significantly raising terminating access fees paid by OVDs, and by significantly increasing Comcast’s ability and incentive to retard the development of competing OVDs. Economic analysis I have conducted since submitting that declaration, which is discussed below, reinforces my conclusion that the Transaction would substantially lessen competition and tend to create a monopoly as a result of both horizontal and vertical competitive effects.
3. I also found that the economic arguments and evidence presented by Comcast’s economist, Dr. Mark Israel, in his initial declaration, in support of his conclusion that the Transaction did not raise competitive concerns were not valid. Dr. Israel claimed that households have many choices in ISPs when in fact they do not; that Comcast does not have an ability or incentive to foreclose OVDs, when, through its actions, Comcast has already demonstrated that it does; and that the Transaction would not increase terminating access fees because he claims that a larger firm would not be able to extract a higher price, when in fact there is a strong positive relationship between the size of wired ISPs and the terminating access prices they charged.

³ Declaration of David S. Evans, August 25, 2014 (“Evans Declaration I”). My professional background and curriculum vitae are provided there.

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4. Comcast, in its “Opposition to Petitions to Deny and Response to Comments,” has submitted two new declarations that respond to my economic analysis, one by Dr. Israel, and the other by Professor Dennis Carlton. Dr. Israel’s second declaration presents substantial new economic evidence and arguments. Professor Carlton’s declaration makes some theoretical observations based on his understanding of the record. Counsel for Netflix has asked me to review the economic evidence and arguments presented by Comcast’s economists in these latest submissions, which I do in this Declaration.⁴ What follows is a brief summary of my conclusions.

A. Overview of Response to Comcast’s Economists

5. The Transaction would aggregate the largest and third-largest wired ISPs in the country, resulting in an entity that would have a terminating access monopoly over 29 million wired broadband households. That is 40 percent more than Comcast has today.⁵ After the Transaction, Comcast would control access to {{ }} of wired broadband households.⁶ That share would likely increase over time with the migration from DSL to cable and as fiber deployment slows.

⁴ My declaration relies in part on a declarations of Mr. Ken Florance of Netflix. *See* Declaration of Ken Florance, December 23, 2014 (“Florance Declaration II”); and Mr. Florance’s prior declaration, Declaration of Ken Florance, August 25, 2014 (“Florance Declaration I”).

⁵ Calculation based on Letter from Francis M. Bruno, Comcast, to Marlene H. Dortch, Federal Communications Commission, MB Docket No. 14-57 (June 27, 2014) (“Comcast June 27 Letter”). Stated more precisely, the entity would have a terminating access monopoly over 29 million customer accounts, where in some cases there may be multiple customer accounts in a household, or more than one household using a customer account, or business customer accounts that do not correspond to a household. For simplicity, I refer to customer accounts of all types as “households” in this report.

⁶ Calculations based on Comcast June 27 Letter, p. 2; Supplemental Data to Comcast June 27 Letter, MB Docket No. 14-57 (June 27, 2014) (“Comcast Supplemental Data”); Internet Access Services: Status as of June 30, 2013, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (June 2014), available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-327829A1.pdf (“June 2013 FCC IAS Report”). The number of pre-merger subscribers comes from the Comcast Supplemental Data, which is based on Form 477 data for June 30, 2013 from Comcast and TWC. The number of broadband divestitures comes from page 2 of the Comcast June 27 Letter. The denominator is the number of fixed broadband connections reported in the June 2013 IAS Report, excluding satellite and fixed wireless

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6. Comcast's share of households following the Transaction actually understates the competitive significance of the Transaction. Comcast would have a monopoly bottleneck over so many households that it would dictate success or failure for existing and, more importantly, new OVDs. It would substantially lessen competition and tend to create a monopoly in two ways.

- a. Horizontal Unilateral Effect. The combination of these two very large ISPs would result in a significant increase in terminating access fees as a result of increased bargaining power. This is a standard unilateral price effect from a horizontal combination. The Transaction would consolidate two of the major input suppliers to OVDs and other edge providers of broadband connections to subscriber households.
- b. Vertical Effect. The combination of these very large ISPs would increase Comcast's incentive and ability to slow and reduce OVD competition to maintain its significant market power over the provision of MVPD and broadband services. That effect results from the fact that OVDs provide significant long-run competition for Comcast's MVPD business, and that a successful OVD industry will increase the likelihood of competitive entry into broadband in the long term.

These harms are national, significant, and enduring.

connections. Note that the count of subscribers for Comcast and TWC used here differs from the count of subscribers reported on page 2 of the Comcast June 27 Letter. The latter figure is based on data from Comcast for March 31, 2014 and from TWC for April 17, 2014. In general, when I compare Comcast or Time Warner Cable subscribers to an industry aggregate, I used the Comcast June 2013 FCC Form 477 data, which is directly comparable to the most recent industry aggregates reported in the June 2013 FCC IAS Report. When I am not comparing their subscriber counts to an industry aggregate, I use the subscriber counts reported in the Comcast June 27 Letter, as this data is more recent. In all cases, I use the number of divestitures reported in the Comcast June 27 Letter, as this appears to be the most reliable data for that number. Note that this approach understates the significance of the merger, since the number of subscribers in the divested footprint in 2014 Q1 is likely to be larger than the number of subscribers in that footprint in 2013 Q2. Thus, when I calculate the share of the combined entity using the June 2013 subscriber counts with the 2014 Q1 divestiture counts, I overstate the relative magnitude of the divestiture. Also, note that the count of divestitures in the Comcast June 27 Letter is different from the count of divestitures used by Dr. Israel in his share calculations. The exact reason for the difference between Comcast's Letter and Dr. Israel on the number of net divestitures is unclear. Also, note that in this Declaration, I do not restrict attention to connections above a minimum speed threshold, other than the minimum speed required to be included in the FCC's broadband reports (200 Kbps in at least one direction). This is different from my calculations in Evans Declaration I, where I used speed thresholds to show that Comcast and Time Warner faced very limited competition from ISPs with comparable speeds. In this Declaration, I have defined a national broadband market that does not include any size thresholds and have used shares that are consistent with that definition. The shares of Comcast, Time Warner Cable, and the combined entity would be even larger if a speed threshold were to be imposed and the merger was considered in a narrower market.

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7. Dr. Israel and Professor Carlton have presented an economic analysis that not only supports this Transaction, and denies the significant horizontal and vertical effects I have identified, but necessarily implies that a merger of all non-overlapping cable ISPs in this country would raise no competitive issues whatsoever.⁷ Comcast could, under their analysis, consolidate all the non-overlapping cable ISPs. That would give Comcast a more than {{ share of wired broadband households today and more than a {{ share in five years as DSL subscribers migrate to cable and fiber deployment slows.⁸ Their thesis is extreme and has no meaningful limiting principle.
8. A key point of contention between us concerns the “degradation episode” which provides a natural experiment for comparing Comcast’s ability and incentive to foreclose

⁷ The merging cable systems need not be literally non-overlapping before the merger, provided that they make appropriate divestitures to remove the overlap as part of the merger transaction(s).

⁸ For this calculation, I started with the set of all cable ISPs in the United States, based on the technology codes in the NTIA’s national broadband map. For Comcast and TWC, I took the number of subscribers from the Comcast Supplemental Data. For the other large cable ISPs, I took the number of subscribers reported by the Leitchman Research Group. For the smaller cable ISPs, I took the total number of cable broadband connections reported by in the FCC’s Internet Access Services, subtracted the number accounted for by the large cable ISPs, and divided the remainder across each small cable ISP in proportion to the population of their footprint (which was calculated by matching the coverage data from the NTIA National Broadband Map to population data from the U.S. Census). Each cable ISP’s subscribers were distributed across the Census blocks in the ISP’s footprint in proportion to the block’s population. The hypothetical non-overlapping cable monopolist gets all of the customers of all of these ISPs, with the exception of blocks served by more than one cable ISP. In those blocks, the hypothetical monopolist gets the customers from only one of the ISPs. I performed this calculation two ways: by giving the monopolist the subscribers of the cable ISP with the most in that block, and by giving the monopolist the subscribers of the cable ISP with the fewest in the block. The denominator is the number of fixed broadband connections reported in the June 2013 FCC IAS Report, excluding satellite and fixed wireless. The two methods yields shares that were very close (respectively, {{ of all broadband connections, or {{ of all broadband connections). To extrapolate this number forward, I estimated the rate of subscriber growth for each technology. For each technology other than FTTP, I assumed that the subscriber growth (CAGR) in each year going forward would equal the CAGR over June 2011 to June 2013. For FTTP, that assumption is inappropriate, as its rate of growth has been slowing. Instead, for FTTP, I set the growth rate going forward equal to the growth rate of cable. Modelling the decline in growth rate by measuring the current deceleration of growth would yield similar results. I assumed that the ratio the non-overlapping cable monopolist subscribers to all cable subscribers remained constant. The result was an estimate of the share of the non-overlapping cable monopolist of {{ in June 2019. All references below to the share of the non-overlapping cable monopolist in this declaration are based on the methodology described in this footnote.

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competition with other smaller wired ISPs. I argue that this episode shows that Comcast has the ability and incentive to foreclose OVDs pre-merger; Dr. Israel disputes that.

1. The “Degradation” Natural Experiment

9. In November 2013, Netflix had approximately {{ customers who relied on Comcast for the broadband service to their homes.⁹ Early that month the average quality of Netflix’s streaming service to households served by Comcast dropped sharply.¹⁰ Streaming quality declined through the holiday season, which is a particularly important time of year for Netflix. Consumers watch more video then and are more likely to sign up for accounts.

10. Comcast customers who wanted to watch Netflix had much poorer viewing experiences than the customers of smaller cable ISPs that wanted to watch Netflix from the pre-degradation period (January to October 2013) to the nadir of the degradation (January to late February 2014). As a result of the degradation, Netflix saw a spike in support calls from customers that used Comcast as their wired ISP compared with other smaller wired ISPs. Some customers cancelled their subscriptions.¹¹ In work completed after my first declaration, I have found that Comcast’s practices resulted in {{

}}.¹² The

average quality of Netflix’s streaming service improved almost immediately after Netflix

⁹ The number of Netflix customers using Comcast is based on information from Netflix.

¹⁰ Evans Declaration I, ¶¶ 106-111; Florance Declaration I, ¶ 47.

¹¹ Florance Declaration I, ¶ 51.

¹² Calculation based on Netflix data. {{

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agreed to pay Comcast a terminating access fee to provide sufficient capacity to reduce the congestion and resulting degradation in late February 2014.

11. This natural experiment is important because it refutes the position taken by Dr. Israel that Comcast does not have the ability or incentive to foreclose edge providers from subscribers and would continue to lack that ability after the Transaction. Dr. Israel dismisses the relevance of this episode for assessing Comcast's ability and incentive to impose terminating access fees based on two claims made by Comcast.

12. Comcast claims that Netflix did this to itself.¹³ It says that Netflix had more than 40 settlement-free paths to send traffic to Comcast but chose not to use them.¹⁴ As explained in Netflix's Reply, there were only six competitive options for transit services for high-bandwidth customers in the United States.¹⁵ Netflix used all six, either directly or indirectly via other carriers.¹⁶ Each of these partners had settlement free paths to Comcast.¹⁷ Once Netflix became a customer of these transit providers, Comcast let those connections congest unless Comcast was paid an access fee. Comcast's peering policies ensured that any transit provider that carried Netflix traffic would have to pay a terminating access fee to avoid congestion. If it did not agree to pay Comcast a terminating access fee, Netflix would face either congestion or

¹³ Comcast Corp., Opposition to Petitions to Deny and Response to Comments, September 23, 2014 ("Comcast Opposition"), p. 216; Declaration of Kevin McElearney, September 19, 2014 ("McElearney Declaration"), ¶ 25.

¹⁴ *Id.*

¹⁵ Netflix, Inc., Reply of Netflix, Inc., December 23, 2014 ("Netflix Reply"), p. 14; Letter from Robert M. Cooper, Cogent, to Marlene H. Dortch, Federal Communications Commission, MB Docket No. 14-57, November 18, 2014 ("Cogent Ex Parte Letter"), p. 6.

¹⁶ Netflix Reply, p. 14. In its recent ex parte, Cogent suggests that five additional entities—Sprint, PCCW, Telecom Italia, GTT, and Zayo—are "secondary competitors" for high-bandwidth customers. Cogent Ex Parte Letter, p. 6. Netflix inquired of each of these transit providers, but none was willing or able to make its capacity, such as it was, available to Netflix. {{ }} indicated that they had no capacity to offer; {{ }} refused to sell capacity to Netflix because they were concerned about their relationship with Comcast. See Netflix Reply, p. 14; Florance Declaration II, ¶ 32.

¹⁷ Netflix Reply, p. 6; Florance Declaration II, ¶ 32.

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would pay a transit provider or CDN that itself paid a terminating access fee that it would pass through to Netflix.

13. Comcast also accuses Netflix of purposefully degrading its streaming service to Comcast subscribers. Mr. McElearney, a Senior Vice President of Comcast, claims that Netflix dumped traffic on Comcast's network without notice, and that Netflix was using unethical and deceptive maneuvers to reduce its costs. Netflix does not dump traffic on to the Comcast network or other wired ISPs. All of the traffic Netflix delivers to the doorstep of Comcast, and other wired ISPs, consists of content that the ISP's customer requested from Netflix and that the ISP is supposed to deliver to the customer as part of its broadband contract with that customer.

14. As a matter of economics, Comcast's assertions that Netflix intentionally degraded service to {{ }} of its customers, for four months, during the highly valuable holiday season, are inconsistent with rational profit-maximizing behavior. I have not seen any evidence from Comcast, nor in my review of documents from Netflix, that support Comcast's claims that Netflix intentionally degraded service to its own customers.¹⁸ Quite to the contrary, Netflix was deeply concerned about the impact of the congestion episode on its business.

15. Comcast therefore does not have any credible basis for dismissing the evidence from the degradation natural experiment and that natural experiment is fatal to many of the claims made by Dr. Israel and Professor Carlton. The degradation episode confirms that Comcast has the *ability* to foreclose Netflix from accessing Comcast subscribers because, in fact, it did foreclose Netflix from accessing Comcast subscribers. Comcast determines the port capacity

¹⁸ *Id.* ¶ 19. Dr. Israel does not report having reviewed any contemporaneous business documents supporting Comcast's claim that it believed Netflix was intentionally degrading service to its own customers.

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available for providing uncongested routes within its network to its subscribers. Other large ISPs, excluding those three that engaged in a degradation strategy to secure access fees, have generally provisioned sufficient port capacity to ensure that their subscribers can watch Netflix streams that those subscribers have requested.

16. The degradation natural experiment also shows that Comcast has the *incentive* to foreclose Netflix from accessing Comcast subscribers. Comcast's decisions on providing port capacity were not, in fact, blunted by fear that its subscribers would switch ISPs, or switch to lower priced services, as Dr. Israel claims. Comcast chose to degrade service to subscribers who wanted to watch Netflix despite the possibility of lost profits, if any, from its subscribers. That possibility was not sufficiently threatening to deter Comcast from degrading Netflix service to its own subscribers—many of whom no doubt blamed Netflix for the poor service.

2. Comcast's Contract with Netflix and Its Implications for Market Power

17. Virtually all wired ISPs provide Netflix access to their subscribers at no charge. Comcast and the other three largest wired ISPs forced Netflix to pay terminating access fees starting in early 2014. Comcast was able to increase the terminating access fee from the zero price that edge providers typically pay for access to subscribers to a positive amount. By increasing price above the market level, Comcast demonstrated that it possessed, and was exercising, market power.

18. In their reply, Comcast and its economists dispute that Comcast has market power over terminating access fees. They claim that Netflix did not pay for access to subscribers and that Netflix ended up paying less as a result of the contract. That is not correct. Netflix is paying Comcast an additional fee to provide uncongested paths between the edge of Comcast's

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network to Comcast households that have requested Netflix content. It is not paying Comcast for transit or Content Delivery Network (CDN) services. That is seen most directly by comparing Comcast to the more than {{ }} other wired ISPs that Netflix interconnects with directly.¹⁹ Netflix does not pay for transit or third-party CDN services to get its content to these wired ISPs. It also does not pay terminating access fees to these wired ISPs for transporting content within their networks to households that requested it. In fact, Netflix, based on estimates discussed below, is paying {{ }} per Mbps more in total to reach Comcast subscribers than it is paying to reach subscribers at other large cable ISPs that have not imposed terminating access fees.

19. Dr. Israel and Professor Carlton also claim that the size of the terminating access fees were too small to matter and show affirmatively that Comcast does not have market power. Dr. Israel claims, for example, that “[t]he small size of Comcast’s charges for interconnection refutes any theory that Comcast’s large size as an ISP parlays into anti-competitive power over edge providers or their agents.”²⁰ Professor Carlton makes a similar point. That analysis is wrong as a matter of antitrust economics. Their conclusion is based on a finding that the terminating access fees as a fraction of overall revenue and costs are small. There is no authority for taking a price increase, calculating it as a percentage of overall revenue and costs for a company, and concluding that it is not relevant because it is small. Under that calculation even the most egregious attempt to monopolize a component of production would pass muster since increasing the price of a component, that itself constitutes a small fraction of the overall cost of the product, would be “miniscule.”

¹⁹ I am not including in this comparison the next three largest wired ISPs, after Comcast, that have also secured terminating access fees.

²⁰ Israel Declaration II, ¶ 12. Dr. Israel refers to “anti-competitive power.” I assume he means market power since anti-competitive power is not a term of art in antitrust.

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20. The standard approach in antitrust analysis is to ask whether a firm can increase price significantly over the competitive level for that product or service.²¹ Comcast did in fact increase the cost to Netflix of reaching Comcast subscribers that wanted to use Netflix from 0 to {{ }} per Mbps.²² The Transaction would lead to a substantial increase in that price given the empirical evidence described below.

21. The relevant base for assessing the impact of the Transaction is even higher. There are sound economic reasons to believe that Comcast did not seek the profit-maximizing price—that is, did not exercise its full market power—because of the intense scrutiny of both the merger (announced shortly before the Netflix deal) and the net neutrality debate (which was heating up at the time). Comcast won, and Netflix lost, a significant battle fought publicly and privately over several years to cross the zero price line. Having won that battle, and having crossed that line, Comcast can march forward now and seek higher prices.

22. Dr. Israel and Professor Carlton also point to the fact that Comcast and Netflix entered into an {{ }}, and argue that this contract eliminates any possibility of competitive harm going forward. For the purposes of evaluating the competitive effects of the Transaction, the focus by Dr. Israel and Professor Carlton on the duration and dollar value of the Netflix contract is misplaced. The contract is relevant for assessing whether Comcast has the ability and incentive to impose terminating access fees. Beyond that, the issue is whether the Transaction would result in an increase in the terminating access fees to OVDs and to other

²¹ Or, in the context of a merger, whether the combination will increase the current price for the product or service significantly. U.S. Department of Justice and Federal Trade Commission (2010), “Horizontal Merger Guidelines,” available at <http://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf>, § 1.

²² This calculation is described below. *See, infra*, n. 113.

edge providers, including those that have not yet been forced to pay Comcast a terminating access fee.

23. In fact, Netflix is not immunized from the effects of the proposed Transaction because of the length of its contract with Comcast. Netflix enters into long-term contracts for programming, including {{ }}. Between now and the expiration of the contract with Comcast, Netflix will negotiate and enter into numerous content licensing agreements that will extend well beyond the expiration of the Comcast contract. Netflix can expect that after the Comcast contract expires, therefore, it will face the threat of dramatically increased fees that must be contemplated even today as it negotiates licensing deals for content.

3. The Source of Comcast's Market Power and Its Implications for the Competitive Effects from Acquiring Time Warner Cable

24. Comcast has significant market power over terminating access fees today. I showed in my earlier declaration that Comcast's ability and incentive to extract payments from Netflix results from the fact that it controls access to about 21.1 million customers.²³ These households sit behind interconnection points that act as gateways through which content requested by Comcast's customers gets to Comcast households. Comcast controls what goes through those gateways.

25. The Transaction would increase the size of this terminating access monopoly by about 40 percent to 29.6 million households, after accounting for the proposed divestitures.²⁴ The economic analysis and evidence I presented in my previous declaration shows that Comcast

²³ Comcast June 27 Letter, p. 2.

²⁴ Comcast June 27 Letter, p. 2.

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would have significantly more market power after the Transaction and would be able to use that bargaining power to secure significantly higher terminating access fees. The increase in bargaining power would increase Comcast's market power and result in a significant increase in price.

26. Dr. Israel rejects the above conclusion regarding increased bargaining power in his second declaration, as he did in the first, by citing a *particular* economic model that *assumes* that the increase in the size of a firm does not convey more bargaining power. Actual experience shows that firms that control significantly more demand or supply have greater bargaining power, extract higher prices as sellers, or get lower prices as buyers.

27. Dr. Israel then claims that the empirical evidence I put forward does not show a relationship between price and size because I have not controlled for quality. He is wrong. His claimed measures of quality are either not relevant to the contract negotiations, or they are measures of size—and proxies for bargaining power—rather than quality. He mainly uses the number of interconnection points for a wired ISP as a measure of quality. Larger wired ISPs have more interconnection points largely because they operate in more localities. As I discuss below, additional interconnection points have nothing to do with quality of service for Netflix.²⁵

28. Under the theory put forward by Dr. Israel, Comcast would have no more bargaining power than a small ISP, even if Comcast owned the largest ISP in every part of the country and therefore controlled access to more than half of the households with broadband service in the country. Further research I have conducted has found consistent and substantial evidence that, in fact, larger ISPs charge higher terminating access fees on a per unit of traffic basis.

²⁵ Florance Declaration II, ¶¶ 17, 21.

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29. The remainder of my declaration provides more detailed responses to those claims and to other claims made by Dr. Israel and Professor Carlton. I note, however, that Dr. Israel and Professor Carlton do not dispute most of the economic evidence I presented in my first declaration, including:

- A detailed empirical analysis of the wired ISP providers available to Comcast and Time Warner Cable customers, which shows that these subscribers typically have one, often poor, alternative;
- Evidence on the facts of switching based on an FCC study and the likelihood of switching based on the obstacles subscribers face;
- The effect of the degradation episode on the quality of Netflix transmissions to Comcast's subscribers; and,
- The financial impact to Netflix of foreclosure.

They do, of course, dispute the interpretation of this evidence, and its weight, for analyzing the competitive effects of the Transaction and present other evidence in rebuttal.

B. Impact of Transaction on Competition and Consumers

30. Counsel for Netflix has asked me to expand my economic analysis on why the Transaction would significantly harm competition and consumers. I have concluded that the Transaction would harm competition and consumers based on the following analysis.

31. ISPs are two-sided platforms that connect subscribers and edge providers.²⁶ As with other two-sided platforms, ISPs can, in principle, set prices to both sides. The price to an individual side can, whether set by competition or by monopoly, be positive, negative or zero.²⁷

²⁶ There is no dispute among most of the economists who have submitted declarations on this point. Israel Declaration II, ¶¶ 181-5; Declaration of Joseph Farrell, August 25, 2014 ("Farrell Declaration"), ¶¶ 26-27. As I will show below, Comcast's economists are selective in analyzing the implication of ISPs being two-sided platforms on the competitive effects of the Transaction.

²⁷ David S. Evans and Richard Schmalensee (forthcoming), The Antitrust Analysis of Multisided Platform Businesses, in Roger Blair and Daniel Sokol (eds.), Oxford Handbook on International Antitrust Economics, Oxford: Oxford University Press, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2185373. The

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The total price charged by the ISP is the sum of the prices that it charges subscribers and edge providers for connection. For the purposes of this declaration, I focus on the impact of the Transaction on OVDs that distribute long-form content. These OVDs compete with Comcast for providing programming to consumers and for procuring programming from producers and distributors.²⁸ OVDs currently constitute a large fraction of edge provider traffic and are likely to constitute an even higher fraction in years to come.

32. ISPs that lack significant market power charge subscribers for Internet access, but do not separately charge OVDs, or the CDNs or transit providers that OVDs may use, to deliver content to the ISP's subscribers. In recent years, some very large ISPs with significant market power, including Comcast, have sought to break this zero-price equilibrium and to charge OVDs (and the CDNs and transit providers used by OVDs and other edge providers) a terminating access fee. I am not expressing any opinion concerning whether their doing so is or is not contrary to public policy, nor am I taking any position on the net neutrality debate. My focus here is entirely on whether the Transaction, and in particular Comcast's increase in subscribers, would substantially lessen competition, tend to create a monopoly, and harm consumers.²⁹

fact that profit-maximizing prices can be below marginal cost on one side, or below zero, is a prediction that is robust across the leading theoretical models of two-sided platforms and is true as an empirical matter. There is no controversy in the economics literature over this point.

²⁸ I therefore do not address whether and to what extent the Transaction could have a significant effect on non-OVD edge providers.

²⁹ The term "consumers" in antitrust analysis refers to buyers of services, including business buyers. In the case of ISPs, there are two groups of consumers: households and edge providers, including OVDs, who connect to each other. When Professor Carlton uses the term "consumer" in his declaration, he is referring to only one of these groups of consumers—the households—and is excluding the other group of consumers—the edge providers. His analysis of the horizontal effects of the merger therefore excludes one side of the platform entirely. The other way to put this point is that the Transaction involves B2C providers on one side and B2B providers on the other side. Professor Carlton's analysis of horizontal effects ignores the consolidation of the B2B input providers.

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33. My analysis does not depend on defining a precise relevant antitrust market and calculating shares in that market.³⁰ I have found, however, that an appropriate relevant antitrust market for evaluating this Transaction consists of wired ISPs that operate in the United States. A hypothetical monopolist consisting of all such ISPs in the United States would have enormous bargaining power over OVDs. It would be able to prevent OVDs from obtaining access to 94.2 million broadband customers.³¹ It would therefore be able to increase the total connection fee paid by OVDs for access to the ISP's subscribers significantly above the competitive level. This national market is consistent with how Comcast and other very large ISPs have negotiated interconnection agreements with OVDs. Comcast, for example, negotiated contracts with several OVDs, which operate nationally, for access to Comcast subscribers regardless of geographic location.³²

34. In what follows, an ISP is said to “foreclose” an OVD from accessing the ISP's subscribers if the ISP can significantly decrease the quality of (“degrade”) the connection between the subscriber and the OVD, the subscriber cannot switch to an alternative ISP in a reasonable amount of time, and the OVD cannot find an alternative way to reach the subscriber. Therefore, the term “foreclose” includes partial foreclosure. An ISP's market power over OVDs depends on its ability to foreclose an edge provider since, by foreclosing access, or

³⁰ Contrary to the claims of Dr. Israel (Israel Declaration II, ¶ 17), I have not used market shares (or market-share based measures such as HHIs) to assess market power or the impact of the merger. In fact, because the market power for an ISP comes from its control over access to individual households, and at least in the short run it is not possible to substitute one ISP for another, market share figures understate market power over OVDs and over the total connection price.

³¹ June 2013 FCC IAS Report, p. 17. As I discuss below, a hypothetical monopolist could raise price significantly if it controlled an even narrower market such as all non-overlapping wired ISPs in the US.

³² Dr. Israel and Professor Carlton reach the wrong conclusion on the issue of market definition because they ignore the OVD side of the ISP platform. Their emphasis on the fact that Comcast and Time Warner Cable do not compete with each other in local markets on the subscriber side of the platform is misplaced. The impact of this Transaction on the price of connecting edge providers and subscribers is a result of consolidating the multiple, local, non-competing terminating access monopolies of Comcast and Time Warner Cable across the country.

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threatening to foreclose access, the ISP can demand and secure payment from the OVD. The size of the club that an ISP wields in negotiation depends on the number of subscribers it can foreclose from the OVD.³³

35. An ISP has significant market power if it can impose a high enough cost on an OVD to force that OVD to pay a terminating access fee that exceeds the competitive level. An ISP can successfully impose those costs on an OVD—thereby exercising its market power—where the ISP can degrade the connection between the OVD and its subscribers; the ISP’s subscribers cannot easily switch to another ISP; and OVDs that provide long-form content cannot otherwise reach these consumers. Comcast can do this for 21.1 million subscribers, comprising {{ }} of all U.S. wired broadband households.³⁴ That is how Comcast forced large OVDs, which have opposed having to pay terminating access fees, to do so. Therefore, Comcast has significant market power over OVDs today.

36. Comcast’s degradation of the connection between Comcast subscribers and Netflix confirms that Comcast already has significant market power. Prior to the degradation, Netflix did not pay Comcast or any other ISP a terminating access fee for delivering content to that

³³ It is important to distinguish the role of market power and bargaining power in the analysis. Market power refers to the ability of a firm to charge prices over the competitive level; the question in merger analysis is whether the merger would result in an increase in market power. Bargaining power refers to how the gains to trade are split between two parties. Firms routinely bargain with each other. The fact that one party has more bargaining power for various reasons is unremarkable and does not necessarily reflect market power as that term is used in antitrust. However, an increase in bargaining power can result in an increase in market power and thereby cause competitive harm. See Aviv Nevo, Deputy Assistant Attorney General for Economics, Antitrust Division, U.S. Department of Justice (2014), “Mergers that Increase Bargaining Leverage,” Remarks as Prepared for the Stanford Institute for Economic Policy Research and Cornerstone Research Conference on Antitrust in highly Innovative Industries, January 22, 2014, available at <http://www.justice.gov/atr/public/speeches/303149.pdf>.

³⁴ The number of Comcast subscribers comes from the Comcast June 27 Letter, p. 2. Since the total number of U.S. interconnections is not available for the same time period as this letter, the share calculation is based on data from an earlier time period. Specifically, the number of Comcast subscribers comes from the Comcast Supplemental Data. This is divided by the total number of U.S. fixed internet connections (excluding satellite and fixed wireless) as reported in June 2013 FCC IAS Report, p. 17.

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ISP's subscribers. By degrading the connection between Netflix and Comcast subscribers that wanted to watch Netflix, Comcast was able to break the zero-price equilibrium, adhered to by all wired ISPs historically, and impose a significant charge.

37. The Transaction would result in Comcast securing a significant increase in that market power. The number of subscribers to which it controls access would increase from 21.1 million to 29.6 million. Its bargaining power would increase substantially because it could foreclose, or threaten to foreclose, 40 percent more subscribers than it could before the Transaction.³⁵

The fact that Comcast and Time Warner Cable do not compete on the other side of the market—for subscribers in local areas—does not alter this conclusion. They each have large terminating access monopolies over their subscribers on one side of the market. The combination of these large terminating access monopolies would result in a significant increase in market power on the other side of Comcast's ISP platform—the OVD side.

38. Comcast's increased monopoly power results from the fact that OVDs have fewer choices for constructing their networks and therefore more difficulty walking away from the consolidated firm. OVDs compete nationally with each other and also need scale given their fixed costs. It is easier to walk away from a wired ISP that has {{ }} of wired broadband households, as Comcast does pre-merger, or {{ }} of wired broadband households, as Time Warner Cable does pre-merger, than to walk away from a wired ISP that has {{ }} of wired broadband subscribers, as Comcast would have post-merger.

39. The merger reduces the choices that OVDs have in building their distribution networks. Today, an OVD can reach {{ }} of wired broadband subscribers readily from the 400+ wired ISPs that do not charge for access. Then it has four other wired ISPs that it can add

³⁵ Comcast June 27 Letter, p. 2.

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to its network. After the merger, these options disappear. AT&T and Verizon are together much smaller than post-merger Comcast. As a result, the options described above for playing Comcast off against the other large wired ISPs drop from three (Time Warner Cable plus Verizon; Time Warner Cable plus AT&T; and Verizon plus AT&T) to zero. The loss of Time Warner Cable as a separate actor may limit the ability to bargain with AT&T and Verizon as well. After the merger, an edge provider that needed to reach more than {{ }} of American wired broadband households to have a compelling business model for itself and investors has no choice but to deal with Comcast.

40. Comcast could use this increased market power in several possible ways to harm competition and consumers. With its greater bargaining power, it could demand and secure a higher terminating access fee from edge providers, including OVDs. The empirical evidence, based on natural experiments, I presented in my previous declaration demonstrates this. Most ISPs do not control enough subscribers to demand and secure terminating access charges, so that the terminating access fee that they charge is zero. Of the handful of very large ISPs that do charge a positive price, the larger ones have secured higher prices. Comcast has 1.8 times as many broadband subscribers as Time Warner Cable, and was able to secure a terminating access fee that was {{ }} times higher than what Time Warner Cable secured on a per-unit (Mbps) basis. Professor Farrell showed a similar price-size relationship for the fees that ISPs pay Cogent, a transit provider—in this case the payment goes from the ISP to Cogent and smaller ISPs pay more. I present further evidence in support of this price-size relationship below.

41. Comcast's increased market power also would substantially increase Comcast's ability and incentive to suppress competition by OVDs. The increasing supply of OVD content

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reduces Comcast's ability to earn profits from offering MVPD services to its captive subscribers. As households gain more programming choices, Comcast loses revenue from customers paying for less video-on-demand, moving to lower-priced packages with less content, and dropping MVPD services altogether. It can make some of this revenue back from raising broadband prices to households and increasing terminating access fees to OVDs. However, it loses the ability to use different bundles of MVPD services to engage in highly refined price discrimination. It would likely face regulatory resistance to the price increase to broadband households needed to offset the loss of MVPD profits, and if it did increase prices substantially it would likely prompt municipalities and states to lower regulatory barriers to entry into providing broadband.

42. A successful OVD industry also increases the risk to Comcast of competitive entry into its broadband business. Broadband entrants such as Google Fiber have found that they need to provide a strong video programming bundle to persuade consumers to switch from cable providers that offer a bundle of broadband and video programming.³⁶ This barrier to entry would fall if consumers could obtain most content online.

C. Organization of Declaration

43. This declaration consists of two main sections in addition to this Introduction (Section I) and a brief conclusion (Section IV).

44. Section II uses the standard economic framework for mergers to organize my analysis of the impact of the Transaction on competition and my responses to Comcast's economists. It presents my analysis of market definition, market power, and anticompetitive effects. It

³⁶ Brian Fung, "Here's the Biggest Thing Holding Google Fiber Back," *Washington Post*, October 6, 2014, available at <http://www.washingtonpost.com/blogs/the-switch/wp/2014/10/06/video-is-holding-google-fiber-back/>.

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incorporates additional empirical work I have conducted concerning the impact of the degradation episode on Netflix and Comcast customers and on the relationship between terminating access fees and subscribership levels for wired ISPs.

45. Section III presents a detailed response to Dr. Israel's declaration generally in the order that he presents his arguments. I respond to Professor Carlton's arguments, which are largely theoretical, in this section as well.

46. As I stated in my previous declaration, my analysis is ongoing, and I reserve the right to supplement my analysis. The fact that I have not responded to claims made by Comcast or its economists does not mean that I agree with those claims.³⁷

³⁷ In my previous declaration, I had a brief footnote that observed that the economic literature on the relationship between firm size, investment and innovation did not support the efficiency defense of the merger offered by Drs. Rosston and Topper on behalf of Comcast. It said: "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. 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," *Handbook of the Economics of Innovation*, Amsterdam: North Holland Elsevier, Vol. 1, 129-213. 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 (1997), *The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business*, Boston, MA: Harvard Business School Press. 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." See Evans Declaration I, n. 12 (internal citations to Comcast economists' filings omitted).

Drs. Rosston and Topper claim that "Dr. Evans provides one theoretical criticism that narrowly assumes that the benefit of increased innovation due to economies of scale can occur only if the amount of investment and innovation increases more than in proportion to firm size." See Declaration of Gregory L. Rosston and Michael D. Topper, September 20, 2014 ("Rosston/Topper Declaration II"), ¶ 13. I disagree. Drs. Rosston and Topper claim that, as a result of Comcast's increased size, more projects will exceed its hurdle rate (the minimum required return on investment) and therefore it will do more innovation. The implication of that proposition is that bigger firms are more innovative. All else equal, the bigger firm has more projects that exceed the hurdle rate. They are claiming that "bigger is better." As a purely theoretical proposition, divorced from what happens empirically, there is nothing wrong with the proposition. The problem is that the implication that bigger is better, which is what they rely on to claim efficiencies as a theoretical matter, does not have support, as a matter of consensus, in the economics literature on innovation. Comcast's economists do not cite any general empirical support in their initial declaration or in their reply declaration, including as a set of references to the

sentence claiming that I ignore “support in the economics literature”—they cite no support at all. *See* Rosston/Topper Declaration II, ¶ 13.

Drs. Rosston and Topper then go on to say, “Consider a simple example. Suppose Comcast’s scale justified it investing \$1 billion to develop its X1 set-top box platform and TWC’s scale justified it investing \$500 million to develop its own set-top box platform with fewer features. Even if the level of investment scaled only proportionally with firm size, the combined company would have the scale to justify investing \$1.5 billion in a set-top box platform. This platform, which would be more advanced than either the Comcast or TWC platforms in isolation, would be available to all customers in the former Comcast and TWC service areas. As we described in our April Report, the difficulties involved in contracting between MVPDs preclude Comcast and TWC from achieving this benefit of scale absent the transactions. Therefore, customers would benefit from economies of scale even though investment increases in proportion to firm size, providing a counter example to Dr. Evans’ assertion.” *See* Rosston/Topper Declaration II, ¶ 14. I do not think this illustration proves their point. The implication is that the bigger firm generates more innovation because it is spending more money. Presumably, it is not spending more money to get less innovation.

Drs. Rosston and Topper provide some anecdotal evidence on Comcast’s investments and innovation but have provided no systematic evidence that that Comcast’s acquisitions have resulted in a higher rate of innovation relative to smaller cable companies. I would have expected that economists putting forth the claim that the merger of two large cable companies will result in more investment and innovation than in the absence of the merger would have presented empirical studies based on a cross-sectional analysis of investment and innovation across the wide-size distribution of cable companies or a time series analysis of investment and innovation for Comcast, which has grown through numerous mergers over time, or a panel study that looks at both temporal and cross-section dimensions. Instead, Drs. Rosston and Topper, and Dr. Israel, provide a series of examples of claimed efficiencies.

As a result, I did not find the lengthy discussions by Drs. Rosston and Topper, or by Dr. Israel, of the efficiency benefits conveyed by the Transaction in their initial declarations as having any significant empirical substance as a matter of economics. In any event, I chose not to focus on the “specific efficiencies” (see Declaration of Dennis W. Carlton, September 22, 2014 (“Carlton Declaration”), ¶ 8) they offered and their efficiency arguments are not the focus of this or my earlier declaration.

II. Antitrust Analysis of the Transaction

47. This section shows the Transaction would have:

- Horizontal unilateral effects that would raise the total price for connecting OVDs and households and reduce the output of OVDs; and
- Vertical effects that would tend to foreclose OVDs from competing with MVPDs, raise the price and restrict the output of OVD and MVPD programming, and maintain substantial market power in the provision of broadband.

A. Economic and Technical Background

1. The Movement of Content to Wired ISP Networks and Within Wired ISP Networks

48. Wired ISPs operate local networks. The local network consists of wires that extend from residential locations to routers that control the movement of traffic back and forth between the ISP and the subscriber.³⁸ Wired ISPs that operate many local networks connect those local networks to high-level routers that connect traffic between edge providers and local networks. Many wired ISPs connect at Internet Exchange Points (IXPs) or other interconnection locations.

49. Consumers at residential locations that subscribe to an ISP can send a request for content to an edge provider. The ISP receives that request at a router and makes various provisions for sending that request over the Internet to the edge provider. The edge provider then sends the content to the ISP that then transports it to the household that made the request. The wired ISP, as a technical matter, ultimately controls what goes from the household to the edge provider and what comes from the edge provider to the household. Virtually all wired ISPs transport content to the household without any charge to the content provider and provide paths that are generally uncongested to that content, as I will discuss below.

³⁸ This discussion is based on my understanding from Netflix.

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50. A wired ISP is therefore akin to an island fortress that has a monopoly on intra-island transport and that suppliers can reach by one or more bridges or ports. The island fortress has the ability to limit traffic on those bridges and to those ports. It also has the ability to impose bridge tolls and port fees. It can, if it wants, build more bridges, expand its ports, and add ports. It can also, if it wants, limit the amount of traffic that gets through the bridges (e.g., it can close off lanes or reduce capacity at terminal points) or that comes through the ports (e.g., it can limit the number of landing slots or the hours of operation). Households on the island fortress can order supplies. Those supplies are delivered to the points of entry. Those who control the island then take responsibility for deliveries to the households.

51. There is a relatively competitive market for transporting traffic to and from ISPs. Interconnected transit providers move traffic to and from edge providers to ISPs. The transit delivery to the ISP often happens at an IXP. Sometimes it is convenient to move and store content that is likely to be needed close to the ISP's "last mile" network, so that it does not need to be transited. CDNs provide that service. A CDN connects at the IXP or another designated connection point.

52. Although the analogy is not exact, transit providers to ISPs are like railroads and ferry services to the fortress island. The transit providers make it possible to move content back and forth between ISPs and edge providers. However, the transit providers terminate at the border of the ISP, just as a railroad would terminate at the end of the bridge going into an island fortress, or the ferry would terminate at an island port.

53. A transit service does not transport traffic directly from or to a residence. The ISP takes the content from the transit provider and transports it over the "last mile" to the residence. It similarly takes content from the residence and moves it back across the same "last mile"

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infrastructure to the transit provider. CDNs are like a warehouse facility at the terminus of the bridge or at the port. Just as the island fortress picks up supplies at a warehouse near its edge, ISPs take the traffic from the CDNs. (CDNs may themselves transport traffic to ISPs and/or rely on transit providers to do so—I use “transit providers” generally to refer to firms that haul Internet traffic.)

54. Comcast and its economists make it seem as if the ISP is not an island fortress at all, and that there is a public road system that enables any supplier to get to any household that has ordered those supplies. In Comcast’s description, anyone who comes to a bridge or a port can go right through the gates of the island and get to the household more or less unimpeded. If a particular gate is congested, according to Comcast, the supplier merely needs to switch routes to any number of other gates. Comcast makes it seem as if their network is like Washington, D.C. Any trucker can just drive into the city and deliver packages anywhere it wants.

55. It does not work that way. Comcast operates a closed network in which it controls what goes through its routers to its residential customers, and controls what goes from its residential customers to its routers. To use my analogy, it controls all of the bridges and the ports for its island and it has a monopoly on intra-island transport. Virtually all wired ISPs charge their residential customers to provide intra-island transport for services their customers have requested, but they do not additionally charge outside service providers for this intra-island transport. Comcast and three other very large ISPs, however, do charge for an additional fee to outside service providers.

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56. I showed in my previous declaration that Comcast's customers cannot readily switch to another ISP and that OVDs cannot reach those subscribers in any other way. As a result, Comcast has a "terminating access monopoly"³⁹ or "bottleneck facility".⁴⁰

2. Provision of Ports by Wired ISPs for Content Delivery

57. A wired ISP must have enough capacity at the edge of its network, and in the network leading to the subscriber's home, to carry the traffic requested by subscribers. Capacity at the edge of an ISP's network is typically measured in terms of ports, which are physical connection points that can each handle a certain maximum amount of traffic. If ISPs do not have enough port capacity, their customers will encounter delays in downloading and, in the case of bandwidth-intensive video, they will encounter problems such as poor picture quality, delays in starting the stream, and interruptions in the stream. Virtually all ISPs add enough capacity to ensure that their subscribers can download content from the Internet at the speeds they have committed to in their agreement with those subscribers.

58. The amount of content that American households download over the Internet has increased dramatically over time. Table 1 shows the amount of data transmitted over the Internet from 1992-2013, with the projected growth through 2018. The compound annual growth rate was 134 percent over 1992-2013 and 71 percent over 2007-2013. In recent years increasing consumption of online video, online video games, and video calling have contributed to greater demands on broadband capacity. Generally, ISPs have added enough capacity to deal with the increasing demands from their subscribers for content.

³⁹ Mark Armstrong (2002), "The Theory of Access Pricing and Interconnection," in M. Cave, S. Majumdar, and I. Vogelsang (eds.), *Handbook of Telecommunications Economics*, Vol. 1, 297-386, Amsterdam: North-Holland; OECD Competition Committee (2004), "Access Pricing," available at <http://www.oecd.org/regreform/sectors/27767944.pdf>.

⁴⁰ Joshua S. Gans (2001), "Regulating Private Infrastructure Investment: Optimal Pricing for Access to Essential Facilities," *Journal of Regulatory Economics*, 20(2): 167-189.

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Table 1: Growth in Global Internet Traffic

Year	Global Internet Traffic
1992	100 GB per Day
1997	100 GB per Hour
2002	100 GB per second
2007	2000 GB per second
2013	28,875 GB per second
2018 (Forecast)	50,000 GB per second

Source: Cisco (2014), The Zettabyte Era – Trends and Analysis, available at http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/VNI_Hyperconnectivity_WP.pdf, p. 4.

59. Netflix’s experience is a good illustration of how ISPs have kept pace with the increase in traffic. Between October 2011 and August 2014, the total number of hours streamed by American households from Netflix increased by about {{ }}, and the total amount of data being streamed increased by about {{ }}.⁴¹ Despite the pronounced increase in broadband demand, Netflix customers obtained higher average bitrates at virtually all ISPs, reflecting the fact that ISPs had more than enough capacity to accommodate the increase.

60. Figure 1 shows the average bitrates and the total number of hours viewed over the 16 largest ISPs that did not degrade Netflix’s traffic during 2013.⁴² The average bitrate of Netflix traffic increased from {{ }} to {{ }} between the week ending October 9, 2011 and the week ending June 29, 2014 for these 16 wired ISPs.⁴³ These Netflix customers therefore got increasingly better viewing quality over time, despite their increased used of broadband capacity.

⁴¹ Calculations based on data from Netflix.

⁴² The largest 20 wired ISPs, including these 16 and the 4 wired ISPs that did degrade traffic, accounted for {{ }} of Netflix’s hours.

⁴³ {{

}}

Figure 1: Total Hours per Week and Average Bitrate at 16 Non-Degrading Large Wired ISPs

{{

}}

3. Wired ISPs As Two-Sided Platforms and Their Pricing Structure

61. Wired ISPs are two-sided platforms. Economists who have written in support of and in opposition to the Transaction agree on this characterization.⁴⁴ Dr. Israel has cited my work on two-sided platforms, including my survey paper of this area co-authored with Professor Richard Schmalensee.⁴⁵ That literature finds that to evaluate competitive effects concerning platforms, economists must examine both sides of the platform.

62. It is well known in the literature on two-sided platforms that the profit-maximizing prices to customers on the two sides of the platform are interdependent. It is also well

⁴⁴ Israel Declaration II, ¶¶ 181-5; Farrell Declaration, ¶¶ 26-27.

⁴⁵ Israel Declaration II, nn. 210, 217, 230.

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established that the profit-maximizing price to one side of the platform may be less than marginal cost, zero, or less than zero.⁴⁶

63. Most wired ISPs in the United States charge consumers a monthly fee for connecting to the Internet; some may impose variable charges based on the amount of bandwidth used. In return for these fees, ISPs send requests from the household to the edge provider. The edge provider then uses its CDNs and transit relationships to pay to deliver the requested content to the doorstep of the ISP. That doorstep is usually at an IXP, where ISPs have decided to make connections available to third parties. At that point, the ISP carries the content across its network to the household that requested it. ISPs generally do not charge edge providers, including OVDs, terminating access fees for, in effect, opening the door to allow the traffic to be delivered to the household.⁴⁷ Therefore, from the standpoint of an ISP, the residence pays for Internet access but the edge provider does not pay for connection to the ISP's network.

⁴⁶ This result also means that comparing price and marginal cost does not provide meaningful evidence on market power. David S. Evans and Richard Schmalensee (forthcoming), "The Antitrust Analysis of Multisided Platform Businesses," in Roger Blair and Daniel Sokol (eds.), *Oxford Handbook on International Antitrust Economics*, Oxford: Oxford University Press, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2185373; Marc Rysman (2009), "The Economics of Two-Sided Markets," *Journal of Economic Perspectives*, 23(3), 125-143; Jean-Charles Rochet and Jean Tirole (2006), "Two-Sided Markets: A Progress Report," *RAND Journal of Economics*, 37(3): 645-667. As a result Dr. Israel's claim that Comcast charges terminating access fees that are less than marginal cost does not provide any evidence on whether increasing those fees from zero to a significant positive amount reflected an exercise of market power. See Israel Declaration II, ¶ 12. A competitive equilibrium among two-sided firms could result in a price to one side being substantially less than marginal cost. It is possible that a two-sided firm could increase that price significantly but that the price would still be less than marginal cost.

⁴⁷ For a direct connection between an edge provider and an ISP, the ISP does not generally charge an access fee. For a connection between an edge provider and an ISP that goes through a CDN and/or a transit provider, the ISP does not generally charge the entity with which it is interconnected an access fee. Only the very largest ISPs charge access fees. See Florance Declaration I, ¶ 60.

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64. That particular pricing structure—one side pays the ISP, the other side does not—is a very common pricing structure for two-sided platforms. It is the market equilibrium in many industries based on two-sided platforms.⁴⁸

65. Up until recently, all of the more than 400 wired ISPs in the United States charged their customers for uploading and downloading content, but did not charge terminating access fees to Netflix, or the CDNs or transit providers used by Netflix, for carrying the traffic from the doorstep of an ISP's network to the household.⁴⁹ In the last several years, a few very large wired ISPs in the United States, including Comcast, have sought to change that pricing model by charging certain OVDs (or their CDNs or transit providers), including Netflix, an additional fee for delivering from its doorstep to the subscribers' household content that the subscriber household has requested.⁵⁰

66. Netflix, starting in the first half of 2014, agreed to pay terminating access fees demanded by the four largest wired ISPs in the country. As a result, in these four cases, Netflix pays to get its traffic to the front door of the ISP, as it always has, and then pays an additional fee to get the ISP to open its door and allow traffic through that the ISP's subscribers have requested. For all of the other more than 400 other ISPs in the country, Netflix incurs costs for getting its traffic to the front door of the ISP, but incurs no additional fee for any of those ISPs to open the door and transport content to the ISP's subscribers who have asked for it. Positive

⁴⁸ David S. Evans and Richard Schmalensee (forthcoming), *The Antitrust Analysis of Multisided Platform Businesses*, in Roger Blair and Daniel Sokol (eds.), *Oxford Handbook on International Antitrust Economics*, Oxford: Oxford University Press, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2185373.

⁴⁹ Florence Declaration I, ¶¶ 6, 26.

⁵⁰ I am not claiming that seeking these fees is anticompetitive, nor am I offering any opinion that their doing so is, or is not, contrary to sound public policy. My focus is entirely on the impact of the Transaction on competition.

terminating access fees are the exception; virtually all wired ISPs do not charge edge providers for transport from their doorsteps to the households that have requested content.

67. With that background on the wired ISP business, I turn to market definition.

B. Market Definition

68. Market definition is a useful way to organize information on an industry and the competitive constraints that firms in an industry, including the subject of an investigation, face. Many economists, including me, agree that antitrust economics should avoid rigid approaches to market definition.⁵¹ Ultimately, the market should be defined to help shed light on, and not obscure, whether or not a particular business practice (such as a merger) has competitive effects. There is no reason that market definition must result in rigid boundaries, which seldom apply in the real world.⁵² Ultimately, as the antitrust agencies have recognized, it is a tool to assess whether there are competitive effects.⁵³

69. Market definition for industries involving two-sided platforms requires particular care.⁵⁴ Platforms compete with each other on both sides, and these sides are interdependent. For a merger of two-sided platforms, market definition needs to identify the competitive constraints

⁵¹ See David S. Evans (2010), "Lightening Up Market Definition," in Einer Elhauge (ed.), *Research Handbook on the Economics of Antitrust Law*, New York: Edward Elgar; Joseph Farrell and Carl Shapiro (2010), "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," *B.E. Journal of Theoretical Economics*, 10(1); Dennis W. Carlton (2007), "Market Definition: Use and Abuse," *Competition Policy International*, 3(1).

⁵² Contrary to what Dr. Israel suggests, there is no disagreement among us on this point. Israel Declaration II, ¶ 17. Unfortunately, Comcast and its economists use market definition to obscure the analysis by insisting that the only relevant market involves the local competition that takes place on the subscriber side of the platform.

⁵³ U.S. Department of Justice and Federal Trade Commission (2010), "Horizontal Merger Guidelines," available at <http://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf>, § 4 ("The Agencies' analysis need not start with market definition. Some of the analytical tools used by the Agencies to assess competitive effects do not rely on market definition, although evaluation of competitive alternatives available to customers is always necessary at some point in the analysis.")

⁵⁴ David S. Evans (2009), "Two-Sided Market Definition," ABA Section of Antitrust Law, Market Definition in Antitrust: Theory and Case Studies, available at <http://ssrn.com/abstract=1396751>.

that would limit the ability of the merging platforms to increase the price on either side of the platform and to increase the total price paid by both.⁵⁵

70. My focus is on whether the Transaction could result in an increase in the price for connecting OVDs and other edge providers.⁵⁶ I consider an informal application of the hypothetical monopolist test to assess the relevant antitrust market. As is well known, the test involves determining the minimum set of providers, that if they were hypothetically combined into a single firm, would be able to raise price profitably by a small but significant amount for a non-transitory period of time. At that boundary, competitive constraints are not strong enough to prevent a profitable price increase.

71. Let me begin by describing the extent to which different wired ISPs impose competitive constraints on each other. OVDs may want to use all of the wired ISPs to reach the ISPs' customers and distribute content to them. The more the better, so long as the price is right. Nevertheless, the OVDs can play the wired ISPs off against each other and, if necessary, forgo distribution to some small subset of consumers. They can do that because they have other wired ISPs (and thus other potential customers) that they can choose to work with. The competitive constraint on wired ISPs arises from the fact that OVDs can choose to select enough wired ISPs to reach enough consumers to operate their businesses profitably. The ability of OVDs to walk away from a wired ISP and pursue its business accessing other

⁵⁵ Eric Emch and T. Scott Thompson (2006), "Market Definition and Market Power in Payment Card Network," *Review of Network Economics*, 5(1); David S. Evans (2009), "Two-Sided Market Definition," ABA Section of Antitrust Law, *Market Definition in Antitrust: Theory and Case Studies*, available at <http://ssrn.com/abstract=1396751>; Elena Argentesi and Marc Ivaldi (2007), "Market Definition in Printed Media Industries: Theory, Practice, and Lessons for Broadcasting," in Paul Seabright and Jurgen von Hagen (2007), *The Economic Regulation of Broadcasting Markets*, Cambridge, UK: Cambridge University Press, 225-254. Alternatively, if the investigating authority decides to conduct single-sided market definition it needs to consider both sides and the interdependencies.

⁵⁶ I also consider the effect of the Transaction on overall prices.

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subscribers through other wired ISPs is the reason why small wired ISPs cannot charge access fees and why even among the very large ISPs the smaller of those very large ISPs charge less than the largest ones do.

72. The greater bargaining power of the larger wired ISPs comes from the elimination of choice of dealing with smaller wired ISPs and the elimination of access to the subscribers of those ISPs. Consider the situation in which there are four wired ISPs of equal size. An OVD can choose among 15 different bundles of the four to get more or less coverage. For example, it can walk away from any one of the four and still have coverage of 75 percent of households. The edge provider loses those choices when the wired ISPs are consolidated into a single wired ISP. It goes from 15 options to just one.

73. In the wired ISP case, in other words, just as in a differentiated product case, a merger eliminates a constraint on prices that results from having separate firms and tends to increase the market power of the merging firms and raise price by substantially lessening competition among the firms.⁵⁷ The fact that one case involves the elimination of direct substitution possibilities, and the other is based on the elimination of choices of other providers,⁵⁸ is a distinction without a difference when it comes to competitive harm.

⁵⁷ The substantial lessening of competition for the merger of non-overlapping wired ISPs is not exactly like what happens in the common case of a merger of firms that produce differentiated products. In the differentiated product case the possibility that consumers will use the product of firm A instead of the product of firm B if firm A raises its price, and vice versa, constrains the prices of both firms before the merger. The merger results in an increase in market power and price, assuming the substitution effect between the two products is strong enough, by allowing the merged firm to capture the benefits of the diversion of sales. The competitive constraint on differentiated product producers arises from the fact that consumers are using one product instead of another, at least at the margin, and that a producer that raises its price will cause some consumers to use another producer's product.

⁵⁸ The wired ISPs, however, may also be substitutes in demand thereby providing a further competitive constraint. Depending on the prices being charged by different wired ISPs, edge providers may decide to build their distribution networks by substituting between different wired ISPs and substituting greater expenditure on marketing in the territory of one wired ISP rather than another. In theory, there may be cases in which it is profit maximizing to do deals with every wired ISP. However, for firms that have scarce capital and

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74. We can see the impact of the consolidation of wired ISPs on OVDs by considering what likely happens when we move from a highly fragmented industry to a consolidated one. With a highly fragmented industry there are a large number of small wired ISPs, each operating in a local area. No individual small wired ISP is essential to a national OVD. The OVD can reach virtually the entire country and secure scale economies even if any one edge provider declines to distribute it. No single wired ISP has significant bargaining power except over its household customers, who are a small fraction of the nation. In this case, the OVD faces the profit-maximizing price from these small-wired ISPs, which experience from many small ISPs over more than a decade strongly shows would be zero in the absence of significant bargaining power. That is the competitive equilibrium in the market.

75. At the other extreme, there would be a single national broadband monopolist that would provide wired ISP services to all subscriber households. A national broadband monopolist could threaten to withhold access to an OVD. That would effectively prevent the OVD from operating its business, since it would not be able to reach any household. The national broadband monopolist would stand as a bottleneck facility between OVDs and all households. The threat of foreclosure would enable the national broadband monopolist to extract a significant toll from OVDs.⁵⁹ The national broadband monopolist would be able to demand and secure a significant increase in terminating access fees to OVDs (or to the CDNs and transit providers who serve those OVDs) over and above the level that would occur in the

management time (a situation that describe most new ventures) there may be practical limits on how many wired ISP relationships to have, and therefore the firm may substitute between a limited number of ISPs. This situation has not arisen yet because most wired ISPs have not charged for access.

⁵⁹ To simplify matters, I am going to assume that the national monopoly does not change prices to households as a result of controlling overlapping wired ISPs and therefore focus entirely on the impact of the consolidation on the edge provider side. The point is that even abstracting from any impact on the price that households pay for connection, the merger raises the total connection price between OVDs and households by raising the price to OVDs.

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absence of this consolidation.⁶⁰ OVDs would not have any other feasible way to reach those subscribers.

76. The hypothetical national monopolist of all wired ISPs would have extraordinary bargaining power over OVDs. As I showed in my previous declaration, larger ISPs impose higher terminating access fees. Comcast was 1.8 times as large as Time Warner Cable and imposed a terminating access fee that was {{ }} times larger than the terminating access fee Time Warner Cable imposed on Netflix.⁶¹ The hypothetical national broadband monopolist would be {{ }} times the size of Comcast and {{ }} times the size of Time Warner Cable.⁶² As a result, the hypothetical national broadband monopolist would be able to profitably raise OVDs terminating access fees significantly.

77. It is unlikely that a national broadband monopolist that could engage in price discrimination and has significant market power over subscribers would pass through much of this toll revenue to subscribers in the form of lower prices. Thus, the total price paid to the intermediary for connection would be higher than in the multiple small ISPs case. Also, because their costs have gone up, some OVDs would likely raise the prices they charge to consumers (and/or reduce the quality of the service they provide to consumers).

78. As I noted above, most ISPs in the United States do not charge positive terminating access fees. Therefore, I take zero as the competitive level that would exist in the absence of

⁶⁰ This hypothetical monopolist would also be able to increase subscription prices to households because it would eliminate local competition. I put that effect to one side and focus solely on the impact of the consolidation on the price to the OVD side of the market. Focusing just on the OVD side, it is highly plausible, as discussed below, that the increased fees would not result in a significant reduction in subscription fees so that the total price for connection paid by both sides of the platform would go up as well.

⁶¹ Comcast June 27 Letter, p. 2; *infra*, n. 113; and Table 2.

⁶² Comcast Supplemental Data; June 2013 FCC IAS Report.

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the consolidation. The hypothetical monopolist would be able to raise profitably the terminating access fee, and to raise it significantly.⁶³

79. A smaller hypothetical monopolist than the one I have just described would also likely impose a significant increase in the terminating access fee over the competitive level. One interesting candidate to consider is a hypothetical monopolist of all non-overlapping wired cable ISPs in the country since, under Comcast's theory, a merger that resulted in such a firm would pose no competitive problems.⁶⁴ That hypothetical monopolist would control access to approximately {{ }} subscribers, accounting for {{ }} of households using wired ISPs with download speeds of at least 200 Kbps. It would account for more over time as DSL subscribers migrate to cable and fiber deployment slows. Based on the evidence discussed below, I would expect that the hypothetical monopolist would be able to profitably raise terminating access fees significantly.

80. Dr. Israel's and Professor Carlton's objections to this definition of the relevant market are wrong as a matter of antitrust economics. They insist that the only relevant antitrust market for considering the impact of the merger is a local market in which households decide how to obtain broadband services.⁶⁵ That approach ignores the potential impact of a merger of ISPs on the edge providers on the other side of the platform. There is no economic reason why one would exclude the impact on edge providers from an analysis of ISP mergers. That is

⁶³ Dr. Israel disagrees with this conclusion. He argues that larger ISPs would not charge higher connection fees. Therefore, under his analysis a merger to monopoly of ISPs would not result in an increase in bargaining power. I discuss why his analysis is wrong in detail below.

⁶⁴ See, *supra*, n. 7.

⁶⁵ Israel Declaration II, ¶¶ 19-21; Carlton Declaration, ¶ 9.

especially true given that several ISPs, including Comcast and Time Warner Cable, have imposed terminating access fees on OVDs.⁶⁶

81. Nothing in my analysis, however, depends on a precise boundary of that market. What does matter critically is that the analysis recognizes that there is another side to ISPs—the edge providers' content that consumers want to access using their chosen ISP.

82. I now examine whether the Transaction would result in the merged company realizing a significant increase in market power over OVDs. I proceed in two steps. First, to help identify competitive constraints, I examine the extent to which Comcast currently has market power over OVDs. Second, I examine how the Transaction would change Comcast's market power over OVDs.⁶⁷

C. Competitive Constraints on Market Power

83. I consider whether it is possible for Comcast and Time Warner Cable, individually, to obtain a significant increase in access fees charged to OVDs by degrading or threatening to degrade an OVD's video stream and thereby demanding and securing a significantly higher terminating access fee.⁶⁸ To answer that question, it is necessary to look at the potential competitive constraints on Comcast and Time Warner Cable. Those constraints come from

⁶⁶ I note that Dr. Israel has a discussion of how it may be optimal for an ISP to impose charges, including differential ones, on edge providers. *See* Israel Declaration II, ¶¶ 186-197.

⁶⁷ Dr. Israel and Professor Carlton criticize me, and other experts for the opponents to the Transaction, for examining Comcast's market power. *See* Israel Declaration II, ¶ 38 and Carlton Declaration, ¶ 9. Those criticisms are misplaced since that analysis, whether they agree with its conclusions or not, is helpful for assessing whether there are competitive constraints on the ability of Comcast and Time Warner Cable to raise terminating access fees. The extent, and nature, of these competitive constraints are relevant for assessing the change in market power resulting from the Transaction.

⁶⁸ In my analysis, the increase in price results from individual negotiations with OVDs and not an increase in a posted price.

both sides of their platforms. In the discussion below, for brevity, I refer to Comcast.

However, unless otherwise noted, a similar analysis applies to Time Warner Cable.

84. I first examine the ability of Comcast subscribers to switch to another broadband provider in the face of degradation in the quality of OVD streaming. I then examine Comcast's recent claim that Netflix, and other OVDs, have many ways of reaching subscribers on Comcast's network that do not require payment for access. Third, I document the extent to which Comcast's congestion of its network made it difficult for its subscribers to watch Netflix. Finally, I respond to Comcast's claims that the terminating access fee that it negotiated with Netflix is too small to worry about or is affirmative evidence of Comcast's lack of market power.

1. Comcast subscribers' ability to switch to another ISP

85. I showed in my previous declaration that Comcast subscribers have essentially nowhere to turn. They typically have one wired broadband alternative. Their choices are even more limited, if as is likely true for heavy users of OVD services (as well as other services such as games and video conferences), they want fast broadband connections. Moreover, the costs of switching are high. To put it colloquially, it is a pain to switch cable providers, and people seldom do unless they move. As a result, I conclude that if Comcast significantly degraded the quality of service to an OVD, Comcast would likely not lose a material number of customers.⁶⁹

⁶⁹ Dr. Israel points out that many people do move and when they do they have to decide which wired ISP to choose. He suggests that Comcast faces a competitive constraint because people could choose another wired ISP when they move. It is true that people do not have switching costs in this case. However, the only households that are relevant are those that are moving to a residential location that Comcast serves. I have shown that in most cases there is only one alternative available to Comcast and often not a very good one.

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86. Dr. Israel describes an alternative universe in which it is common and easy for customers to switch from Comcast. Dr. Israel's evidence for this assertion is not reliable.⁷⁰

Specifically:

- The Global Strategy Group ("GSG") Survey results Dr. Israel reports suffer numerous methodological and substantive problems and are flatly inconsistent with other studies of consumer behavior and the real world results of Comcast's and Time Warner Cable's degradation of Netflix's services. The GSG Survey finds that more than 70 percent of consumers would switch away from their ISPs if the ISP degraded Internet traffic under various scenarios. If such unprecedented switching had taken place, it would not have been hard to document. Yet, Dr. Israel provides no such evidence.
- Dr. Israel overstates churn for Comcast's services substantially by including "those whose service is disconnected for failure to pay." Dr. Israel's approach implies that over five years, more than {{ people who are subscribers today, and who do not move, will drop Comcast.⁷¹ In fact, Comcast's data show that a very small fraction of broadband customers (approximately {{ a year⁷²), who are not moving, voluntarily leave Comcast. That figure is consistent with the FCC's study on switching after accounting for switching from DSL to cable.
- Dr. Israel incorrectly cites to increases in Comcast's call-center volume as "real world" evidence of consumers' willingness to switch. Dr. Israel provides no evidence on the impact to Comcast, and no details from the transcripts of these calls to determine whether Comcast, for example, benefited by using these calls as opportunities to sell more expensive broadband packages.⁷³ By contrast, Netflix has provided transcripts, some of which I excerpt below, that show {{

}}

87. An OVD could resist Comcast's increase in interconnection fees if it had another viable way to reach the ISP's subscribers. Consumers typically have a mobile wireless ISP in addition to a wired ISP. One possibility posited by Comcast is to reach consumers through mobile

⁷⁰ These findings are described in detail in Section III.C.

⁷¹ Israel Declaration II, ¶ 94.

⁷² Comcast data produced in {{ }}. This calculation is described in more detail below in Section III.C.

⁷³ Israel Declaration II, ¶ 56.

wireless. That alternative is not feasible for providers of long-form video, as I explained in my previous declaration. Data caps on mobile wireless make this prohibitively expensive.

According to the Consumerist, streaming all of the episodes of *Breaking Bad* (46.5 hours) in HD in a single billing cycle would cost \$1200 to \$2200 using LTE due to fees for exceeding data caps, even if the user used the cellular connection for no other data.⁷⁴

88. Aside from the cost, households may not want to watch a long-form video on a mobile device or be able to connect their mobile wireless to a television set. Data from Netflix on viewing habits confirms that mobile wireless ISPs are not a feasible or desirable alternative for households. Only {{ }} of Netflix hours are streamed using a mobile wireless ISP. Dr. Israel's claims that mobile wireless is becoming a realistic alternative to wired broadband for OVD subscribers are wrong, when it comes to viewing movies, television shows, and other long-form content.⁷⁵

89. Comcast's broadband subscribers therefore do not have a feasible way to watch OVDs without relying on Comcast to provide a reliable broadband connection.

2. The Ability of an OVD to Reach Comcast Subscribers Without Paying a Toll

90. I next examine whether OVDs can find a realistic way to send content to Comcast subscribers without paying for access.

91. Comcast decides whether it will pick up content that gets delivered to the front door of its network and transport that content to its household subscribers. It can decide whether or not

⁷⁴ Consumerist, "Comcast Says Mobile Data Is Competitive, But It Costs \$2k to Stream Breaking Bad Over LTE," August 18, 2014, available at <http://consumerist.com/2014/08/18/comcast-says-mobile-data-is-competitive-but-it-costs-2k-to-stream-breaking-bad-over-lte/>.

⁷⁵ See discussion below in Section III.E.2.

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to connect to a transit provider or CDN and it can decide how much capacity to make available to that transit provider or CDN. Comcast is thus like the island fortress described earlier. It controls the transportation network on the island. Those off of the island fortress can send things to the edge of the island by various means. But once those things get to the edge of the island—the bridges or ports—the authorities in charge of the island fortress take over to move things to households within the island. Netflix found in 2013 that every major way into Comcast’s island fortress either had a toll or was congested.

92. Comcast says, in effect, that there is a public road system running across the island with no tolls and no congestion so that anyone can get things to households without going through the island authority. Dr. Israel bases his response to my economic analysis of Comcast’s market power on this description of how cable ISPs work.

93. Specifically, Comcast claims that Netflix could have reached Comcast’s subscribers by using any of at least 40 settlement free paths offered by transit providers and that therefore Comcast has no market power over Netflix, or other OVDs, for connecting with its subscribers.⁷⁶ In fact, Netflix attempted to use all six of the largest transit providers in the world, all of which had settlement-free routes into Comcast’s network.⁷⁷ In each case, Comcast critically impeded Netflix’s ability to serve Comcast subscribers’ requests for traffic by threatening to raise prices to the transit provider if it carried significant Netflix traffic, or by degrading traffic. Comcast, for example, was able to pressure {{ }} into not providing

⁷⁶ Comcast Opposition, pp. 217, 219. Comcast has since revised the “40” down to {{ }}. Letter from Francis Buono, Counsel for Comcast Corp., to Marlene Dortch, FCC, at 6 (Dec. 8, 2014).

⁷⁷ Netflix Reply, p. 6; Florance Declaration II, ¶ 32.

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Netflix with its available capacity, and it was able to force Level 3 into a paid peering arrangement for some of Netflix's traffic.⁷⁸

94. Given this experience, Netflix had no reason to believe that it would have a different experience with other transit providers. Under the peering policies adopted by Comcast, every smaller transit provider that Netflix did not try would have faced the same issue as the larger ones that Netflix did try: delivering Netflix's traffic via a smaller transit provider would have put that transit provider out of ratio, and therefore out of Comcast's so called "settlement free peering" policy, which is discussed below. Comcast would have therefore demanded that the transit provider drop Netflix, face congestion, or pay terminating access fees.⁷⁹

95. Comcast also claims that a competitive market for transit prevents Comcast from exercising market power. That is wrong because transit providers do not have the ability to transport content within the closed walls of Comcast's network and therefore cannot provide that service to OVDs. While an OVD may choose among competitive transit providers to bring its data to Comcast's last mile network, only Comcast can "open the door" and transport content from its doorstep to its subscribers who requested that content. Comcast therefore has the power to set the capacity levels any given transit provider has into Comcast's network either through direct agreements or through Comcast's peering policy. That, in turn, allows Comcast to demand, and unilaterally set, interconnection fees from transit providers.

96. Comcast can set a price floor in the competitive transit market at least for traffic above certain ratio levels determined by Comcast. This is similar to the island fortress authority imposing a weight-based toll on truckers crossing a bridge to deliver their wares at the island

⁷⁸ Florance Declaration II, ¶ 37; Florance Declaration I, ¶¶ 38, 49.

⁷⁹ Florance Declaration II, ¶ 34.

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depot. That toll is a cost to the truckers and in a competitive market would be passed on to the customers in the form of higher transportation prices.

97. Competition in the transit market therefore cannot discipline the fees Comcast imposes for interconnection access for the simple reason that all traffic requested by Comcast's subscribers must cross through Comcast's ports.⁸⁰ Comcast could charge the transit provider who will pass the cost on to the OVD or it can charge the OVD directly.⁸¹ Competition in the transit market no more disciplines Comcast's interconnection fees than competition in the trucking market disciplines the tolls on the bridges coming into Manhattan.

98. A further technical issue that bears on competitive constraints is whether an ISP can target the traffic of a particular OVD and make a credible threat to degrade the quality of that OVD's traffic without reducing the ability of its subscribers to access the Internet so much that they do switch to another broadband provider. My understanding is that due to the characteristics of different types of Internet traffic, Comcast was able to degrade Netflix's traffic without reducing the ability of its subscribers generally to access the Internet.⁸²

99. I conclude from this analysis that Comcast has market power over interconnection to their subscribers by OVDs. The "Comcast degradation" natural experiment confirms this conclusion, and I turn to that next.

⁸⁰ Florance Declaration II, ¶ 13.

⁸¹ In addition, {{

}} Small transit and enterprise-services providers are likely very sensitive to the possibility of losing access to Comcast's network or of increases to the costs of interconnecting with Comcast. Larger entities, such as the largest transit providers, would be less sensitive to pressure from Comcast. But, as Comcast's efforts against Cogent and Level 3 demonstrate, even large transit providers have been unable to resist Comcast's efforts to increase the cost of interconnection.

⁸² Comcast did impose some collateral damage on customers other than the ones using Netflix. Cogent has explained to the FCC that employees of one of Cogent's business customers had significant problems in working remotely from home as a result of Comcast's actions. See Cogent Ex Parte Letter, pp. 5-6.

3. The Comcast Degradation Episode

100. Starting in the autumn of 2013, Netflix found that the streaming quality for Comcast subscribers was getting worse, and the quality continued to worsen through the holiday season. In some cases, the degradation of the viewing experience was so severe that subscribers were not able to watch at all. There was a rapid increase in the number of support calls coming from its customers that used Comcast over the final weeks of 2013 and beginning of 2014.⁸³ To correct for seasonal effects, I compared Comcast with Charter since subscribers of these two systems experienced similar viewing quality prior to the degradation episode.⁸⁴ The support calls from Comcast subscribers {{ relative to Charter.

101. Several excerpts of online chat transcripts between customer support personnel and Netflix customers describe the difficulties encountered by Netflix customers who used Comcast. The following quotes are verbatim from the transcripts:

⁸³ I obtain similar results to those described below when we compare Comcast to the eight largest cable ISPs (excluding Time Warner Cable, which also degraded the quality of service during a portion of the time considered).

⁸⁴ The data in Figure 2 is monthly. We have shown Feb-2014 as not being in the shaded degradation period, when in fact approximately the first half of February was over before Comcast and Netflix reached their agreement.

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102. My econometric analysis finds that Comcast customers experienced a sharp decline in their average viewing quality for Netflix. {{

}}⁸⁵ This enabled users to view videos at a quality level {{

}}. The average weekly bitrates

were also highly correlated as noted above; the two series had a correlation coefficient of {{
}}.

103. Starting in November 2013, the average bitrate obtained by customers of these two systems diverged. Charter held steady. Comcast nosedived. Between the last week of October

⁸⁵ {{

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2013 and the last week of December 2013 the average weekly bitrate fell {{ }} for Comcast customers and rose {{ }} for Charter customers. I found that {{ }} of Comcast customers saw their average weekly bitrates decline between October 2013 and January 2014. Most Comcast customers therefore had their viewing experiences degraded. In some cases that degradation involved having great viewing quality become less good and in other cases that involved average viewing quality becoming poor and in some cases unwatchable.

104. Figure 2 shows the ratio of average weekly bitrates for Charter and Comcast for December 31, 2012 through June 29, 2014, with the ratio in the week ending February 23, 2014 normalized to 1. These figures are based on a statistical method—known as difference-in-differences estimation—that isolates the effect of a treatment on one group (Comcast customers in this case) relative to a control group (Charter customers in this case). The estimation method controls for seasonal and other factors that could influence the results. It is apparent that the degradation started around the week ending November 3, 2013. Average bitrates for Comcast customers returned to normal about a week after Netflix and Comcast signed the contract for additional port capacity.

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Figure 2: Ratio of Average Bitrates (Comcast/Charter), Relative to Week Ending 2/23/2014

{{

}}

105. Netflix executives saw the deterioration in viewing quality for its Comcast subscribers as a serious business concern.⁸⁶ {{

}}

106. {{

⁸⁶ Florance Declaration I, ¶¶ 52-53 and conversations with Netflix executives.

}}

107. For Netflix, there was only solution to the problems caused by the degradation: to pay Comcast to ensure that there was an uncongested path between the edge of its network and the households of its subscribers. Netflix acquiesced to Comcast's demands. Under the contract signed February 18, 2014, Netflix agreed to pay Comcast to provide sufficient capacity for Comcast subscribers to stream Netflix. Almost immediately after the contract was signed, Comcast opened up significant port capacity and Netflix observed that the streaming quality for its Comcast customers rapidly went back to normal.

4. The Significance of the Terminating Access Fees

108. Comcast's success in securing terminating access fees and Netflix's acquiescence to these fees was a significant event. The *New York Times* described it as "as a milestone in the history of the Internet, where content providers like Netflix generally have not had to pay for access to the customers of a broadband provider."⁸⁷ Reflecting its notoriety, the keywords "Netflix Comcast deal February 23 2014" yields 118,000 results on Google Search.⁸⁸

109. It is likely that the fees that Comcast has negotiated recently with Netflix, among others, do not reflect its full market power. Comcast has been waging a battle for several years to break the zero-price equilibrium for edge providers. Breaking the zero barrier places Comcast

⁸⁷ Edward Wyatt and Noam Cohen, "Comcast and Netflix Reach Deal on Service," *New York Times*, February 23, 2014, available at <http://www.nytimes.com/2014/02/24/business/media/comcast-and-netflix-reach-a-streaming-agreement.html>.

⁸⁸ Based on a search query I submitted to Google Search on December 18, 2014.

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in a position to increase fees going forward. Just crossing that barrier, with one of the strongest opponents of terminating access fees, was a significant victory.⁸⁹

110. At the same time Comcast was negotiating these fees, it was pursuing two other initiatives that could have been adversely affected if it demanded and secured much higher fees that fully reflected its market power. It was planning this Transaction, which it knew would go before the FCC, a reviewing authority that had expressed serious concerns over charging edge providers, and the U.S. Department of Justice. It was also still immersed in the ongoing debate over net neutrality.⁹⁰

111. Nevertheless, Comcast demanded and secured a significant terminating access fee from Netflix. Comcast and its economists claim that Comcast saved Netflix money and that the fees are so small they actually show Comcast lacks market power. That is not the case.

a. The Impact of the Comcast Contract on Netflix's Cost of Providing Content to Comcast Subscribers

112. The contract imposed an incremental cost on Netflix solely for the purpose of Comcast agreeing to provide uncongested routes between the edge of its network to the subscribers on

⁸⁹ David Crow, "Netflix Wants to Put Comcast Genie Back in 'Fast Lane' Bottle," *Financial Times*, November 9, 2014, available at <http://www.ft.com/cms/s/0/0bc54d54-639e-11e4-8216-00144feabdc0.html#axzz3MYtZkixn> ("The agreement [between Comcast and Netflix] he [Reed Hastings] made was so important because it set a precedent that content companies like Netflix should pay companies like Comcast to access their customers, and led to a string of similar agreements with other internet providers including Verizon."); Chris Morran, "Netflix Agrees to Pay Comcast to End Slowdown," *Consumerist*, February 23, 2014, available at <http://consumerist.com/2014/02/23/netflix-agrees-to-pay-comcast-to-end-slowdown/> ("The question is what sort of precedent this Netflix/Comcast deal sets for the rest of the marketplace. By making this deal with the nation's largest cable company (which is trying to become even larger with its plan to purchase Time Warner Cable), Netflix will likely need to reach a similar paid-peering arrangement with Verizon, TWC, and others. If a company wants to get into the streaming video business, paid-peering would now have to be considered part of the price for entry into the marketplace. Which is another reason one should be concerned about the proposed Comcast/TWC merger. By combining the country's two largest ISPs, you'd create a single entity that could effectively set all the standards and rates for paid-peering arrangements; if a company wants to reach the home audience, Comcast would determine how much it will cost.").

⁹⁰ While Comcast publicly supports the FCC's 2010 Open Internet rules, it opposes application of those rules to points of interconnection, so Comcast's statement of support is irrelevant relative to the terminating access fees discussed here.

its network. The contract made the total cost to Netflix for reaching Comcast subscribers higher than it would have been if Comcast had not charged a terminating access fee.

113. Dr. Israel argues that the fact that only Comcast and the other three largest ISPs charge access fees “does not establish that {{

}}; only that it pays more *to the ISP itself*, with which it connects directly.”⁹¹ This claim is wrong.

114. None of the more than 400 ISPs other than the four largest ones charge access fees. In more than {{ }} cases, Netflix connects directly to the ISP and Netflix pays zero to interconnect. That compares to the approximately {{ }} per Mbps it has to pay Comcast.⁹² In each of these more than {{ }} cases, Netflix bears the costs of making its content available at the interconnection points and the ISP agrees to take the content and transmit it to its subscribers who have requested it.⁹³ Netflix connects to Comcast in the same way; it bears the costs of making its content available at the interconnection points, without use of a middleman, yet Comcast charges an access fee.

115. In Section III below, I show that the total costs Netflix incurs to reach other ISPs’ subscribers, including Netflix’s costs of operating as its own CDN, are lower than it incurs to

⁹¹ Israel Declaration II, ¶ 166 (emphasis in original).

⁹² Of these more than {{ }} ISPs, more than {{ }} interconnect with Netflix at IXPs, as does Comcast. And more than {{ }} interconnect with Netflix using Open Connect appliances that are embedded in the ISP’s network, which is less costly to Netflix as it does not bear the cost of maintaining servers at an IXP.

⁹³ For the other more than {{ }} other ISPs, Netflix uses a transit provider, which takes the traffic to another location at which it has agreed to interconnect with the ISP. These are typically smaller ISPs that do not have a presence at IXPs so that they cannot connect with Netflix at an IXP. Such an ISP takes traffic at the point at which it connects to the Internet (through its transit provider, which it pays) and does not charge either the transit provider or Netflix for interconnection. These ISPs therefore also demonstrate that the norm is to not charge an access fee. The fact that Netflix pays a transit provider to take traffic to the point at which these ISPs connect to the Internet is irrelevant to a comparison with Comcast, as Netflix takes its traffic to the IXPs at which it connects to Comcast. Moreover, as I discuss below, even though the comparison is irrelevant, Netflix’s total costs of connecting to these ISPs even including the transit fee is still less than the total cost of connecting to Comcast.

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reach Comcast's subscribers. I present this comparison only to respond to Comcast's misleading claims that it has lowered Netflix costs. Such comparisons are unnecessary because we can directly observe the price of interest—the access fee. Comcast's access fee of about {{ }} per Mbps is significantly above the zero fee that it used to charge and above the zero fee that the more than {{ }} ISPs other than the four largest ones charge.

b. Comcast's Argument that Terminating Access Fees are Too Small to Worry About Is Spurious

116. Dr. Israel claims that the terminating access fees paid by Netflix and other edge providers are so “miniscule” as a percent of total sales that they show that Comcast does not have any market power:

The small size of Comcast's charges for interconnection refutes any theory that Comcast's large size as an ISP parlays into anti-competitive power⁹⁴ over edge providers or their agents. ... More generally, the amount of money at issue in Comcast's interconnection agreements is {{ }}. For example, Netflix's {{ }}⁹⁵.

He supports this conclusion by calculating the ratio of interconnection payments as a percent of costs and revenues.⁹⁶ Professor Carlton makes a similar point.⁹⁷

117. The comparison between the terminating access fees and total revenue is not sensible as a matter of economics and is not consistent with how merger analysis is conducted by antitrust agencies.⁹⁸ Suppose that producers of inputs that comprise a small portion of total costs could merge and raise prices. The total cost of production would rise if that happened for many

⁹⁴ I assume Dr. Israel meant “market power” instead of “anti-competitive power” which is not a term of art that is typically used in antitrust analysis.

⁹⁵ Israel Declaration II, ¶ 12.

⁹⁶ Israel Declaration II, ¶ 135.

⁹⁷ Carlton Declaration, ¶ 14.

⁹⁸ The approach taken by Dr. Carlton and Dr. Israel is not endorsed in the U.S. Department of Justice and Federal Trade Commission (2010), “Horizontal Merger Guidelines,” available at <http://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf>, or by any other authority on merger analysis that I am aware of.

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inputs. Sound merger analysis examines whether the price of the inputs that are the subject of the merger increases and not on their impact on overall revenues.⁹⁹

118. Dr. Israel also claims that the terminating access fees are lower than the marginal cost of serving traffic and therefore cannot reflect the exercise of market power.¹⁰⁰ That inference, even if it were true, is wrong in the case of two-sided platforms. As noted earlier, a standard result for two-sided platforms, predicted by theory and confirmed in practice, is that the price to one side of a two-sided platform could be less than marginal cost, zero, or less than zero even if the platform is run by a monopolist. Comcast increased the terminating access fee from zero to an amount significantly more than zero and significantly more than other very large ISPs were charging. This departure from the standard price of zero charged by other ISPs was not the result of differences in costs that Comcast incurred for interconnecting with OVDs that other ISPs did not.¹⁰¹

119. I conclude that Comcast's successful effort to break the zero-price equilibrium shows that it has significant market power over the terminating access fees it charges to connect OVDs and subscribers. Its efforts resulted in Comcast charging positive fees for terminating access,

⁹⁹ This mistake is reflective of a more general analytical error made by Dr. Israel and Professor Carlton in not analyzing the horizontal unilateral effects of the merger on the edge provider side of the market and therefore not applying standard merger analysis to the B2B side of the market. It is routine for the enforcement agencies to object to mergers in B2B markets that increase the price of inputs by small but significant amounts with complete disregard for the impact of those price increases on total revenues or total costs. See, e.g., Complaint, In the Matter of Verisk Analytics, Inc., Insurance Service Office, Inc., and EagleView Technology Corporation, Docket No. 9363, Dec. 16, 2014 (Proposed combination of the two largest providers in the U.S. of rooftop aerial measurement services and reports – services sold to insurance companies so that they may estimate rooftop damage – 35% of all real property insurance claims in the U.S. The parties abandoned the transaction.); Complaint, United States v. Continental AG and Veyance Technologies, Inc., No. 1:14-cv-02087 (D.D.C. filed Dec. 11, 2014) (Proposed combination of the two largest providers in North America of commercial vehicle air springs – products sold to OEMs for truck, trailer, and bus suspension systems. Divestiture ordered.).

¹⁰⁰ Israel Declaration II, ¶¶ 136-138. See Section III.A.2 below for more details on the flaws in Dr. Israel's approach.

¹⁰¹ See, *supra*, n. 45.

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unlike many other ISPs in the United States, and unlike its longstanding prior practice of not charging for interconnection.¹⁰²

120. I next analyze whether the Transaction would result in a significant increase in the market power held by Comcast and thereby lead to an increase in terminating access fees to OVDs.

D. Change in Market Power from Transaction

121. The Transaction will increase the number of subscribers controlled by Comcast from 21.1 million to 29.6 million, a 40 percent increase. In negotiations with OVDs, Comcast would be able to degrade, or threaten to degrade, streaming service for 8.5 million more subscribers than it can today.¹⁰³ In my previous declaration, I showed how that would increase Comcast's bargaining power, and its ability to demand and secure a higher price.

122. I will start with a brief summary of what I found.

- a. I interviewed executives at Netflix who were involved in the negotiations. Netflix, which has negotiated with a number of very large ISPs, and entered into paid interconnection agreements with four very large ISPs, has indicated that a key consideration in the negotiations is the size of the ISP and its ability to affect service to Netflix's subscribers. Netflix's view is hardly surprising, and is consistent with common business perceptions of the importance of size in negotiations.
- b. I conducted an economic analysis of Netflix's business—which bears similarities to many other OVD businesses—and showed that the financial impact of being foreclosed from subscribers increased dramatically with the number of subscribers foreclosed. The ultimate, if unstated, threat from each of the very large ISPs that Netflix negotiates with is that it will disrupt Netflix's traffic on the ISP's network. Because of the high fixed costs of content, and the virtuous circle I described in my previous declaration, a loss of subscribers has a huge impact.

¹⁰² Time Warner Cable also has significant market power as reflected in its ability to secure terminating access firms from Netflix and other edge providers in contrast to smaller wired ISPs.

¹⁰³ Comcast June 27 Letter, p. 2.

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- c. I then examined the terminating access fees that Netflix pays the four very large ISPs. I showed that below a size threshold, ISPs are unable to demand and secure a terminating access fee. It requires significant market power to do so. The four largest wired ISPs have succeeded in doing just that. In their case, there is a strong relationship between price per Mbps and the number of subscribers. Other factors weigh in as well, but they are consistent with the factors that Netflix says are important in negotiations. I showed that Comcast, with 1.8 times as many subscribers as Time Warner Cable, was able to secure a terminating access fee that was $\{\{ \quad \quad \quad \}\}$ times higher than Time Warner Cable's terminating access fee.¹⁰⁴

123. Dr. Israel responds that there is no evidence—at all—that the size of ISPs matters.

Much larger ISPs cannot, he concludes, demand and secure higher terminating access fees despite their ability to foreclose an OVD from a far greater number of subscribers. That is a remarkable proposition. It is also wrong and without meaningful support.

124. First, Dr. Israel claims that my conclusion is “atheoretic.” Let us begin with why Dr. Israel apparently believes he is being “theoretic.” He has referenced a game-theoretic model that shows that, under certain unproved assumptions, an increase in the size of one party would not necessarily result in an increase in the share of the gains to trade they are negotiating over. That model *assumes that bargaining power does not depend on size*. I detailed in my previous declaration that other authors have shown that relaxing various assumptions of that model, including the one pertaining to bargaining power, reverses the perverse result that size does not matter in cases, like this one, where there could be scale economies in cost or demand.

125. The reason that economists have written papers responding to that model is because they recognize that the result is counter-intuitive and inconsistent with experience.¹⁰⁵ Common

¹⁰⁴ The ratio of subscribers is based on data from the Comcast June 27 Letter, p. 2. The ratio of terminating access fees is based on calculations from the Netflix agreements with Comcast and with Time Warner Cable.

¹⁰⁵ Nodir Adilov and Peter J. Alexander, Horizontal Merger: “Pivotal Buyers and Bargaining Power,” 91 *Economics Letters* 307 (2006) (“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. Raskovich (2003) argues that the post-merger pivotal nature of the firm will diminish its bargaining

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experience would suggest that an increase in size increases bargaining power and, therefore, how much the party whose size has increased can demand and secure.¹⁰⁶ When one party gets bigger it can make threats that, if carried out, impose greater costs on the other party—such as walking away from the deal.

126. Economists can—should—also take into account practical experience in reaching judgments. Speaking for myself, I have encountered many business negotiations over the years where size matters greatly and none where bigger firms—as predicted by Dr. Israel’s model—actually get worse deals than smaller firms as a result of their size. Just because we use math does not mean that economists have to ignore common sense and practical experience. Likewise, the fact that one rejects a particular model, based on assumptions that are neither plausible nor tested, and that generates perverse predictions that do not seem to make sense, does not make one “atheoretic.”

127. Dr. Israel then attempts to deal with the facts. He disputes the evidence that Professor Farrell and I have provided showing that larger ISPs are able to demand better terms. Dr. Israel argues that the number of interconnection locations is a measure of quality that needs to be taken into account when comparing ISP size and access fees. He claims that after including the number of interconnection locations in Professor Farrell’s regression analysis, Professor

position. 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.”). See also Stéphane Caprice (2007), *Upstream Competition and Buyer Mergers*, Working Paper, available at <https://www.diw.de/sixcms/detail.php/86150>; Howard Smith and John Thanassoulis (2012), “Upstream Uncertainty and Countervailing Power,” 30 *International Journal of Industrial Organization* 483-495 (2012).

¹⁰⁶ Christopher M. Snyder, “Why do larger buyers pay lower prices? Intense supplier competition,” 58 *Economic Letters* 205-209, 205 (“The popular press frequently reports that, relative to small buyers, large buyers have more ‘clout’ in their negotiations with suppliers. It is commonly reported, for example, that retail superstores are able to extract price concessions from manufacturers. The formal empirical literature generally supports these claims.” (internal citations omitted)).

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Farrell's finding that {{

}} goes away.

128. Dr. Israel's purported measure of ISP quality is highly correlated with ISP size. Larger ISPs generally have more interconnection locations because they typically cover a larger geographic footprint. The greater number of interconnection points of larger ISPs is mainly because they are larger, not because they provide interconnections closer to their subscribers. As I discuss below, from Netflix's perspective, the number of interconnection points does not significantly affect the quality of interconnection. {{

}}.¹⁰⁷ By adding the number of interconnection locations into Professor Farrell's regression analysis, Dr. Israel is in fact adding a measure that is highly correlated with size. By doing so, he creates a classic multi-collinearity problem in which {{

}}.

129. As I discussed above, Dr. Israel also argues that the evidence I presented in my initial declaration that {{

}} conflates which party is being paid (an ISP versus a CDN or transit provider) versus how much is being paid. And, as I explained above, we can observe directly that none of the more than 400 ISPs other than the four largest charge access fees. Moreover, for the more than {{ }} ISPs that Netflix connects to directly to the ISP—so that there is no middleman involved—Netflix pays zero to interconnect other than for the four largest ISPs.

130. Since completing my first declaration, I have reviewed additional evidence on interconnection agreements that demonstrate the relationship between price and size. From the

¹⁰⁷ Florance Declaration II, ¶ 17.

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interconnection rates reported by Dr. Israel for OVDs and CDNs for Comcast and Time Warner Cable, it is clear that Comcast charges {{ }} for interconnection. Table 2 shows the comparison.¹⁰⁸

Table 2: Comparison of Access Fees Charged by Comcast and Time Warner Cable Access Fees

{{

}}

131. It is clear from Table 2 that {{

¹⁰⁸ {{

}} See Response to Specification 54, Response of Time Warner Cable Inc. to the Commission's Information and Data Request, September 11, 2014. The rates reported in the table are the rates underlying the summaries reported by Dr. Israel in Table 7 of Israel Declaration II. {{

}}

The fees reported in Table 2 are based on contracted capacity, so that the fees reported will significantly exceed \$/Mbps fees based on actual 95th percentile usage (as in common in the industry) for two reasons. First, it is not desirable to use anything close to the full capacity of a port. It is common to increase capacity when capacity utilization is above 70 percent to avoid congestion. See Declaration of Henry (Hank) Kilmer, August 25, 2014, ¶ 62. Moreover, 95th percentile usage is less than peak capacity usage. {{

This is why {{ }} is significantly lower than the {{ }} If the \$/Mbps estimates are calculated on a consistent basis across contracts, it does not generally pose an issue to use contract capacities as for the rates reported in Table 2—indeed it may be helpful or necessary, such as when data on actual usage are not available.

}}

132. These negotiations provide natural experiments for assessing the impact of the merger on prices. They tell a consistent story that larger wired ISPs are able to negotiate higher prices. In addition we know that several wired ISPs smaller than these have demanded access fees unsuccessfully from Netflix. The vast majority of smaller wired ISPs generally do not even raise the issue.

133. Those natural experiments are consistent with the hypothesis that beyond a size threshold, wired ISPs that have more subscribers secure higher access fees because the cost of walking away from these wired ISPs becomes increasingly costly to the edge providers.

134. With the preceding results in hand, I turn to the horizontal and vertical effects of the Transaction.

E. Horizontal Unilateral Effects of Transaction on Terminating Access Fees

135. I first show that the Transaction would result in a significant increase in the terminating access fees paid by OVDs and the other price paid by OVDs and households for broadband connections. Based on the natural experiments discussed above, I would expect that the

¹⁰⁹ {{

}}

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Transaction would result in the merged entity increasing the terminating access fee by about {{ relative to what Comcast would charge in the absence of the merger, and by about {{ relative to what TWC would charge in the absence of the merger. I then discuss the claim by Comcast's economists that Netflix, at least, does not need to worry about this because it has a long-term contract. Finally, I respond to Dr. Israel's claim that we could ignore any increase in price to edge providers because it will lead to a countervailing decrease in price to households.

1. The Impact of the Transaction on Comcast's Prices to OVDs for Interconnection

136. I have concluded above that Comcast and Time Warner Cable are two-sided ISP platforms that participate in a national broadband market that connects edge providers and households. Comcast and Time Warner Cable both have substantial market power today. A merger would significantly increase the market power that each holds individually today. The combined firm, which would account for {{ of wired broadband households, would have about {{ more wired broadband households than Comcast has today and about {{ more wired broadband households than Time Warner Cable has today.¹¹⁰ Those figures will likely increase over time given the migration of households from DSL to cable and the slowing of fiber deployment.¹¹¹

¹¹⁰ Comcast June 27 Letter, p. 2.

¹¹¹ For more details on the slow growth of DSL due to the migration of households from DSL to cable, see *infra*, Section III.E.1. The growth of fiber has been slowing and is likely to slow even further, given that Verizon, the leading deployer of fiber broadband, has stated that it does not plan to expand its fiber footprint. See Roger Cheng, "Verizon to End Rollout of FiOS," *Wall Street Journal*, March 30, 2010, available at <http://www.wsj.com/news/articles/SB10001424052702303410404575151773432729614>; Karl Bode, "Verizon: 30% or More of Our Users Will Never Get FiOS," *DSLReports*, May 7, 2014, available at <http://www.dslreports.com/shownews/Verizon-30-or-More-of-Our-Users-Will-Never-Get-FiOS-128862>.

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137. Given the price-size relationship I have documented among ISPs, it is likely that the Transaction would result in a significant increase in price. This increase in price does not come from the elimination of competition between Comcast and Time Warner Cable for household subscribers. It comes, on the other side of the platform, from the elimination of choices that OVDs have for building their networks—in particular the ability to negotiate separately with Comcast and Time Warner Cable and walk away from either of them—that it will not have following the proposed Transaction.

138. The Transaction would increase the economic significance of the threat that Comcast could make to OVDs that refuse to pay higher terminating access fees. Using Netflix as an example, the ultimate threat—full foreclosure—would result in eliminating {{ }} of Netflix's operating margin after the Transaction compared with {{ }} before.¹¹² Mr. Florance confirms that, consistent with his experience in negotiating interconnection deals, including one with Comcast, he would expect Netflix to accede to a higher terminating access fee as a result of the greater threat.¹¹³

139. I have examined the relationship between the terminating access fees and size (measured by the share of Netflix viewing hours) for the four deals that Netflix negotiated to provide an indication of the extent to which the Transaction could affect terminating access fees for OVDs. I have used data on the {{

¹¹² This calculation is similar to ones I describe in Evans Declaration I, ¶ 131, except that in this report I calculate the share of Netflix streaming potentially excluded by Comcast without imposing any speed threshold.

¹¹³ Florance Declaration I, ¶ 62.

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}}¹¹⁴ I find that even in this small sample of ten ISPs, the share of Netflix hours has a large and statistically significant effect on the interconnection price. The expected interconnection fee rises from {{

}}. Given this relationship, I find that the Transaction (including the divestiture) would result in a {{ }} increase in the expected Comcast terminating access fee (from {{

}} to {{ }} and a {{ }} increase in the Time Warner Cable terminating access fee (from {{ }} to {{ }}) with a weighted average increase, for the combined entity, of {{ }}.¹¹⁵ I am not claiming that this

¹¹⁴ For this analysis, for those ISPs with positive fees, I used estimates of the effective monthly access fee based on 95th percentile usage, which is commonly used in the industry. The monthly payment (in dollars) made by Netflix to each ISP is based on Netflix's contract with that ISP. For a measure of traffic usage, for Comcast, I used actual data on its peak usage in August 2014, divided by 1.2, a ratio that Netflix uses to estimate 95th percentile usage based on peak usage, to obtain an estimate of 95th percentile usage. I divide the monthly payment (in dollars) by the estimated 95th percentile traffic (in Mbps) to estimate the monthly fee in \$/Mbps. {{

}} The calculated access fees for these ISPs using this approach have the same ratio to each other and to Comcast as using the contract capacities, which is the approach Dr. Israel used in Table 7 of Israel Declaration II. The percentage changes I report from the regression results would be essentially the same using the contract rates, as used by Dr. Israel. I report the effective rates for greater comparability with third-party CDN rates, which I report elsewhere in this declaration.

¹¹⁵ These results are based on a Tobit censored regression with 10 observations: the four ISPs that charge an access fee (Comcast, AT&T, TWC, and Verizon), and the next six largest wired ISPs (CenturyLink, Charter, Cox, CableVision, BrightHouse, and Frontier). Including additional ISPs (all of which would have an very small number of hours and an interconnection price of zero) would have only make the results even more statistically significant, and would have only a modest effect on the measured magnitude of the effect. The dependent variable is the access fee, measured in dollars per Mbps. The explanatory variable is the share of Netflix viewing hours in August 2014 (the most recent period for which we have the data). The marginal effects of share on the expected fee are non-linear because of the censoring at 0. In calculating the share of the post-Transaction combined entity, I assume that the combined entities share equals the combined share of Comcast plus TWC, reduced by the fraction of broadband subscribers included in the divestiture (as reported in the Comcast June 27 letter). For the weighted percentage increase in fee for the combined entity, I calculate the average pre-Transaction fee for Comcast and Time Warner, using their pre-Transaction shares as weights. I tested the appropriateness of the Tobit specification by calculating the LM-statistic for the test against the alternative of a model that is non-linear in the regressors and contains an error term that can be heteroskedastic

analysis provides precise predictions of the impact of the Transaction on terminating access fees for OVDs, but only that it is indicative that the impact is likely to be significant relative to standards ordinarily used in merger analysis.

Table 3: Tobit Regression of Interconnection Price on Share of Netflix Hours

{{

}}

140. The resulting increase in terminating access fees that Comcast will be able to charge as a result of the Transaction is likely to be substantial in absolute terms for several reasons.

141. First, I would expect for the reasons discussed above that, in the absence of regulatory provisions that prevent Comcast from effectively charging OVDs for access, Comcast would charge much higher terminating access fees in the future. Therefore, the base from which the Transaction-specific increase is calculated would be larger as would the Transaction-specific increase. For example, if Comcast demanded a terminating access fee of {{ }} from Netflix—more than {{ }} times higher than today—Netflix would be better off paying

and non-normally distributed, with critical values calculated using a parametric bootstrap. The test did not reject the null hypothesis, which supports my use of the Tobit model.

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the fee than giving up the revenue from Netflix customers who are dependent on Comcast as their ISP.¹¹⁶ The same is true for other OVDs with similar business models.

142. Second, market observers predict that the OVD business will expand significantly in the coming years. Consumers have shown that they like the viewing and pricing models offered by OVDs, and Netflix has demonstrated that it is possible to serve these consumers profitably. I would expect that the existing OVDs—Amazon, Hulu, YouTube, VIMEO, Crackle, Blip, Vudu, and Redbox Instant—will expand and that others will enter. Cisco projects that the total size of the global Internet video industry in 2018 will be 69,972 Petabytes per month, 3.6 times the volume in 2013.¹¹⁷ According to PricewaterhouseCoopers, electronic home video streaming is expected to reach \$10.1 billion in 2018, up from \$3.3 billion in 2013.¹¹⁸ The Transaction would result in a significant increase in terminating access fees to a much wider group of market participants in the future.

2. The Impact on Netflix Given Its Long-Term Contract

143. Dr. Israel and Professor Carlton claim that the fact that Comcast and Netflix agreed to a {{ demonstrates that Netflix has no cause for concern and that Comcast does not have significant market power.¹¹⁹ {{

¹¹⁶ For this calculation, I started with the effect on Netflix's operating margin from a complete loss of Comcast subscribers, based on the calculation reported above in ¶ 138. I took this to be the maximum Netflix would be willing to pay (\$432 million in 2013). I divided this by Comcast's 95th percentile traffic in August 2014 ({{ })), estimated using the method described above in footnote 113 to get a price of {{ })) annually, or {{ })) monthly. I compared the \$430 million to the contracted price in 2014 ({{ })), which is less than {{ })) of \$432 million).

¹¹⁷ Cisco (2014), "Cisco Visual Networking Index: Forecast and Methodology, 2013-2018," available at http://www.cisco.com/c/en/us/solutions/collateral/service-provider/ip-ngn-ip-next-generation-network/white_paper_c11-481360.pdf, p. 10.

¹¹⁸ Gary Krakow, "Streaming Movie Revenue Forecast to Surpass Box Office Totals," *TheStreet.com*, June 5, 2014, available at <http://www.thestreet.com/story/12734638/1/streaming-movie-revenues-forecast-to-surpass-box-office-totals.html>.

¹¹⁹ Israel Declaration II, ¶ 174, Carlton Declaration ¶ 15.

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}}. The length of this contract does not reduce the risks the Transaction poses to competition and consumers.

144. To begin with, for the purposes of evaluating the Transaction, the relevant question is what OVDs that have not already entered into long-term contracts with Comcast will pay. Comcast will be negotiating those terms after having established the precedent of positive terminating access fees, and outside of the glare of regulatory scrutiny coming from its proposed acquisition of the second largest cable system in the country and the current heated debate over net neutrality. Indeed, approval of this Transaction may well be taken by Comcast as vindication of its absolute right to charge for interconnection, which could embolden it to more fully exercise its market power and increase access fees. I would expect that OVDs and other edge providers will obtain significantly less favorable terms than Netflix and other OVDs obtained in the shadow of the merger filings for this Transaction.

145. {{

}}

146. Second, Comcast's agreement to provide port capacity does not preclude it from imposing higher costs on Netflix, in other ways, for connecting with Comcast's subscribers relative to other ISPs with less market power. Comcast could demand payments from Netflix to end these practices as well. Comcast can employ other tactics for reducing the ability of its subscribers to stream content from Netflix, and it can charge Netflix for modifying those tactics. Netflix, for example, has partnered with a number of U.S. MVPDs to make Netflix accessible on their set-top boxes.¹²⁰ Consumers benefit when they can more easily access Netflix or other OVDs with a single-click from the set-top box they are using for linear programming and video-on-demand. {{

}} Netflix has not entered into a deal with Comcast for access to the set-top box. Comcast could use its increased market power to exact higher fees for access to its set-top boxes than it would have in the absence of the Transaction.

147. A contract for interconnection also does not necessarily prevent Comcast's use of differentiated data caps. Comcast has the technical ability to place different data caps on different services or to exclude entirely its own video services from those data caps. This

¹²⁰ Based on information from Netflix.

would have the effect of rationing consumers' use of disfavored third-party OVDs and pushing those subscribers to use Comcast's video services or to use an OVD that has negotiated an agreement with Comcast to avoid those data caps.

3. The Role of "See-Saw" Effect in Limiting Competitive Harm

148. Dr. Israel claims that the "see-saw" effect for two-sided platforms implies that even if Comcast increased terminating access fees that would not cause competitive harm. In effect, he is claiming that an increase in the price to OVDs would be matched by an equal decrease in the price to consumers. There is no basis in the economics of two-sided platforms for such a fortuitous result. In this case, it is unlikely that Comcast would pass back much if any of the revenue gain from OVDs to its subscriber much less *all* of the revenue gain.

149. As I discussed earlier, two-sided platforms choose prices for each side. Those prices are interrelated because the demands by the two sides are interdependent. Following a change in demand or cost, a profit-maximizing firm may decide to reduce the price to one side and to increase the price to another side.¹²¹ The existence of the "see-saw" effect, however, does not provide an efficiency justification for the exercise of market power by Comcast in imposing terminating access fees in February 2014—i.e., increasing the price to the edge provider side of the market, with respect to some OVDs, from zero to a positive amount. Nor does it provide a justification for the increased terminating access fees that would result from the Transaction.

150. The competitive equilibrium for wired ISPs—reflected in the pricing decisions by wired ISPs in the United States—involves charging subscribers for access to the Internet, and then

¹²¹ The "see-saw" effect is often discussed in the context of regulation. When a regulator imposes a cap on the price on one side, and forces that price down, a profit-maximizing platform may increase the price on the other side. For example, I have shown that this occurs in the case of regulatory interventions in payment cards.

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permitting those subscribers to download and upload content to the Internet, and not charging edge providers for providing content requested by those subscribers.

151. Starting around 2009, as discussed in my previous declaration, Comcast began taking steps to break this pricing equilibrium and assess terminating access fees on edge providers, including OVDs. The most plausible explanation for why Comcast was able to do that is that it had gained market power as a result of increasing the number of subscribers that it controlled (including through acquisitions) and decreasing its reliance on transit providers to connect to the Internet.¹²² The same was true for other very large ISPs that followed Comcast's approach. I have seen no evidence that Comcast sought to establish a different pricing model than smaller ISPs because it was efficient for Comcast to do so, but not efficient for others to do so.

152. That does not complete the analysis, however. When a two-sided platform obtains additional market power on one side of the platform it is possible, although not necessary,¹²³ that it will choose to increase price to that side while decreasing the price to the other side. Ordinarily we would expect that the total price would go up as a result of increased market power, although it is possible that the price to the other side could go down somewhat. The price decrease on one side would generally not offset the price increase on the other side so the

¹²² A substantial share of Comcast's growth in subscribers has come through acquisitions, including Maclean Hunter in 1994 (550,000 subscribers), E.W. Scripps in 1995 (800,000 subscribers), Jones Intercable in 1998 (1 million subscribers), Prime Communications in 1998 (430,000 subscribers), Greater Philadelphia Cablevision (79,000 subscribers), Lenfest Communications in 2000 (1.3 million subscribers), select AT&T Broadband cable systems in 2001 (585,000 subscribers), Baltimore AT&T Broadband in 2001 (112,000 subscribers), Adelphia Communications in 2005 (1.7 million subscribers), Susquehanna Communications in 2005 (225,000 subscribers), and Patriot Media in 2007 (81,000 subscribers). Comcast, "Comcast Timeline," available at <http://corporate.comcast.com/news-information/timeline>.

¹²³ E. Glenn Weyl (2010), "A Price Theory of Multi-Sided Platforms," *American Economic Review*, 100(4): 1642-1672.

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total price would go up.¹²⁴ Therefore, there is a strong presumption that in an increase in price to one side as a result of a merger will result in an increase in the total price.

153. In this particular case, it is unlikely that Comcast would reduce prices materially to subscribers because it is able to engage in extensive price discrimination and faces little competition for broadband services. A higher terminating access fee increases the value of a subscriber for Comcast and therefore provides an incentive to charge a lower price to subscribers at the margin. However, Comcast could introduce new pricing tiers to attract households that were not willing to subscribe to its ISP service at current prices. It would prefer not to lower prices to existing subscribers if it can avoid it. Comcast might also have an incentive to lower the prices of fast broadband service to encourage subscribers to consume more OVD content for which it receives a terminating access fee. It would prefer to do this in a targeted way. Therefore, I would not expect a significant decrease in Comcast's prices to its subscribers as a result of the increased terminating access fee revenue, much less the complete offset claimed by Dr. Israel. The Transaction would increase the total price for connections as well as the price to OVDs.

154. I conclude from this analysis in this section that Comcast would likely increase terminating access fees significantly if the Transaction were approved, and that the increased fees would be economically significant. The Transaction substantially lessens competition for connecting edge providers and households and gives Comcast a monopoly in the national market for broadband access. The serious vertical effects I discuss next would exacerbate this

¹²⁴ There is no theoretical or empirical basis for believing that there would be an exact offset except in highly unusual circumstances that do not apply here.

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competitive harm in the national broadband market and extend the competitive harm to the MVPD business.

F. Impact of Transaction on Comcast's Incentive and Ability to Harm OVD Competition

155. Comcast and Time Warner Cable earn considerable profits as a result of facing little competition for households. These two companies have a combined market cap of \$186 billion.¹²⁵ That makes the combined company the 17th most valuable American company.¹²⁶ The valuation is remarkable given that Comcast and Time Warner Cable operate broadband and MVPD services in only a portion of the United States, with footprints covering only 35 percent and 21 percent of the United States population, respectively.¹²⁷ Their profits come from having cable franchises that, as we have seen, face little competition in the case of broadband and limited competition when it comes to MVPD services and no near term prospect of competitive entry in local areas.

156. The rapidly evolving OVD industry places those profits at risk for two reasons that I discuss below. Left unimpeded, OVDs will tend to displace linear programming and video on demand thereby reducing the profitability of Comcast and Time Warner Cable's MVPD businesses. In the long term, a robust OVD industry would make it easier for companies to enter broadband in local areas. Entrants today have to incur considerable expense to provide a video offering to compete with incumbents and are at a significant competitive disadvantage

¹²⁵ Calculation based on data from Bloomberg on closing prices and shares outstanding for December 18, 2014.

¹²⁶ For a list of the 50 largest American companies by market capitalization as of December 18, 2014, *see* <http://www.iweblists.com/us/commerce/MarketCapitalization.html>, visited December 20, 2014.

¹²⁷ National Telecommunications and Information Administration, National Broadband Map, December 2013, available at <http://www.broadbandmap.gov/about-provider/comcast-corporation/nationwide/> and <http://www.broadbandmap.gov/about-provider/time-warner-cable-inc/nationwide/>

relative to Comcast, which pays much less for programming because of its significant bargaining power.

157. The Transaction increases the ability and incentives of the merging parties to slow and restrict OVD growth to maintain their significant market power in the provision of MVPD and broadband services.

1. The Evolution of the Nascent OVD Industry

158. Video programming is a major source of entertainment for Americans. The average adult watched almost 40 hours a week in the second quarter of 2014 according to Nielsen.¹²⁸

Until a few years ago, consumers got virtually all of that programming from their MVPD—a local cable, telco, or direct satellite-provider—or from fixed media such as DVDs.

Technically, many could have streamed programming since the early 2000s. But during most of the first decade of the century broadband speeds were not fast enough for streaming movies and television shows and no business had succeeded in making what was then called “Internet TV” compelling for consumers.

159. That changed towards the end of the decade. An increase in average broadband speed and improvements in streaming technology made high quality streaming of long-form content at home possible. Around the same time, several innovative business models provided increased value to consumers. OVD entrants gave consumers almost instant access to large quantities of video and thereby eliminated the transaction costs of going to a video rental store

¹²⁸ Nielsen (2014), “Shifts in Viewing: The Cross-Platform Report September 2014,” available at <http://www.nielsen.com/us/en/insights/reports/2014/shifts-in-viewing-the-cross-platform-report-q2-2014.html>. U.S. adults age 18 and up spent a total of 39 hours and 51 minutes per week watching video content. This total includes the reported times for traditional television, time-shifted television, DVD/Blu-Ray devices, multimedia devices, Internet video, and smartphone video. It excludes the 1 hour and 10 minutes spent per week using video game consoles, which includes both time spent watching video content, time spent playing games, and time spent consuming other media content.

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or even dealing with DVDs by mail. Some OVDs offered people a new way of consuming television that many found appealing—“binge watching” multiple episodes over a short period of time rather than periodic installments, and with no advertising.

160. The new OVD industry, following the pattern of information-technology businesses over the last 40 years, disrupted existing industries and threatened the survival of the incumbents. The economic impact was first seen in the video rental industry. Streaming OVD content was a direct substitute for video rental. Companies that specialized in renting from physical locations faced serious difficulties. Blockbuster, the largest chain, filed for bankruptcy in 2010, as did Movie Gallery (the parent company of the Hollywood Video chain).¹²⁹ More than 24 thousand video rental stores closed between 2004 and 2013.¹³⁰

¹²⁹ “Movie Gallery Files for Bankruptcy,” *New York Times* (February 4, 2010), available at <http://dealbook.nytimes.com/2010/02/04/movie-gallery-files-for-bankruptcy/>; “Blockbuster Files for Bankruptcy,” *New York Times* (September 23, 2010), available at <http://dealbook.nytimes.com/2010/09/23/blockbuster-files-for-bankruptcy/>.

¹³⁰ As of December 31, 2004, Blockbuster had 5,803 stores in the United States, including both company-operated and franchised stores. Blockbuster, 10-K for Period Ending December 31, 2004, available at <https://www.sec.gov/Archives/edgar/data/1085734/000119312505063510/d10k.htm>. As of January 8, 2008, that number had declined somewhat to 4,855. Blockbuster, 10-K for Period Ending January 6, 2008, available at <https://www.sec.gov/Archives/edgar/data/1085734/000119312508048757/d10k.htm>. In November 2013, Blockbuster closed the last of its company-owned stores, leaving it with just 50 remaining franchise stores. Marc Graser, “How Fitting: ‘This Is the End’ the Last Movie Rented from Blockbuster,” *Variety* (November 11, 2013), available at <http://variety.com/2013/biz/news/this-is-the-end-blockbuster-1200820318/>. As of January 2, 2005, Movie Gallery had 2,511 stores in North America, plus another 2,000 stores from its pending acquisition of Hollywood Entertainment. Movie Gallery, 10-K for Period Ending January 2, 2005, available at https://www.sec.gov/Archives/edgar/data/925178/000110465905012029/a05-1900_110k.htm. As of December 1, 2008, its total number of stores in North America had declined somewhat to 3,290. Movie Gallery, 10-K for Period Ending January 6, 2008, available at <https://www.sec.gov/Archives/edgar/data/925178/000119312508255936/d10k.htm>. It announced the liquidation of its remaining U.S. stores in May 2010 and its remaining Canadian stores in June 2010. Mike Spector and Peter Lattman, “Hollywood Video Closes Its Doors,” *Wall Street Journal*, May 3, 2010, available at <http://online.wsj.com/articles/SB10001424052748704608104575220370429528864>; “Movie Gallery Liquidating All 181 Stores in Canada,” *Bloomberg Businessweek* (June 16, 2010), available at <http://www.businessweek.com/ap/financialnews/D9GCJ00O0.htm>. Independent video stores in the United States declined from 24,000 in 2004 to 10,000 in 2013. Gary Moskowitz, “Comedy Nights and Party Supplies: How Local Video Stores Are Struggling to Survive,” *Time* (November 15, 2013), available at <http://entertainment.time.com/2013/11/15/film-camp-and-party-supplies-how-local-video-stores-are-scrambling-to-survive/>.

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161. The disruption for MVPDs has just begun, however, because the OVD industry has just started to offer direct substitutes for MVPDs. Current OVDs do not offer much of the video programming that households particularly desire—such as live sports, news, and other live television. According to recent estimates, consumers spend only 5-10 percent of the time they spend watching video at home watching online video.¹³¹ Moreover, history teaches us that it will take time for the OVD industry to reach its potential. New industries take a long time before they reach maturity¹³² and that has proved true for Internet-based ones. For example, 15 years after the start of the commercial Internet, e-commerce is only 6.4 percent of all retail sales.¹³³ And, categories such instant messaging, social networking, and portals have evolved enormously over that period.

162. Even at this early stage, however, it is clear the OVDs are as much a threat to the long-run viability of MVPDs as they were to short-run viability of the video rental industry. The FCC found in its analysis of video programming competition that OVDs are increasingly competing head-to-head with MVPDs. A small percentage of households are replacing MVPDs with OVDs (cord-cutters), other new households are using OVDs instead of MVPDs (cord-nevers), and still others are downgrading their MVPD packages (cord-shavers).¹³⁴

¹³¹ Nielsen (2014), “Shifts in Viewing: The Cross-Platform Report September 2014,” available at <http://www.nielsen.com/us/en/insights/reports/2014/shifts-in-viewing-the-cross-platform-report-q2-2014.html>. Nielsen reports the time spent per week for adults 18+ based on the device used, not the service. Some devices such as DVD/Blu-Ray players and game consoles can be used for OVD content, non-OVD content, or non-video content. To get the lower bound on the share of online video in all home video, I assumed that all time spent with DVD/Blu-Ray and game consoles was spent on non-online video. To get the upper bound, I assumed that all of the time spent with these devices was spent on online-video. For both numbers, traditional and time-shifted TV was counted as non-online video, and multimedia devices, internet video, and smartphone video was counted as online video.

¹³² Michael Gort and Steven Klepper (1982), “Time Paths in the Diffusion of Product Innovations,” *Economic Journal*, 92(367): 630-653.

¹³³ U.S. Census Bureau, “Quarterly Retail E-Commerce Sales, 2nd Quarter 2014,” (August 15, 2014) available at https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf.

¹³⁴ FCC, 15th Report on Video Competition, 2013, ¶¶ 316-318.

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163. Meanwhile the OVD industry is beginning to introduce more content that directly substitutes for MVPD content. Several programming providers have announced that they are considering or experimenting with providing content online through their own services or by licensing their content to others.¹³⁵ OVDs are also developing substitutes for the news and talk shows currently available only through MVPDs. Netflix, for example, has started a talk show hosted by comedian Chelsea Handler, and Yahoo News hired television anchor Katie Couric to provide news features.¹³⁶ In November 2014, CBS launched CBSN, a 24/7 streaming news network.¹³⁷

164. As the OVD industry evolves over a time, and as there is an increasing supply of content through OVDs, it is likely that consumers will increasingly substitute consuming video content from OVDs for consuming video content on MVPDs. Some consumers will subscribe

¹³⁵ In September 2014, DirecTV began offering NFL Sunday Ticket as a standalone streaming service, targeting customers in multi-unit residences that do not allow satellite dishes. (“NFLSUNDAYTICKET.TV for Apartment Dwellers at New, Low Prices,” *NFL.com*, September 3, 2014, available at <http://www.nfl.com/news/story/0ap3000000388471/article/nflsundaytickettv-for-apartment-dwellers-at-new-low-price>.) That same month, ESPN suggested that it is considering offering a stand-alone streaming service, albeit one that would not carry content that duplicates their broadcasts. (Jared Newman, “ESPN Still Pondering Standalone Streaming Service, But Not the One You Want,” TechHive, September 12, 2014, available at <http://www.techhive.com/article/2607024/espn-still-pondering-standalone-streaming-service-but-not-the-one-you-want.html>.) In mid-October, HBO announced that it would launch a stand-alone version of its HBO Go streaming service in 2015 in the United States. (Joe Flint and Shalini Ramachandran, “HBO To Launch Stand-Alone Streaming Service,” *Wall Street Journal*, October 15, 2014, available at <http://online.wsj.com/articles/hbo-to-launch-standalone-streaming-service-1413385733>.) The next day, CBS announced a subscription streaming service for its network shows, and Univision suggested that it was working on a stand-alone streaming service. (CBS, “CBS Brings Programming Direct to Consumers with New Multi-Platform Digital Subscription Service,” October 16, 2014, available at <http://www.cbspressexpress.com/cbs-interactive/releases/view?id=40966>; Joe Flint, Shalini Ramachandran, and Keach Hangey, “Cable Cord-Cutters Beware: Prices Could Be Higher, Not Lower,” *Wall Street Journal*, October 16, 2014, available at <http://online.wsj.com/articles/prices-add-up-with-a-la-carte-tv-1413501679>.) In November, CBS announced a stand-alone Showtime streaming service for 2015. (Tess Stynes and Joe Flint, “CBS Promises Streaming Service as Earnings Jump,” *Wall Street Journal*, November 5, 2014, available at <http://online.wsj.com/articles/cbs-earnings-jump-on-gain-from-outdoor-spinoff-1415223505>.)

¹³⁶ Netflix, “Chelsea Handler Teams with Netflix to Revolutionize the Talk Show,” June 19, 2014, available at <https://pr.netflix.com/WebClient/getNewsSummary.do?newsId=1356>; Yahoo, “Yahoo Announces Deal with Katie Couric,” November 25, 2013, available at <https://tv.yahoo.com/news/yahoo-announces-deal-katie-couric-171545451.html>.

¹³⁷ CBS News, “CBSN: About the Streaming Network,” November 6, 2014, available at <http://www.cbsnews.com/news/about-the-cbsn-live-streaming-video-channel/>.

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to a single MVPD and will have access to multiple OVDs. They will be able to substitute between cable channels and video on demand from the MVPD and the multiple OVDs. Other consumers will find that they can get by without an MVPD especially as more programming, such as sports and news, moves to OVDs. The key transformation is that households will move from a world in which they must single-home on an MVPD, which provides all of their programming, to a world in which they can multi-home on OVDs in addition to, or in lieu of, the single choice they have today.

165. All of this assumes, of course, that the OVD industry will be able to evolve unfettered by restrictions on competition imposed by incumbents threatened by the disruption to their long-time business models.

2. The Long-Term Impact of the OVD Industry on Comcast's MVPD Business

166. The long-term development of the OVD industry presents multiple financial threats to Comcast.¹³⁸ The company has noted that more and more competitors are entering the OVD market, “positioning themselves as full or partial competitors to MVPDs” with growing numbers of subscribers.¹³⁹ It recognizes OVDs as a serious competitive threat.¹⁴⁰

¹³⁸ Dr. Israel claims that a broadband customer generates a higher incremental margin. Israel Declaration II, ¶¶ 59-60. That phenomenon results, however, from the fact that broadband is a high fixed cost, but low variable cost business. In order for Comcast to remain in that business, it must incur incremental fixed costs. Comcast, as I discuss below, bundles MVPD services with broadband services and uses programming and broadband bundles as part of its price discrimination strategy. Given these circumstances, it is not possible from the information in the public record, and that I have seen so far in the confidential submissions to the FCC, to estimate accurately either the incremental profitability of MVPD and broadband or their relative contributions to overall profits.

¹³⁹ Applications and Public Interest Statement, In re Applications of Comcast Corporation and Time Warner Cable Inc. for Consent to Transfer Control of Licenses and Authorizations, FCC, MB Docket No. 14-57 (Apr. 8, 2014) (“Comcast Application”), p. 144 (“Along with new wireline MVPD entrants, like Google Fiber, a number of online businesses like Netflix, Apple, Google, Amazon, Hulu, Sony, and a host of smaller companies, are entering the online video space and positioning themselves as full or partial competitors to MVPDs.”); *id.* p. 5 (“Competition has only increased since this ruling. . . . For example, Netflix now has over 33 million customers in the United States alone, with another 11 million international customers; Google’s video websites now attract over 157 million unique viewers each month who watch nearly 13 billion videos; Apple iTunes viewers

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167. Indeed, Comcast's MVPD profit stream, and its market value, is affected in at least six ways by the evolution of the OVD industry.

168. First, OVDs directly reduce the revenue Comcast receives from subscribers. The company loses video-on-demand (VOD) and pay-per-view (PPV) revenue as consumers decide to watch OVD programming rather than paying for a VOD movie or PPV event. {{

}}¹⁴¹ It also loses advertising revenue. Many of Comcast's deals with programmers provide it with advertising slots, against which it sells advertising.¹⁴²

169. Second, Comcast would have to pay more for programming for two reasons. Programming distributors typically receive income from selling advertising. If they have fewer viewers, they will get less revenue, and therefore demand more in other programming fees, all

purchase over 800,000 TV episodes and over 350,000 movies per day. Apple has launched Apple TV and seems poised to launch a more comprehensive set-top box product. Likewise, Amazon currently offers a streaming video service and just announced the planned release of Amazon Fire TV, an advanced video set-top device."); *id.* p. 146 ("Indeed, OVDs are increasingly an outlet for original programming that is succeeding with millions of viewers on online platforms with no MVPD carriage at all."); Declaration of Gregory L. Rosston and Michael D. Topper, April 8, 2014 ("Rosston/Topper Declaration I"), ¶ 171 ("In addition, Netflix, Apple, Google, Amazon, Hulu, Sony, and other smaller online companies are entering or have entered online video provision and are positioning themselves as competitors to MVPDs for at least some services (like VOD) or are even poised to offer full linear replacement services.").

¹⁴⁰ Comcast has argued that the merger would make it a stronger competitor against national OVDs. *See* Rosston/Topper Declaration I, ¶ 83 ("In addition to making Comcast a better competitor with its traditional facilities-based MVPD and broadband rivals, the increased investment in advanced video services due to the transaction will allow Comcast and cable providers generally to be stronger competitors to major national and global technology companies and OVDs like Apple, Samsung, Sony, Google, Netflix, Amazon, and others who also sell video products, technologies, and services to consumers—and who serve many more users and employ many more developers than Comcast and TWC combined."); Comcast Application, p. 27 (pro-merger economist noting that the merger would result in "a better competitor and innovator in the *competitive cage match* in which providers of connectivity, devices, apps, services and content fight for a share of the value the broadband world creates." (emphasis added)).

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¹⁴² In 2013, Comcast's advertising revenue from these deals amounted to 11 percent of its revenue from residential video, and 5 percent of its overall cable revenues. Comcast Corp., 10-K for the Period Ending December 31, 2013, p. 53.

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else equal.¹⁴³ Comcast also claims that the increased demand for OVD programming reduces its bargaining leverage over programmers and thereby increases its costs.¹⁴⁴

170. Third, the availability of OVD programming reduces the willingness of customers to pay for access to MVPD services, including linear programming. It therefore reduces the maximum that any given consumer is willing to pay for the MVPD service, which forces Comcast to choose between lower prices or fewer subscribers, reducing its profitability even with extensive price discrimination.

171. Fourth, the growth of OVDs reduces the number of households who will subscribe at all to Comcast's MVPD services. Comcast loses the incremental revenue and profit from these cord-cutters and cord-nevers.¹⁴⁵

172. Fifth, the development of the OVD industry reduces Comcast's competitive advantage as a programming provider relative to other competing MVPDs. Currently Comcast competes with other local providers through its programming offering. As consumers have access to

¹⁴³ In the context of a la carte pricing, the U.S. General Accounting Office has noted that since advertising accounts for about half of the revenue for cable networks, declining advertising revenues could cause cable networks to increase the fees they charge cable operators. U.S. General Accounting Office (2003), "Issues Related to Competition and Subscriber Rates in the Cable Television Industry," GAO-04-8, available at <http://www.gao.gov/new.items/d048.pdf>, pp. 6, 30, 34-36, 38.

¹⁴⁴ Rosston/Topper Declaration I, ¶ 188 ("The number of hours Americans spend watching video over the Internet has grown 70% since June 2010. Surveys of TV households show that the percentage of TV watching time that is spent on viewing of Internet streaming to computers, TV sets, and handheld devices more than quadrupled, from 3% in 2011 to 13% in 2013. Approximately 53 million households used online video viewing in 2013. As OVD providers continue to grow, especially as they begin to offer linear programming, they will give content providers even more ways to distribute their programming and remain viable, which limits Comcast's bargaining leverage in acquiring programming. Indeed, OVDs are increasingly an outlet for original programming that is succeeding – with millions of online customers even though the programming is not carried by any traditional MVPD.").

¹⁴⁵ Experian (2014), "Cross Device Video Analysis," available at <http://www.experian.com/marketing-services/cross-device-video-analysis.html?intemp=emsblog>, pp. 6-7; Keach Hagey and Suzanne Vranica, "Nielsen to Measure Netflix Viewing," *Wall Street Journal*, November 19, 2014, available at http://www.wsj.com/news/article_email/nielsen-to-measure-netflix-viewing-1416357093-1MyQjAXMTA0MDE2OTYxNzklWj.

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more programming over OVDs, the relative difference between Comcast and its local competitors will decline.

173. Sixth, the development of the OVD industry will increase the amount that Comcast will have to pay content owners for exclusive programming in cases where it is competing for such rights with OVDs. OVDs like Netflix are already competing with Comcast for programming, and that competition is likely to intensify.¹⁴⁶ A similar effect will raise the amount that Comcast will have to pay in cases where Comcast purchases carriage rights from cable networks that compete with Netflix for programming rights.

174. The evolution of the OVD industry therefore poses a highly significant financial threat to Comcast's MVPD business. Facing that threat, Comcast needs to decide how to respond. Should it invest in strategies that would reduce the seriousness of the risk to its MVPD business by slowing and reducing the growth of the OVD industry?

3. The Ability of Comcast to Recover Lost MVPD Revenues from Its ISP Platform

175. One possible answer to this question, which seems to be the one proposed by Comcast and its economists, is that Comcast should be happy, or at least indifferent, about the evolving OVD industry.¹⁴⁷ A key argument is that OVDs benefit Comcast's broadband customers, and that Comcast should be able to charge those broadband customers enough to generate at least as

¹⁴⁶ See Shalini Ramachandran and Amol Sharma, "Cable Fights to Feed 'Binge' TV Viewers: Comcast, Verizon FiOS Vie with Netflix, Amazon for Rights to Show Complete Series," *Wall Street Journal*, September 20, 2013, available at <http://www.wsj.com/news/articles/SB10001424127887324807704579083170996190590?mg=reno64-wsj&url=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB10001424127887324807704579083170996190590.html>; Andrew Wallenstein, "The Deal That Could Dim Netflix's Emmy Afterglow: Potential Fox-Comcast Pact Portends Troubling Trend for SVOD Biz," *Variety*, September 24, 2013, available at <http://variety.com/2013/digital/news/the-deal-that-could-dim-netflixs-emmy-afterglow-1200660976/>.

¹⁴⁷ Carlton Declaration, ¶¶ 11-12, Israel Declaration II, ¶¶ 12, 116-129. Drs. Rosston and Topper, on the other hand, argue that Comcast needs to increase its size in order to compete with the OVD industry. See Rosston/Topper Declaration II, ¶¶ 11, 33.

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much profits in its broadband business as it would lose on its MVPD business.¹⁴⁸ That theory runs into several obstacles in the particular circumstances that present themselves in this matter.¹⁴⁹

176. First, Comcast would face significant risk in assuming that it will be able to completely, or largely, offset lost MVPD profits with higher broadband profits. It is highly uncertain how the OVD industry will evolve, what types of programming it will offer, what business models it will operate, how many players and what size it will tolerate, and precisely how it all could affect Comcast. Comcast has an incentive to reduce its risk by remaining vertically integrated into the distribution of programming—that is, protecting its existing MVPD business—and preventing competition from OVDs for its MVPD subscribers. That is particularly the case if the best Comcast can do is cover its MVPD losses.

177. Second, the theory that Comcast can replace MVPD profits with broadband profits ignores the extent to which Comcast relies on its MVPD business to engage in price discrimination. Comcast offers different video packages and bundles of video packages and broadband speed to its customers. As a result, Comcast has a total of {{ }} different product offerings, including those involving VoIP, as of June 2014.¹⁵⁰ These offerings can target different demand levels (willingness to pay) by consumers. In addition, Comcast's customer service representatives further customize these offerings through individual

¹⁴⁸ Carlton Declaration, ¶¶ 11-12, Israel Declaration II, ¶¶ 12, 116-129.

¹⁴⁹ Professor Carlton and Dr. Israel do not explain how, in practice, Comcast would recoup the losses on its MVPD business from its broadband business and Comcast does not offer any insights into this either.

¹⁵⁰ {{ }} To be conservative, this count combines a) commercial and residential versions of a product, and b) bulk and non-bulk versions of a product. If these are both counted separately, the total count of products rises to {{ }}. If bulk and non-bulk products are combined but commercial and residential products are counted separately, the count is {{ }}. If residential and commercial products are combined but bulk and non-bulk products are treated separately, the count is {{ }}.

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negotiations.¹⁵¹ As a result, Comcast can approach first-degree price discrimination, which involves extracting the entire surplus from each individual consumer based on his or her individual demand schedule. If the MVPD business shriveled it would not be able to make up the profits lost from a reduced ability to engage in such extensive price discrimination.

178. Third, the theory assumes that Comcast would be allowed by regulators to raise broadband prices enough to compensate for the loss in MVPD profits. It would have to raise broadband prices significantly to compensate for lost MVPD profits based on current figures. Given the lack of local competition for broadband service and the history of cable and communications regulation in this country, it is likely in my view that regulators would object to such increases, or that the price increase would result in legislation to impose regulation, or that local regulators would lower regulatory barriers to entry into local broadband markets or establish municipal broadband providers.¹⁵²

179. Fourth, Comcast does not believe the theory endorsed by its economists and therefore is unlikely to act as if it does. Internal documents show, understandably, that Comcast is extremely concerned about the long-run impact of the OVD industry on its profitability. The Commission noted in the Comcast/NBCU Order that:

[Comcast's] internal documents and public statements demonstrate that they consider OVDs to be at least a potential competitive threat. The record here is replete with e-mails from Comcast executives and internal Comcast documents showing that Comcast believes that OVDs pose a potential threat to its

¹⁵¹ Timothy B. Lee, "Comcast's Pricing Shell Game," *Forbes*, June 6, 2012, available at <http://www.forbes.com/sites/timothylee/2012/06/06/comcasts-pricing-shell-game/>.

¹⁵² Some municipalities have shown concern about the high prices of broadband, and have already started to take steps to encourage entry. See Brian Heaton, "Cities to FCC: Remove Barriers to Broadband Competition," *Governing: The States and Localities*, July 25, 2014, available at <http://www.governing.com/news/headlines/cities-to-fcc-remove-barriers-to-broadband-competition.html>.

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businesses, that Comcast is concerned about this potential threat, and that Comcast makes investments in reaction to it.¹⁵³

180. {{

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That is inconsistent with the prediction from the theory put forward by Comcast's economists.

181. Comcast's own behavior is not consistent with the sanguine—and counter-intuitive—view of Dr. Israel and Professor Carlton that Comcast prefers to embrace rather than extinguish OVDs, even though OVDs threaten its basic business model.

4. Comcast's Strategies for Stemming Long-Term Losses from OVDs

182. Comcast can invest in a number of strategies that could harm OVDs. These strategies could be used to pursue any or all of the following three goals:

- a. Slow and restrict the overall growth of the OVD industry. The longer Comcast can protect its MVPD profits, and develop its own OVD substitute, the better for it.
- b. Disadvantage OVDs that are particular threats because of their size or degree of substitutability with Comcast's programming and thereby restrict the OVD industry.
- c. Make it difficult for OVDs to provide content to Comcast's subscribers, in particular OVDs that provide content that is more substitutable with Comcast's content. Even if OVDs succeed outside its walls, Comcast has an incentive to keep them out.

¹⁵³ Memorandum Opinion and Order, *In the matter of Application of Comcast Corporation, General Electric Company, and NBC Universal, Inc. For Consent to Assign Licenses and Transfer Control of Licensees*, MB Docket No. 10-56, January 20, 2011 ("Comcast-NBCU Order"), ¶ 85.

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183. Pursuit of these goals would not require that Comcast effectively destroy any particular OVD, or the third-party OVD industry, to make this a profitable strategy for Comcast. They just require that the benefits that Comcast gets from slowing or reducing the growth of the OVD industry are large enough to offset any costs.

184. Comcast has at least six different tactics at its disposal to execute one or more of the three strategies above:

1. Increase terminating access fees above the normal profit maximizing level¹⁵⁵ as a part of a raising-rivals cost strategy to slow the growth of OVDs.
2. Reduce the quality and consistency of the signal between the OVD and the household, thereby reducing the substitutability with its own content and reducing OVD demand.
3. Refuse to provide necessary upgrades to support innovations in the delivery of OVD content to its subscribers.
4. Impose data caps that result in higher costs for the delivery of OVD, or particular OVD, programming than Comcast's MVPD or own OVD programming. These discriminatory data caps could be applied to either side of the platform or both sides: consumers and OVDs.
5. Pay a premium for certain important programming to prevent OVDs from acquiring that programming, pay for the rights to programming to deny that programming to particular OVDs, or pay for most-favored-nation clauses to deny exclusives to OVDs.
6. Use its set-top box to increase the difficulty and lower the quality of consuming content from OVDs relative to its own MVPD or OVD services, including refusing to allow OVDs to appear as an application of the set-box box and be as convenient for the television user as a channel, or impose contract restrictions on third-party set-top boxes that restrict subscriber access to some OVDs.

185. Comcast has demonstrated its ability to employ these tactics. The degradation episode discussed earlier shows that Comcast can choke off OVD access to subscribers and that it perceives the cost to itself of choking off access as minimal. Comcast has also imposed data caps. Comcast's own MVPD services and its Xbox 360 Xfinity On-Demand application are

¹⁵⁵ That is, above the profit-maximizing level that it would charge in the absence of considering the benefits of foreclosing MVPD competition.

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unaffected by its data caps, which has the effect of allowing its consumers to use OVDs to supplement its MVPD services, but not to replace them entirely.¹⁵⁶ Comcast is aggressively competing against OVDs for exclusive rights to new programming.¹⁵⁷ {{

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186. The cost of implementing tactics that impair the ability of OVDs to reach Comcast's customers is very low, as I showed earlier. Comcast subscribers have nowhere to turn and OVDs that supply long-form video have no feasible alternatives for reaching Comcast subscribers.

¹⁵⁶ Comcast, "FAQs: Xbox 360," available at <http://xbox.comcast.net/faqs.html>; Jacob Minne (2013), "Data Caps: How ISPs Are Stunting the Growth of Online Video Distributors and What Regulators Can Do About It," *Federal Communications Law Journal*, 65(2): 233-260; "Kneecapping the Future: Comcast's Unjustified Internet Caps and the Plan to Kill Video Competition," *Freepress*, available at https://www.freepress.net/sites/default/files/resources/Comcast%20New%20Caps%20Factsheet_FINAL.pdf; Serdar Yegulalp, "Welcome to the Internet's New Toll Lane," *InfoWorld Tech Watch*, January 15, 2014, available at <http://www.infoworld.com/article/2609716/net-neutrality/welcome-to-the-internet-s-new-toll-lane.html>. Note that Comcast's MVPD service is not IP-based. Also, note that Comcast's data caps are currently mostly being imposed on a trial basis in a large but limited portion of its footprint (Huntsville and Mobile, Alabama; Atlanta, Augusta and Savannah, Georgia; Central Kentucky; Maine; Jackson, Mississippi; Knoxville, Nashville and Memphis, Tennessee; Charleston, South Carolina; Tucson, Arizona). Comcast, "Questions & Answers About Our Data Usage Plan Trials," December 5, 2014, available at <http://customer.comcast.com/help-and-support/internet/data-usage-trials/>. Note that Comcast has stated that it expects to impose data caps throughout all of its footprint within the next five years. Thomson Reuters StreetEvents, "CMCSA – Comcast Corporation at MoffettNathanson Media & Communications Summit," Interview with David Cohen (Comcast EVP), May 14, 2014, available at <http://files.shareholder.com/downloads/CMCSA/3168999141x0x754850/059910f6-e9e0-4ec8-b2c2-05cabdfcc644/Comcast%20at%20MoffettNathanson%20Transcript.pdf>, p. 13 ("...I would predict that in 5 years Comcast at least would have a usage-based billing model rolled out across its footprint.")

¹⁵⁷ Shalini Ramachandran and Amol Sharma, "Cable Fights to Feed 'Binge' TV Viewers: Comcast, Verizon FiOS Vie with Netflix, Amazon for Rights to Show Complete Series," *Wall Street Journal*, September 20, 2013, available at <http://www.wsj.com/news/articles/SB10001424127887324807704579083170996190590?mg=reno64-wsj&url=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB10001424127887324807704579083170996190590.html>; Andrew Wallenstein, "The Deal That Could Dim Netflix's Emmy Afterglow: Potential Fox-Comcast Pact Portends Troubling Trend for SVOD Biz," *Variety*, September 24, 2013, available at <http://variety.com/2013/digital/news/the-deal-that-could-dim-netflixs-emmy-afterglow-1200660976/>.

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187. The success of the strategies depends on the fact that Comcast has a terminating access monopoly that covers 21.1 million American subscribers, which constitutes about {{ }} of American wired broadband households. I am not suggesting that Comcast would prevent the survival and emergence of any particular OVD. However, it has a large enough number of subscribers to reduce the number of viewers of OVDs and, through the vicious circle of reduced operating capital and reduced ability to purchase programming, significantly decrease the quality of programming OVDs provide their remaining viewers. Comcast also could affect the likelihood of survival for some OVDs. Most new entrants in any industry fail to achieve critical mass. Comcast's tactics could prevent some new OVDs from entering the market or surviving. Comcast benefits from slowing and reducing the rate of growth of OVDs. It has incentives to do that up to the point where marginal benefits of further investments equal marginal costs.

5. Impact of the Transaction on Comcast's Incentives and Ability to Harm OVDs

188. The Transaction results in a significant increase in the ability of Comcast to pursue strategies and employ tactics that would substantially lessen competition and tend to create a monopoly, thereby harming competition and the public. The merged firm would control 40 percent more subscribers than it does today.¹⁵⁸ Each of the tactics described above would impose proportionately more harm on OVDs as a result of the Transaction. There is a bigger club behind every tactic. Table 4 explains why.

¹⁵⁸ Comcast June 27 Letter, p. 2.

Table 4: Impact of Transaction on Effectiveness of Tactics to Harm OVDs

Tactic	Effect of Transaction
Increasing terminating access fee	Raises cost of access to larger portion of OVD customers
Reducing quality and consistency of signal	Forecloses access to larger proportion of OVD customers
Refusing to provide upgrades to support innovation	Reduces value of demand-increasing quality improvement to larger proportion of OVD customers
Imposing data caps	Forecloses access to larger proportion of OVD customers
Paying premium to withhold exclusive content to slow OVDs	Increases bargaining power that helps deny exclusive to OVDs
Using set-top box and other software and hardware assets	Forecloses access to larger proportion of OVD customers

189. The Transaction also results in a significant increase in the incentive to engage in these tactics. The benefit of pursuing each tactic increases as a result of the Transaction. First, each tactic causes proportionately more harm to OVDs and therefore increases the likelihood that the tactic will slow or reduce the growth of OVDs. Second, the benefits of pursuing these strategies accrue to a larger base of subscribers. Third, Comcast internalizes the benefits of its strategy that would flow to Time Warner Cable in the absence of the Transaction.¹⁵⁹

190. In short, the merged firm imposes more harm, realizes the benefits of imposing that harm across more subscribers, and internalizes more of the benefits.

191. The cost of pursuing each tactic decreases for two reasons. First, as a result of the Transaction, Comcast is able to average the fixed costs of the tactics across a larger subscriber base, thereby increasing its return. Second, as a result of the Transaction, the costs of engaging

¹⁵⁹ By contrast, smaller cable companies, including possibly Time Warner Cable, would not have the ability to affect the OVD industry and would not benefit from engaging in the tactics described above. Smaller cable companies may therefore find it in their individual profit interests to embrace the OVD industry even though each might be better off if the OVD industry did not thrive.

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in some of these tactics drops dramatically for Time Warner Cable since the combined company, using Comcast's transit relationships, will incur minimal costs from pursuing strategies that congest some access points to the network.

192. This analysis shows that Comcast has the ability and incentive to retard the development of the OVD industry and that the Transaction would increase the ability and incentive to do so. OVDs would lose and, in the end, people who want to watch programs.

6. The Role of OVDs in Broadband Competition

193. Comcast has a further incentive to employ these and perhaps other tactics to harm OVDs. As I have shown above, Comcast and Time Warner Cable face little significant competition in the provision of broadband. That is unlikely to change in the near term. Longer term, however, a robust OVD industry could reduce the barriers to entry into the provision of wired broadband for the reasons I discussed in my previous declaration.¹⁶⁰

194. Wired broadband entrants face many obstacles. One of them involves having to provide programming bundles. Consumers currently want a bundle of broadband and video programming.¹⁶¹ New entrants face a significant disadvantage. Broadband entrants operate at

¹⁶⁰ Evans Declaration I, ¶ 179.

¹⁶¹ An FCC working paper found that 39 percent of consumers who switched ISPs cited "Getting a bundle of Internet, TV and phone services from a single company" as the "major reason" for having switched. See FCC (2010), "What Drives Consumers to Switch - Or Stick With - Their Broadband Internet Provider," Working Paper, p. 3. A Bernstein Research survey of households in the Google Fiber areas reveals that most people considering Google Fiber are interested in a bundle of pay-TV and broadband. See Bernstein Research, "Google Fiber: What Do Kansas City Residents Say About It?", May 6, 2013, p. 2. Bernstein found that Google's double-play offer was the option most competitive with TWC's corresponding packages. Bernstein also purports that the purpose of the bundled pricing is to reduce churn.

Potential broadband entrants must offer MVPD in addition to broadband to be competitive (The FCC has long recognized that a broadband provider must offer video programming to successfully enter the market. For a recent example, see First Report and Order, Review of the Commission's Program Access Rules and Examination of Programming Tying Arrangements, 25 FCC Rcd. 746, ¶36 (2010) (concluding that "a wireline firm's decision to deploy broadband is linked to its ability to offer video.") (Program Access Order). Municipal fiber providers have also asserted that access to video programming is essential to the success of an ISP. (LUS, Complaint for Violations of Section 628 of the Communications Act and 47 C.F.R. § 76.1001 et seq., p. 3, File

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a significant cost advantage compared with much larger rivals in the same markets like Comcast, which can negotiate much lower programming costs.¹⁶² Google, for example, with its size and resources, pointed to the difficulty of assembling a compelling programming bundle as one of the major obstacles in providing fast broadband.¹⁶³

195. A robust OVD industry reduces the cost of broadband entry and enables new broadband providers to enter one market (broadband) rather than two (broadband and video). Potential broadband entrants—from large Internet players such as Google to municipalities that want to start their own systems—could focus on the provision of broadband only. Subscribers would then turn to OVDs to obtain programming in the same way that consumers select their own Internet services and mobile apps today.

196. This OVD competition poses enormous financial risk to Comcast, even if it does not flourish for another decade. Comcast must make substantial long-term investments in broadband. Competition poses a significant risk to these sunk-cost investments. More importantly, Comcast's market value is ultimately based on two related terminating access monopolies: its cable-based MVPD business, which is under direct threat from OVD

No. CSR-8357-P (filed June 8, 2010) (small municipal fiber provider stating that access to video programming is essential to its ability to successfully offer its fiber service).)

¹⁶² Declaration of Gary Biglaiser, August 26, 2014, Exhibit A, p. 28 (“Unfortunately, in the programming market it is well-known that larger MVPDs get much better programming rates than smaller ones. It flies in the face of reality to think that by enlarging, Comcast will gain no additional market power as a purchaser in the programming market.”). Frontier Communications, Petition to Deny, August 25, 2014 (“Frontier Petition to Deny”), p. 4 (“[T]he cost of content for video programming remains staggering for new entrants that lack the scale and scope of cable companies like Comcast and Time Warner Cable individually, let alone that of the merged entity.”); NTCA-The Rural Broadband Association, Petition to Deny, August 25, 2014 (“NTCA Petition to Deny”), p. 3 (citing NTCA 2013 Broadband/Internet Availability Survey Report (May 2014) <http://www.ntca.org/images/stories/Documents/Advocacy/SurveyReports/2013ntcabroadbandsurveyreport.pdf>) (“Ninety-nine percent of respondents to a recent NTCA survey stated that access to reasonably priced programming was a barrier to the provision of video programming”); Frontier Petition to Deny, p. 5 (“The underlying programming costs remain one of the largest barriers to entry for new entrants”).

¹⁶³ Brian Fung, Here's the Single Biggest Thing Holding Google Fiber Back, *Washington Post*, Oct. 6, 2014, <http://www.washingtonpost.com/blogs/the-switch/wp/2014/10/06/video-is-holding-google-fiber-back/>.

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competition as discussed above; and its ISP business, which could be a further casualty of a robust OVD industry that facilitates entry into the provision of broadband in local areas.

197. In conclusion, Comcast would have a significant incentive to invest in slowing or thwarting OVDs even if there was a small chance that the development of a robust OVD industry would put both its MVPD and its ISP business at risk. The cost of engaging in these strategies is small, as discussed above. The benefits, while distant, are potentially huge. Comcast has the ability and incentive to reduce that risk. The Transaction would increase that ability and enhance that incentive.

III. Detailed Response to Dr. Israel

198. This section provides a detailed response to Dr. Israel's claims in his second declaration on five main issues that I have not addressed in detail in the preceding section.¹⁶⁴ I have found that Dr. Israel's claims are not supported by the economic evidence and arguments he presents:

- a. *Dr. Israel disputes the evidence that Professor Farrell and I have provided showing that larger ISPs are able to demand higher access fees. Dr. Israel argues that the number of interconnection locations is a measure of quality that needs to be taken into account in a comparison of ISP size and access fees. Dr. Israel claims that after including the number of interconnection locations in Professor Farrell's regression analysis, Professor Farrell's finding that {{*
- }} disappears.*

Dr. Israel's purported measure of ISP quality is largely a measure of ISP size. Larger ISPs generally tend to have more interconnection locations because they cover a larger geographic footprint. By adding the number of interconnection locations into Professor Farrell's regression analysis, Dr. Israel is in fact adding in a highly correlated measure of size. By doing so, he is creating a classic multicollinearity problem in which {{

}}. His criticism of my empirical evidence on the relationship between Netflix's terminating access prices and the size of the ISPs is wrong for the same reason.

¹⁶⁴ With respect to these issues, Professor Carlton does not make any claims in addition to those made by Dr. Israel, so I restrict my attention to Dr. Israel's claims in this section.

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- b. *Dr. Israel claims that Comcast's service was significantly harmed due to the degradation episode in an attempt to show that purposeful degradation of peering points is not in its economic interest.*

Dr. Israel, however, provides no evidence on the impact to Comcast and no details from the transcripts of customer service calls to determine whether Comcast, for example, benefited by using these calls as opportunities to sell more expensive broadband packages.¹⁶⁵ By contrast, Netflix has provided transcripts of support calls that show explicitly the distress that Comcast caused Netflix customers that rely on Comcast to watch Netflix.

- c. *Dr. Israel cites Comcast's churn rate to argue that consumers switch broadband providers frequently. Dr. Israel calculates Comcast's annual churn rate as {{ }}, exclusive of customers who disconnected because they moved.*

Dr. Israel's calculations include a number of methodological errors. Most critically, he includes involuntary disconnections (such as disconnections for non-payment) in his estimate. Such involuntary churn is not relevant to an assessment of the willingness and ability of customers to switch ISPs.

- d. *Dr. Israel cites results from a survey of broadband subscribers prepared for Comcast in connection with this proceeding as support for a number of his claims. For example, he relies on the survey as support for his claim that the vast majority of an ISP's customers would switch away from the ISP if it degraded Internet service significantly.*

There are many serious flaws in the survey design and methodology that render its results unreliable. For example, [[]] respondents that stated they had a smartphone with a mobile wireless data plan also stated that they do not have a mobile wireless data plan (such as for use with a smartphone) when asked a separate question. Even leaving aside the flaws in the survey, its results purporting to show that almost all consumers say they would switch in the face of degradation of Internet service by their ISPs are contradicted by empirical evidence on what consumers actually do.

- e. *Dr. Israel claims that DSL has grown much more quickly than cable in recent years as support for his claim that DSL is a strong competitor to cable. He reports that the number of DSL subscribers grew at a 26.9 percent annual rate from 2009 to 2013, while the number of cable subscribers grew at a 17.9 percent rate over the same period.*

This finding is based on a sleight of hand. Dr. Israel's claimed DSL growth statistics result from his use of a 3 Mbps threshold. During this time, many DSL subscribers upgraded to speeds in excess of 3 Mbps (although 3 Mbps is still

¹⁶⁵ Israel Declaration II, ¶ 56.

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generally much slower than the speeds for cable subscribers). The claimed growth comes purely from the modest upgrades in DSL speeds. Taking all subscribers regardless of speed, there was an increase of over 11 million cable subscribers from 2009 to 2013, as compared with essentially no change in the number of DSL subscribers.

199. Sections A-E below provide details on Dr. Israel's claims concerning these issues and my discussion of the flaws in his claims.

A. Impact of Transaction on Terminating Access Fees

200. Dr. Israel offers three arguments regarding the impact of the Transaction on access fees. First, he argues that the empirical evidence that Professor Farrell and I have presented documenting that larger ISPs obtain better terms for interconnection is unreliable. Second, he argues that we should focus on Netflix's costs of sending traffic rather than on the access fees themselves. Third, he argues that the Commission's decision in Comcast-NBC Universal provides support for the assumption of a constant split between buyer and seller that is invariant to buyer or seller size in the bargaining model relied on by Dr. Israel. As I discuss in the following subsections, each of these arguments is wrong.

1. Empirical Evidence

201. In my initial declaration and the initial declaration filed by Professor Joseph Farrell, we presented different empirical evidence establishing that larger networks commanded better terms for interconnection fees. Dr. Israel argues that Professor Farrell and I have failed to account for relevant quality differences among networks that, according to Dr. Israel, would account for the better terms received by larger networks.

202. With respect to Dr. Farrell's empirical analysis, Dr. Israel argues that "[c]omparisons between larger ISPs that do offer backbone services—and thus for whom the relevant decision may be between settlement-free interconnection vs. charging for interconnection services—and

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smaller ISPs, who generally have to *pay* for transit and at best might hope to get settlement-free terms, are effectively meaningless due to this fundamental difference.”¹⁶⁶

203. Dr. Israel is pointing to the fact that smaller ISPs are in a worse bargaining position because they are more dependent on transit providers. The fact that a larger ISP is less dependent on transit does not mean that it provides higher quality to a CDN or to Netflix in terms of connecting to the ISP’s customers. Indeed, one of the reasons why the Transaction will increase access fees is that Time Warner Cable is more dependent on transit providers than Comcast is, so that the merged entity will have greater bargaining power with respect to the Time Warner Cable customers because it will be less dependent on transit than Time Warner Cable currently is today.

204. Dr. Israel also argues that “[g]reater ISP connectivity to the Internet reduces the costs of direct interconnection with the ISP because of the presence of more interconnection options for edge providers and because of the reduced distance between servers.”¹⁶⁷ (By “greater connectivity” he is referring to an ISP having more places where transit providers and CDNs can connect.) Larger ISPs often cover greater geographic areas and therefore, not surprisingly, have more interconnection points across all of those areas so as to receive traffic closer to their subscribers. For example, a hypothetical ISP that has customers in Boston and customers in Chicago would likely use interconnection points in both regions. If instead the Boston and Chicago operations were hypothetically owned by two distinct ISPs of the same size in each region as the combined ISP, the Boston ISP would probably not have an interconnection point in Chicago.

¹⁶⁶ Israel Declaration II, ¶ 153 (emphasis in original, internal citation omitted).

¹⁶⁷ Israel Declaration II, ¶ 154

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205. The greater number of connection points of the combined ISP is a function of its geographic scope, which is correlated with size, not of any significantly greater efficiency that the combined ISP provides. Indeed, Mr. Florance has stated that from Netflix's perspective, interconnection consists of straightforward hardware arrangements and that the only "quality" that Netflix considers is whether the ISP can provide sufficient bandwidth to fulfill the needs of Netflix subscribers using that ISP.¹⁶⁸

206. Dr. Israel's claim that the greater number of interconnection points of larger ISPs is primarily a measure of the higher quality of the access they provide is therefore wrong. Rather, the greater number of interconnection points of larger ISPs is primarily a reflection of ISP size—e.g., the number of geographic footprints it is in. By adding the number of interconnection points into Professor Farrell's regression analysis, Dr. Israel is in fact adding in a highly correlated measure of size. By doing so, he is creating a classic multicollinearity problem in which {{
}}.¹⁶⁹

207. Dr. Israel offers a similar criticism of the evidence I presented in my initial declaration that {{

}} Dr. Israel argues that my finding is not reliable because
I failed to control for the quality of the ISP. As I have explained above, Dr. Israel's purported

¹⁶⁸ Florance Declaration II, ¶¶ 17, 21.

¹⁶⁹ {{

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quality measures are in fact measures of ISP size, not quality. Notably, Dr. Israel, who has access to the agreements signed by Comcast and Time Warner Cable, does not dispute that {{

}}

208. As I discussed above, the number of interconnection locations that an ISP has—which Dr. Israel claims as a quality measure—is not a measure of the quality of the interconnection. Rather, it is correlated with the size of the ISP. If the number of interconnection locations were important, I would expect it to be a significant factor in determining the price of interconnection. {{

}}.¹⁷⁰

209. Dr. Israel also states that “[he] also understand[s] that other differences across ISPs generate differences in the quality of their interconnection services. Such differences include greater server capacity and more efficient server utilization, which also reduce the costs of interconnection and thus create additional surplus.” Dr. Israel appears to be confusing interconnection and CDN services. As Mr. Florance explains, interconnection services only consist of the provision of network ports and cross-connect cable.¹⁷¹ Netflix does not purchase CDN services from Comcast, only interconnection that provides transport between Comcast’s doorstep and the household that has requested Netflix content as part of their contract with Comcast.

¹⁷⁰ Florance Declaration II, ¶ 17.

¹⁷¹ Florance Declaration II, ¶ 11.

2. Dr. Israel's Flawed Claims Regarding Comparisons to Comcast's Access Fee

210. Dr. Israel criticizes the comparison I presented in my initial declaration showing that larger ISPs have more bargaining power than smaller ISPs with respect to Netflix. As I have discussed, the empirical evidence is clear that {{

}} and that {{

}}

211. Dr. Israel argues that my analysis “does not establish that {{
}}; only that it pays more *to the ISP itself*, with which it connects directly.... The fact that Netflix pays the ISP, rather than some other interconnection provider, does not establish that Netflix pays more in total.”¹⁷²

212. As I discussed above, for each of the more than {{ }} ISPs that Netflix interconnects with directly, other than the four largest, Netflix does not pay a terminating access fee. (The more than {{ }} other ISPs that Netflix connects to using a transit provider do not charge for access either.¹⁷³) Netflix does not use a third-party provider (a transit provider or a CDN) to connect to these more than {{ }} ISPs or to Comcast. In sharp contrast Comcast charges a positive access fee of about {{ }} per Mbps, while the other ISPs charge nothing for subscriber access. The only ISPs that Netflix connects to directly that it pays are Comcast, Time Warner Cable, AT&T and Verizon.

¹⁷² Israel Declaration II, ¶ 166 (emphasis in original).

¹⁷³ In these cases, Netflix uses a transit provider, which takes the traffic from the IXP at which Netflix connects to the transit provider to another location at which the transit provider has agreed to interconnect with the ISP. These are typically smaller ISPs that do not have a presence at IXPs so that they cannot connect with Netflix at an IXP. Such an ISP takes traffic at the point at which it connects to the Internet (through its transit provider, which it pays) and does not charge either the transit provider or Netflix for interconnection. The service provided by the transit provider to Netflix to connect to these ISPs is not needed in cases where the ISP is present at an IXP.

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213. Dr. Israel also argues that “[a]bsent data to compare the prices Netflix pays to the large ISPs with which it interconnects directly, relative to the prices it pays to transit providers and to the costs it incurs to operate its CDN, Dr. Evans’ comparisons say nothing about [1] whether large ISPs capture higher prices than other transit providers, [2] which of these methods is most costly to Netflix, or [3] whether these highly technical distinctions between interconnection methods have any material negative effect on Netflix.”¹⁷⁴

214. Let me take each of Dr. Israel’s three points in turn. First, he suggests that the question of “whether large [terminating] ISPs capture higher prices than other transit providers” is relevant. Dr. Israel’s suggestion that a large terminating ISP’s provision of terminating access is a type of transit is wrong. The typical service provided by a transit provider to Netflix, or any edge provider or CDN, is to transport traffic between different ISPs and/or exchange points—many of which are physically distant from each other. By contrast, the interconnection services provided by large terminating ISPs are merely for access to the ISP’s internal network and for providing uncongested paths from the edge of that internal network to the subscribers that have requested content.

215. Netflix’s agreement with Comcast covers only the provision of port capacity to interconnect with Comcast’s network to provide an uncongested path from the edge of Comcast’s network, over the last-mile, to the Comcast subscriber that requested the Netflix content. Netflix’s agreement does not provide for transit service, CDN service, or any other service involved in getting content to the edge of Comcast’s network.

216. Under the agreement, Netflix must pay, as it did before the agreement, for all of the costs that were previously incurred by a third-party CDN, including:

¹⁷⁴ Israel Declaration II, ¶ 169 (numbered points, [1], [2], [3] added for ease of discussion).

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- Transit costs for transporting data across the country to reach interconnection points with Comcast;
- Engineers to develop and maintain Netflix’s CDN;
- Hardware; and,
- Fees related to maintaining a presence at an IXP including fees for space, power, and air conditioning.

217. The second question Dr. Israel raises—i.e., “which of these methods is most costly to Netflix”—is also irrelevant. In a merger where firms are supplying an intermediate good that is an input to a final good, as a matter of antitrust practice and sound economics, the focus is on the impact of the merger on the price of that intermediate good.¹⁷⁵ Attempting to discern if the price of the final good has been elevated is unnecessary if, as here, we can directly observe the price being charged for the intermediate good. The relevant issue here is whether the proposed merger will allow Comcast to increase access fees significantly. As I have discussed, the greater bargaining power of larger ISPs in commanding higher access fees, as compared with smaller ISPs that charge nothing for access, indicates this is likely.

218. Given that we can directly observe the price of interest—namely the access fee—it makes no economic sense to compare the total costs of different interconnection methods, which can be complicated given differences in costs across time or across interconnection methods or ISPs for reasons that have nothing to do with the access fee. If we care about the price of an input and can observe it directly, it makes no economic sense to instead attempt to infer differences in the input prices by analyzing output prices, which differ for reasons unrelated to differences in input prices.

¹⁷⁵ United States Department of Justice and Federal Trade Commission (2010), “Horizontal Merger Guidelines,” § 6.2 (noting mergers of firms that sell intermediate goods through bilateral bargaining should be analyzed using similar approaches to those used to analyze other differentiated products industries).

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219. Nevertheless, for completeness, I now describe how Comcast's terminating access fees increase Netflix's total costs of delivering streaming video to Comcast's customers in comparison to other benchmarks. The relevant benchmarks are situations in which a terminating access fee is not being charged. The following are the ways in which Netflix currently delivers content to subscribers, which do not include access fees except in the case of the four largest ISPs, and the associated costs:

- ISPs with embedded Netflix servers. More than {{ }} ISPs interconnect with Netflix using Open Connect appliances that are "embedded" within the ISP's network. None of these ISPs charge a terminating access fee. In this case, Netflix's costs of serving traffic to a large ISP using this approach are about {{ }} per Mbps.¹⁷⁶ This represents the costs Netflix needs to incur in order to deliver traffic to an ISP within the ISP's network using Open Connect appliances.
- ISPs that connect with Netflix at IXP. More than {{ }} ISPs interconnect with Netflix at an IXP or other public interconnection point. With the exception of the four largest ISPs, none of them charge a terminating access fee. Netflix's costs of serving traffic using this approach to an ISP that is not charging a terminating access fee are about {{ }} per Mbps.¹⁷⁷ This represents the costs Netflix needs to incur in order to deliver traffic to an ISP at an IXP. Netflix's costs of serving traffic to Comcast using this approach is about {{ }} per Mbps. This consists of the same {{ }} per Mbps costs incurred by Netflix to exchange traffic at an IXP as with other ISPs but, in

¹⁷⁶ All the \$ per Mbps estimates discussed in this section are based on the 95th percentile traffic methodology that is common in the industry. The {{ }} Mbps estimate consists of an estimated {{ }} per Mbps of hardware costs, {{ }} per Mbps of CDN headcount costs, and {{ }} per Mbps of estimated allocation of general and administrative expenses. The hardware costs are estimated based on the costs of serving traffic to {{ }}, which uses embedded Open Connect appliances. The cost per Mbps of cache servers generally decreases as ISP size increases. Netflix's costs for larger ISPs would likely be at or below the cost for {{ }}; Netflix's costs for smaller ISPs would be significantly higher. I report the estimate for {{ }} as that is more comparable to the costs of connecting to Comcast using embedded Open Connect appliances. Because Netflix does not provide CDN services to third parties, it does not incur certain costs that some third-party CDNs would incur, such as sales and marketing expenses. Third-party CDNs would need to cover such costs in their fees and would need in the long run to cover the cost of capital invested. A full comparison between a self-supplied CDN and a third-party CDN would need to account for these types of differences.

¹⁷⁷ This estimate consists of {{ }} per Mbps of IXP costs, {{ }} per Mbps of CDN headcount costs, and {{ }} per Mbps of estimated allocation of general and administrative expenses. Because Netflix does not provide CDN services to third parties, it does not incur certain costs that some third-party CDNs would incur, such as sales and marketing expenses. Third-party CDNs would need to cover such costs in their fees and would need in the long run to cover the cost of capital invested. A full comparison between a self-supplied CDN and a third-party CDN would need to account for these types of differences.

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addition, Netflix must pay a {{ }} per Mbps terminating access fee imposed by Comcast.¹⁷⁸

- ISPs that connect with Netflix using a transit provider. More than {{ }} ISPs interconnect with Netflix using a transit provider.¹⁷⁹ Netflix connects to the transit provider at an IXP and the transit provider takes the traffic to another interconnection point closer to the ISP. The ISPs served using this approach are typically smaller ISPs that do not have a presence at an IXP. Netflix's costs of serving traffic to a small ISP using this approach are about {{ }} per Mbps. This consists of {{ }} per Mbps in costs incurred by Netflix to exchange traffic at an IXP with the transit provider plus an approximate {{ }} per Mbps in fees paid to the transit provider.

220. Another benchmark is the cost to Netflix of using CDNs in the absence of Comcast charging CDNs access fees that increase the CDNs' costs of doing business. It does not make sense to use the cost of using CDNs and/or transit providers at a point in time when those costs are affected by Comcast's attempts to charge terminating access fees and/or degrade its connections, as those costs would be artificially inflated. The most direct CDN benchmark would be Netflix's costs of using {{ }} as a CDN from its contract entered into November 1, 2010, with terms covering the first quarter of 2011 through the fourth quarter of 2013. Shortly after the contract was signed, Comcast attempted to charge {{ }} a terminating access fee for the first time and was successful.¹⁸⁰ A conservative estimate based on that agreement is that CDN costs would be approximately {{ }} per Mbps based on be

¹⁷⁸ The Comcast access fee is calculated based on the methodology discuss above. See, *supra*, n. 113.

¹⁷⁹ For these ISPs, Netflix uses a transit provider, which takes the traffic from the IXP at which Netflix connects to the transit provider to another location at which the transit provider has agreed to interconnect with the ISP. These are typically smaller ISPs that do not have a presence at IXPs so that they cannot connect with Netflix at an IXP. Such an ISP takes traffic at the point at which it connects to the Internet (through its transit provider, which it pays) and does not charge either the transit provider or Netflix for interconnection. The service provided by the transit provider to Netflix to connect to these ISPs is not needed in cases where the ISP is present at an IXP.

¹⁸⁰ Letter from John M. Ryan, Assistant Chief Legal Officer, Level 3 Communications, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket. No. 09-191, Nov. 30, 2010, p. 2. To the extent that any potential concern about Comcast seeking an access fee was a consideration in negotiating a contract, then the comparison is conservative as the rates would have been lower absent such a concern.

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the CDN fees charged by {{ }} before {{ }} was forced to pay a terminating access fee to Comcast.¹⁸¹

221. Table 5 summarizes these benchmarks and compares them to the costs of serving subscribers at Comcast under the Netflix agreement with Comcast. Under Netflix's agreement with Comcast, Netflix's costs are between: {{ }} per Mbps more than with many other large- and medium-sized ISPs. It is also at least {{ }} per Mbps more than my estimate of what Netflix would pay a third-party CDN such as {{ }} to provide the same services—absent Comcast's intervention in charging {{ }} a terminating access fee.

222. These results reflect that reality that Comcast is charging an *additional* fee solely for the purpose of providing an uncongested path for Comcast to transport Netflix content that its subscribers have requested from the edge of the network, where Netflix has delivered that content, to the household who requested it. That additional fee raises Netflix's cost of delivering traffic significantly. As I noted above, the most relevant comparison is between the access fees charged by the different ISPs, in which case it is clear that Comcast is charging a {{ }} per Mbps while all ISPs other than the other three largest ISPs charge zero.

¹⁸¹ This estimate is based on the agreement Netflix with {{ }} in November 2010. The estimate uses the stated {{ }} per Mbps traffic rate for 4Q 2013 as the current rate, without adjusting for further decreases in rates to the present. This estimate includes estimated storage costs of {{ }} per Mbps based on a {{ }} ratio for Netflix of CDN storage fees to CDN traffic fees in 2013 (last year of significant CDN use at Netflix). This is a conservative lower-bound estimates in that it assumes no further decrease in traffic or storage rates after 4Q 2013 even though the stated rates in the agreement declined by more than 50 percent from the first quarter of 2011 to the fourth quarter of 2013. Because Netflix does not provide CDN services to third parties, it does not incur certain costs that some third-party CDNs would incur, such as sales and marketing expenses. Third-party CDNs would need to cover such costs in their fees and would need in the long run to cover the cost of capital invested. A full comparison between a self-supplied CDN and a third-party CDN would need to account for these types of differences. The comparison to the {{ }} rates is conservative in this regard.

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Table 5: Netflix Costs of Delivering Traffic Using Its CDN and a Third-Party CDN

{{

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223. Dr. Israel also argues that the Netflix agreement with Comcast is beneficial to Netflix because “the contract includes guaranteed unit cost *reductions* year-over-year.”¹⁸² As I have discussed above, there are reasons to believe that Comcast would be able to raise the access fee significantly at the end of the agreement. But, in any event, the declines that Dr. Israel points to are much lower than declines in transit costs, which have declined 33 percent over the last year and an average of 35 percent annually over the last three years.¹⁸³ By contrast, the decline in the Comcast rate based on the contracted capacity in each year is only {{
}}. The decline
in the rates for usage above the contracted capacity is even lower, at {{

}}.¹⁸⁴ By the last year of the renewal period of
the contract, the Comcast fee would be {{
}} based on the contract rates than
if the decline had been at the 33 percent annual decline for transit fees.{{

¹⁸² Israel Declaration II, ¶ 174, citing McElearney Declaration, ¶ 43 (emphasis in original).

¹⁸³ See <http://drpeering.net/white-papers/Internet-Transit-Pricing-Historical-And-Projected.php>. This is the data source used by Mr. McElearney in his discussion of historical transit prices.

¹⁸⁴ Comcast-Netflix Agreement, February 18, 2014, Service Schedule 1, Sections 1, 5.c, 5.e.

}}

224. The third question Dr. Israel raises—i.e., “whether these highly technical distinctions between interconnection methods have any material negative effect on Netflix”—is also irrelevant.¹⁸⁵ As I have discussed above, whether the price of the intermediate good is a small or large proportion of the cost of the final good is generally not relevant to an inquiry into the existence of market power over the price of that intermediate good or changes in that market power. In fact, Dr. Israel’s approach would exempt many mergers from serious scrutiny, since only mergers involving products that constitute a large fraction of the costs for businesses (or a large portion of household spending in the case of consumer goods) would be relevant.

225. ISPs control access into their networks and to their subscribers. As I have discussed, the competitive price for such access is zero. The four largest ISPs have market power and have charged Netflix for access. The relevant issue here is whether the proposed merger will allow Comcast to increase access fees significantly. As I have discussed, the greater bargaining power of larger ISPs in commanding higher access fees indicates that this is likely.

¹⁸⁵ Dr. Israel reports the results of an event study he conducted to “further assess whether the direct interconnection agreements—or the anticipation of the transaction and any associated inferences about future changes to interconnection agreements—has had any negative effect on Netflix or other edge providers.” He claimed that the “results provide additional evidence that market participants did not expect the transaction to harm edge providers.” See Israel Declaration II, ¶¶ 177-179. One basic flaw underlying Dr. Israel’s event study is that one would not expect the events to have the effect that Dr. Israel claims to be testing. One event is the publication of rumors of a Comcast-TWC deal and a second event is the announcement of the deal. Dr. Israel uses these events to test whether the deal would be harmful to Netflix or other edge providers. His implicit assumption is that the event study would reveal the extent to which the market believed the merger would harm Netflix. But this presumes that the FCC and the Department of Justice would permit such a deal if there were such harm, which is the very issue that they are assessing. The other two events that Dr. Israel looks at are the announcement of the access fee agreements between Netflix and Comcast and TWC, respectively. Analyzing the financial market reaction to these agreements is only meaningful if they are unexpected. But, to the contrary, it should have been expected that Netflix would need to pay the largest ISPs for access given the ability of these ISPs to restrict access to their large networks. The fact that Netflix was forced to capitulate was not meaningful new information to the financial markets in this respect. Thus, the lack of market reaction to these events that Dr. Israel claims to find in his event study does not have the implications he claims.

3. Commission Decision in Comcast-NBC Universal

226. Dr. Israel argues that “the fact that economic theory makes no systematic prediction on the shape of the surplus functions means that it also makes no general prediction on the directional impact of the merger” on the access fees charged by the merging parties.¹⁸⁶ As I discussed in my initial declaration, Dr. Israel relies on an economic model that assumes that the bargaining power of all sellers is the same with respect to all buyers. It further assumes that the split will be 50/50 regardless of the size of the buyer or seller. As I have discussed, the empirical evidence in this case is that most ISPs, covering a wide range of sizes, charge zero. Only very large ISPs charge positive fees. {{

}}

227. Dr. Israel argues that “the Commission itself employed [the bargaining model relied on by Dr. Israel] in its analysis of Comcast-NBC Universal to assess the effect of the transaction on NBCU’s programming prices to Comcast’s MVPD rivals. The predictions of that analysis were based on the changes in the outside options of the various parties.”¹⁸⁷

228. In the Comcast-NBC Universal proceeding, one of the questions at issue was the degree to which Comcast’s ownership of NBCU programming would give it an incentive to raise the price of NBCU programming to other MVPDs because Comcast would gain some cable subscribers if alternative MVPDs were denied NBCU programming.

229. That transaction did not pose an issue of how changes in buyer or seller size would affect bargaining power. Rather, the issue was the impact of the gain to Comcast as a cable provider from denial of NBCU programming to other MVPDs on Comcast’s pricing of NBCU

¹⁸⁶ Israel Declaration I, ¶ 144.

¹⁸⁷ Israel Declaration I, ¶ 145 (internal citations omitted).

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content. Given that the relevant question in the Comcast-NBC Universal transaction was the impact of the transaction in changing the surplus from reaching deals with MVPDs, it made sense to consider models that were based on changes in the surplus on the terms of the deals. In this Transaction, the fact that Comcast and Time Warner Cable would be combined does not directly change the surplus from reaching a deal with Netflix—as compared with the Comcast-NBC Universal transaction where the transaction resulted in a new revenue stream for the merged entity’s outside option (which reduces the size of the surplus from reaching a deal). Thus, relying on a model that assumes that bargaining power is fixed, regardless of buyer and/or seller size, does not make sense.

230. Moreover, in assessing the Comcast-NBC Universal transaction, the Commission did not endorse an assumption that the split would necessarily be 50/50 between buyer and seller. To the contrary, the Commission explicitly noted that more popular networks would be expected to have more bargaining power than less popular networks—i.e., that the larger networks (in terms of viewership and/or intensity of viewing) had more bargaining power than smaller ones.¹⁸⁸ The Commission cited an empirical study that estimated that NBCU would be expected to have a 53/47 split with telco MVPD providers and a 56/44 split with satellite MVPD providers.¹⁸⁹ The Commission adopted a 50/50 split assumption because these estimates were close to the 50/50 assumption in the theoretical model, and also noted that the

¹⁸⁸ Comcast-NBCU Order, ¶ 40, (“Estimates for six NBCU national cable networks are reported. In order to use these estimates to infer NBCU’s bargaining skill parameter in negotiating with various types of MVPDs, we need to account for the fact that national cable networks are almost always sold as a bundle, combining marquee networks and less established networks. To the extent that the content provider obtains carriage of less popular networks rather than a higher price for more popular networks (e.g. USA Network) when negotiating the terms at which an MVPD will accept a bundle of programming, the reported empirical estimates of the bargaining skill of any individual network could be biased. In particular, this dynamic would tend to generate a downward bias for the bargaining skill parameters associated with individual popular networks and an upward bias for the parameters associated with less popular networks.”) (internal citation omitted).

¹⁸⁹ Comcast-NBCU Order, ¶ 40

applicants had relied on that assumption.¹⁹⁰ There was therefore no endorsement of a 50/50 assumption in situations where the bargaining split may be expected to deviate either across firms or from the 50/50 assumption. Rather, there was an explicit recognition that we should expect that larger firms would have greater bargaining power.

B. Claimed Harm to Comcast's Service from Degradation

231. Dr. Israel argues that his claim that degrading Internet service harms Comcast's business is supported by the real world experience from Comcast's degradation of Netflix streaming.¹⁹¹ The "real-world experience" he cites is an increase in the number of customer service calls to Comcast. However, he provides no details from the transcripts of these calls to determine whether, for example, customers blamed Comcast or Netflix.¹⁹² As I discuss below, Dr. Israel also cites a survey prepared for Comcast in connection with the review of this Transaction that finds that more than 70 percent of consumers would switch away from their ISPs if the ISP degraded Internet traffic under various scenarios. If such unprecedented switching had taken place, it would not have been hard to document. Dr. Israel provides no such evidence.

232. I have reviewed transcripts of Netflix's customer service chats in connection with degradation of Netflix streaming by Comcast and other large ISPs.¹⁹³ {{

¹⁹⁰ Comcast-NBCU Order, ¶ 40

¹⁹¹ Israel Declaration II, ¶ 56.

¹⁹² Israel Declaration II, ¶ 56.

¹⁹³ Transcripts provided by Netflix.

}} Some Netflix

subscribers stated they would cancel service:

- {{

}}

- {{

}}

- {{

}}

C. Comcast's Churn Rate

233. Dr. Israel attempts to rely on Comcast's churn rate—the proportion of its customers that are disconnected—to argue that consumers switch broadband providers frequently.¹⁹⁴ Dr.

Israel reports an annual churn rate of {{ }} for Comcast, excluding churn from customers who moved.¹⁹⁵ Dr. Israel's analysis of the churn data is fundamentally flawed. He uses imprecise inputs, which exaggerate his estimates. Most importantly, Dr. Israel includes involuntary churn, such as customers who are disconnected by Comcast for non-payment, in

¹⁹⁴ Israel Declaration II, ¶ 94. See also Israel Declaration II, ¶ 32. I take the churn rate to be equal to (number of broadband customers who disconnect between month t and t+1)/(number of broadband customers in month t). As I discuss below, disconnections can be voluntary or involuntary on the part of the customer and the relevant churn rate for assessing the ability of customers to switch from Comcast is based only on disconnections that the customer makes voluntarily.

¹⁹⁵ Dr. Israel also reports Comcast's churn rate inclusive of customers who have moved. He argues that that it is appropriate to rely on a switching rate inclusive of customers who move because "[t]o the extent that customers switch ISPs when they move, this means that moves break whatever switching costs exist and give ISPs a chance to compete for moving customers." See Israel Declaration II, n. 104. Comcast does not, however, have a chance to compete for customers who move outside of its footprint, so the existence of such movers does not impose any constraint on Comcast's actions. More generally, churn rates inclusive of customers who disconnected when they moved greatly overstates the likelihood of switching for the vast majority customers who do not move. Moreover, Dr. Israel's estimated churn rate for all customers, including those how moved, is overstated for the same reasons that Dr. Israel's estimated churn rate for non-movers is grossly overstated, as I show below.

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his estimated churn rate. Correcting Dr. Israel's errors results in a churn rate excluding movers that is only {{ }} a year, more than {{ }} lower than Dr. Israel's reported estimate of {{ }} a year.

234. Dr. Israel reports an estimate of churn exclusive of consumers who moved of {{ }} percent a year based on the Comcast churn data.¹⁹⁶ This estimate is more than {{ }} as the switching rates from the FCC study I discussed in my first declaration (rate of 11.6 percent) and the Comcast-commissioned survey that Dr. Israel relies on and that I discuss below (about 10 percent).¹⁹⁷ Note that the FCC study included all wired ISPs and therefore included switching from DSL to cable. I would not characterize an estimate of the switching rate from the churn data that is {{ }} as being "in line with" the other estimates, as Dr. Israel does.¹⁹⁸

235. Moreover, my review of Dr. Israel's churn rate methodology and the underlying data finds that Dr. Israel has made significant errors in his use of the data. Dr. Israel calculates a churn rate among non-movers using the following approach: "Comcast's data shows that the monthly churn rate for broadband customers has been in the {{ }} percent range for several years.... Comcast data indicates that approximately {{ }} of aggregate broadband churn is due to customers moving.... Assuming that the aggregate monthly churn rate is {{ }} percent (midpoint of {{ }} percent), monthly churn excluding

¹⁹⁶ Israel Declaration II, n. 106.

¹⁹⁷ See FCC (2010), "What Drives Consumers to Switch - Or Stick With - Their Broadband Internet Provider," Working Paper, pp. 5-6 and Evans Declaration II, fn. 62; Comcast data produced in FCC Information and Data Request – Exhibit 74.3, p. 5.

¹⁹⁸ Israel Declaration II, ¶ 94.

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movers is {{ }} percent (i.e. {{ }}), and therefore the implied churn excluding movers is approximately {{ }} percent annually.”¹⁹⁹

236. The data Dr. Israel relies on shows that for Comcast overall, the monthly churn rate is only between about {{ }} and about {{ }}, rather than between {{ }} and {{ }} as Dr. Israel claims. The average monthly churn rate is only about {{ }} for the twelve months ending in June 2014 (the last month of available data).²⁰⁰ By starting with a monthly churn rate of {{ }} rather than {{ }}, Dr. Israel has overstated the churn rate by about {{ }}

237. Dr. Israel’s calculation to exclude movers is based on his claim that {{ }} of Comcast’s churn is due to movers. The document he provided to support this claim showed that movers accounted for {{ }} of Comcast’s churn. Just making this adjustment and using the actual monthly churn rate shows that Comcast churn from non-movers was about {{ }} a year rather than the {{ }} Dr. Israel reported.²⁰¹

¹⁹⁹ Israel Declaration II, ¶ 94 and n. 106.

²⁰⁰ {{ }} The average monthly churn rate is similar in preceding years, at {{ }} and {{ }} for the twelve month periods ending June 2013 and June 2012 respectively. To the extent that Dr. Israel is including customers who downgrade their broadband service in his calculations, that is inappropriate. For Comcast customers experiencing degraded Netflix streaming, it is unlikely they would downgrade their broadband speeds. If anything, as indicated in the Netflix customer service chats I cited above, it is more likely they would attempt to upgrade their broadband speeds, thereby providing a benefit to Comcast.

²⁰¹ Dr. Israel also appears to be calculating the annual churn rate by multiplying his estimated monthly churn rate by 12. The appropriate calculation given a constant monthly churn rate is given by $[1 - (1 - \text{monthly rate})^{12}]$ rather than $[12 \times \text{monthly rate}]$. At the {{ }} rate used by Dr. Israel, the correct figure would be {{ }} rather than the {{ }} he reported. In the calculations I report, I have used the correct approach and have also used the individual monthly churn rates for the twelve months ending in June 2014 (the last month of available data). {{ }}

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238. Dr. Israel makes an additional critical mistake by ignoring the fact that, as explicitly reported in the data he uses, only a portion of those consumers that churn do so voluntarily. Among non-movers, about {{ }} percent of those leaving Comcast were doing so voluntarily. Churn that is not voluntary is not relevant to an assessment of whether the threat of switching by consumers would limit Comcast's ability to engage in, for example, degradation of OVD video streaming for the substantial majority of customers who do not disconnect from Comcast voluntarily. The data produced by Dr. Israel do not separate churn resulting from non-payment versus other involuntary reasons. A different Comcast document, however, found that about {{ }} of consumers disconnecting were disconnected by Comcast for non-payment of their bills.²⁰² Such involuntary disconnections do not impose any constraints on Comcast's actions with respect to the vast majority of Comcast subscribers who pay their bills.

239. If we take only the {{ }} percent of non-mover customers that disconnected from Comcast and did so voluntarily, the annual churn rate is only {{ }}, which is over {{ }} lower than Dr. Israel's claim of a {{ }} annual churn rate. On a monthly basis, the voluntary churn is only about {{ }} on average. The Comcast churn rates are lower than the switching rates found by the FCC's study, but it is likely that the rate of consumers switching away from Comcast is lower than across all ISPs, as a significant portion of switching in recent years has been due to consumers switching away from lower speed DSL offerings.

D. Comcast Survey

240. Dr. Israel cites results from a survey of broadband subscribers by Global Strategy Group (GSG) as support for a number of his claims. It appears that this survey was prepared

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for Comcast in connection with this proceeding, as opposed to having been prepared in the ordinary course of Comcast's business operations. There are serious flaws in the survey design and methodology that render its results unreliable. Even if I set those flaws aside, there is direct evidence that shows the claimed findings of the survey are wrong. For example, Dr. Israel relies on the survey to claim that Comcast is constrained because it could not degrade Netflix streaming without being subject to a mass exodus of its broadband subscribers. In fact, the evidence is that Comcast did degrade Netflix streaming without any such consequence.

1. Survey Methodology Is Unreliable

241. There are significant reasons to question the reliability of the survey.

242. First, the sample for the survey was provided by an online panel provider. The identity of the panel provider was not disclosed in the materials I have seen. According to the Best Practices of the American Association for Public Opinion Research (AAPOR), "[i]n a bona fide survey, the sample is not selected haphazardly or only from persons who volunteer to participate. It is scientifically chosen so that each person in the population will have a measurable chance of selection.... Virtually all surveys taken seriously by social scientists, policy makers, and the informed media use some form of random or probability sampling, the methods of which are well grounded in statistical theory and the theory of probability."²⁰³

243. Survey samples taken from online panels are not probability-based. Rather, they are panels of individuals who agree to participate in the panel in return for various inducements. As part of the panel, they are sent surveys for which they fall within the target population of the

²⁰³ American Association for Public Opinion Research, "Best Practices", available at <http://www.aapor.org/AAPORKentico/Standards-Ethics/Best-Practices.aspx>.

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survey. Such panelists are not randomly selected. They have self-selected by being willing to participate in the panel, typically in response to solicitations by the online panel provider.

244. The AAPOR states that:²⁰⁴

When we draw a sample at random—that is, when every member of the target population has a known probability of being selected—we can use the sample to make projective, quantitative estimates about the population. A sample selected at random has known mathematical properties that allow for the computation of sampling error.

Surveys based on self-selected volunteers do not have that sort of known relationship to the target population and are subject to unknown, non-measurable biases. Even if opt-in surveys are based on probability samples drawn from very large pools of volunteers, their results still suffer from unknown biases stemming from the fact that the pool has no knowable relationships with the full target population.

245. Second, according to the AAPOR's Best Practices, someone conducting a survey should "[p]retest questionnaires and procedures to identify problems prior to the survey."²⁰⁵ It is unclear from the materials provided whether that was done and how it was done. It is not clear, for example, whether a careful assessment of whether respondents understood and accurately replied to the questionnaire was undertaken. I do not have access to the individual responses to undertake a more detailed assessment, but one area of inconsistency in responses to related questions is notable.

²⁰⁴ American Association for Public Opinion Research, "Opt-In Surveys and Margin of Error", available at <http://www.aapor.org/AAPORKentico/Education-Resources/For-Researchers/Poll-Survey-FAQ/Opt-In-Surveys-and-Margin-of-Error.aspx>.

²⁰⁵ American Association for Public Opinion Research, "Best Practices", available at <http://www.aapor.org/AAPORKentico/Standards-Ethics/Best-Practices.aspx> ("High quality surveys and polls always provide adequate budget and time for pretesting questionnaire(s) and field procedures. A pretest of the questionnaire and field procedures is the only way of finding out if everything 'works' especially if a survey employs new techniques or a new set of questions. Because it is rarely possible to foresee all the potential misunderstandings or biasing effects of different questions or procedures, it is vital for a well-designed survey operation to include provision for a pretest. All questions should be pretested to ensure that questions are understood by respondents, can be properly administered by interviewers, and do not adversely affect survey cooperation.")

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246. Out of the 1012 total respondents, [[]] indicated they owned a smartphone.²⁰⁶ Of these [[]] smartphone owners, [[]] indicated they had a wireless data plan for the smartphone.²⁰⁷ A different set of questions in the survey asked respondents to first identify the types of Internet connections they had at home and, if mobile wireless was not named, respondents were asked if they had mobile wireless service. Of the [[]] respondents indicating they had a wireless data plan, [[]] indicated they had a mobile wireless connection at home.²⁰⁸ Of the remaining [[]], fully [[]] indicated that they did not have mobile wireless service.²⁰⁹ That is, [[]] respondents who answered yes to “Do you have a wireless data plan for your smartphone?” answered no when asked:

“Do you have a wireless or mobile broadband service that allows you to connect to the Internet with a mobile device (this does not include devices that only connect to Wi-Fi)? Examples of wireless or mobile broadband service include an AT&T data plan for your smartphone, iPad or tablet; or a Verizon data plan for your Jetpack mobile hotspot device?”²¹⁰

Anyone answering yes to the first question should answer yes to the second, yet nearly [[]] respondents appeared not to understand and/or failed to pay attention to these questions.

247. The reliability of the survey is therefore highly questionable.

²⁰⁶ [[]]

²⁰⁷ [[]]

²⁰⁸ [[]]

]]

²⁰⁹ [[]]

²¹⁰ [[]] Comcast data produced in FCC Information and Data Request – Exhibit 74.3, pp. 1, 5.

2. Impact of Comcast Degradation

248. Dr. Israel relies on the GSG survey as support for his claim that customers switching to a different ISP if Comcast degraded the quality of Netflix streaming would act as a significant competitive constraint on Comcast. Before even getting into the flaws in the survey, we know that the claim is wrong. In fact, Comcast did degrade the quality of Netflix streaming, and Comcast customers did not leave Comcast in droves (if they had, I assume Dr. Israel or Comcast would have reported as much).

249. Dr. Israel cites the survey for the claimed finding that “the vast majority [71-80 percent] of broadband users are likely to switch to another ISP, even an ISP *offering slower speeds*, if their current ISP were to take any of the following actions: ‘prevent access to favorite websites’; ‘slow down Internet speeds for your favorite websites; or ‘slow down Internet speeds for Netflix.’”²¹¹

250. As I have discussed, the reliability of the survey as a whole is highly questionable. There are also significant reasons to question the reliability of the specific question that Dr. Israel relies on here. The hypothetical posed by the question is highly unrealistic. It states as a fact for the respondent that his/her ISP is at fault for the slowdown in Internet access. In reality, there can be extensive disputes between an ISP and an OVD over the assignment of blame for poor video streaming performance, with consumers unlikely to be able to understand the competing arguments. Moreover, the hypothetical also clearly states as a fact that the ISP that offers slower speeds does not take any of these actions, such as slowing down video streaming.²¹² In reality, consumers may have little confidence that slow video streaming would

²¹¹ Israel Declaration II, ¶ 90.

²¹² Comcast data produced in FCC Information and Data Request – Exhibit 74.3, p. 5.

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likely be fixed by switching ISPs, especially when other ISPs may also be engaging in the same practices. In addition, the question is vague as it does not state how much slower the speeds offered by the alternative ISP are.

251. The findings of the GSG survey relied on by Dr. Israel are also at odds with the findings of an October 2013 analysis commissioned in the ordinary course of business by Netflix. That analysis advised Netflix that {{

}}²¹³ The study noted that attempting to get consumers to switch away from their ISP was unlikely to be successful:

{{

}}²¹⁴

252. Dr. Israel also attempts to use the survey results from a similar question on the survey about switching to “another provider like DSL or Wireless broadband” in reaction to the respondent’s ISP degrading Internet access as support of his claim that wireless broadband and DSL are attractive alternatives to cable broadband (used in the standard sense).²¹⁵ Again, the question is poorly worded. First, the question includes both DSL and wireless, so that it is unclear which technology it is that consumers are willing to switch to. Second, given the definition of cable broadband as “high-speed internet connection through your phone or cable company,” which would appear to include DSL, it is quite possible that consumers would count cable broadband (in the standard sense) to be “like DSL.” The question at issue does separate

²¹³ {{

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²¹⁴ {{

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²¹⁵ Comcast data produced in FCC Information and Data Request – Exhibit 74.3, p. 4 (emphasis in original).

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the definitions of cable, fiber, DSL and wireless broadband technologies, but the fact that the definitions differ from those given in a preceding question is in itself enough to question the reliability of the responses to this question.

253. Dr. Israel also attempts to rely on the survey for evidence on the extent of switching by broadband customers. He claims that the survey shows that “one-third of survey respondents switched providers in at least the past two years, and nearly half (49 percent) switched providers within the past four years.”²¹⁶ Dr. Israel’s ignores the fact that 40 percent of respondents stated that they switched because of a move.²¹⁷ If we exclude 40 percent of the 33 percent of respondents that switched in the prior two years, we would get roughly 10 percent a year who switched, which is not inconsistent with the 11.6 percent figure I reported in my initial declaration based on an FCC study.²¹⁸ They are also {{

}}

3. Mobile

254. Dr. Israel also claims that the survey “documents extensive usage of wireless broadband today, including for ‘high-bandwidth’ activities such as video.”²¹⁹ He cites the survey as finding that “approximately 42 percent of survey respondents indicated that they use wireless broadband *at least as much as wired broadband for high bandwidth activities*, and 60 percent

²¹⁶ Israel Declaration II, ¶ 93.

²¹⁷ Comcast data produced in FCC Information and Data Request – Exhibit 74.3, p. 5.

²¹⁸ Evans Declaration I, ¶ 81 and n. 62.

²¹⁹ Israel Declaration II, ¶ 88.

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or more use wireless broadband at least as much as wired broadband for low-bandwidth activities.”²²⁰

255. As with his reliance on the survey’s claimed finding on the impact of degradation by Comcast on switching by broadband subscribers, Dr. Israel does not test the survey’s results against real world evidence. In fact, consumers do not currently view Netflix using mobile wireless to any significant extent. As I reported in my original declaration, about {{ }} percent of Netflix hours are viewed over a mobile wireless connection, compared to about {{ }} percent on a wired broadband connection. So even if consumers are using mobile wireless for a range of Internet activities, it is still the case that they find it unsuitable for watching Netflix’s long-form video content.

256. In defending the claimed finding in the survey concerning the relative use of mobile wireless versus cable, Dr. Israel argues that “the survey is careful to avoid confusion between mobile broadband, the subject of the question, and Wi-Fi.”²²¹ The only basis he offers for this claim is that the survey has a statement that wireless service does not include Wi-Fi. But there is no evidence to show that respondents to this online survey actually read those clarifications, or that they understood them if they did read them.

257. Another significant source of confusion in the framing of that question is the definition of “cable broadband [I]nternet” as a “high-speed internet connection through your phone or cable company and includes cable Wi-Fi accessible on your mobile device.”²²² I assume, based on what I understand the intent of the survey to be, that this definition of “cable” is meant to

²²⁰ Israel Declaration II, ¶ 88 (emphasis in original).

²²¹ Israel Declaration II, n. 100.

²²² Comcast data produced in FCC Information and Data Request – Exhibit 74.3, p. 2.

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encompass services such as basic DSL from telcos, U-verse from AT&T, and FiOS from Verizon. But such a definition is at odds with standard usage and likely to lead to confusion. Whether a Google fiber subscriber would count in this definition is unknown. Using definitions that are different from standard usage, even if the definitions are provided, is likely to lead to confusion among respondents.

258. The particular question at issue is also itself poorly phrased for the use that Dr. Israel makes of it. The question asks “how often” mobile wireless is used compared to cable broadband for “[h]igh-bandwidth activities such as streaming media applications like YouTube, Netflix, Hulu, etc.”²²³ The fact that YouTube is included and listed first is a source of concern. As I discussed above, the use of mobile wireless is much more common for viewing short-form video content, such as on YouTube, versus long-form video content, such as on Netflix. The fact that consumers may watch a lot of YouTube on mobile wireless is not particularly relevant to whether they would be willing to use mobile wireless rather than cable broadband for viewing Netflix. Moreover, asking “how often” is vague. “Often” could be taken, and is perhaps most reasonably taken, to mean frequency, as in “how many times.” Thus, a respondent who watched 2 clips on YouTube that were each 2 minutes long using mobile wireless and 1 two hour movie on Netflix would accurately reply that he or she used mobile wireless more often, even though that would be meaningless to the question of whether Netflix consumers would use mobile wireless to watch Netflix’s long-form content.

²²³ Comcast data produced in FCC Information and Data Request – Exhibit 74.3, p. 2.

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E. DSL and Mobile Wireless

1. DSL Growth

259. Dr. Israel claims that actual data on market growth shows that DSL has been growing faster than cable. As support for his claims, Dr. Israel reports statistics on broadband customers over time in Table 4 of his declaration. To show why his claims are incorrect, I reproduce his Table 4 below (without the columns relating to mobile wireless, which I address separately below) along with an analogous version of that Table including all subscribers, rather than just those meeting the 3 Mbps threshold Dr. Israel used.

Table 6: Wired Broadband Subscribers (in thousands) by Technology, 3 Mbps Threshold and All Subscribers

Month	3 Mbps Threshold				All Broadband Subscribers			
	FTTP	DSL	FTTP+DSL	Cable	FTTP	DSL	FTTP+DSL	Cable
Jun 2009	3,333	5,623	8,956	23,958	3,548	30,848	34,396	41,434
Dec 2009	3,739	6,408	10,147	28,583	3,980	31,212	35,192	42,439
Jun 2010	4,192	6,288	10,480	30,616	4,441	30,950	35,391	43,923
Dec 2010	4,725	7,316	12,041	32,338	4,993	31,637	36,630	45,334
Jun 2011	5,188	8,925	14,113	34,113	5,477	31,770	37,247	46,698
Dec 2011	5,606	10,377	15,983	34,699	5,898	31,478	37,376	48,263
Jun 2012	6,001	12,905	18,906	37,798	6,300	31,312	37,612	49,664
Dec 2012	6,425	13,061	19,486	44,133	6,728	31,111	37,839	51,646
Jun 2013	6,989	16,063	23,052	46,014	7,261	31,009	38,270	52,760
Annual Growth Rate	20.4%	30.7%	26.9%	17.9%	19.6%	0.1%	2.7%	6.2%
Increase in Subscribers (beginning to end)	3,656	10,440	14,096	22,056	3,713	161	3,874	11,326

Source: June 2013 FCC IAS Report, Tables 5 and 7.

260. Dr. Israel points to the 30.7 percent average annual growth rate of DSL as compared to the 17.9 average annual growth rate of cable as support for his claims about the strength of DSL as a broadband technology. What Dr. Israel is focusing on, however, is not true DSL growth but upgrades of DSL consumers to higher speed tiers.²²⁴ Elsewhere, in explaining why

²²⁴ This is true on net for DSL. In addition to DSL subscribers who upgraded during this time period, there will be individual subscribers switching to and from DSL. As I show below, on net DSL has declined since June 2011

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he did not look at higher speed thresholds, Dr. Israel concedes that looking at upgrades would fail to present an accurate picture, even though that is exactly what he is doing by using a 3 Mbps threshold.²²⁵

261. The right side of Table 6 above shows the full picture. We see that DSL has been essentially flat over that period, with an average annual growth in subscribers of only 0.1 percent (and negative 1.2 percent per year over the last two years), while cable subscribers have increased significantly, with a 6.2 percent average annual increase.²²⁶ Given that cable was starting from a higher base, the absolute numbers are even more striking: an increase of over 11 million cable subscribers versus an increase of only 161,000 DSL subscribers.²²⁷

262. With the fuller picture of broadband subscriber growth from the right side of Table 6, we can see that the faster DSL growth that Dr. Israel points to using a 3 Mbps threshold comes from consumers who are upgrading to higher speed service in recent years. Only about 18 percent of DSL subscribers were above 3 Mbps in June 2009, as compared to 58 percent of cable subscribers. What Dr. Israel claims as DSL growth is really an attempt by DSL to keep up with cable speeds. It is also notable that even if one focuses on the figures using the 3 Mbps

(and grew only very slowly before then), so that the growth Dr. Israel claims based on a 3 Mbps threshold is, on net, coming from an increase in DSL subscribers that exceed the 3 Mbps threshold over this time period.

²²⁵ Israel Declaration II, n. 62. (“[I]f I were to use a higher speed cutoff, it would largely capture upgrades by some customers rather than overall growth rates, and it would only capture growth rates for the highest speed telco options without answering the question about the overall set of telco options.”).

²²⁶ In my initial declaration, I reported certain figures for DSL exclusive of AT&T’s U-verse. Dr. Israel claims that my exclusion of U-verse was an error. See Israel Declaration II, ¶ 80. The point I was making in my initial declaration was that slower forms of DSL were becoming increasingly less attractive to consumers. Whether one characterizes U-verse as a faster form of DSL or not, it makes no sense to include U-verse when discussing slower forms of DSL. In my analysis, I did not otherwise exclude U-verse. For example, the results I reported in Table 2 of my initial declaration on the lack of alternatives to Comcast and Time Warner Cable, included U-verse along with all other forms of wired broadband.

²²⁷ Dr. Israel also criticizes me for failing to provide a “unified view” of telco broadband providers by discussing DSL separately from fiber, see Israel Declaration II, ¶ 67. The point I was making in my initial declaration was that slow forms of DSL were poor alternatives for consumers who had chosen substantially faster cable broadband offerings. I also note that as shown in Table 6, even if we look at all forms of DSL and fiber combined, cable has grown more in relative and absolute terms in recent years.

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threshold, the absolute increases in cable subscribers is more than double that for DSL, about 22 million versus 10 million.

263. And, while DSL subscribers have been upgrading to plans above 3 Mbps, cable subscribers have been moving to yet higher speeds, as shown in Table 7.

Table 7: Wired Broadband Subscribers (in thousands) by Technology, 3 Mbps and 25 Mbps Thresholds

Month	3 Mbps Threshold				25 Mbps Threshold			
	FTTP	DSL	FTTP+DSL	Cable	FTTP	DSL	FTTP+DSL	Cable
Jun 2009	3,333	5,623	8,956	23,958	40	0	40	0
Dec 2009	3,739	6,408	10,147	28,583	83	1	84	200
Jun 2010	4,192	6,288	10,480	30,616	338	6	344	370
Dec 2010	4,725	7,316	12,041	32,338	607	41	648	547
Jun 2011	5,188	8,925	14,113	34,113	814	74	888	1,526
Dec 2011	5,606	10,377	15,983	34,699	979	84	1,063	5,552
Jun 2012	6,001	12,905	18,906	37,798	1,321	105	1,426	7,037
Dec 2012	6,425	13,061	19,486	44,133	1,831	137	1,968	10,016
Jun 2013	6,989	16,063	23,052	46,014	2,508	168	2,676	19,816
Annual Growth Rate	20.4%	30.7%	26.9%	17.9%	97.7%	411.7%	102.1%	285.1%
Increase in Subscribers (beginning to end)	3,656	10,440	14,096	22,056	2,468	168	2,636	19,816

Sources: Internet Access Services: Status as of June 30, 2009, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (September 2010), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301294A1.pdf, Table 1; Internet Access Services: Status as of December 31, 2009, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (December 2010), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-303405A1.pdf, Table 12; Internet Access Services: Status as of June 30, 2010, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (March 2011), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-305296A1.pdf, Table 12; Internet Access Services: Status as of December 31, 2010, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (October 2011), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-310261A1.pdf, Table 12; Internet Access Services: Status as of June 30, 2011, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (June 2012), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-314630A1.pdf, Table 12; Internet Access Services: Status as of December 31, 2011, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (June 2012), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-318810A1.pdf, Table 10; ; Internet Access Services: Status as of June 30, 2012, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (May 2013), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-321076A1.pdf, Table 10; Internet Access Services: Status as of December 31, 2012, Federal Communications Commission: Industry Analysis and Technology Division, Wireline Competition Bureau (December 2013), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-324884A1.pdf, Table 10; June 2013 FCC IAS Report, Tables 7 and 10.

264. As with Table 6, the left side of Table 7 reproduces Dr. Israel's Table 4 using his 3 Mbps threshold. The right side shows the change in subscribers over time using a 25 Mbps threshold. The subscriber counts using the 25 Mbps threshold show that a lot of the activity in

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cable has been a move to speeds above 25 Mbps. The growth rate and absolute growth for cable above 25 Mbps is much higher for cable than for DSL and/or FTTP. Indeed, the subscriber count as of June 2013, at 19.8 million for cable versus 2.5 million for FTTP and 0.2 million for DSL, shows that the telcos have been marginal competitors above 25 Mbps so far. And, DSL, with only about 168,000 subscribers above 25 Mbps (less than 1 percent of the number of cable subscribers above 25 Mbps), has been essentially non-existent at the 25 Mbps threshold.

265. Dr. Israel focuses only on the statistics shown on the left side of Table 7, which shows upgrades in DSL plans to speeds above 3 Mbps. On a relative, though not absolute basis, the “growth” in DSL was greater than for cable. But that is because most cable subscribers were already above 3 Mbps. Many cable subscribers were upgrading their plans from below 25 Mbps to above 25 Mbps over this time period. In addition, new cable subscribers were joining with plans exceeding 25 Mbps. When we look at statistics using a 25 Mbps threshold, we see much higher “growth” for cable than DSL. And, as we saw above in Table 6, when we look at all cable versus DSL subscribers, cable growth has been much higher than DSL on both an absolute and relative basis, even when U-verse is included in the DSL counts.

2. Mobile Wireless

266. Dr. Israel argues that mobile wireless Internet access is a good alternative for wired Internet access. He argues that the fact that I reported only {{ }} percent of Netflix viewing hours were using mobile wireless is “a backward-looking view of mobile wireless video usage in a world where conditions are changing so rapidly that only a forward-looking view will suffice.”²²⁸ This appears to be a concession on Dr. Israel’s part that currently mobile wireless

²²⁸ Israel Declaration II, ¶ 82.

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is not a good alternative for wired Internet access for Netflix viewing. His argument is that mobile will become a good alternative soon. I show that this claim is not correct.

267. Dr. Israel first argues that “industry analysts recognize that mobile is the number one growth area for Netflix itself: ‘[M]ost Netflix content is still watched on TV screens, but ... mobile is seeing the biggest growth, in part because of the way phones have been changing.’”²²⁹ This is a highly selective use of the article cited. A more balanced review of the article finds that it fundamentally undermines Dr. Israel’s claim that mobile wireless is a good substitute for cable. The article notes that in assessing viewing on mobile devices, “Netflix’s designers came upon an unexpected challenge: 87 percent of all mobile sessions last less than ten minutes — but Netflix didn’t have any content that was less than ten minutes long. That’s why the company decided to experiment with shorter-form content.”²³⁰ That demonstrates that consumers do not view mobile wireless as a good alternative for viewing long-form content, which is mainly what Netflix offers and its subscribers are paying for. That is, while viewing of short-form content over mobile wireless might serve as a complement to viewing of long-form content using wired broadband, it is not a good substitute.

268. Second, Dr. Israel cites an article discussing a statement by Hulu claiming that “content on Hulu has jumped from zero percent to 20% viewership using mobile devices.”²³¹ The statement does not distinguish viewing on mobile devices using a mobile wireless connection versus using WiFi that is connected to a wired broadband connection. Moreover, the statement

²²⁹ Israel Declaration II, ¶ 82, citing Janko Roettgers, “Netflix May Add Short-form Content to Increase Mobile Usage,” GIGAOM, September 5, 2014, available at <https://gigaom.com/2014/09/05/netflix-short-clips/>.

²³⁰ Janko Roettgers, “Netflix May Add Short-form Content to Increase Mobile Usage,” GIGAOM, September 5, 2014, available at <https://gigaom.com/2014/09/05/netflix-short-clips/>. It is unclear whether the discussion relates only to viewing using mobile wireless broadband or also includes viewing on mobile devices connected using WiFi to consumers’ wired broadband service at home.

²³¹ Israel Declaration II, ¶ 82, citing Deborah Yao, “Wireless Operators Getting Serious about Mobile Video,” SNL, September 10, 2014, available at <https://www.snl.com/InteractiveX/ArticleAbstract.aspx?id=29163017>.

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does not distinguish between viewing on a smartphone versus viewing on a tablet such as an iPad. It appears likely that tablets are included in that statistic given that Hulu includes tablets in its discussion of mobile devices elsewhere.²³² Increases in viewing of online video on tablets over WiFi at home have no relevance to the potential threat of mobile wireless to wired broadband.

269. Third, Dr. Israel claims that “Verizon is poised to launch a new mobile-focused OTT business in 2015.”²³³ In particular, he cites an article stating that the Verizon offering “would deliver content from major broadcasters and live sporting events to smartphones via a technology called multicasting, which avoids congesting the network because it essentially allows the carrier to broadcast content over a single stream of airwaves that consumers can tune in to.”²³⁴ Importantly, the multicasting aspect of Verizon’s potential offering—broadcasting the same programming to multiple subscribers—would not work for Netflix’s individualized programming model. Moreover, Netflix would need Verizon’s permission and cooperation to offer such a product. Whether or not Verizon’s potential offering is successful, its success would not demonstrate the feasibility of consumers abandoning their wired broadband connections to rely solely on mobile wireless broadband.

270. And fourth, Dr. Israel cites a report by Ericsson, stating that “[v]ideo is the largest and fastest growing segment of mobile data traffic. It is expected to grow around 13 times by 2019, by which time it is forecasted to account for over 50 percent of all global mobile data

²³² Karen Nischol, “Free Hulu Clips On The Go!”, Hulu Blog, October 23, 2013, available at <http://blog.hulu.com/2013/10/23/free-hulu-clips-on-the-go/>.

²³³ Israel Declaration II, ¶ 82.

²³⁴ Israel Declaration II, ¶ 82, citing Ryan Knutson, “Verizon Eyes Digital Video Service by Mid-2015,” *The Wall Street Journal*, September 11, 2014, available at <http://online.wsj.com/articles/verizon-ceo-eycs-digital-video-service-by-mid-2015-141046715>.

traffic.”²³⁵ Dr. Israel is conflating the importance of video to mobile wireless usage with the importance of mobile wireless usage to OVDs such as Netflix. The same report that Dr. Israel references indicated that video already accounted for 40 percent of all global mobile data traffic in 2013. As I have discussed, Netflix viewing over mobile wireless connections is essentially negligible today. That is true at the same time video accounts for 40 percent (or more) of mobile wireless data usage. It is implausible that going from 40 percent in 2013 to 50 percent in 2017 tells us that Netflix viewing over mobile wireless connections will become appreciably more attractive to consumers any time in the near future.

IV. Conclusion

271. Based on the economic analysis presented above, I conclude that this Transaction would cause public harm. It would create a national monopoly bottleneck that would control access to 30 percent of American broadband subscribers. It would enable Comcast to increase the price that OVDs would have to pay to obtain access to Comcast’s subscribers significantly, as a result of horizontal unilateral effects, and to maintain its significant market power in the MVPD and broadband markets, as a result of vertical effects.

272. That would be bad enough. But then under the economic theories advanced by Comcast the merged company would be able to acquire the remaining non-overlapping cable ISPs thereby securing a national monopoly bottleneck over {{ }} of American wired broadband households as of today and more than {{ }} in a few years.

²³⁵ Israel Declaration II, ¶ 82, citing “Ericsson Mobility Report: On the Pulse of the Networked Society,” *Ericsson*, June 2014, available at <http://www.ericsson.com/res/docs/2014/ericsson-mobility-report-june-2014.pdf>.

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273. I therefore recommend that the FCC block this Transaction and prevent Comcast from continuing on a process that could result in the creation of a massive national bottleneck monopoly standing between edge providers and American consumers of Internet content.

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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 December 23, 2014.

A handwritten signature in black ink, appearing to read 'DSE', with a long horizontal flourish extending to the right.

David S. Evans
Chairman
Global Economics Group, LLC

EXHIBIT 5

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**Contrary to Professor Carlton's Theory, Comcast Has a Strong
Incentive to Engage in Vertical Foreclosure**

By

David S. Evans*

March 18, 2015

*Chairman, Global Economics Group; Lecturer, University of Chicago Law School; Executive Director, Jevons Institute for Competition Law and Economics, and Visiting Professor, University College London. This paper responds to a request made by the FCC at the FCC's Economic Analysis Workshop to provide comments on Professor Carlton's vertical foreclosure theory.

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Professor Carlton says that economic theory demonstrates that Comcast would profit more by embracing OVDs as complements than by engaging in vertical foreclosure strategies. Meanwhile Comcast's documents are replete with statements by its senior management that OVDs are a serious threat to its business and with proposals for protecting its MVPD revenue streams. Comcast's actions also speak otherwise as the company has taken steps to limit competition by OVDs and treats them as competitors rather than complements. This paper explains why Professor Carlton is wrong, and Comcast is right, about the threat that OVDs pose.

I. SUMMARY OF PROFESSOR CARLTON'S "NO VERTICAL FORECLOSURE" THEORY

Professor Carlton has two related claims that are based on the Chicago single-monopoly profit theorem.¹

First, he says that Comcast would have no incentive to engage in vertical foreclosure unless it "would acquire market power over consumers with whom it does not currently deal or have market power over." He says that, "even if Comcast were to destroy Netflix (and all other OVDs), Comcast would not benefit [because] it would not obtain access to any customers over whom it does not already have 'market power'... and, therefore, gain no additional power to harm consumers above what it already had absent the foreclosure."²

Second, he says that if OVDs and Comcast are competing for customers, Comcast "has an incentive to reach a mutually beneficial vertical arrangement."³ He goes on to say, "Thus, the Internet service provider (ISP) and the edge provider have an incentive to negotiate terms to split the surplus that their interaction generates in a way that makes both better off. When ISPs and

¹ Professor Carlton cites Rey and Tirole (2007) for a summary of the Chicago single-monopoly profit theorem. Declaration of Dennis W. Carlton, September 22, 2014 ("Carlton Declaration"), ¶ 12, citing Patrick Rey and Jean Tirole (2007), "A Primer on Foreclosure," in Mark Armstrong and Robert Porter (eds.), *Handbook of Industrial Organization*, Vol. 3, North Holland, pp. 2145-2220 ("Rey and Tirole (2007)"), at p. 2182. After summarizing the Chicago single-monopoly profit theorem Rey and Tirole go on to discuss the literature that shows specific situations in which a monopolist in one market would have incentives to engage in foreclosure strategies with regard to an entrant in another market. In particular they summarize the literature that shows that a monopolist may engage in foreclosure in an adjacent market to deter entry into its monopoly market. Rey and Tirole (2007), at pp. 2182-2194. See also Rey and Tirole (2007), at 2155-2182.

² Declaration of Dennis Carlton, September 22, 2014 ("Carlton Declaration"), ¶ 11. See also Dennis Carlton, FCC Economic Analysis Workshop, January 30, 2015, Transcript ("Workshop Transcript"), pp. 168-172.

³ Carlton Declaration, ¶ 11.

OVDs negotiate directly and flexibly, such flexibility removes any pricing-related constraints that might otherwise inhibit the ability to negotiate a mutually beneficial outcome.”⁴

He gives an example of such an arrangement:

Suppose a consumer who pays \$5 to Comcast for video on demand (VOD) services considers switching to Netflix instead of consuming those VOD services (a form of ‘cord-shaving’). In such an instance, Comcast could charge Netflix \$5 for the switch if Comcast is the monopoly supplier to Netflix, as Commenters allege, and therefore has no incentive to destroy Netflix to prevent the switch.⁵

These theoretical assertions are all based on numerous assumptions about the products and markets in question. Professor Carlton does not identify, much less verify, that these assumptions hold in this particular matter. I discuss these assumptions further below and show it is unlikely that they are satisfied here, given the facts concerning Comcast’s MVPD and ISP businesses and the development of the OVD industry. Then I document that the senior management of Comcast, after apparently considering the risks posed by OVDs carefully, disagrees with Professor Carlton’s reasoning.

II. PROFESSOR CARLTON’S VIEW THAT “ACCESS TO CUSTOMERS OVER WHICH COMCAST DOES NOT HOLD MARKET POWER” IS A NECESSARY CONDITION FOR VERTICAL FORECLOSURE IS WRONG

Professor Carlton’s claim that “access to customers over which Comcast does not hold market power” is a necessary condition for vertical foreclosure is based on the Chicago single-monopoly profit theorem. Briefly, this is the theorem. Suppose product A must be purchased in order to buy product B, suppose everyone who buys A also buys B, and suppose a company is the monopoly seller of product A to some set of customers. That company can extract all of the monopoly profit from them by charging the monopoly price for product A. It cannot do better than that by monopolizing product B, assuming it must charge a single price for A and not engage in price discrimination. It could do better under these assumptions only if it could figure out a way to extend that monopoly power over a new set of customers. This conclusion only holds, necessarily,

⁴ Carlton Declaration, ¶ 11 n.21. *See also* Dennis Carlton, Workshop Transcript, pp. 168-169.

⁵ Carlton Declaration, footnote 21.

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in a static market and in which the two products at issue are sold in fixed proportions or in which other specific assumptions are true.⁶

Professor Carlton's theoretical claim is not necessarily correct, however, in a dynamic market in which competition threatens to erode a company's monopoly power. In that situation, the monopoly could have an incentive to use its monopoly power to prevent that competition from reducing its monopoly power over some or all of its customers. As Rey and Tirole note,

[E]ven when the two goods are complements, entry in the adjacent market B may facilitate entry in the monopolized market A. Then, the incumbent monopolist M may be tempted to deter entry in the adjacent market in order to help prevent entry in its core market.⁷

That is the situation Comcast is in. Comcast currently has very secure market power over providing broadband access to households in its local area and its documents discussed below show that it shares that view. The development of OVD alternatives, however, and the resulting widespread availability of video programming on the Internet, may in the long run enable potential broadband entrants to avoid both the effort of licensing bundles of programming and the cost disadvantage of doing so at small-scale, thereby enabling them to enter as broadband-only or broadband-almost-only suppliers.⁸ Therefore, the success of OVD alternatives would cause Comcast to face the long-run risk that it would lose not only its MVPD monopoly, but its ISP monopoly as well.

Professor Carlton's theoretical claim is also not necessarily true in static markets when the two goods are consumed in variable rather than fixed proportions, or the company engages in price discrimination, which is the case here. In fact, Comcast engages in highly refined price discrimination by offering variable bundles of broadband and programming services. It uses programming services to extract more surplus from the households over which it holds monopoly power in access.⁹ The threat is that OVDs would displace linear programming, take that price

⁶ Alden F. Abbott and Joshua D. Wright (2010), "Antitrust Analysis of Tying Arrangements and Exclusive Dealing," in Keith N. Hylton (ed.), *Antitrust Law and Economics*, Edward Elgar, pp. 183-212, at pp. 187-188, 195; Rey and Tirole (2007), at pp. 2155-2158; Michael H. Riordan (2008), "Competitive Effects of Vertical Integration," in Paolo Buccirossi (ed.) *Handbook of Antitrust Economics*, MIT Press, pp. 145-182, at pp. 148-151.

⁷ Rey and Tirole (2007), at p. 2183.

⁸ Declaration of David S. Evans, December 23, 2014 ("Evans Declaration II"), ¶¶ 193-197.

⁹ Evans Declaration II, ¶ 177.

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discrimination tool away from Comcast, and thereby limit its ability to extract monopoly profits from households through price discrimination.¹⁰³

OVDs also threaten to prevent Comcast from extending its market power to a whole generation of “cord-cutting” consumers who are not signing up for cable at all but are instead consuming video content from OVDs and other edge providers.¹¹ That decline in demand over time would reduce the ability of Comcast to use its linear programming and video-on-demand service bundles to engage in price discrimination. Comcast could conclude that foreclosure is a superior strategy to accommodation even if there were a low probability that the development of OVDs would reduce its significant market power in broadband. If giving OVDs access did reduce Comcast’s broadband market power, there would not even be the single monopoly profit assumed by the theorem.

Finally, Professor Carlton’s theoretical claim is based on the assumption that the monopolist could, in practice, continue to extract its full monopoly profit following entry into the provision of the complementary product. To the extent that OVDs reduce demand for MVPD services, Comcast could respond in two basic ways neither of which would likely enable Comcast to recoup its lost profits.

¹⁰³ Of course, Comcast could try to recover these lost profits from the OVD, but that is not plausible either as I address in the next section.

¹¹ Evans Declaration II, ¶¶ 162, 171. In the last few months, a number of firms have announced new plans to launch stand-alone OTT video services, which will make cord-cutting and cord-shaving even more attractive. These new offerings include HBO Go (announced October 15, 2014), CBS All Access (announced October 16, 2014), PlayStation Vue (announced November 13, 2014), and Sling TV (announced January 5, 2015). Time Warner, “HBO Chairman and CEO Richard Plepler Announces HBO to Offer a Stand-Alone HBO Streaming Service in 2015,” October 15, 2014, available at <http://www.timewarner.com/newsroom/press-releases/2014/10/15/hbo-chairman-and-ceo-richard-plepler-announces-hbo-to-offer-a>; Cynthia Littleton, “HBO to Launch Standalone Over-the-Top Service in U.S. Next Year,” *Variety*, October 15, 2014, available at <http://variety.com/2014/tv/news/hbo-to-launch-over-the-top-service-in-u-s-next-year-1201330592/>; CBS Corporation, “CBS Bring Programming Direct to Consumers with New Multi-Platform Digital Subscription Service,” October 16, 2014, available at <http://www.cbcorporation.com/news-article.php?id=1026>; Sony, “Sony Network Entertainment International LLC (SNEI) and Sony Computer Entertainment Inc. (SCE) Today Unveiled Playstation Vue, a Pioneering New Cloud-Based TV Service that Reinvents the Television Experience,” November 13, 2014, available at <http://www.sony.com/SCA/company-news/press-releases/sony-corporation-of-america/2014/sony-network-entertainment-international-and-sony-.shtml>; GigaOm, “A Sneak Peak at Sony’s Playstation Vue Internet TV Service,” January 28, 2015, available at <https://gigaom.com/2015/01/28/a-sneak-peek-at-sonys-playstation-vue-internet-tv-service/>; DISH, “Sling TV to Launch Live, Over-the-Top Service for \$20 Per Month,” January 5, 2015, available at <http://about.dish.com/press-release/products-and-services/sling-tv-launch-live-over-top-service-20-month-watch-tvs-tablets>.

(1) Since the OVDs are complementary to broadband, it could raise the prices to its broadband customers. As I have discussed previously, that strategy encounters three problems. One is that Comcast may not be able to make as much profit, given its loss of programming as a metering device for engaging in price discrimination. Another is that this response would result in a massive, nationwide increase in the prices for all of Comcast's broadband products and thus invite regulatory scrutiny.¹² And finally, a significant increase in broadband prices and the widespread availability of OVD video programming would increase the likelihood of broadband-only entry by competitors.

(2) Alternatively, Comcast could attempt to charge OVDs directly. That is the solution that Professor Carlton posits.¹³ He says that Comcast will be able to enter into a mutually beneficial contract with the OVDs that would enable it to make at least as much profit as it made as an MVPD. I turn next to Professor Carlton's analysis of this alternative.

III. PROFESSOR CARLTON'S "CONTRACT BETWEEN COMCAST AND OVDs IS BETTER THAN FORECLOSURE" CLAIM

As noted above Professor Carlton's observed, by way of example, that "Comcast could charge Netflix \$5" in order to recover its lost revenue of \$5.¹⁴ That could be true only under very particular conditions that are not present here.

A. Professor Carlton's No-Vertical Foreclosure Contract Works Only Under Certain Conditions That Are Not Likely to Hold Here

Let me start with a more fully developed example than the one Professor Carlton has provided to show a situation in which he could be exactly right. In my example there is a consumer, Jake, a Comcast linear programming channel called Channel 77, and an OVD that I will call Zebra. Obviously, this example, like Professor Carlton's, abstracts from a number of real-world details. Table 1 summarizes the financial details discussed below.

¹² Evans Declaration II, ¶ 178.

¹³ Professor Carlton must assume for his analysis that applicable laws and regulations do not prevent Comcast from entering into the sorts of contracts he envisions or that Comcast can identify other ways to charge OVDs that recover its profits but do not violate the letter of those laws or regulations. In the discussion below I assume this is the case as well.

¹⁴ Carlton Declaration, footnote 21.

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Table 1: Situation in Which Comcast Can Find a Deal under Which Accommodating OVD Entry is Superior to Foreclosure

	Consumer value and price charged	Demand by consumer (1 indicates yes, 0 no)	Cost	Access Fee Received (Paid)	Profit Margin From Consumer
Before Entry					
Comcast Channel 77	\$10	1	\$3	NA	\$7
Entry with No Access Fee					
Comcast Channel 77	\$10	0	\$3	\$0	\$0
Zebra	\$12	1	\$3	\$0	\$9
Entry with Access Fee*					
Comcast Channel 77	\$10	0	\$3	\$8	\$8
Zebra	\$12	1	\$3	(\$8)	\$1

*In this case Comcast receives \$8 in access fee revenue and Zebra pays \$8 in access fee revenue denoted by (\$8) to reflect the fact that it is a negative contribution to its margin. Comcast receives only this access fee revenue, and incurs no cost, since Jake does not take Channel 77.

In the initial situation, with no OVD competition, Jake watches Comcast's Channel 77. Comcast charges Jake an extra \$10 to obtain Channel 77. It costs Comcast \$3 to supply Channel 77 to Jake. Comcast makes a margin of \$7 off of Jake. This is shown in the "Before Entry" part of Table 1.

An OVD, Zebra, appears. Zebra has content that Jake prefers over Channel 77, and he would watch Zebra rather than Channel 77 if both were available. If Zebra had access to Jake, it should be able to charge Jake more than \$10, say \$12, because Zebra is superior to Channel 77. Suppose Zebra also incurs a cost of \$3 to supply its content. It would make a margin of \$9 in the absence of any access charge by Comcast. This is shown in the "Entry with No Access Fee" part of Table 1.

If Comcast allowed Zebra to reach Jake and did not impose any access charge, Jake would sign up for Zebra at \$12 and drop Channel 77 at \$10. Comcast would lose margin of \$7.

Alternatively, if Comcast did not allow Zebra to reach Jake, it would retain its margin of \$7. In that case Comcast would have engaged in vertical foreclosure.

Professor Carlton says, however, that Comcast would not engage in vertical foreclosure because Comcast could make more money by entering into a contract with Zebra. Comcast, for example, could reach an agreement with Zebra under which Zebra pays an access charge of \$8. In that case Zebra would make \$1 ($\$12 - \$8 - \3). This is shown in the “Entry with Access Fee” section of Table 1.

Under this contract, Zebra earns \$1 of margin, which is better than nothing, Comcast earns \$8 of margin, which is \$1 better than the \$7 it had before, and Jake has a better programming package. Under this particular contract Comcast and Zebra are splitting the additional surplus of \$2 ($\$12 - \10) created by Zebra at that \$12 price. That is the scenario that Professor Carlton envisions in which Comcast and an OVD enter into a mutually advantageous contract and split the surplus created by innovative entry. But as I discuss below, that scenario differs in critical ways from the facts of the current case.

B. The Conditions Under Which Professor Carlton’s No Vertical Foreclosure Contract Works Are Quite Special and Foreclosure Is the More Likely Strategy

The result above that Comcast can do a deal under which it fully recovers its lost profits is quite fortuitous. In fact, contrary to Professor Carlton, Comcast is better off effectively denying Zebra access whenever Zebra’s margin is less than Comcast’s margin of \$7.

Suppose, for instance, that Zebra was able to charge Jake \$11 and Zebra’s cost was \$5. Then its margin would be \$6. Even if Zebra handed over its entire margin, Comcast would be \$1 short—it would lose \$7 from Jake when he drops Channel 77 and gain only \$6 from Zebra. To put it another way, the access fee that Comcast would need to charge to just recover its lost profits (\$7) would leave Zebra with a negative margin of \$1 as shown in the “No Entry with Access Fee” part of Table 2, below. Comcast cannot enter into a mutually advantageous deal with Zebra. Comcast concludes that it is better to foreclose Zebra. It could do that by charging an access fee of more than \$6, which Zebra cannot afford to pay, deny access all together rather than entering into a fruitless contract negotiation, or, if complete denial is infeasible, do what it can to impede access to minimize its loss of MVPD profits.

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Table 2: Situation in Which Comcast Finds Foreclosing OVD Entry Is Superior to Accommodation

	Consumer value and price charged	Demand by consumer (1 indicates yes, 0 no)	Cost	Access Fee Received (Paid)	Profit Margin From Consumer
Before Entry					
Comcast Channel 77	\$10	1	\$3	NA	\$7
Entry with No Access Fee					
Comcast Channel 77	\$10	0	\$3	\$0	\$0
Zebra	\$11	1	\$5	\$0	\$6
Foreclosure Through Access Fee*					
Comcast Channel 77	\$10	0	\$3	\$7	\$7
Zebra	\$11	1	\$5	(\$7)	(\$1)

* In this case Comcast would receive \$7 in access fee revenue to just recoup its lost profits; that fee would result in Zebra losing \$1. Zebra would therefore be foreclosed from profitably serving the subscriber in this example. Any "access" fee over \$6 would lead to this same result

While it is possible that OVDs make more margin than Comcast, and it is possible that Comcast and OVDs could strike deals in which Comcast is better off, there is no obvious reason why that must be so, and Professor Carlton offers no evidence that it is so. If it is not, Comcast's best strategy is to foreclose, effectively, rather than accommodate in this simple class of examples.

One response to this conclusion might be that foreclosure of Zebra is the right outcome, from a social welfare standpoint, if its costs are really higher than Comcast's. Zebra generates less social surplus (\$6 which is the difference between Jake's value of \$11 and Zebra's cost of \$5) than Comcast (\$7 which is the difference between Jake's value of \$10 and Comcast's cost of \$3).¹⁵

¹⁵ Note that for simplicity I have constructed the examples so that the provider sets a price equal to consumer surplus. One of the benefits consumers might get from access is more consumer surplus as a result of more competition between Comcast's MVPD and the OVDs.

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There are many reasons, however, why Comcast may not really be more efficient than Zebra despite these figures. The markets involved here are not the static, perfectly competitive markets of textbooks and journals. Comcast's cost advantage could result from monopsony power over programmers, for instance, rather than superior efficiency. Zebra could also be a growing OVD that has not achieved all the benefits of scale, so its costs are higher now than they would be if it were allowed to grow. In a dynamic industry, it would in fact be hard to sort out during the entry and growth phase which firm would be more efficient in long-run equilibrium. Since Comcast has no way to know what Zebra's costs might become or how Zebra might become even more dangerous, it has no incentive to allow Zebra to survive, let alone to grow.

The example in which Comcast and Zebra do strike a deal in this hypothetical example, however, raises further issues. Comcast always has the option of denying access. It therefore needs to get at least its lost margin to do a deal. That necessarily means that the only deal it will offer the OVD will be one in which the OVD gives up an amount that is equal to Comcast's lost profits. The OVD would have to make twice the margin of Comcast, in the absence of an access fee, to end up with a margin as good as Comcast after the access fee. The likely decimation of OVDs' margins under Professor Carlton's fortuitous contract would reduce investment and entry by OVDs. And while that may not result in full foreclosure, even this case could result in slowing and restricting the growth of the OVD industry.

More importantly, these examples only consider Comcast's lost profits from its MVPD business. They do not account for the risk of losing profits from its ISP business and thus the entirety of its market power as a result of entry into broadband. Even a modest probability of this happening would make some degree of foreclosure of OVDs a more profitable strategy, in terms of expected value, than accommodation through the contracts Professor Carlton envisions. For example, if Comcast could charge an access fee that only recovered its lost MVPD profits, any probability that OVD entry would eliminate its broadband profits would push it from accommodation, through charging an access fee, to foreclosure.

C. Comcast's Incentives to Engage in Vertical Foreclosure in the Real World

In the real world, neither OVDs nor Comcast make business decisions based on simple margins. OVDs have to make fixed-cost investments and, for companies that follow Netflix's

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model, these fixed costs constitute a large fraction of overall costs. The OVD industry is also a relatively new industry and the growth of the industry is likely to result from significant new entry. Entrants in any market, particularly dynamic, fast-changing ones, face significant risks, and many do not ultimately succeed. Terminating access fees at levels that would compensate Comcast just for its lost MVPD profits (not taking into account the potential for lost ISP profits) would nevertheless deter OVDs from entering the industry or force them to adopt different business models that deliver less value to consumers.

Therefore, there is no basis for assuming that OVDs would be able to operate viable businesses that deliver value to consumers if they had to pay Comcast terminating access fees that compensated Comcast for the profits it would lose if they were successful. As noted above, the OVDs would have to have business models that in effect start with Comcast's profit levels, so that it can turn this sum over to Comcast, and then try to make a margin on top of that.

Comcast also faces significant uncertainty in setting the terminating access fee. It has to assess the expected loss of MVPD profits that would follow from allowing an OVD access to its subscribers. That is likely to depend on the nature of the OVD's programming and how it evolves over time. Comcast would eventually learn enough about the OVD business to make this determination. But during the entry and growth phase of the OVD industry, it can only guess. If it sets the fees too low, it could risk significant loss of profits. It is also possible once people make the decision to watch OVDs it is difficult to get them to come back and watch MVPDs.

I would expect that Comcast would build a significant risk premium into these (hypothetical) terminating access fees in light of this uncertainty, since it would be less costly to err by setting the fee too high than by setting it too low. And it is conceivable that it decides that foreclosure is the best strategy if the terminating access fees that would recover its lost profits inclusive of the risk premium would need to be so high as to make it unlikely that OVDs would enter into contracts anyway. The risk to its ISP business from OVD programming increasing the likelihood of broadband entry significantly exacerbates these concerns and further reduces the likelihood that Comcast would reach an accommodation with OVDs rather than foreclose them.

IV. WHAT COMCAST SAYS

If Professor Carlton's theory were true, Comcast should embrace OVDs because they are complements to its broadband product. By making broadband more valuable, Comcast should be able to make more money from its customers. Moreover, to the extent that OVDs substitute for its MVPD programming, Comcast should be able to charge OVDs an access fee that more than covers the lost profits. Overall, Professor Carlton argues, Comcast should be able to make greater profits by accommodating OVDs than by foreclosing them.

However, Comcast's documents are inconsistent with Professor Carlton's conclusion. They show that {{

}}¹⁶ {{

}}.

A. Comcast Senior Executives View OVDs as the Most Serious Risk to Its MVPD, ISP, and NBCU Businesses

Comcast recently found that OVDs were {{ threats to the company after taking into account the benefits and costs of OVDs to Comcast's MVPD and ISP businesses. That conclusion is based on the {{

}}.¹⁷ {{

}}¹⁸

¹⁶ Comcast's senior management has done, in effect, what is called the "vertical arithmetic" in antitrust economics to balance the benefits and costs of foreclosure.

¹⁷ {{ }}

¹⁸ {{ }}

Figure 1: {{

}}

Figure 1, which is taken from {{}}, summarizes their assessment of top risks {{}}. The most serious risks are {{}}. The risks are broken down into {{}}. The two most serious risks—the one with the highest vulnerability and impact—are {{}}. Both result from competition with OVDs.

The most serious risk to its ISP and MVPD business, and the second most serious risk to Comcast overall, is {{}}. That corresponds to {{}}. Included in this category are:

{{

}}¹⁹

{{

}}²⁰

The {{ }} highlights the importance of these and other issues faced by the company and, in particular, the critical role of {{ }}.

{{

}}²¹

The risk assessment recognized that there could be mitigating factors. In particular Comcast noted that {{

}}²² Comcast, however, {{

}}

}}

In fact, the only mitigating factor it mentions concerning OVDs is {{

}}²³

Comcast's {{ }} also viewed OVDs as posing the most significant risk to {{ }} and in fact the most serious risk to {{ }}. That risk is {{ }}. The {{ }} noted that, {{

¹⁹ {{ }}

²⁰ {{ }}

²¹ {{ }}

²² {{ }}

²³ {{ }}

gave {{ }}²⁴ It as examples. Comcast viewed this risk as significant because:

{{

}}²⁵

B. Comcast Actions Show It Views OVDs as Threats Overall and Has Decided Not to Accommodate Them

Comcast has taken a number of actions that are consistent with its viewing OVDs as a threat and that it has chosen to compete with OVDs rather than accommodate them.

- It reduced the quality of service to its customers who wanted to watch Netflix between November 2013 and February 2014, as I have described previously. Smaller cable companies, which do not earn significant profits from their MVPD businesses, have not adopted similar strategies.
- It has refused to integrate Netflix's application onto its set top box, {{

}}²⁶

Its documents reflect that this is a deliberate decision to dampen the competitive threat posed by Netflix: {{

²⁴ {{ }}

²⁵ {{ }}

²⁶ {{

}}

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}}²⁷

- It has started to impose data consumption caps on its subscribers, which includes metering of OVD traffic, while simultaneously not metering some of its own video services against data consumption limits.²⁸ Notably, by contrast, just two weeks before the merger was announced, {{

}}²⁹

- Despite not offering an OTT video service outside of its footprint, {{

}} As one TWC document explained: {{

}}³⁰

Comcast documents also contain various statements that indicate the executives view OVDs as {{ }}

²⁷ {{

}}

²⁸ See Timothy B. Lee, *Net Neutrality Concerns Raised About Comcast's Xbox On Demand Service*, Ars Technica, Mar. 26, 2012, <http://arstechnica.com/tech-policy/2012/03/net-neutrality-concerns-raised-about-comcasts-xbox-on-demand-service/>.
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³⁴ {{

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³⁵ {{

V. PROFESSOR CARLTON'S CLAIM THAT COMCAST FACES SIGNIFICANT COMPETITION IN BROADBAND IS NOT VALID

Professor Carlton has argued that the {} is consistent with Comcast lacking significant market power in broadband and therefore lacking the ability to engage in foreclosure strategies relying on its terminating access monopoly:

Now, what's perfectly consistent with the board deck is that there's competition for broadband. They have no — very little market power in broadband. OVDs are going to come in and cable TV margins are going to disappear.... [T]hat's perfectly consistent with people in the company being worried about OVD if they're not a monopolist of broadband....³⁶

Once again, the understanding of Comcast's senior management is not consistent with Professor Carlton's claims. In the {} presentation, Comcast {}

{}. It concluded that there are {}

}}³⁷ {}

}}³⁸ {}

}}³⁹

Comcast could not have concluded otherwise, given the evidence. Most consumers have only one alternative broadband provider; that provider is generally DSL, which consumers are moving away from; switching costs from Comcast are very high; and few people in fact drop Comcast.⁴⁰ The economic marketplace evidence does not leave much room for doubt that Comcast has significant market power—essentially a terminating access monopoly—over most of its

}}

³⁶ Dennis Carlton, Workshop Transcript, pp. 188-189.

³⁷ {} {}

³⁸ {} {}

³⁹ {} {}

⁴⁰ Evans Declaration I, ¶¶ 64-71; Evans Declaration II, at ¶¶ 85-88.

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household subscribers, {{ }}. The merger will increase its market power over OVDs and increase both its incentive and ability to foreclose OVDs.⁴¹

* * *

Professor Carlton's theory that Comcast would enter into mutually beneficial contracts with OVDs is based on various unsupported assumptions that are inconsistent with the actual facts concerning Comcast and the competitive threat that OVDs pose to Comcast's MVPD and ISP profits, not to mention its NBCUniversal profits. Most importantly, Comcast has considered whether it makes sense to accommodate OVDs and has concluded that it is not in the company's interest to do so. It has taken a number of actions to make it harder for its subscribers to access OVDs and its executives have recommended against cooperation with OVDs.

⁴¹ Evans Declaration II, ¶¶ 155-197.

EXHIBIT 6

**Comcast's Acquisition of Time Warner Cable Would Result in an
Economically Significant Increase in the Magnitude of
Terminating Access Fees
for Online Video Distributors**

**By
David S. Evans*
April 6, 2015**

*Chairman, Global Economics Group; Lecturer, University of Chicago Law School; Executive Director, Jevons Institute for Competition Law and Economics, and Visiting Professor, University College London.

I. Introduction and Summary

This paper addresses four related issues concerning the price effects of the merger in light of the evidence and arguments submitted to date and, in particular, following the FCC Economic Analysis Workshop.

First, I show there is robust evidence that Comcast has significant market power over access to its broadband subscribers and thus has the power to impose terminating access fees that significantly exceed the competitive level. Comcast can restrict access to its network by significantly degrading the video streaming quality that its subscribers receive for an OVD and can demand terminating access fees to end those restrictions.

Second, I show there is robust evidence that larger ISPs charge significantly higher terminating access fees. This evidence implies that Comcast's market power over terminating access fees for OVDs would increase significantly as a result of the merger. Based on this evidence, the estimated increase in terminating access fees resulting from the merger are much higher than the 5-10 percent increase often used as a threshold of significance in merger analysis.

Third, I show that there is no basis for dismissing these significant increases in prices based on the fees that Netflix agreed to pay Comcast to end the congestion that reduced the quality of Netflix's video streaming for Comcast's customers. It is unlikely that Comcast exercised its full market power in negotiating the terms of that contract, and thus the relevant base for assessing an increase in market power is likely to be a multiple of the value of the

Netflix contract.¹ Moreover, the OVD industry is likely to grow rapidly, so that even if the Netflix contract were the relevant base for assessing the increase in terminating access fees, the absolute size of the increase in terminating access fees would be very large when applied to a much larger industry. It is not appropriate to evaluate the economic significance of the increase in prices based on the size of a nascent industry that is expected to grow rapidly over time and on the basis of a contract negotiated in the midst of an impending merger application and regulatory proceedings.

Fourth, I show that under Professor Carlton’s theory that Comcast would not engage in vertical foreclosure because it could get its monopoly profit through charging OVDs² (a theory I have argued is incorrect), the merger would have significant price effects.³ “Under Professor Carlton’s theory, Comcast could charge OVDs about {{ }} of terminating access fees annually by 2022 {{ }}, and that amount could rise by an additional {{ }} due to increased market power from the merger.” The present value of the increased fees resulting from the merger exceeds {{ }}.⁴

¹ In negotiating the contract with Netflix, Comcast focused on breaking the zero price equilibrium for terminating access fees and setting a precedent with the Netflix contract. For further discussion see Declaration of David S. Evans, December 23, 2014 (“Evans Declaration II”), ¶¶ 109-111 and discussion below at pp. 19-20.

² Professor Carlton does not explain in what manner the fees would be imposed, but they will represent an access charge, regardless of *how* they are imposed.

³ His theory is wrong as applied to the facts of this matter, and is contradicted both by analyses conducted by Comcast’s senior management and presented to its Board, and by Comcast’s actions to treat OVDs as competitors rather than complements. See David S. Evans, “Contrary to Professor Carlton’s Theory, Comcast Has a Strong Incentive to Engage in Vertical Foreclosure,” March 18, 2015 (“Evans Vertical Paper”).

⁴ Comcast’s corporate structure influences the terminating access fees that it would charge OVDs and how these relate to the impact of the merger on competition. If Comcast were only acting as an ISP, it would charge OVDs terminating access fees to maximize its ISP profits. In those circumstances the merger results in a pure horizontal effect. The larger ISPs, as I have shown, charge a higher terminating access fee. Declaration of David S. Evans, August 25, 2014 (“Evans Declaration I”), ¶¶ 135-148; Evans Declaration II, ¶¶ 136-142. My analysis in this paper shows that, even if the Netflix contract reflected the full exercise of market power, the economic magnitude of the increase in terminating access fees would be significant. It is more likely that the Netflix contract does not reflect the full exercise of market power, so the annual terminating access fees would be even

To assess the magnitude of the increase in terminating access fees in this matter, the U.S. Department of Justice and Federal Communications Commission should consider the impact of the increase of these fees on the OVD industry over the long run. First, the OVD industry is nascent but is expected to continue to grow rapidly. Using current OVD revenues would greatly understate the economic impact of the merger. Second, the approving authorities cannot count on dynamic competition to discipline the impact of the merger on price in the longer run. Comcast faces little prospective competition in providing high-speed broadband service to American households. Furthermore, the merger would increase its long-run market power by raising the barriers to entry into providing high-speed broadband.⁵

II. Comcast’s Market Power over Terminating Access Fees

In this section, I summarize the evidence and state of debate following the FCC Economic Analysis Workshop on whether Comcast has significant market power over terminating access. The evidence is robust and there appears to be little real disagreement

larger. Comcast also operates as an MVPD that competes with OVDs for viewers. In those circumstances, there are two possible price effects from the merger, which result from the interplay of vertical and horizontal forces. One possibility, advocated by Professor Carlton, is that Comcast enters into mutually beneficial contracts with OVDs under which the OVDs get access to subscribers and Comcast at least recovers its OVD profits. Declaration of Dennis W. Carlton, September 22, 2014 (“Carlton Declaration”), ¶¶ 11-12. In those circumstances, the merger increases those terminating access fees as a result of increased bargaining power and greater lost profits per subscriber as I discuss below. The other possibility is that Comcast determines that it cannot recover its lost profits from OVDs and therefore either does not enter into a contract with OVDs or charges terminating access fees that make it unprofitable for OVDs to seek access. In those circumstances, the merger increases terminating access fees because it increases the incentives and ability to foreclose OVDs, as I have explained earlier. Evans Declaration II, ¶¶ 155-197. The long-run effect of OVD growth on ISP entry exacerbates this effect. In these circumstances terminating access fees are just one weapon for foreclosing OVDs. One strategy is to make the terminating access fees prohibitively expensive.

⁵ Potential entrants face significant regulatory and legal obstacles to entry into local broadband markets some of which have resulted from Comcast’s direct or indirect lobbying efforts. They also face a significant cost disadvantage because Comcast can secure much lower prices for distributing programming. The merger would increase Comcast’s long-run market power by increasing its programming cost advantage as well as its bargaining position in interconnection negotiations. Evans Declaration I, ¶¶ 85-86, 152-175; Evans Declaration II, ¶¶ 136-142, 194. The merger would increase its long-run market power by maintaining and raising the barriers to entry into providing high-speed broadband. Evans Declaration I, ¶ 179; Evans Declaration II, ¶¶ 193-197.

remaining on this point between Comcast's economists and the economists for the opposing parties.⁶

Comcast has significant market power over the terminating access fees paid by OVDs because it provides the only way that OVDs can provide long-form videos to households that use Comcast as their broadband provider. There is no credible evidence that competition between broadband providers limits that market power, and significant credible evidence that it does not. Households have limited choices and high switching costs, and they seldom switch.⁷

⁶ Dr. Israel still maintains that Comcast is disciplined because consumers could and would switch ISPs if the quality of OVD service declined but, as I discuss further below, he has no credible evidence to support this point.

⁷ Evans Declaration I, ¶¶ 64-71, 78-89; Evans Declaration II, ¶¶ 85-89. Dr. Israel has filed an ex parte submission in which he elaborates on his claims regarding the willingness of consumers to switch ISPs. Comcast Ex Parte Submission, February 23, 2015, Appendix A. I address two of his main points here.

First, he continues to rely on the Global Strategy Group (GSG) survey commissioned by Comcast for the purposes of this proceeding, though he now concedes that "I recognize that the GSG data are not actual marketplace outcomes and thus do not perfectly predict how many consumers would actually switch." Comcast Ex Parte Submission, February 23, 2015, Appendix A, at pp. 5-6. The ex parte filed by GSG is even more equivocal about the value of the survey results, noting that "[o]pinion research reflects what people say they might do in a hypothetical situation *which may deviate in substantial ways from what happens in real-world situations.*" Comcast Ex Parte Submission, February 19, 2015, Global Strategy Group Memorandum, at p. 1 (emphasis added). This is a somewhat remarkable concession and it is difficult to take the survey results seriously in light of that alone. I explained some of the flaws in their approach in my earlier declaration.

In addition, as I have noted, the finding of the survey that the vast majority of the subscribers would switch to a different ISP in the face of, for example, degradation of OVD streaming is generally implausible and flatly inconsistent with lack of such switching when Comcast did degrade the quality of Netflix streaming. Dr. Israel argues that this degradation happened while AT&T and Verizon also degraded the quality of Netflix streaming, so that it does not provide a test of degradation of Netflix by Comcast alone. Comcast Ex Parte Submission, February 23, 2015, Appendix A, at pp. 4-5. If Dr. Israel were correct that this was the reason for the lack of switching, then that indicates that degradation at the same time by the largest ISPs is a coordinated strategy they can undertake without significant costs. But Dr. Israel is not correct that this was why the real-world outcome differed from the GSG survey results. There were many regions in which Comcast does not compete with AT&T or Verizon, and the vast majority of Comcast broadband subscribers did not abandon Comcast in those regions, so that it is wrong to ascribe the lack of switching to the degradation by AT&T and Verizon.

I also note that GSG's claim in its ex parte disputing my explanation of why their survey results were internally inconsistent fails to address my criticism and is wrong. Comcast Ex Parte Submission, February 19, 2015, Global Strategy Group Memorandum, at p. 2. GSG refers to the responses to Questions 12 and 13 in its survey. The point I made in my declaration was that [[]] of the respondents who answered that they had a wireless data plan in Question 13 answered "no" in Question 2, to which they should have answered "yes" because they had a wireless data plan such as for a smartphone. The GSG ex parte simply fails to address this.

Comcast has claimed, however, that it cannot prevent OVDs from traversing its network and reaching those subscribers. In particular, Comcast has argued that Netflix could have used more than 40 settlement-free paths during the “congestion episode” in late 2013 and early 2014, and decided not to use them, and therefore chose to harm itself.⁸ As described below, Dr. Israel has conceded that Comcast was determined to charge Netflix interconnection fees, directly or indirectly, and had no intention of allowing Netflix to use settlement free paths. There is robust evidence that Comcast has charged Netflix terminating access fees for accessing Comcast customers over the “last-mile” of its network and that Comcast has either charged terminating access fees to CDNs and transit providers that Netflix has relied on, has congested their connections and induced them not to want to do business with Netflix, or has demanded that the provider cease accepting Netflix traffic.⁹

Second, Dr. Israel does not appear to dispute my analysis showing that his calculation of a {{ }} annual Comcast churn rate among non-movers was vastly overstated and should have been a {{ }} rate for voluntary churn. Instead, Dr. Israel continues to assert that involuntary churn is as relevant as voluntary churn. Comcast Ex Parte Submission, February 23, 2015, Appendix A, at pp. 6-7. A substantial portion of involuntary Comcast churn is from disconnections by Comcast for non-payment. It is implausible that a concern about the impact of degradation on this population of non-payers is a significant restraint on Comcast’s actions. Dr. Israel also asserts that churn from consumers who moved is relevant. . Comcast Ex Parte Submission, February 23, 2015, Appendix A, at p. 6. Churn rates inclusive of customers who moved greatly overstates the likelihood of switching for the vast majority of customers who do not move. Moreover, Comcast does not have a chance to compete for customers who move outside of its footprint, so the existence of such movers does not impose any constraint on Comcast’s actions.

⁸ Comcast revised the claim of “more than 40 settlement free paths” to exclude nine of those paths in an ex parte submission to the FCC on December 8, 2014. Letter from Francis M. Bruno to Marlene H. Dortch, FCC, MB Docket 14-57 (December 8, 2014), at pp. 2-3. Then, at the FCC Economic Analysis Workshop, they abandoned the claim.

⁹ For a discussion of this strategy on the part of the largest ISPs, see Level 3 Communications Inc., “Response to Request for Information from Level 3 Communications, Inc.,” February 11, 2015, at p. 4 (“The key trend that Level 3 has observed in [the area of ISP network management practices] is that, as the Internet has grown, and particularly as the economic importance of the Internet has grown, the large eyeball ISPs have increasingly attempted to leverage their control over access to users to extract tolls.... Notably, in order for an ISP to be successful in demanding a toll, it must ensure that there are no non-toll (i.e., settlement-free) routes into its network that can offer sufficient capacity to take the traffic. And so a related trend is that some of the largest ISPs have, for the last several years, despite repeated requests, refused to increase interconnection capacity with Level 3 and other Transit Service and CDN providers unless Level 3 or these others pay a toll.”).

Virtually all wired ISPs in the US provide enough port capacity to enable their subscribers to obtain the content they have requested from OVDs and other edge providers. They do not charge OVDs or other edge providers for that port capacity. Nor do they impose any other charges on OVDs or other edge providers for carrying traffic between the edge of the network where that traffic originates and the household where it terminates.¹⁰

Comcast did something different. It refused to provide enough port capacity for carrying Netflix traffic requested by Comcast's subscribers unless CDNs and transit providers that Netflix relied on, or Netflix itself, paid interconnection fees. As a result of this strategy, the video quality of Netflix's traffic for Comcast subscribers declined precipitously at the end of 2013. The degradation of Netflix's traffic continued until Netflix agreed to pay Comcast to provide enough port capacity for Netflix customers that relied on Comcast. It entered into such a contract on {{ }}.¹¹

Comcast claimed that Netflix did not have to pay terminating access fees because it could have used "more than 40 settlement-free peers" to access Comcast's network.¹²

According to Dr. Israel's declaration:

¹⁰ Evans Declaration II, ¶¶ 63-66; Declaration of Ken Florance, August 25, 2014 ("Florance Declaration I"), ¶¶ 43, 60; Declaration of Ken, December 23, 2014 ("Florance Declaration II"), ¶ 15. According to Level 3, "With the exception of Comcast, Level 3's Interconnection Agreements with the 19 ISPs identified in response to Request 1 [by the FCC] are either Settlement-Free Peering agreements or Transit Service agreements where Level 3 is the selling party." Level 3 Communications Inc., "Response to Request for Information from Level 3 Communications, Inc.," February 11, 2015, p. 1.

¹¹ As Level 3 has observed, "And when commercial entities, like Netflix or Major League Baseball, sell a streaming video service that critically depends on their customers having reliable, uncongested access, those commercial entities will have no choice but to pay a toll if the ISP controls access to a sufficient number of customers." Level 3 Communications Inc., "Response to Request for Information from Level 3 Communications, Inc.," February 11, 2015, p. 4.

¹² "Comcast reaches well over 99 percent of the Internet's networks through more than 40 settlement-free peers and numerous other commercial interconnection agreements, and across our interconnection partners there is more than enough capacity into our network - even enough to carry all of Netflix's Comcast-bound traffic-which is available at reasonable, market-based prices." Comcast Corp., Opposition to Petitions to Deny and Response

“[T]he interconnection charges that lie at the heart of [the] theories of harm are ... literally zero for more than 40 ‘settlement-free’ paths into the Comcast network.”¹³

“Most simply, the existence of over 40 *settlement-free paths* into the Comcast network is inconsistent with the claim that Comcast can impose anti-competitive harms on interconnection”¹⁴

“[T]he fact that there are over 40 settlement-free paths into the Comcast network demonstrates that having a large number of broadband customers does not parlay into the ability to charge high prices for interconnection services. ...[A] claim that Comcast could force higher prices on all paths even though more than 40 are settlement-free today-would depend on an implausibly large and entirely unproven increase in bargaining power over the entire Internet backbone due to the proposed transaction.”¹⁵

Ken Florance and I explained that these claims were wrong in our earlier submissions.

In particular, I noted that Comcast has a closed private network and that Comcast can, and does, limit traffic between the edge of its network and the households on its network.

Dr. Israel retracted these claims concerning the availability of settlement-free paths to Netflix at the FCC Economic Analysis Workshop as the following exchange demonstrates.¹⁶

[Israel:] “In the meantime, Comcast was saying we’re negotiating with you. We don’t think you should have interconnection for free. We’re not going to let you ...if you try to go somewhere else and backdoor that, ultimately if we see the Netflix traffic, we’re in the middle of a commercial negotiation over what the price should be.”¹⁷

In response to this, I said,

to Comments, September 23, 2014, pp. 209-210, quoting Declaration of Kevin McElearney, September 19, 2014 (“McElearney Declaration”), ¶ 3. See also Declaration of Mark A. Israel, September 22, 2014 (“Israel Declaration II”), ¶ 52, also quoting McElearney Declaration, ¶ 3.

¹³ Israel Declaration II, ¶ 6.

¹⁴ Israel Declaration II, ¶ 12.

¹⁵ Israel Declaration II, ¶ 133.

¹⁶ As noted above in footnote 8, Comcast revised its count from {{ }} to {{ }} and its economists abandoned the claim altogether at the FCC Economic Analysis Workshop.

¹⁷ Mark Israel, FCC Economic Analysis Workshop, January 30, 2015, Transcript (“Workshop Transcript”), pp. 92-93.

[Evans:] “I think what I heard Mark say is that we agree that Comcast’s position is that Netflix needed to pay a terminating access fee, either directly to Comcast or indirectly to someone else that had an interconnection terminating access fee deal with Comcast. At least I think that’s what I heard. So let me continue and maybe Mark can tell us whether I misunderstood that.”¹⁸

Dr. Israel then came back to respond to me. He said,

[Israel:] “... I don’t disagree that Comcast with Netflix—Comcast and other ISPs with Netflix and others have negotiated with them in order to you know, charge a – in order to charge a fee for traffic that coming onto the last mile of the network. I don’t disagree the negotiation was over Comcast’s view that Netflix should pay Comcast something.”¹⁹

Comcast and Dr. Israel also argued that Comcast was saving Netflix money.²⁰ That is an odd claim in light of the lengths that Comcast went to impose interconnection fees on Netflix and the lengths to which Netflix went to avoid these. At the FCC Economic Analysis Workshop Dr. Israel appears to have repeated this claim, although it isn’t entirely clear, and offered apples-to-oranges comparisons to suggest that Netflix saved money from the Comcast deal.²¹

Dr. Israel has reiterated his claims in an ex parte submission.²² He continues to rely on the flawed comparison of the costs to Netflix of serving traffic to Comcast subscribers with the costs to Netflix of serving traffic to very small ISPs that do not connect at Internet Exchange Points (IXPs).²³ This is like arguing that if, for example, a soda manufacturer uses its own trucks to distribute soda directly to the warehouses of supermarket chains but chooses to pay an

¹⁸ David Evans, Workshop Transcript, p. 95.

¹⁹ Mark Israel, Workshop Transcript, pp. 98-99.

²⁰ Israel Declaration II, ¶ 134.

²¹ Mark Israel, Workshop Transcript, pp. 65-66.

²² Comcast Ex Parte Submission, February 23, 2015, Appendix B.

²³ Comcast Ex Parte Submission, February 23, 2015, Appendix B., at pp. 1-4.

intermediary to distribute soda to small corner stores that do not have warehouse facilities, it would be appropriate to compare the cost of distribution to the largest supermarket chain with the cost of distribution to small corner stores.

To take the analogy further, Dr. Israel is saying, following my example, that if the four largest supermarket chains charge an access fee and the fees increase with the size of the chain, while other smaller supermarket chains charge a zero fee, we should not infer from that that there is a correlation in the size of the supermarket chain with the level of access fees charged. Rather, he points to the fact that there are additional costs of distribution to small corner stores and the need to pay intermediaries to reach those stores as equivalent to the access fees charged by the largest supermarket chains. Even if it were true, the fact that it may be more expensive to distribute soda to small corner stores than it is to distribute soda to the largest supermarket chain after accounting for its access fee does not mean we should not be concerned about the impact on access fees of a merger of the first and third largest supermarket chains. Dr. Israel is wrong to focus on total costs rather than on access fees and he is wrong to compare dealing with the largest firms to dealing with extremely small ones without accounting for other differences in the transactions.²⁴

²⁴ Dr. Israel's comparison is so inappropriate that the figures he uses are beside the point, but I will also note that he uses the wrong figures for his comparisons. He compares the rough estimate of {{ }} per Mbps that I reported that Netflix pays transit providers to reach small ISPs that do not interconnect at IXPs with his calculation of an incremental {{ }} per Mbps that Netflix pays Comcast as a terminating access fee. As I noted in my declaration, all the traffic cost figures I reported, including the {{ }} per Mbps fee to transit providers, were on an industry standard 95th percentile basis. Evans Declaration II, footnote 175. See also, Evans Declaration II, footnote 108. In calculating the {{ }} per Mbps Comcast fee, Dr. Israel uses a different methodology, estimating the cost based on contracted capacity. Contracted capacity differs from 95th percentile capacity in two significant ways. First, 95th percentile capacity is based not on peak capacity but rather on the 95th percentile of capacity used when measuring usage at frequent intervals. As I noted in my declaration, {{ }} Second, 95th percentile capacity is based on actual usage, which will differ from contracted capacity. Thus the {{ }} per Mbps Comcast access fee calculated by Dr. Israel is

I reported the apples-to-apples comparison of access fees in my second declaration.²⁵

Netflix connects directly to Comcast at an IXP. Netflix also connects directly to several hundred other ISPs at IXPs. In all those cases, for Comcast as well as the several hundred other ISPs, Netflix bears the entire cost of getting traffic to the IXP using its CDN. The only difference between these several hundred ISPs and Comcast is that these ISPs do not charge Netflix a terminating access fee and Comcast does. Netflix therefore pays substantially more to get traffic to Comcast subscribers than to the subscribers of these other ISPs by the amount of the terminating access fee.

III. The Relationship between Terminating Access Fees and Number of ISP Subscribers

There is robust evidence that larger ISPs charge higher terminating access fees. Dr. Israel has conceded the fact of this relationship. He has offered no credible economic evidence in support of the claim that prices are higher because larger ISPs offer some value other than access to more subscribers.

Three independent sources of evidence show there is a significant relationship between the size of terminating access fees and the number of ISP subscribers.

Netflix Interconnection Deals with ISPs. The Netflix interconnection deals show that the four largest wired ISPs are able to charge a positive terminating access fee, and that no smaller wired ISP is able to charge an access fee greater than zero. Among the four largest wired ISPs, the highest fee is charged by the largest (Comcast) and the lowest fee is charged by

understated if comparing fees on a 95th percentile basis. The estimate I reported in my declaration of {{ }} per Mbps is appropriate for the comparisons I reported.

²⁵ Evans Declaration II, Table 5 and ¶¶ 220-222.

the smallest ({{ }}). All smaller ISPs charge nothing. I submitted a Tobit regression that shows that there is a highly significant positive relationship between the terminating access fees and the share of subscribers.

Comcast and Time Warner Cable Interconnection Deals. The Comcast and Time Warner Cable interconnection deals show that Comcast charges the same edge providers roughly {{ }} as Time Warner Cable on average. Comcast has 1.8 times as many subscribers as Time Warner Cable. These interconnection deals involve {{ }}

Charter, which is smaller than Comcast and Time Warner Cable, {{ }}

}}.²⁶ In addition there is {{ }}

}}.²⁷

The Cogent Interconnection Deals. Professor Farrell obtained data on the prices Cogent charges {{ }} ISPs for peering, the number of subscribers at each ISP, and the number of cities at which Cogent interconnects with each ISP. He found that {{ }}

}}²⁸

²⁶ For further details of the interconnection agreements for each of the three ISPs, see Evans Declaration II, ¶¶ 130-131 and Table 2.

²⁷ In addition, {{ }}

²⁸ Declaration of Joseph Farrell, August 25, 2014 (“Farrell Declaration I”), ¶¶ 172-176; Declaration of Joseph Farrell, December 23, 2014 (“Farrell Declaration II”), ¶¶ 58-67. Dr. Farrell showed that there were significant data errors in Dr. Israel’s econometric analysis.

There is no dispute among the economists working for the merging parties and the opposing parties that large wired ISPs charge higher interconnection fees. According to Dr. Israel, “... I don’t disagree with the numbers that ... indicate that the {{
 }}.”²⁹ He also says, “...it is true today that larger ISPs in some cases like this charge higher interconnection payments.”³⁰

Dr. Israel claims that these higher fees are a “reflection of quality and capacity.” However, in the case of the Netflix interconnection agreements he has provided no evidence that Netflix received any service from the four wired ISPs it paid—other than agreement to do what more than 400 other wired ISPs of varying size did at no charge: ensure there is enough port capacity to enable ISP subscribers to obtain high quality downloads of content those ISP subscribers requested. As Ken Florance of Netflix explained in his declaration, “[T]he only ‘quality’ of an interconnection service we take into consideration . . . is whether the ISP can provide sufficient bandwidth to fulfill the needs of our subscribers. That quality . . . does not vary across ISPs, and certainly did not vary across the four ISPs we ultimately were forced to pay.”³¹ In other words, Netflix was simply interested in obtaining necessary port capacity. This is confirmed in an internal Comcast email from {{
 }}, stating that {{

²⁹ Mark Israel, Workshop Transcript, p. 56.

³⁰ Mark Israel, Workshop Transcript, p. 56.

³¹ Florance Declaration II, ¶ 21. See also *id.* ¶¶ 17-21.

}}³²

Dr. Israel has also provided no economic or technical evidence that the number of interconnection points could account for the price differences between the very large ISPs. For example, he has provided no meaningful evidence that Comcast is providing edge providers something more than {{

}}—other than access to more subscribers.

The only empirical evidence Dr. Israel has put forward does not support his quality claims.³³ Professor Farrell has shown that Dr. Israel's analysis was subject to significant data errors that once corrected reverse Dr. Israel's result.³⁴ But even aside from these data errors, Dr. Israel's original analysis provides no statistically reliable evidence that the number of interconnection points explains the differences in prices. His interconnection variable was not statistically significant at the five percent level typically used by economists in professional and consulting work including on antitrust matters; he claimed it was statistically significant based on using a 10 percent level of significance not ordinarily used in econometric work.

He claimed at the FCC Economic Analysis Workshop that his regression nevertheless proved that the number of interconnection points was a better explanation than subscribers because the inclusion of this variable rendered the subscriber variable insignificant. However,

³² {{ }}

³³ Dr. Israel has filed an ex parte submission on this issue. Comcast Ex Parte Submission, February 23, 2015, Appendix B. However, the fundamental problem remains. He has included a variable that is highly correlated with the number of subscribers in the regression, without any significant support for why that variable should have a significant effect on price. He then claims that the coefficient on the number of interconnection points is statistically significant when in fact it is not at the significance levels that economists ordinarily use.

³⁴ Farrell Declaration II, ¶¶ 58-67.

in his regression neither the interconnection variable nor the subscriber variable is statistically significant at the 5 percent level and the coefficients on the interconnection and subscriber variable are statistically indistinguishable as a result of their both having very large standard errors.³⁵ They are jointly significant at the one percent level. All of this simply points to the fact that the number of interconnection points is a proxy for the number of subscribers. In fact, in response to a query from the FCC, Dr. Israel reported that the correlation between the number of interconnection points and the number of subscribers is almost 90 percent.³⁶

The evidence therefore shows robustly that ISPs that control more subscribers can charge significantly larger terminating access fees. The price-size relationship shows that the impact of the merger would be far greater than the 5-10 percent increase often used in merger analysis. Based on the Netflix contracts with wired ISPs, I showed that the merger would result in an increase of {{ }} percent in the overall terminating access fees for the combined entity. The fact that Comcast {{ }} also is consistent with that range of increases. There is no basis in the evidence to conclude that the increase in price would be anything other than “significant” as that term is used in merger analysis. In fact, the evidence indicates that the likely percentage increases are an order of magnitude higher than those that ordinarily cause concern.

³⁵ A test of the equality of the coefficients has a p-value of 0.43.

³⁶ Israel reports a correlation of 0.89 between size and the number of interconnection points. Comcast Ex Parte Submission, December 2, 2014, p. 4.

IV. Netflix's Interconnection Payments to Comcast Are Not a Conceptually or Empirically Valid Base for Evaluating the Economic Significance of the Merger

Comcast's economists claim that we can brush all of these findings aside because Netflix can afford the {{ }} that Comcast is charging it for sufficient port capacity through {{ }} and that these charges are "tiny".³⁷ That claim is not consistent with sound antitrust economics or generally accepted methods for merger analysis.³⁸

A. Terminating Access Fees Are Economically Significant Input Costs for the OVD Industry

The annual terminating access fees charged by Comcast and Time Warner Cable constitute about {{ }} percent of Netflix revenue.³⁹ I have previously demonstrated, and summarize below, why the fees set in these agreements do not reflect the full exercise of Comcast's market power. But even at these levels, this is not a trivial amount. For example, it

³⁷ Carlton Declaration, ¶ 14; Dennis Carlton, Workshop Transcript, pp. 32, 51-52, 86-89; Mark Israel, Workshop Transcript, p. 56.

³⁸ Professor Carlton and Dr. Israel also use the Netflix contract to argue that it shows that Comcast does not have significant market power

³⁹ This figure is based on the Comcast and Time Warner Cable interconnection fees to Netflix of {{ }} per year and {{ }} per year as specified in the respective Comcast and Time Warner Cable contracts with Netflix. To express the Netflix fees to Comcast and Time Warner Cable as a proportion of revenues, I divide the {{ }} per year Comcast charges Netflix and the {{ }} per year Time Warner Cable charges Netflix by the portion of Netflix revenue ({{

{{ }} attributable to Comcast and Time Warner Cable subscribers, respectively. This gives average fees of {{ }} percent of OVD revenues for Comcast and {{ }} percent of OVD revenues for Time Warner Cable, for a weighted average of {{ }} percent for the two companies. Note that this weighted average of {{ }} percent can also be derived by dividing the Comcast and Time Warner Cable's combined terminating access fee ({{ }}) by the amount of Netflix's revenue that can be attributed to the two companies combined, without accounting for divestitures. If instead I divided by the amount of Netflix's revenue attributable to the two companies' subscribers, net of subscribers to be divested, the resulting percentage fee would rise to {{ }} percent. Using {{ }} percent as the terminating access fee (rather than {{ }} percent) would imply even higher Comcast fees to the OVD industry as a whole.

is around the level of payment card interchange fees that have been the subject of highly contentious litigation between retailers and payment card networks.⁴⁰

That input cost would increase significantly following the merger. Based on the price-size calculations above showing a predicted {{ }} percent increase, it would {{
 }}, to {{ }} percent of revenue for OVDs entering into new contracts, even setting aside the fact that we are starting from a level of fees that does not reflect the full exercise of Comcast’s market power.⁴¹ Terminating access fees would therefore be an even more significant input cost for OVDs after the merger.

B. Terminating Access Fees and the Merger-Specific Increase Would Grow Rapidly Over Time

The OVD industry is relatively new and is expected to expand considerably over time. It is therefore not appropriate to assess the economic significance of the increase in the terminating access fees based on the current size of the industry. Although there are few publicly available estimates of the growth of the domestic OVD industry, several analysts have reported estimates of the growth of the global OVD industry, and these provide a guide as to

⁴⁰ For the same reason, in the analysis of a consumer product merger one would not dismiss a price increase for a consumer product because it constitutes a small percent of overall household expenditures. Consumers spend around 0.8 percent of their total household expenditures on dairy products. U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2011, available at <http://www.bls.gov/cex/csxstnd.htm>. We would not dismiss the price effect of a merger of yogurt manufacturers because it accounts for a “tiny” percent of household spending.

⁴¹ These estimates only refer to price increases resulting from the horizontal effects of the merger under the assumption that Comcast does not engage in vertical foreclosure strategies. If it did engage in vertical foreclosure strategies one such strategy could involve charging a fee higher than the profit-maximizing fee as an ISP or charging a fee higher than the profit-maximizing fee as an integrated MVPD and ISP under Professor Carlton’s theory. Comcast would set a fee higher than the profit-maximizing fee because it would benefit from foreclosure of OVDs, in the form of higher MVPD and ISP profits by limiting competition from OVDs.

the growth of the US industry. They ranged from 15 percent for 2014-2018, 25 percent for 2013-2018, and 21 percent for 2010-2020.⁴²

The shift towards the OVD model accelerated in late 2014. Late last year a number of major players announced that they were entering the OVD business.

- On October 15, 2014, HBO announced that the company will offer a stand-alone streaming service in 2015 (subsequently named “HBO Now”).⁴³ A January 2015 survey found that 17 percent of broadband households would “likely subscribe” to the service.⁴⁴

⁴² Infonetics forecasted that global OVD pay-TV subscription revenue will grow from \$5.8 billion in 2014 to just over \$10 billion in 2018. That is a compounded annual growth rate of 15 percent. Infonetics, “Over-the-Top (OTT) Pay TV Expected to Soar to \$10B by 2018; Netflix, Hulu Just the Beginning,” November 19 2014, available at <http://www.infonetics.com/pr/2014/1H14-Pay-TV-Services-and-Subscribers-Market-Highlights.asp>. PwC forecasted that global OVD TV streaming subscriptions will grow from \$3.3 billion in 2013 to \$10.1 billion in 2018. That is an annual growth rate of 25 percent. Steven Rosenbaum, “Digital Video and OTT Poised for Dramatic Growth,” Forbes, June 9, 2014, available at <http://www.forbes.com/sites/stevenrosenbaum/2014/06/09/digital-video-and-ott-poised-for-dramatic-growth/>. Digital TV Research has projected that U.S. OVD video revenues (including subscriptions, advertising, and other revenues) will grow from \$2.3 billion in 2010 to \$15.5 billion in 2020. That is a compounded annual growth rate of 21 percent over that decade Digital TV Research, “OTT Revenues to Rocket to \$42 Billion by 2020,” September 24, 2014, available at <http://www.digitaltvresearch.com/ugc/press/100.pdf>. In its non-subscription data, Digital TV Research does not report the split between growth over 2010-2014 and over 2014-2020 for U.S. total OVD revenue. They report figures for total U.S. OVD revenue for 2010 and for 2020. They also report worldwide OVD revenues for 2010, 2014, and 2020. For the U.S. OVD revenue estimate, I have assumed that the share of the total 2010-2020 U.S. OVD growth that occurred in 2010-2014 was the same as the share of world-wide OVD revenue growth that occurred in 2010-2014. This gives us an estimate of total US OVD revenue in 2014 of \$7.0 billion, compared to \$2.3 billion in 2010 and \$15.5 billion in 2020. The estimated growth rate for 2014-2020 based on this calculation is 14.3 percent.

⁴³ Time Warner, “HBO Chairman and CEO Richard Plepler Announces HBO to Offer a Stand-Alone HBO Streaming Service in 2015,” October 15, 2014, available at <http://www.timewarner.com/newsroom/press-releases/2014/10/15/hbo-chairman-and-ceo-richard-plepler-announces-hbo-to-offer-a>; Cynthia Littleton, “HBO to Launch Standalone Over-the-Top Service in U.S. Next Year,” Variety, October 15, 2014, available at <http://variety.com/2014/tv/news/hbo-to-launch-over-the-top-service-in-u-s-next-year-1201330592/> (“...HBO’s unambiguous announcement of its intention to embrace the [stand-alone OTT] opportunity still caught the biz by surprise.”); Time Warner, “HBO to Launch Standalone Premium Streaming Service in April,” March 9, 2015 available at [http://www.timewarner.com/newsroom/press-releases/2015/03/09/hbo-to-launch-standalone-premium-streaming-service-in-april](http://www.timewarner.com/newsroom/press-releases/2015/03/09/hbo-to-launch-standalone-premium-streaming-service-in-april;);

⁴⁴ Amadou Diallo, “HBO’s Web-Only Service Projected to be a Huge Hit,” Forbes, January 22, 2015, available at <http://www.forbes.com/sites/amadoudiallo/2015/01/22/hbos-web-only-service-projected-to-be-a-huge-hit/>.

- On October 16, 2014, CBS announced “CBS All Access,” an OTT service delivering live streaming and full seasons of current shows for \$5.99 per month.⁴⁵
- On November 13, 2014 Sony announced PlayStation Vue, a cloud-based TV service.⁴⁶
- On January 5, 2015, DISH announced plans for a 2015 Q1 launch of Sling TV, a stand-alone OTT live-TV streaming service that includes 12 channels (including ESPN) for \$20 per month.⁴⁷
- Apple is reported to be in the process of launching an OTT service in the fall of 2015, offering “consumers a ‘skinny’ bundle with well-known channels like CBS, ESPN and FX, while leaving out the many smaller networks in the standard cable TV package.”⁴⁸

Analysts expect more entry.⁴⁹ If the OVD industry were to displace much of the existing MVPD industry, as some commentators expect, these growth figures are significantly understated.

⁴⁵ CBS Corporation, “CBS Bring Programming Direct to Consumers with New Multi-Platform Digital Subscription Service,” October 16, 2014, available at <http://www.cbscorporation.com/news-article.php?id=1096>.

⁴⁶ Sony, “Sony Network Entertainment International LLC (SNEI) and Sony Computer Entertainment Inc. (SCE) Today Unveiled Playstation Vue, a Pioneering New Cloud-Based TV Service that Reinvents the Television Experience,” November 13, 2014, available at <http://www.sony.com/SCA/company-news/press-releases/sony-corporation-of-america/2014/sony-network-entertainment-international-and-sony-.shtml>; GigaOm, “A Sneak Peak at Sony’s Playstation Vue Internet TV Service,” January 28, 2015, available at <https://gigaom.com/2015/01/28/a-sneak-peek-at-sonys-playstation-vue-internet-tv-service/>.

⁴⁷ DISH, “Sling TV to Launch Live, Over-the-Top Service for \$20 Per Month,” January 5, 2015, available at <http://about.dish.com/press-release/products-and-services/sling-tv-launch-live-over-top-service-20-month-watch-tvs-tablets>.

⁴⁸ Keach Hagey, Shalini Ramachandran and Daisuke Wakabayashi, “Apple Plans Web TV Service in Fall,” March 17, 2015, available at <http://www.wsj.com/articles/apple-in-talks-to-launch-online-tv-service-1426555611>. The report noted that “For now, the talks don’t involve NBCUniversal, owner of the NBC broadcast network and cable channels like USA and Bravo, because of a falling-out between Apple and NBCUniversal parent company Comcast Corp., the people familiar with the matter said. Apple and Comcast were in talks as recently as last year about working together on a streaming television platform that would combine Apple’s expertise in user interfaces with Comcast’s strength in broadband delivery. Apple came to believe that Comcast was stringing it along while the cable giant focused on its own X1 Web-enabled set-top box, the people said. One media executive said it may be difficult for Apple to launch a service without NBCUniversal channels.”

⁴⁹ Kenneth Ziffren, “Who Wins the Race to Go Over-the-Top,” March 20, 2015, Hollywood Reporter, available at <http://www.hollywoodreporter.com/news/power-lawyer-ken-ziffren-who-780897>; Claire Atkinson, “Amazon Plans a Streaming-Video Alternative,” November 21, 2014, New York post, available at <http://nypost.com/2014/11/21/amazon-plans-a-streaming-video-alternative/>.

C. Comcast’s Contract with Netflix Does Not Reflect the Full Exercise of Market Power and Is Therefore Not the Relevant Base for Assessing the Economic Magnitude of the Price Increases

I showed above that the terminating access fees based on the Netflix contract amount to {{ }} percent of OVD revenue. It is likely the Comcast did not exercise its full market power in negotiating the contract with Netflix. It is likely that Comcast would charge OVDs much higher terminating access fees in the future, in the absence of the merger, so that the base for assessing the increase in the terminating access fees resulting from the merger would be larger. In other words, the relevant base for calculating the economic significance of the terminating access fees is likely to be a multiple of the {{ }} percent and the increase in the terminating access fees is therefore likely to be a multiple of the {{ }} percent.

Comcast entered into a contract with Netflix over terminating access fees on {{ }}. That was {{ }} days after Comcast publicly announced its proposed acquisition of Time Warner Cable.⁵⁰ Comcast therefore faced a strategic choice: if it charged a higher fee reflecting its full market power, it would be providing opponents of the merger clear evidence that it had significant market power over interconnection fees. It had a significant incentive to charge a lower fee than it could to increase the likelihood of the merger being approved. In addition, independent of the timing of the merger, the pendency of proceedings regarding the Open Internet Order provided an additional incentive not to seek to maximize terminating access fees. As a result, the level of the terminating access fees that OVDs would pay in the

⁵⁰ Netflix first noticed Comcast congestion in mid-2013, and began negotiations shortly thereafter. The ultimately successful round of negotiations began in January 2014. Florance Declaration I, ¶¶ 45, 49, 56-57; McElearney Declaration, ¶ 43. The Comcast-Time Warner Cable merger was publicly announced on February 13, 2014. Comcast Corporation, “Time Warner Cable to Merge with Comcast Corporation to Create a World-Class Technology and Media Company,” February 13, 2014, available at <http://corporate.comcast.com/news-information/news-feed/time-warner-cable-to-merge-with-comcast-corporation>. {{

}}

event that Comcast had exercised its full market power is likely to be substantially higher than the level reflected in the Netflix contract.⁵¹

The Netflix contract itself may not prevent Comcast from imposing higher pecuniary or non-pecuniary costs on Netflix over the remaining life of the contract. For example, Comcast could breach the contract. Comcast can also limit Netflix's ability to reach subscribers in ways that do not depend on port capacity, for example by imposing data caps, and seeking higher fees to address such limitations.

V. The Merger Would Lead to an Economically Significant Increase in OVD Interconnection Fees Based on Professor Carlton's "No Vertical Foreclosure Contract Theory"

If Professor Carlton were right that Comcast would enter into mutually beneficial contracts with OVDs,⁵² rather than engage in a foreclosure strategy, then he is wrong that the merger would have "tiny" price effects. Comcast would charge substantially higher terminating access fees than discussed above if it charged OVDs for its lost profits, as described by Professor Carlton's theory. In this section, I report estimates of the terminating access fees under Professor Carlton's theory and the increase in those fees that would result from the merger.⁵³ Since I do not believe that Professor Carlton's theory is correct—Comcast would more be likely foreclose than accommodate OVDs through a "mutually beneficial contract"—I

⁵¹ As I have noted before, Comcast was engaged in a public battle to "break zero" for terminating access fees. Its contract with Netflix, the largest OVD and most vociferous opponent to terminating access fees, set an important precedent for OVDs regarding terminating access fees. Evans Declaration I, ¶¶ 108-111.

⁵² Even if it was possible to strike a deal between Comcast and an OVD, this "mutually beneficial" contract could result in an OVD having to hand over most of its potential profits to Comcast. See Evans Vertical Paper.

⁵³ I focus on the terminating access fees in 2022 { {

}}

also do not believe that the estimates reported below are, in fact, relevant to evaluating the horizontal effects of this merger.⁵⁴

A. Professor Carlton’s “No Vertical Foreclosure Contract Theory”

Comcast operates both an ISP and an MVPD. There is increasing evidence that OVDs compete with MVPDs for viewers.⁵⁵ Comcast’s documents also indicate that it is {{

}}.⁵⁶ Consequently, when Comcast considers the prices to charge for terminating access fees it would consider the fact that allowing an OVD to access its subscribers would result in the loss of profits to its MVPD and ISP businesses. As a result of this “vertical effect” it would charge a higher terminating access fee than it would charge if it only operated an ISP business. As OVDs become closer substitutes for MVPDs, and lower barriers of entry to the ISP business, we would expect Comcast would charge terminating access fees much higher than the levels discussed above.⁵⁷

Professor Carlton has argued that Comcast would seek to recover its lost MVPD profits by charging OVDs access fees.⁵⁸ However, he argues that Comcast would not have an incentive to engage in “vertical foreclosure.” He says that if OVDs and Comcast are competing for

⁵⁴ Evans Vertical Paper.

⁵⁵ Experian (2014), “Cross Device Video Analysis,” available at <http://www.experian.com/marketing-services/cross-device-video-analysis.html?intcmp=emsblog>, at p. 6; MarketingCharts, “Pay TV Trends: Cord-Cutting and Cord-Shaving on the Rise,” January 21, 2014, available at <http://www.marketingcharts.com/television/pay-tv-trends-cord-cutting-and-cord-shaving-on-the-rise-39291/>.

⁵⁶ {{

}}

⁵⁷ It will become apparent from the calculations below that these lost profits are not accounted for in the current terminating access fees Comcast is charging Netflix.

⁵⁸ Carlton Declaration, ¶¶ 11-12.

customers, Comcast “has an incentive to reach a mutually beneficial vertical arrangement.”⁵⁹ He goes on to say, “Thus, the Internet service provider (ISP) and the edge provider have an incentive to negotiate terms that split the surplus that their interaction generates in a way that makes both better off. When ISPs and OVDs negotiate directly and flexibly, such flexibility removes any pricing-related constraints that might otherwise inhibit the ability to negotiate a mutually beneficial outcome.”⁶⁰

He gives an example of such an arrangement: “Suppose a consumer who pays \$5 to Comcast for video on demand (VOD) services considers switching to Netflix instead of consuming those VOD services (a form of ‘cord-shaving’). In such an instance, Comcast could charge Netflix \$5 for the switch if Comcast is the monopoly supplier to Netflix, as Commenters allege, and therefore has no incentive to destroy Netflix to prevent the switch.”⁶¹ In other words Comcast would seek to charge OVDs like Netflix a fee for access to Comcast’s subscribers to compensate Comcast for the fact that those subscribers would reduce their demand, and Comcast’s profits, for MVPD services as result of these OVD choices.⁶²

Comcast would therefore be no worse off by giving OVDs access to its subscribers and better off if it also shares in the surplus created by OVD entry under Professor Carlton’s theory. He claims that it is better to accommodate OVDs than to foreclose them. As I have stated

⁵⁹ In fact, this “mutually beneficial” outcome could also be described as Comcast demanding a ransom for the release of Netflix’s hostage customers. See Evans Vertical Paper.

⁶⁰ Professor Carlton’s analysis does not hold, even given his other assumptions, in the situation in which OVDs threaten its long-term broadband monopoly (see Evans Declaration II, ¶¶ 155-197) or result in lost profits for NBCU (see { { } }).

⁶¹ Carlton Declaration, ¶¶ 11-12.

⁶² The basic idea is that, if consumers value programming from an OVD more than they value programming from Comcast, then there must be some surplus that would enable Comcast and the OVD to enter into a deal, split the surplus, and have Comcast and the OVD both better off. Although Comcast loses the MVPD revenue, it also avoids the cost of licensing programming, and charges the OVD more than enough to offset its lost MVPD margin. Meanwhile the OVD gets access to Comcast’s customers and makes some surplus too.

previously, Professor Carlton’s theory is incorrect. But if it were true, Comcast’s accommodation of OVDs would result in OVDs paying substantial terminating access fees as I show next.

B. Estimate of Comcast’s MVPD Profits at Risk

Comcast’s video revenues are about {{ }} per subscriber per month and its video operating margin is about {{ }} percent.⁶³ Thus, its operating profits from video are about {{ }} per subscriber per month. It also incurs customer acquisition expenses, which I estimate conservatively at {{ }} per customer, expressed on a monthly basis.⁶⁴ As a result its video profits net of customer acquisition expenses are about {{ }} per subscriber per month averaged over the expected life of each customer. These calculations are rough but precise enough for establishing that interconnection fees would likely be economically substantial under Professor Carlton’s “no vertical foreclosure contract theory.”

Comcast’s MVPD profits likely result largely from Comcast’s ability to negotiate favorable programming licensing deals. Programming expenses are the major component of

⁶³ {{ }} This document is the same source Dr. Israel relied on for assessing the relative profitability of different types of customers for Comcast. See Israel Declaration II, ¶¶ 59-61. Note that these numbers are for video-only customers. Using these numbers as a proxy for Comcast’s profit for all MVPD customers is conservative, since bundle customers are typically more profitable.

⁶⁴ Comcast reports an upfront customer acquisition cost for video of {{ }}. See {{ }}. I amortize this on a monthly basis using the information on the attrition rate over time of video-only customers. See {{ }}. I estimate the constant monthly amount that would result in a net present value of {{ }} at the beginning of the period. I note that Comcast also reports that the customer life expectancy for video-only customers is {{ }}. See {{ }}. If I had calculated the monthly acquisition cost using that estimate of life expectancy, the estimate would have been significantly lower, which would have resulted in a significantly higher MVPD profit per subscriber. To be conservative, I use the former calculation. I also note that triple play customers are significantly more profitable for Comcast than video-only customers because they have lower attrition rates. To be conservative, I did not estimate the higher profitability of triple play customers and attribute a portion of that additional profitability to the video product (which is part of the triple play product). The estimate of the profit margin could also be further adjusted by a) accounting for installation revenues, or b) accounting for promotional discounts not included in the monthly ARPU. Data on these factors were not available in the {{ }}. Data on these factors were available for {{ }} and the net effect of these adjustments based on those data would be to increase the estimated profit margin, which would increase the MVPD profit threatened by OVDs.

costs for an MVPD. My understanding is that the largest MVPDs pay significantly less for programming than smaller ones. Smaller ISPs have indicated that the video business is essentially unprofitable on a standalone basis—AT&T, which is about a quarter the size of Comcast as an MVPD, has stated that “our video product is, on its own, unprofitable.”⁶⁵ Smaller ISPs have also indicated the video is unprofitable and is essentially a loss leader for getting ISP subscribers.⁶⁶

This analysis indicates that Comcast’s MVPD profits, on a per subscriber basis, result in significant part from its size. An important implication of this is that Comcast’s profits would fall disproportionately from a loss of subscribers. As it has fewer subscribers it would have less bargaining power and its profits per subscriber would fall.⁶⁷

The growth of the OVD industry would jeopardize those profits. Much of the increase in OVD revenue is likely to come at the expense of MVPD revenue as consumers substitute one for the other.⁶⁸ Table 1 shows projected OVD revenue as a percent of current MVPD

⁶⁵ Statement of Randall Stephenson (Chairman, CEO, and President of AT&T Inc.), Hearing: The Proposed Merger of AT&T and DirecTV, United States House of Representatives, Committee on the Judiciary, Subcommittee on Regulatory Reform, Commercial and Antitrust Law, June 24, 2014, available at <http://judiciary.house.gov/cache/files/f6c337d5-a54e-4681-b611-88f1443a2e71/stephenson-testimony.pdf>.

⁶⁶ At a recent investor conference, the CFO of TiVo noted that “One thing that is very interesting about the international market relative to the U.S. market is everyone looks at the U.S. cable market today and says that the value is all created from broadband. Video is looked at as a loss leader or some might look at it as a tack-on for additional margins from what they can secure from the broadband. The profits aren’t being driven by video.” SeekingAlpha, “TiVo CFO Naveen Chopra at MKM Partners Investor Day Conference,” September 24, 2014, Transcript available at <http://seekingalpha.com/article/2519165-tivo-cfo-naveen-chopra-at-mkm-partners-investor-day-conference?page=2>.

⁶⁷ This reduced bargaining power and higher programming cost reduces Comcast’s advantage relative to smaller ISPs and in particular ISP entrants. That provides a further incentive for Comcast to engage in vertical foreclosure contrary to Professor Carlton’s theory. See Evans Declaration II, ¶¶ 193-197.

⁶⁸ The exact relationship between increases and OVD revenue and MVPD revenue is complicated. If consumers paid OVDs and MVPDs the same effective prices for content and if OVD viewership substituted one for one for MVPD viewership, a 100 percent increase in OVD revenue relative to 2014 (from \$7.0 billion to \$14.0 billion) would result in an { { } } percent decrease in MVPD revenue (from { { } } to { { } }) relative to 2013. If substitution is less than one for one then MVPD revenue would fall less than OVD revenue

revenue as of 2022.⁶⁹ It ranges from {{ }} percent of MVPD revenue with an OVD growth rate of 15 percent to {{ }} percent of MVPD revenue with an OVD growth rate of 25 percent.⁷⁰ Given the current pace of change, and how rapidly change has taken place in other industries disrupted by the Internet, it is conceivable that in the absence of foreclosure the OVD model could displace a much larger fraction of MVPD revenue by 2022.

Table 1: U.S. OVD Revenue in 2020 under Various Growth Assumptions

OVD Revenue CAGR 2014-2022	OVD Revenue, 2022 (\$ bil.)	OVD 2022 Revenue as % of 2013 MVPD Revenue
15%	\$21.3 billion	{{ }}
20%	\$30.0 billion	{{ }}
25%	\$41.6 billion	{{ }}

Based on these estimates, it is plausible that if Comcast gave OVDs access to its subscribers it could lose a substantial portion of its MVPD profits by 2022. It is plausible that Comcast could even lose all, or close to all, of its MVPD profits, even though it would retain a substantial part of its MVPD revenue. If there is a shift to an equilibrium in which consumers turn first to OVDs for content, the profitability of the MVPD model could deteriorate quickly.

would rise. If OVD effective prices are lower than MVPD effective prices then MVPD revenue would fall more than OVD revenue.

⁶⁹ For this calculation, I started with an estimate of \$7.0 billion total U.S. OVD revenues in 2014 based on data from Digital TV Research (which includes subscription, advertising, purchase, and rental revenues) and assumed a constant compound annual growth rate of 15, 20, or 25 percent. Note that in its non-subscription data, Digital TV Research reported U.S. OVD revenue in 2010 (\$2.3 billion) and in 2020 (\$15.5 billion), but did not report a separate number for 2014. Digital TV Research, “OTT Revenues to Rocket to \$42 Billion by 2020,” September 24, 2014, available at <http://www.digitaltvresearch.com/ugc/press/100.pdf>. They also report worldwide OVD revenues for 2010, 2014, and 2020. For the 2014 U.S. OVD revenue estimate, I have assumed that the share of the total 2010-2020 U.S. OVD growth that occurred in 2010-2014 was the same as the share of world-wide OVD revenue growth over 2010-2020 that occurred in 2010-2014. This gives us an estimate of total US OVD revenue in 2014 of \$7.0 billion.

⁷⁰ I estimated size of the U.S. MVPD industry in 2013 by taking the number of MVPD subscribers as of year-end 2013 as reported by SNL Kagan and multiplying by {{

}}.

To estimate what Comcast would have to seek in terminating access fees, I need to calculate the total amount of profit that Comcast would lose if it gave OVDs access.⁷¹ As noted above, Comcast’s monthly profit per MVPD subscriber is {{ }}. I assume that Comcast would lose 50 percent of its MVPD profits in 2022 if it allowed OVDs access to its subscribers. As I have noted, it is possible that OVDs could displace more MVPD revenue and profit by 2022. Comcast’s MVPD profits depend in significant part on its scale, so that a given percentage loss in revenues would likely result in a disproportionately larger loss of profits. I take a loss of 50 percent of MVPD profits as a plausible scenario.⁷²

The loss of 50 percent of its MVPD profits would amount to {{ }} annually.⁷³ Comcast would have to charge OVDs at least this amount annually to eliminate its incentives for vertical foreclosure under Professor Carlton’s theory. This estimate is conservative, in that it does not take into account the profits Comcast may lose if ubiquitous OVD programming results in accelerated entry by broadband ISPs.

C. Estimates of the Merger-Specific Increase in Fees Under Professor Carlton’s “No Vertical Foreclosure Contract Theory”

After the merger, Comcast would be able to increase the access fees it could demand from OVDs as a result of its larger size. It will be able to do so for two merger-specific reasons.

⁷¹ I note that these estimates of lost MVPD profits are for Comcast only. I have not attempted to calculate a similar figure for Time Warner Cable in the absence of the merger. Also, as noted above, these estimates are based on {{ }} under the Carlton no vertical foreclosure contract framework discussed.

⁷² Even with a loss of only 25 percent of its MVPD profits, the impact of the merger on terminating access fees would still be substantial. And with a greater loss of its MVPD profits, the impact of the merger on terminating access fees would much larger than I report below.

⁷³ For this calculation, I apply the change in MVPD profits per subscriber (12 months * {{ }} per month) times the number of post-Transaction video subscribers ({{ }}) to get {{ }}. This calculation does not estimate the impact on divested subscribers.

The first is the one I discussed above and have addressed in my previous declarations. Comcast would have greater bargaining power as a result of controlling access to a larger share of the nation's broadband subscribers. The price-size evidence described above indicates that the combination with Time Warner Cable would likely result in a significant increase in bargaining power over OVDs.

Professor Carlton's framework for establishing the terminating access fees that would eliminate the incentive leads to a second merger-specific effect on prices. The merged entity would likely secure lower programming costs as a result of its larger size, and realize higher profits because it does not face competitive pressure to pass those lower costs on to its customers. As a result, in the absence of competition from OVDs, Comcast's MVPD profit margin would likely be greater following the merger. It would therefore have more profits at risk and seek compensation for those higher profits under Professor Carlton's theory.

One estimate of the increase in access fees that Comcast could charge as a result of its increased size from the merger is, based on the Tobit regressions discussed earlier, {{ }} percent of the pre-merger Comcast fee.⁷⁴ Taking the assumption that Comcast would lose 50 percent of its video profits, which would result in an access fee of {{ }} per subscriber per

⁷⁴ The {{ }} percent is the estimated increase in Comcast's terminating access fees based on my analysis of the Netflix interconnection agreements. This estimate is based on access fees that larger ISPs are able to OVDs for access to broadband customers. The access fee described in this section is based on the loss of MVPD profits. The MVPD profits come from the ability of larger MVPDs to implicitly charge for access to MVPD customers. The difference between the programming fees paid by larger versus smaller MVPDs can be viewed as an implicit fee for access that the larger MVPDs are able to charge. Thus, while the estimate of a {{ }} percent increase in the Comcast fee arises in a different context from the access fees discussed in this section, both types of fees are for access to a cable company's customers for the purpose of distributing video content and are therefore sufficiently similar I use the {{ }} percent as a starting point. To be conservative, I also consider a range of price increases substantially below {{ }} percent. As I show below, the impact of the merger is substantial throughout the entire range. Note that this is this estimate of the access price estimate is lower than the {{ }} percent I reference above, which is an estimate of the price increase for Comcast and Time Warner Cable taken together. The price increase starting from the Comcast pre-merger price is {{ }}

}}. See Evans Declaration II, ¶ 139.

month, an increase of {{ }} percent would be about an additional {{ }} per MVPD subscriber per month. With respect to the Time Warner Cable subscribers, if we assume that before the merger Time Warner Cable was receiving no more than Comcast was in video profit per subscriber and that after the merger the combined entity would charge the same access fee on former Time Warner Cable subscribers as on former Comcast subscribers, then the additional fee resulting from the merger applicable to the former Time Warner Cable subscribers would be at least as large as the {{ }} per subscriber per month I have calculated for the Comcast subscribers.

Under these assumptions, the merger would increase annual terminating access fees of by {{ }} in 2022.⁷⁵ In addition to a {{ }} percent increase I also consider smaller increases of 10, 25 percent and 50 percent for comparison, which result in increases of the annual terminating access fee of {{ }}, {{ }} and {{ }} respectively.⁷⁶ The present discounted value of these increases over 10 years, from 2022 to 2031, are {{ }} (10 percent increase), {{ }} (25 percent increase), {{ }} (50 percent increase), and {{ }} ({{ }} percent increase) in 2022 dollars.

⁷⁵ This is based on the post-merger entity having 30.0 million MVPD customers (accounting for divestitures).

⁷⁶ Even loss of only 25 percent of its MVPD profits, the impact of the merger on terminating access fees would still be substantial. The impact would be {{ }} assuming a 50 percent increase in fees resulting from the merger. With the loss of 75 percent of its MVPD profits, the impact of the merger would be {{ }} assuming a 50 percent increase in fees.

Table 2: Comcast's Terminating Access Fee Needed to Replace Lost MVPD Revenue

Increase in Terminating Access Fee	Terminating Access Fee (Before Increase)		Terminating Access Fee (After Increase)		Increase in Terminating Access Fee	Net Present Value of the Fee (After Increase) 2022-2031		Net Present Value of the Fee Increase 2022-2031	
10%	{{	}}	{{	}}	{{	}}	{{	}}	{{
25%	{{	}}	{{	}}	{{	}}	{{	}}	{{
50%	{{	}}	{{	}}	{{	}}	{{	}}	{{
{{ }}	{{	}}	{{	}}	{{	}}	{{	}}	{{

Therefore, if Professor Carlton were right that Comcast, in the face of losing MVPD profits, would enter into mutually beneficial contracts with OVDs rather than foreclose them, then Comcast would charge much greater terminating access fees than the approach based on the current Netflix contract described in the preceding section, and the merger would result in an increase in those annual fees that would be more be much greater than that based on the Netflix contract.⁷⁷

VI. Conclusion

Robust evidence shows that Comcast has significant market power over terminating access fees to OVDs because its subscribers have little or no choice but to use Comcast and because OVDs have no way to reach those subscribers but through Comcast's closed private network. Robust evidence also shows that larger ISPs charge significantly higher terminating access fees. Comcast would therefore likely raise terminating access fees significantly following the acquisition of Time Warner Cable. The absolute magnitude of the increase in terminating access fees following the merger is likely to be substantial given that the OVD

⁷⁷ Professor Carlton is not right though. His theoretical analysis is wrong as applied to the facts of this matter and is inconsistent with views stated by, and actions taken by, Comcast's senior management. See Evans Vertical Paper.

industry is growing rapidly and will likely account for a substantial portion of the time American households spend watching long-run videos using their wired ISPs.

* * *

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 April 6, 2015.

A handwritten signature in dark ink, appearing to read 'DSE', is positioned above a horizontal line.

David S. Evans
Chairman
Global Economics Group

EXHIBIT 7

**Public Interest Statement concerning the Merger
of Charter, Bright House, and Time Warner Cable**

Fiona Scott Morton

24 June 2015

I. Introduction

1. I am the Theodore Nierenberg Professor of Economics at the Yale School of Management, a Visiting Professor in the Economics Department of the University of Edinburgh, and a Senior Consultant at Charles River Associates. I was the Deputy Assistant Attorney General for Economic Analysis with the Antitrust Division of the US Department of Justice in 2011 and 2012. I have taught at the business schools of Stanford and the University of Chicago and served as Associate Dean for Faculty Development at Yale School of Management. I received a PhD in Economics from MIT in 1994.

2. At Yale University, I teach courses in the area of competitive strategy and competition economics and policy. My research is in the area of empirical Industrial Organization, the sub-field of microeconomics that includes competition economics and the study of firm behavior. I have authored or co-authored more than 20 articles in a variety of areas of economics. Those articles have been published in leading scholarly and professional journals, including the *American Economic Review*, the *RAND Journal of Economics*, the *Journal of Industrial Economics*, and the *Quarterly Journal of Economics*.

3. The economics of the proposed mergers among Charter Communications (“Charter”), Bright House Networks (“BHN”), and Time Warner Cable (“TWC”) promise substantial procompetitive benefits. Consumers will benefit from the procompetitive incentives and resources of the combined firm (“the post-merger firm” or “New Charter”). These consumer benefits, coupled with the lack of any anticompetitive effects resulting from the mergers, indicate the mergers are in the public interest.

4. In preparing this statement, I have reviewed documents from Charter, TWC and BHN, and interviewed executives from Charter and TWC. I rely on information from those documents and interviews below. As the merger review process continues, more information will become available, and I may update my findings.

II. The merging firms do not compete to provide MVPD, broadband or voice services

5. The mergers will not cause any harmful price effects in the markets for multichannel video programming distributor (“MVPD”), broadband, or voice services. Charter, BHN and TWC have *de minimis* overlap geographically, and therefore do not currently compete to provide MVPD, broadband or voice services to the same subscribers. Because there is *de minimis* geographic overlap between the merging firms, there can be no change in the post-merger firm’s

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incentives to unilaterally increase prices to subscribers.¹ The post-merger firm would not want to raise one of its prices and risk losing a subscriber with the hope of “recapturing” the subscriber with its merging partner’s products. There is no hope of such recapture without meaningful geographic overlap. Therefore, these mergers will not create a loss of competition MVPD, broadband or voice services.

III. Increased incentive to make fixed cost investments

6. New Charter will have an increased incentive to invest in new and upgraded technology and services, because the post-merger firm will have increased scale and scope relative to any of the stand-alone firms. This increased incentive is procompetitive and will lead New Charter to increase its investments. Those increased investments will benefit subscribers.

A. Increased scale

7. Based on the parties’ EOY 2014 subscriber counts, the increase in scale due to the transaction ranges from 58% to 842%, depending on the stand-alone firm and the service. See Table 1. For example, Charter has about 5 million broadband customers and BHN only about 2 million. The merger will join these two entities with TWC and increase TWC’s scale from 12.3 million to over 19 million broadband subscribers.

Table 1			
Subscriber Counts by Company and Service (000)			
End of 2014			
	Video	Broadband	Voice
Stand-alone companies			
Time Warner	10,992	12,253	5,607
Charter	4,293	5,072	2,619
Bright House	2,039	2,057	1,168
Post-merger Company	17,324	19,382	9,394
% increase over stand-alone			
Time Warner	58%	58%	68%
Charter	304%	282%	259%
Bright House	749%	842%	704%

Source: Parties data.

8. Suppose a new product is valuable to subscribers, such as a modem with faster transfer speeds in the home, and that subscribers are more willing to subscribe or to pay more for the improved speeds. A firm will have an incentive to provide this valuable product, if the

¹ In fact, cost savings and other synergies related to the merger will give the post-merger firm an incentive to lower prices. See my discussion below.

additional subscribers and revenue is enough to recover the cost of providing the product. The additional amount must cover both the variable and fixed costs of the product. Variable costs are costs that increase with the number of subscribers. Part of the cost of the modem is likely variable—you need one modem for every subscriber and, as you increase subscribers, you will increase the number of modems you need. But part of the cost of the modem is also fixed. The investment in the design of the modem, for example, is a fixed cost that does not vary as the number of subscribers increases. The additional revenue a firm can earn from a product is the per-subscriber incremental revenue times the number of subscribers. Holding all else constant, the additional revenue increases with the number of subscribers, while the fixed cost stays the same. The more subscribers there are, the more likely it is that the additional revenue outweighs the fixed cost. Thus, it is clear that more fixed cost investments will be undertaken as the number of subscribers, or scale, increases.²

9. The reason it makes sense to highlight the fixed costs of investment is because there are many important innovations whose costs are mostly fixed. Software is a good example; it costs the same amount to write the code no matter how many subscribers use it. When a large number of subscribers use the innovation, the per-subscriber fixed cost is very low. Therefore, it is much easier for the firm to earn a positive return on a software innovation when it has larger scale.

10. Because of the economic benefits of scale, New Charter will have an incentive to incur much larger fixed cost investments in order to create a new product or service than any of the stand-alone firms. The increased incentive to incur larger fixed cost investments will lead to the creation of new products and services that would not have been invested in by the stand-alone firms. These products and services will be valuable to subscribers and will make the combined firm's products more attractive and competitive with substitute products.

² A more formal exposition of the principle that a larger scale will lead to more fixed investment can be based on the classic Dorfman-Steiner Model. See Dorfman, Robert, and Peter O. Steiner, "Optimal Advertising and Optimal Quality," *American Economic Review* 44, 826-36 (1954).

11. For example, consider the fixed costs associated with Charter's Spectrum Guide shown in the table below.³

[BEGIN HIGHLY CONFIDENTIAL]

Spectrum Guide Deployment Cost per Sub

SPECTRUM GUIDE – FIXED CAPEX

(\$ in Millions)

	2014	2015	Total Charter Cost	TWC/BHN Development	Total Cost
Total					

Video Customers	Cost per Sub
Charter	4.3M
TWC	11.0M
BHN	2.0M
Total	17.3M

Cost/sub declines with scale



Assumptions:

1. Variable Returns determined by Charter not included
2. Fixed subscriber numbers used from the 6/2015 market research survey

Charter

[END HIGHLY CONFIDENTIAL]

12. According to this analysis from Charter, Charter will invest more than [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] in fixed product and network operations costs during 2014 and 2015 in order to deploy its new cloud-based Spectrum Guide to Charter subscribers. Allocated over Charter's approximately 4.3 million video subscribers, that [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] translates to [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] per subscriber. Charter estimates that it would cost an additional [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] to enable TWC and BHN set-top boxes to communicate with the Spectrum Guide. Nonetheless, the additional subscribers from TWC and BHN will dramatically reduce the per subscriber cost down to [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. This analysis illustrates the significantly lower per subscriber cost of a fixed investment for the post-merger firm compared to the stand-alone firms. Because the per-subscriber cost is so much lower, New Charter will have an increased incentive to make fixed investments in products like the Spectrum Guide.

13. Some of the products and services that New Charter will invest in will create new or increased competition in adjacent markets. For example, the post-merger firm will have an

³ See <Spectrum Guide Cost Comparison> received 6/17/2015.

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increased incentive to invest in WiFi technology and deployments that will allow it to compete on a facilities basis with current cellular providers. WiFi provides customers alternative access to data services for tablets and other devices from those offered by cellular providers. One potential technology called Home as a Hotspot makes home wireless routers act as wireless hotspots, enabling customers to easily get online from locations away from their own homes. In combination with New Charter's increasing deployment of out-of-home WiFi, this would create a robust WiFi network available for millions of customers.

14. There are many examples of fixed cost investments that the stand-alone firms have chosen not to make due to lack of scale. For example, all three firms cite a lack of scale as a reason for having smaller research and development teams. With more scale, the incentive to increase the size of those teams will increase. TWC, which is the largest of the stand-alone firms, has delayed investments in:

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- ;
- ;
- ;
- ;
- ;
- ; and
- 4

[END HIGHLY CONFIDENTIAL]

15. Similarly, Charter reports that if it had more scale over which to spread development costs it would have been able to:

[BEGIN HIGHLY CONFIDENTIAL]

- ;
-

5

⁴ Based on input from Peter Stern, Executive Vice President and Chief Product, People and Strategy Officer for TWC, provided June 7, 2015.

⁵ Based on input from Richard DiGeronimo, Executive Vice President of Product and Strategy for Charter, provided June 9, 2015.

[END HIGHLY CONFIDENTIAL]

16. With the increased scale, the post-merger firm will be more likely to recover the costs of all of these investments, and is therefore more likely to make them promptly. The result will be higher quality services for subscribers.

B. *Increased geographic scope*

17. Along with increased scale, the post-merger firm will have increased geographic scope. Its increased geographic scope will make certain types of investments more efficient. For example, New Charter will have an increased incentive to invest in attracting and maintaining its subscribers using mass market advertising. Because mass market advertising like television ads are purchased for an entire DMA, the value of the mass market advertising to New Charter increases as New Charter's geographic coverage within a DMA increases. New Charter will be more likely to spend resources using mass marketing to attract and maintain its subscribers because each advertisement will reach a larger number of subscribers or potential subscribers.

18. While other providers, like DirecTV, DISH, AT&T, Verizon, and others, also compete as MVPDs within different DMAs, cable multiple systems operators ("cable MSOs") serve virtually non-overlapping regions. Because their regions are virtually non-overlapping, a higher share of cable MSO subscribers serves as excellent proxy for a cable MSO's breadth of geographic coverage within a DMA. For example, in Q1 2015 Charter accounted for approximately 14% of the cable MSO video subscribers in the Los Angeles DMA, TWC for 73%, and BHN for none. The post-merger New Charter would serve 87% of cable MSO video subscribers in the Los Angeles DMA.⁶ Table 2 illustrates for five large DMAs how post-merger New Charter will create wide geographic coverage. In fact, I understand that today mass market advertising is efficient for only about 50% of Charter subscribers, while it will be efficient for 90% of the post-merger firm's subscribers.⁷

⁶ But note that the post-merger firm would only serve 34% of all MVPD subscribers in the Los Angeles DMA. Other providers like DirecTV, DISH, Verizon, and AT&T would serve 24%, 16%, 12%, and 9% respectively.

⁷ Based on input from Jonathan Hargis, Executive Vice President and Chief Marketing Officer for Charter, provided June 3, 2015.

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Table 2
Summary of Cable MSO and Other MVPD Subscriber Clustering
 Five Large DMAs where Merger of Charter, TWC, and Bright House Creates Clustering

	Los Angeles, CA	Dallas-Ft. Worth, TX	Charlotte, NC	Raleigh-Durham (Fayetteville), NC	Milwaukee, WI
DMA Rank by Total HHS	2	5	23	25	36
Number of Subscribers					
Time Warner Cable	1,277,907	309,688	361,935	405,770	296,920
Charter	247,454	107,385	80,940	30,119	68,845
Bright House	0	0	0	0	0
Charter - TWC	1,525,361	417,073	442,875	435,889	365,765
Other Cable	233,264	76,040	59,595	26,334	820
Total Cable	1,758,625	493,113	502,470	462,223	366,585
Other MVPD					
DirecTV	1,094,248	520,648	213,493	221,118	143,694
DISH	707,169	344,628	149,064	152,018	96,353
AT&T U-Verse	396,228	461,313	69,597	50,186	130,847
Verizon FiOS	520,005	253,291	NA	NA	NA
Total MVPD	4,476,275	2,072,993	934,624	885,545	737,479
Share of Cable Subscribers					
Time Warner Cable	72.7%	62.8%	72.0%	87.8%	81.0%
Charter	14.1%	21.8%	16.1%	6.5%	18.8%
Bright House	0.0%	0.0%	0.0%	0.0%	0.0%
Charter - TWC	86.7%	84.6%	88.1%	94.3%	99.8%
Share of Total MVPD Subscribers					
Time Warner Cable	28.5%	14.9%	38.7%	45.8%	40.3%
Charter	5.5%	5.2%	8.7%	3.4%	9.3%
Bright House	0.0%	0.0%	0.0%	0.0%	0.0%
Charter - TWC	34.1%	20.1%	47.4%	49.2%	49.6%

Source: SNL-Kagan, 2015 Q1.

19. The post-merger firm's increase in geographic scope will make the per-subscriber advertising cost of mass market advertising fall. As such, the post-merger firm will have an increased incentive to advertise, which will intensify competition with rivals and benefit consumers.

20. Although not related to the firm's incentive to invest, another benefit of increased geographic scope is that the post-merger firm will be better able to serve multi-location businesses. Businesses with locations that currently span a combination of the Charter, TWC and BHN networks will be better served by the post-merger firm, because all of the business's locations will be served by a single provider rather than two or three separate providers. Thus, these multi-location businesses will gain a "one-stop-shopping" benefit that will reduce their costs.⁸ A similar benefit will accrue to advertisers that seek to buy advertising on cable TV.

⁸ Note that this benefit does not have a potential countervailing harm, as there is no reduction in competition for subscribers from the merger. See § II above.

Post-merger, advertisers that want to reach subscribers spanning a combination of Charter, TWC, or BHN networks will be able to reach those subscribers by buying ads from a single cable MSO rather than two or three cable MSOs.

IV. Lower marginal costs

21. Because of its increased scale, the post-merger firm's marginal cost will decrease. The post-merger firm's marginal cost will decrease because it will be purchasing higher volumes of inputs like co-axial cable, construction services, set-top boxes, and modems. These higher volumes will allow the post-merger firm's suppliers to achieve economies of scale and their associated cost savings. A portion of these cost savings will likely be passed through to the post-merger firm in the form of lower input prices. In turn, the post-merger firm will likely pass through a portion of the savings associated with lower input prices to its subscribers.⁹ Thus, both suppliers and subscribers will benefit from the post-merger firm's increased scale.

22. Charter's World Box is also a likely source of reduced marginal cost. For example, I understand that TWC currently pays [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] plus [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] in cableCARD fees for an HD set-top box.¹⁰ Charter currently pays [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] plus [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] in platform fees for a World Box HD set-top box that does not need a cableCARD because it uses downloadable security.¹¹ Due to the difference between the cableCARD fees and platform fees, the World Box is less costly than the TWC box by [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. Based on these numbers, if New Charter uses the World Box instead of TWC's box, it will save [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] on each box, which will result in a reduction of the marginal cost to serve video subscribers.

23. I also understand that TWC has lower programming costs than Charter. Because programming costs are typically paid on a per-subscriber basis, if New Charter can lower its programming costs for current Charter subscribers by purchasing all of its programming under TWC's terms, it will reduce New Charter's marginal cost per video subscriber. Part of that reduction in cost would likely be passed through to subscribers in the form of lower prices.

V. Increased speed as a consequence of scale

24. The post-merger firm will have an increased incentive to invest in its network to the benefit of subscribers as described above. A significant aspect of these investments in fiber, software, and hardware is the increased speed that will become available to the post-merger

⁹ A profit maximizing firm that faces a downward sloping demand curve will pass through a portion of the marginal cost savings in the form of lower prices. If the demand curve is linear, the firm will pass through 50% of the marginal cost savings.

¹⁰ See <STB purchasing request 0615115 (2).xlsx>.

¹¹ See <World Box and DCAS DRM Summary_2014-07-17_FINAL.pdf>.

firm's high speed data ("HSD" or "broadband") subscribers. See Table 3 for counts of HSD subscribers by Internet Service Provider ("ISP").

Table 3
High Speed Data Subscribers in U.S. 2014 Q4

	Subscribers	Shares
	Total High Speed Data ¹	Total High Speed Data
1 Comcast	21,962,000	23.6%
Pro-Forma New Charter	19,443,462	20.9%
2 AT&T	16,028,000	17.3%
3 Time Warner Cable	12,253,000	13.2%
4 Verizon Communications	9,205,000	9.9%
5 CenturyLink	6,082,000	6.5%
6 Charter Communications	5,072,000	5.5%
7 Cox Communications	4,841,923	5.2%
8 Cablevision	2,760,000	3.0%
9 Bright House Networks	2,118,462	2.3%
10 Suddenlink	1,212,800	1.3%
Other Operators	11,364,815	12.2%
Total U.S.	92,900,000	100%

1 - SNL Kagan. Total excludes wireless and satellite high speed data subscribers. Figures include commercial customers.

25. Investment in broadband speed is widespread in the industry. EOY 2014 broadband subscriber counts are shown in Table 3. I understand that all major ISPs are investing in improving their networks and attracting more broadband subscribers. For example, companies like Google, AT&T, Cox, CenturyLink and others have announced their intention to invest in gigabit Internet services.¹² Thus, while the merging firms are increasing their number of high speed subscribers, the total number of high speed subscribers is also increasing rapidly, which makes HSD shares a moving target.

26. The increasing number of subscribers with faster broadband speeds does indicate a clear conclusion: investments in complements to speed will become more profitable and more prevalent over time. Complements such as content itself, software interfaces, and mobile applications will all be faster, higher quality, and therefore in higher demand by subscribers as speeds increase. ISPs will want to sell subscribers services they demand, and will have an incentive to invest as described above. In particular, subscribers are likely to take advantage of speed by consuming more Online Video Distributor ("OVD") services. The primary rationale for such speed increases is to *facilitate* use of streaming video services. A credible signal of the post-merger firm's strategy to enhance entry of OVDs is therefore its investment in broadband speed.

¹² See, for example, <http://www.cnet.com/news/race-to-gigabit-internet-service-takes-off/>.

27. Note that the value of increased broadband speed to subscribers is almost certainly enormous, and greatly exceeds any amount subscribers are currently willing to pay for increased speed. The next generation's Amazon, Google, eBay, or Facebook may well arise because of, or benefit from, increased broadband speeds. The value of increased speed will likely be closely tied to the value of new Internet innovations that require speed. With more investment in speed, innovation is more likely to occur faster.

VI. Partnering for Innovation

28. The post-merger firm's larger scale will make it a better partner for innovators. In the same way that the post-merger firm's larger scale increases its incentives to invest in new products and services, it also increases the incentive and ability of the firm to partner with innovators in vertically related markets. For example, by giving an innovator access to its larger base of subscribers, the post-merger firm is more likely to give the innovator an incentive to invest. With access to a larger base of subscribers, the innovator is more likely to gain the scale needed to make a fixed cost investment profitable. An innovator may even be able to achieve the scale it requires for profitability from the post-merger firm alone. This would reduce any uncertainty about its ability to profitably enter and would likely reduce its cost of entering.

29. First, note that there is no required scale for innovation. Some innovations may be profitable with very few subscribers, and others may be profitable only with very many subscribers. One of the benefits of the mergers is that New Charter will become an additional option for innovators that need a large scale for viable entry. And not all innovators need partnership with broadband providers. In fact, numerous edge providers of many types offer content that is agnostic to the identity of the broadband provider. For example, the browser based streaming offerings of YouTube do not require special broadband provider integration. The innovations where partnering benefits the innovator include offerings where the broadband provider can enhance the customer's experience and thus improve the innovator's product. For example, suppose an innovator needs to have access to at least 15-20% of broadband subscribers to justify its fixed cost of investment. Today, only Comcast or AT&T can provide that scale of access by itself. See Table 3. In the past, without either one of Comcast or AT&T as a partner to, for example, optimize a technology to work on a particular cable system, an innovator would have to spend the fixed costs to negotiate and optimize with multiple broadband providers to reach 15-20% of subscribers. This would increase its cost of achieving that initial scale and discourage entry. New Charter will provide another option for entrants that desire a strong partner with scale. Furthermore, Comcast and AT&T are understandably less likely to support innovation that either does not fit their technology (i.e., AT&T's DSL) or their strategic priorities. For example, Comcast is less likely to support OVDs with programming that competes with NBCU programming.

30. Because the post-merger firm will increase the options for innovators that need this type of scale, it will reduce the cost to innovators. The post-merger firm will compete with providers like Comcast, AT&T and others to sponsor the innovation that is best for them and their subscribers. Because the post-merger firm does not have the same incentives as these other providers, this competition to sponsor innovators will lead to a larger variety of products for subscribers.

31. I should also note that growth in broadband subscribers across providers continually improves the options for innovators. As different providers grow, they become more likely to have the scale to support innovation on their own, or to be part of a group of providers that support an innovation.

32. An example of the type of innovation that New Charter will support comes from Charter's current effort to include OVDs on its Spectrum Guide. The Charter Spectrum Guide is a cloud-based system that presents Charter's video service to its subscribers. It includes a program grid that allows subscribers to navigate directly to programs. Charter designed the Spectrum Guide so that it could be expanded to include OVDs in the program grid. Charter is actively working with OVDs, including some of the largest, national OVDs, to include their programming applications within the Charter program grid. This would allow subscribers to access the OVD programming directly from the grid rather than via a separate Internet session using a PC, mobile phone, tablet or other device. Charter believes this will improve the overall experience for its subscribers, and also for OVD subscribers.

33. It is not costless for OVDs to access subscribers of different networks. The OVDs need to design applications that can run on the device the subscriber wants to use. That could be a computer or laptop, but it could also be an application on the MSO's set-top boxes and network. Designing such an application is a fixed cost for the OVD. Charter's Spectrum Guide and World Box lower these costs for the OVD. Currently, if an OVD wanted to build an application for the three distinct Charter, TWC, and BHN platforms, then the OVD would have to develop three distinct applications, increasing the fixed development costs. With New Charter, an OVD would only have to develop the application once. And, New Charter's increased scale, as discussed above, lowers the per subscriber costs even more. This means that New Charter will be an even more desirable OVD partner in the future than any of the stand-alone companies are now.

34. I should note that New Charter's increased scale will not likely give it the ability to foreclose innovators. For example, almost 70 million or 80% of broadband subscribers will be served by firms other than New Charter. Unless an innovator required access to more 70 million broadband subscribers to reach its minimum viable scale, the post-merger firm would not have the ability to foreclose. To put that in context, Netflix launched its video streaming service in 2007 when it had about 7.5 million subscribers, a number one-tenth that size.¹³ Thus, it is very unlikely that the post-merger firm would have the ability to foreclose entry.

VII. Improved access for OVDs

35. A significant concern about the recently proposed Comcast / TWC merger was that Comcast would have an increased incentive to foreclose OVDs. One concern was that by blocking OVDs Comcast could give an advantage to its NBCU unit. Another concern was that Comcast's desire to protect MVPD revenue would create an incentive to foreclose OVDs.

¹³ See "A brief history of the company that revolutionized watching of movies and TV shows," available at

<https://pr.netflix.com/WebClient/loginPageSalesNetWorksAction.do?contentGroupId=10477>.

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36. However, New Charter has different incentives that favor rather than harm OVDs. New Charter will not have a similar incentive to foreclose OVDs and other vertically related providers. Unlike Comcast, New Charter will not own substantial interests in nationwide broadcast and cable programming, while its technology is relative inexpensive for both OVDs and consumers.¹⁴ Because it will not have substantial interests in these vertically related industries, New Charter will not have an incentive to foreclose firms in those industries from access to its subscribers. For example, because New Charter will not have an interest in the production of nationwide video programming, it will not have an incentive to prevent rival networks or OVDs from being distributed to its subscribers in order to favor its own video programming.

37. To the contrary, New Charter will have an increased incentive and ability to promote OVDs and other edge providers in order to encourage usage that expands subscribership to its broadband network. In addition, given that the merging parties are experiencing growth in broadband subscribers as video subscribers decline—and given that each firm's profitability and future success depends far more on its broadband business than its video business—the combined firm will not have any incentive to take any action that harms the attractiveness of broadband to its consumers.

38. To determine if New Charter will have an incentive to foreclose OVDs, one needs to compare the benefits and losses New Charter would get from foreclosure. The benefits will depend on whether OVDs offer services that are substitutes or complements for New Charter services. Is a subscriber that purchases OVD services like Netflix more or less likely to purchase video services from an MVPD? I show below that OVDs are often a complement to MVPD video services, and therefore that it is unlikely that a non-vertically integrated MVPD will have an incentive to foreclose OVDs. In fact, even if OVD services are substitutes for MVPD services, it is unlikely that MVPDs like New Charter will have an incentive to foreclose.

A. *New Charter Will Not Foreclose OVD Providers*

39. Suppose hypothetically that New Charter could somehow refuse OVDs access to its broadband network, making OVDs unavailable to its broadband subscribers. Suppose further that OVD services are substitutes for traditional video services provided by MVPDs. Under these assumptions, if New Charter chose to foreclose OVDs, some of its broadband subscribers would purchase more traditional video services from New Charter, which would be a gain for New Charter. Other broadband subscribers would switch to an ISP that did not foreclose OVD services (such as rival ISP / MVPDs like AT&T/DirecTV, or Verizon), which would be a loss for New Charter. If the gain from the subscribers that stay with New Charter after foreclosure is less than the loss from the subscribers that leave (or that chose not to subscribe in the first place), then the foreclosure would be unprofitable and New Charter would not have an incentive to foreclose. The keys to understanding the incentive to foreclose, then, are the incremental profit

¹⁴ I understand that TWC has a partial interest in iN Demand and the MLB Network. I understand that Liberty Broadband will hold a minority interest in New Charter, and I understand John Malone holds a minority interest in Liberty Broadband. Because John Malone will not have a controlling interest, he will not have the ability to require New Charter to favor any interests he might have in video programming.

margins generated by the different services subscribers choose, and the likely proportions of subscribers switching services versus buying more services when OVDs are not available.¹⁵

i. Single Play subscribers

40. Broadband is an important and growing service for each of the current merging parties and will remain so for New Charter. Table 1 helps to indicate this importance. Combined, the three firms have about 17 million basic video subscribers compared to about 19 million broadband subscribers. In Q1 2013, the combined video services had roughly 0.9 million more subscribers than broadband services.¹⁶ By Q1 2015, broadband services exceeded video services by roughly 2.6 million subscribers.¹⁷ The tilt of subscribers towards broadband is likely to continue into the future.

41. Broadband services are incrementally more profitable on average than video services and require less capital investment for new connections. Recent trends suggest that broadband will only become more profitable relative to video. Broadband revenues have grown faster than the operating costs of broadband services. Between Q1 2014 and Q1 2015, the broadband revenue per subscriber of the top three cable MSOs (Comcast, TWC, and Charter) grew 11.5%, while direct variable cost per subscriber rose only 7.4%.¹⁸ In contrast, over the same period, video revenue per subscriber grew only 1.5%, while direct variable cost per subscriber rose 5.7%. The primary driver in the declining gross margin of cable video service is programming, which is increasingly costly per subscriber.

42. My analysis of incentives below center on “gross margins” earned from subscribers. In general, gross margins are revenues minus the variable costs of producing the goods sold. They measure the amount a company retains from sales that it can use to offset fixed costs, those that are not directly attributed to producing individual units of the goods. They thus do not include so-called “indirect” costs such as marketing and sales forces, service support, and other administrative and fixed costs. These margins also exclude the impact of depreciation and amortization charges associated with capitalized expenditures that are necessary to deliver these services, including set-top boxes and modems, research and development costs and the investments needed to extend or maintain network infrastructure. These capital costs can be

¹⁵ Below I estimate New Charter’s short run gross profit margins for different sets of subscribers based on the high-level financial information from the parties that I have reviewed. As the merger review process moves forward, I might update my findings and assumptions as more detailed data becomes available.

¹⁶ SNL Kagan reports that in Q1 2013 there were 18.3 million video and 17.4 million broadband subscribers of the combined MSOs Charter, TWC, and Bright House. The difference was approximately 876,000.

¹⁷ SNL Kagan reports that in Q1 2015 there were 17.3 million video and 20.0 million broadband subscribers of the combined MSOs Charter, TWC, and Bright House. The difference was approximately 2.6 million.

¹⁸ “Cable video margin falls precipitously to all-time low in Q1,” SNL Kagan Multichannel Market Trends, May 20, 2015.

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significant such as the over \$5.5 billion Charter has invested in capital expenditures such as shared technology and infrastructure since 2012. As such, the gross margins are not the same as a company's earnings or other measures of net profits, and they typically exceed—often dramatically exceed—those other measures.

43. Table 4 below shows the average revenue per user and average gross margins made by TWC, Charter, and BHN, and also the weighted averages that reflect what New Charter might earn in the near future.¹⁹ These averages are across all the subscribers that purchase single play, double play, and triple play services.²⁰ The average revenues are highest for video services.²¹ However, direct expenses, especially with the programming fees that are associated with it, are higher for video services.²² Consequently, the highest gross margins are not made on video services, but on broadband services.

¹⁹ Bright House gross margins after direct expenses by product were not available. For the purposes of analysis, Bright House gross margins as a percentage of revenue are assumed to match the weighted average across TWC and Charter. The numbers in Table 4 are from normal course financial reports from TWC, Charter, and Bright House for full year 2014.

²⁰ Double play and triple play services are bundles of video, broadband and voice services that generally have a discounted price relative to the price of the unbundled services.

²¹ The video average revenues shown in Table 4 include per video subscriber average revenues from advertising. For TWC and Charter, these revenues were around [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] per video subscriber.

²² Direct expenses for video include advertising expenses related to commissions and other expenses associated with third-party sales of advertising.

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Table 4

Average Revenue and Gross Margins

Residential Customers, Full Year 2014

	Video ¹	Broadband	Phone
Average Revenue Per User (ARPU)			
TWC	\$		
Charter	\$		
Bright House	\$		
Weighted Avg	\$		
Gross Margin Percentage after Direct Expenses ²			
TWC			
Charter			
Bright House ³			
Average Gross Margin			
TWC	\$		
Charter	\$		
Bright House	\$		
Weighted Avg	\$		

1 - Video revenues and margins include both video service and advertising, which is dependent on video subscribership.

2 - Direct expenses for video include programming costs, regulatory fees, and video franchise fees. Advertising expenses include commissions and costs of advertising sold.

3 - Bright House advertising revenue and gross margins by product were unavailable.

Figures reflect weighted average of TWC and Charter margins.

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44. Using the estimates of the gross margins in Table 4, consider a simple model of the gains and losses to New Charter that would be associated with any single play broadband subscribers affected by foreclosure. As Table 4 illustrates, the average gross margin for broadband services is [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL], while the average gross margin for video services is [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. Suppose that, in response to OVD foreclosure, some of New Charter's single play broadband customers chose to purchase video services from New Charter. Under that assumption, New Charter would gain an average gross margin of [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].²³ However, some

²³ This is a conservative assumption regarding gross margins for at least two reasons. First, there are one-time-costs for subscribers that are not accounted for in these gross margins. For example, the costs of installation and of a set-top-box are not included in the direct costs, and are therefore not accounted for in these gross margins. Accounting for these costs would reduce the calculated margins. Second, it is likely that a current broadband subscriber would purchase a bundle of broadband and video services and get a discounted price. The [BEGIN HIGHLY

of New Charter's single play broadband subscribers would switch to a different ISP, one that didn't foreclose OVDs. For each subscriber that switched to another ISP, New Charter would lose an average gross margin of [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. And some single play broadband subscribers would not change their purchases at all. Based on this simple analysis, for foreclosure to be profitable for New Charter amongst single play broadband customers, [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] subscribers would have to purchase video services for every [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] subscribers that decided to switch to another ISP [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].²⁴

ii. *Double and Triple Play subscribers*

45. There is potentially even more at stake for New Charter than just the profits available from single play broadband subscribers. The fact is many subscribers often purchase more than just broadband services. For double play subscribers that already purchase both broadband and video services, New Charter has more to lose and less to gain from foreclosing OVDs. For each of these subscribers that chose to leave New Charter for an alternative ISP, New Charter would lose the combined video and broadband average margin. In December 2014, the average revenue for Charter for a video and broadband double play subscriber was [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL], including average advertising revenue per subscriber.²⁵ Based on direct expenses used to calculate Table 4, one can estimate that the average margin for a combined video and broadband customer was [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].²⁶ The

[CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] margin is a blended margin across all types of products and is therefore higher than the margin New Charter earns on a subscriber with a bundle discount. For example, the currently advertised Charter TV Select video and Spectrum Internet bundle entails a \$10 per month discount from the prices of the individual services. Adjusting for this bundle discount, the [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] margin to be gained under foreclosure could be as low as [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. Charter bundles are shown, e.g., at <https://www.charter.com/browse/browse-bundles/bundles>.

²⁴ E.g., [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] roughly equals [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. If the ratio were smaller than [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL], foreclosure would not be profitable for New Charter amongst single play broadband subscribers.

²⁵ All bundle-related ARPU figures in paragraphs 45 and 46 are non-GAAP and recurring in nature for customers in their respective bundles. They exclude one-time charges and adjustments.

²⁶ The average direct expense can be calculated from Table 4 as the average revenue minus the average gross margin. For video (including advertising), this was [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL], while it was [BEGIN

loss would be even greater for triple play subscribers that currently purchase video, broadband, and voice. For those customers, New Charter would risk losing a combined average gross margin of [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].²⁷

46. For each of the double and triple play subscribers that chose to stay and purchase additional or upgraded video services, New Charter would gain very little. Indeed, among Triple Play customers that already have upgraded video service, there is likely little gain to be made from additional or upgraded service.²⁸ Among double play video and broadband subscribers, the gross margin Charter currently makes from upgraded video, for example, is less than [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].²⁹ Amongst double

[HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] for broadband. The potential margin loss would thus be [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL], reflecting the [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] average revenue minus the direct expenses of [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] for video and [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] for broadband.

²⁷ Similar to the calculation for video and broadband double play customers, this margin is calculated as the average revenue from double play customers minus the average direct expenses for each service calculated from Table 4. In December 2014, Charter's average revenue per triple play customer was [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. Based on Table 4, the average direct expense for a triple play customer was [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] reflecting [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] for video (including advertising), [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] for broadband, and [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] for voice. The average gross margin for a triple play customer is thus [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].

²⁸ It is possible that these subscribers might purchase more VOD services. I do not currently have the information necessary to evaluate this potential effect.

²⁹ Specific information on the gross margins earned on upgraded video service is unavailable due to the wide array of options provided by the parties. For the purposes of this illustrative calculation, consider the three basic video packages offered by Charter: Select, Silver, and Gold. Charter currently advertises the Silver upgrade for an additional \$20 and Gold for an additional \$40 over Select. At the end of 2014, Charter had [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] Silver and Gold video tier subscribers, [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of which were Silver. The weighted average video upgrade was then priced [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. Charter incurred approximately [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] per month in direct expenses, or an average of [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] per subscriber, for the

play video and broadband subscribers, then, for foreclosure to be profitable roughly [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] subscribers would have to purchase upgraded video services for every [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] that switched to a different provider.³⁰

iii. *Subscriber mix*

47. If New Charter foreclosed access to OVDs, it would affect all its broadband subscribers, not just those that purchased a particular bundle.³¹ The two prior sections show that an important factor in determining New Charter's incentives to foreclose is the mix of broadband subscribers that take multiple services. That mix will determine what is at risk for New Charter. The following tables present information about the subscriber mix that I have used to estimate the average margin at risk for New Charter's broadband subscribers.

48. Table 5 shows the mix of subscribers across bundled and single play services for TWC, Charter, and BHN as of the end of December 2014. The subscriber mix is similar across TWC and Charter companies. BHN broadband subscribers are significantly less likely to purchase broadband alone. For all three companies, most subscribers purchase bundles. Around [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of subscribers purchase a triple play bundle, while [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] purchase either a double or triple play bundle.

[BEGIN HIGHLY CONFIDENTIAL]

additional video tier and premium video programming to serve its [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] higher tier video customers (including approximately [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] ethnic and other non-standard tier subscribers). This results in a margin of [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] per upgraded subscriber for the upgrade portion of their video service. Note this is not the average gross margin across all subscribers, since [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of Charter's [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] video subscribers already had the Silver and Gold video tiers. The average gross margin for upgraded service across all video subscribers is [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL], reflecting the [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] margin times the [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of video subscribers that do not already have upgraded service.

³⁰ The level of lost customers that make the foreclosure unprofitable is the ratio of lost to gained margin [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] which is roughly [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].

³¹ Note that subscribers need broadband services to access OVDs.

Table 5

Charter, Time Warner, and Bright House Customer Relationships

End of December 2014

	Video	Broadband	Phone	Share of Subscribers				Subscribers (000)			
				TWC	Charter	BHN	New Charter	TWC	Charter	BHN	New Charter
Triple Play	1	1	1	29.2%	32.8%						
Double Plays											
Video/Broadband	1	1									
Broadband/Phone		1	1								
Video/Phone	1		1								
Single Plays											
Video Only	1										
Broadband Only		1									
Phone Only			1								
Total				100.0%	100.0%	100.0%	100.0%	15,198	5,840		

Source: Time Warner, Charter, and Bright House reported totals.

[END HIGHLY CONFIDENTIAL]

Notably, broadband customers typically subscribe to more than just the broadband service. Only a little over [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of broadband customers subscribe only to the broadband service. Table 6 shows the breakout of broadband customers across each bundles type.

[BEGIN HIGHLY CONFIDENTIAL]

Table 6

Broadband Customer Bundles

End of year 2014

	All Subscribers
	Share of
	Subscribers
	Subs
Triple Play	
Video/Broadband	
Broadband/Phone	
Broadband Only	
Total Broadband	100.0%

[END HIGHLY CONFIDENTIAL]

iv. *Average margins across all broadband subscribers*

49. Table 7 summarizes the average revenues and average gross margins by broadband bundle for the 19 million New Charter broadband subscribers shown in Table 6. Since subscribers need broadband services to access OVDs, this is the set of subscribers that might be affected by OVD foreclosure. Larger bundles include more services and have higher average

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revenues. The average direct expenses per subscriber reflect those used in calculation of Table 4 and tallied to include the average direct expense of each service included in the bundle.³²

[BEGIN HIGHLY CONFIDENTIAL]

Table 7			
Charter Average Gross Margin by Broadband Bundle			
	Avg. Revenue	Avg. Direct	Avg. Gross
	per sub ¹	Expense per sub ²	margin per sub
Triple Play			
Video/Broadband			
Broadband/Phone			
Broadband Only			

1 - Reflects Charter average revenues in December 2014.

Video revenues include 2014 average advertising revenue per subscriber.

Excludes installation and bulk housing agreement fees.

2 - Reflects Charter average direct expenses per subscriber for full year 2014.

Excludes installation costs.

[END HIGHLY CONFIDENTIAL]

The gross margin by service bundle helps define the amounts New Charter stands to gain or lose in the event of OVD foreclosure. Table 8 combines the breakdown of broadband subscribers by bundle in Table 6 with the gross margins by broadband bundle in Table 7. For each broadband bundle, Table 8 shows the margin New Charter would lose if the subscriber switched to a rival ISP, and the margin it would gain if the subscriber increased its purchases of video services.³³ These margins are labeled “Loss” and “Gain” under “Impact of Foreclosure.”

[BEGIN HIGHLY CONFIDENTIAL]

³² Direct expenses in Table 7 are based on the full year 2014 figures underlying Table 4. This is conservative. Since December 2014 average direct expenses were approximately **[BEGIN HIGHLY CONFIDENTIAL]** **[END HIGHLY CONFIDENTIAL]** higher than the full year average, gross margins based solely on December 2014 would be slightly lower.

³³ The margins for Loss and Gain in Table 8 are based on the figures shown in Table 7. Losses reflect the entire gross margin per subscriber for each broadband bundle. The potential gains entail calculation of the incremental margin from adding or upgrading bundled video service. For example, the **[BEGIN HIGHLY CONFIDENTIAL]** **[END HIGHLY CONFIDENTIAL]** margin gain for broadband-only subscribers is the **[BEGIN HIGHLY CONFIDENTIAL]** **[END HIGHLY CONFIDENTIAL]** video and broadband double play margin gained minus the **[BEGIN HIGHLY CONFIDENTIAL]** **[END HIGHLY CONFIDENTIAL]** broadband-only margin that was already being received. For existing video and broadband double and triple play customers, the gain is not that they begin video service but instead upgrade to higher video tiers. The average gross margin for upgraded video service was described in a preceding section.

Table 8

Incentive to Foreclose OVDs by Broadband Bundle

	All Subscribers		Netflix Subscribers	Impact of Foreclosure	
	Subscribers	Share of Subs	Subscribers	Share of Subs	Loss Gain
Triple Play					
Video/Broadband					
Broadband/Phone					
Broadband Only					
Total Broadband		100.0%		100.0%	

[END HIGHLY CONFIDENTIAL]

50. Note that many broadband subscribers do not watch online video and therefore would not be affected by OVD foreclosure. For example, according to a survey conducted for Charter in 2014, only about [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of broadband subscribers also subscribe to Netflix.³⁴ Charter's experience is comparable to the rest of the U.S. In Q4 2014, Netflix had 39.1 million U.S. streaming subscribers, which were only 42% of the total 92.9 million U.S. broadband subscribers.³⁵ Assume that subscribers that care about OVDs currently subscribe to Netflix, and that those that do not care about OVDs do not currently subscribe to Netflix. Only current Netflix subscribers, then, will be affected by foreclosure. Table 8 shows an estimate of the number of Netflix subscribers by bundle.

51. Based on the estimated number of Netflix subscribers, New Charter would lose [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] on average for every broadband subscriber that left New Charter, and would gain [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] on average for every broadband subscriber that increased its video purchases. See Table 9. This means that more than [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] subscribers would have to purchase upgraded video services for every [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] that switched to a different provider [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].³⁶ (Note that if I instead assume that all subscribers would be affected

³⁴ See, for example, General Product Meeting: Video On Demand Content Strategy, May 12th, 2014, p. 5. Assume that these penetration rates also apply to Netflix's penetration of TWC and BHN subscribers, and that Netflix has the same penetration amongst subscribers who purchase broadband and voice as those who only purchase broadband.

³⁵ SNL Kagan data.

³⁶ These estimates are conservative. Upgraded or new video service could come with additional installation costs associated with a "truck roll" (technician dispatched to do installation). Installation costs would net against the monthly gross margin gain in determining whether foreclosure was profitable. If these new or upgraded video subscribers did not stay with New Charter for long to pay off the installation costs plus the other losses, New Charter could actually lose money.

rather than just Netflix subscribers, the ratio would increase to [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].

[BEGIN HIGHLY CONFIDENTIAL]

Table 9
Overall Per Subscriber Impact of Foreclosure

	Loss	Gain	Ratio Loss to Gain
All Subscribers			
Netflix Subscribers			

[END HIGHLY CONFIDENTIAL]

B. New Charter would likely lose a significant number of subscribers if it foreclosed OVDs

52. The evidence suggests New Charter would lose a substantial number of profitable broadband subscribers if OVDs were foreclosed. Charter’s survey of subscribers found that consumers want more content than Charter provides. The survey showed that [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of consumers want more options for free programming to watch on demand and [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] want full past seasons of programming that can be “binge” watched.³⁷ OVDs are a source of this type of programming, and therefore access to OVDs increases consumer value for Charter broadband. If even a small percentage of these consumers switch away from New Charter in response to a foreclosure strategy, New Charter would be worse off.

53. Few surveys have directly asked consumers whether they would switch their broadband provider if OVDs were unavailable. One survey by Global Strategy Group (“GSG”) found that over 70% of broadband subscribers also subscribing to Netflix would switch if Netflix service were degraded.³⁸ This implies approximately 27% of total broadband subscribers would switch.³⁹ Note that if New Charter foreclosed OVDs and that foreclosure caused 27% of broadband subscribers to switch to a rival ISP, then [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of broadband subscribers would have to upgrade video services for it to be profitable—an impossibility since only 73% of subscribers would remain with New Charter after the switching.

³⁷ General Product Meeting: Video On Demand Content Strategy, May 12th, 2014, p. 4.

³⁸ Letter from Michael D. Hurwitz, Willkie Farr & Gallagher, to Marlene H. Dortch, FCC, at encl., p. 1 (Feb. 19, 2015).

³⁹ Memorandum from William Lake, FCC, to Marlene Dortch, FCC, Exhibit 1b (public information) (Dec. 9, 2014). This 27% figure reflects 39% of broadband subscribers having Netflix times the 71% that would switch broadband service.

54. The average gain and loss shown in Table 9 can be used to calculate the critical percentage of affected broadband customers whose loss would make foreclosure unprofitable. It shows that for every one average subscriber lost, New Charter would need [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] average subscribers to upgrade video service. Stated another way, the foreclosure would be unprofitable if as little as [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of the affected broadband customers were to switch while *all* of those that did not switch instead upgraded their video service.⁴⁰ Of course, not all broadband subscribers watch OVDs and some will be unaffected by foreclosure. Foreclosure would be even less profitable if the retained broadband subscribers do not all choose to upgrade their video service. For example, if only half of the retained customers upgraded video service, foreclosure would be unprofitable if as little as [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of total broadband subscribers switched away from New Charter.⁴¹

55. The costly response of consumers leaving Charter need not be immediate to make the analysis above applicable. Broadband providers experience substantial churn, giving customers ample opportunity to leave one provider for another or simply stop turning to one of the providers. In any given year, Charter experiences substantial churn among its broadband subscribers. During 2014, typical monthly churn for Charter broadband was around [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] yielding an annual churn around [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. Charter constantly needs to attract new customers to replace this churn just to stay even. An OVD foreclosure strategy that would blemish a broadband provider in the eyes of consumers would also reduce the demand for its broadband service from new customers, and would lead to less broadband growth. Any slowdown in attracting new broadband subscribers could easily result in overall losses as new subscribers are not signed up while existing subscribers are turning away at a rapid pace.

⁴⁰ This percentage of customers lost where foreclosure becomes unprofitable is typically called “critical loss.” Assuming all of the affected broadband customers retained were to upgrade service, it is calculated as the result of the margin gained [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] divided by the sum of the margin gained and the margin lost [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL].

⁴¹ If only half of retained affected customers upgrade video service, the gain would be half as great. The critical loss would be [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of affected customers, which reflects half the margin gained [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] divided by the sum of the margin gained and the margin lost [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL]. Assuming [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of broadband customers subscribe to Netflix, the foreclosure would be unprofitable if [BEGIN HIGHLY CONFIDENTIAL] [END HIGHLY CONFIDENTIAL] of broadband customers switched away from New Charter.

56. Some of broadband churn is natural and can happen from customers moving residences. However, a substantial amount of the churn is due to competition between broadband service providers. A 2010 FCC report found that 37% of broadband users had switched providers one or more times in the past three years.⁴² Of those users that switched, the FCC calculated that 57% did not switch broadband providers because of moving residences. Thus, about 20% ($=57\% \times 37\%$) of total broadband users switched providers in the last three years for reasons other than moving residences.

C. Post-merger incentive to encourage growth in OVDs and other new services

57. New Charter will have an incentive to encourage the growth of OVDs and other new vertically related services and products because those services and products increase demand for its broadband services. As I showed above, on net, a loss in broadband subscribers will be more damaging to the profits of the post-merger firm than any potential gain in revenue from video subscribers. Therefore, New Charter will have an incentive to make the consumer broadband experience more attractive to consumers to expand broadband subscribership.

58. As noted earlier, the majority of OVD users also have video service. In fact, it is likely that some of the OVD services are complements to traditional video services for many subscribers, not substitutes. The ability to watch past seasons of a series, for example, can spur a subscriber's demand to view the current season. HBO's chief executive noted in 2014 that consumers want both OVD and traditional products.⁴³ A survey by TiVo Research and Analytics found that consumers are not currently substituting traditional television for Netflix.⁴⁴ Instead, Netflix viewers were found to watch about the same amount of traditional TV as other viewers. The desire on the part of consumers for OVD products *and* the differentiated products offered by MVPD providers gives an incentive for New Charter to ensure their customers' access to these OVD products.

59. Consumer surveys show that it behooves service providers such as Charter to not only allow but encourage its users to also adopt some OVD streaming. A recent survey by TNS Global of 25,000 U.S. households found that about one sixth of pay TV households changed their level of video service in the past year and that those that stream video were roughly twice as likely to have changed the level of video service.⁴⁵ However, these households were not

⁴² Broadband decisions: What drives consumers to switch—or stick with—their broadband Internet provider, FCC Working Paper, 2010.

⁴³ "HBO is launching a stand-alone streaming service in 2015," Washington Post, October 15, 2014, available at <http://www.washingtonpost.com/news/business/wp/2014/10/15/hbo-is-launching-a-stand-alone-streaming-service-in-2015/>.

⁴⁴ "Netflix subscribers still watching just as much boob tube," CNet, July 19, 2013, available at <http://www.cnet.com/news/netflixsubscribersstillwatchingjustasmuchboobtube/>.

⁴⁵ "Streaming video brings pressures and profits to traditional pay TV," Broadband TV News, November 8, 2014, available at <http://www.broadbandtvnews.com/2014/11/08/streaming-video-brings-pressure-and-profits-to-traditional-pay-tv/>.

disproportionately downgrading pay TV. Instead, households that stream video were nearly twice as likely to have upgraded rather than downgraded video service.

60. If New Charter forecloses OVDs, it is more likely to drive subscribers who view OVD services and traditional MVPD video services as complements to switch to other providers. These customers would be among those already subscribing to bundles including both broadband and video services. They would thus be associated with the higher margins coming from bundled services. The more subscribers in this category that view the services as complements, the more likely that New Charter would lose profits if it attempted to foreclose OVDs.

D. Summary regarding foreclosure

61. As described above, New Charter would likely lose a significant portion of its broadband subscribers if it foreclosed OVDs. And it would likely make attracting the subscribers necessary to replace churn, much less to grow, very difficult. This means that an unrealistically significant portion of any remaining subscribers would have to purchase more video services for foreclosure to be profitable. Furthermore, OVD services and traditional MVPD video services are likely complements for many subscribers, and these subscribers are likely to purchase less video services if OVDs are foreclosed, not more, as required for profitability. For all of these reasons, it is very unlikely that New Charter would find it profitable to foreclose OVDs.

VIII. Conclusion

62. There are a number of strong economic arguments indicating that the proposed transactions will be procompetitive and benefit consumers. First, the merging firms do not compete for consumers of broadband, video, or voice, so there will be no impact on local competition in those markets. Second, New Charter will have much larger scale than its constituent firms and therefore will have additional incentive to undertake fixed cost investments that improve quality and speed of service for consumers. Third, New Charter is not vertically integrated upstream with significant programming interests, while its technology is relative inexpensive for both OVDs and consumers, so it remains open to carrying and partnering with a broad set of complementary firms.

63. Perhaps most importantly, New Charter will have improved incentive and ability to sponsor entry among Internet innovators. New Charter will have the scale and complementary assets to be a strong partner to innovative entrants, lowering their costs and giving them more choices in partners. Moreover, New Charter will have an incentive to make its HSD offering as compelling and attractive as possible in order to attract consumers. This will lead to New Charter continuing to integrate with, encourage, and include OVDs in the Charter user experience (e.g. on the Charter Program Guide). Such a strategy is logical and sustainable because each broadband user is profitable at the margin, and therefore any foreclosure of OVDs that drove away those consumers would not be in the best financial interest of New Charter.

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.

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Executed on Wednesday, June 24, 2015

A handwritten signature in black ink, appearing to read "J. S. [unclear]".

EXHIBIT 8

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**ECONOMIC ANALYSIS OF THE IMPACT OF THE PROPOSED MERGER OF
CHARTER, TIME WARNER CABLE, AND BRIGHT HOUSE NETWORKS
ON VIDEO PROGRAMMING PRICES AND BROADBAND ENTRY AND
COMPETITION**

EVANS DECLARATION I

David S. Evans

January 15, 2016

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I. Introduction and Overview of Declaration

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 vitae 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.¹

4. I have written six major books and more than 100 scholarly articles, many of which concern industrial organization and antitrust. My work has been widely read and cited.² Over

¹ My latest book (with Richard Schmalensee), *Matchmakers: The New Economics of Multisided Platforms*, will be published by Harvard Business School Press in Spring 2016.

² 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/c/pev9.html>. Like many social scientists, I post much of my work on the Social Science Research Network (SSRN). As of January 9, 2016, based on quality-weighted citations, I ranked 173 out of the top 30,000 social scientists globally for whom SSRN reports citation data, 82 out of the top 8,000 economics professors globally for whom SSRN reports citation data, and 6 out of the top

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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 also have taught various aspects of antitrust economics to judges in China and the European Union.³

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, including the Senate Banking Committee, and the House Financial Services Committee, and the House Oversight Committee, and the U.K.'s House of Lords.
6. I have conducted research, published, or submitted testimony on industries that are relevant to the proposed merger (the "Transaction") of Charter Communications, Inc. ("Charter"), Time Warner Cable, Inc. ("TWC"), and Advance/Newhouse Partnership ("BHN" or "Bright House Networks") (together, "Applicants"), including the cable television industry, the media industry, Internet Service Providers, Internet content providers, and the telecommunications industry. I have been invited to lecture on Internet-based industries by the Chinese Ministry of Industry and Information Technology, the Mexican Federal Commission

3,000 law professors globally for whom SSRN reports citation data. My SSRN publications are available at http://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=268756.

³ 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.

of Telecommunications, the U.K.'s OfCom, and the InfoComm Development Authority in Singapore.

7. I previously submitted declarations to the Federal Communications Commission in the proposed merger of Comcast Corporation and Time Warner Cable and I made presentations to the FCC staff and participated in the Economist Roundtable organized by the FCC in that transaction review proceeding.⁴

B. Assignment

8. Counsel for INCOMPAS, a trade association for communications and technology companies, asked me to evaluate (a) whether the Transaction would result in an increase in bargaining power over video programmers and, if so, whether that increase would cause competitive harm and (b) whether Charter's claim, supported by Professor Michael Katz, that the reductions in video programming prices paid by Charter as a result of the Transaction should be counted as an efficiency because some portion of those price decreases would be passed on to subscriber households. I am not offering any opinion on any issue other than those identified above including whether the FCC should approve this Transaction.

C. Principal Findings

9. I have found that the Transaction would result in a significant increase in the prices that video programmers pay for access and distribution to the households of the Applicants and that the increased market power over video programmers resulting from the Transaction would raise

⁴ See David S. Evans, Economic Analysis of the Impact of the Comcast-Time Warner Cable Transaction on Internet Access to Online Video Distributors (Aug. 25, 2014) (submitted with Netflix, Inc., Petition to Deny, MB Docket No. 14-57 (Aug. 27, 2014) ("Evans Comcast Declaration"); David S. Evans, Economic Analysis of the Impact of the Comcast-Time Warner Cable Transaction on Internet Access to Online Video Distributors: Response to Opposition to Petitions to Deny and Response to Comments, MB Docket No. 14-57 (Dec. 23, 2014) ("Evans Comcast Reply Declaration"); Federal Communications Commission, Proposed Comcast-Time Warner Cable-Charter Transaction Economic Analysis Workshop, MB Docket No. 14-57 (Jan. 30, 2015).

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barriers to entry and reduce competition in local broadband. The Transaction would increase the prices to video programmers under (a) a standard single-sided analysis that focuses only on video programmers as purchasers of intermediation services and a (b) two-sided analysis that considers the partial pass-through of that price increase to subscriber households and the impact of the Transaction on the total price paid by video programmers and households together for intermediation services. My conclusion is based on five major specific findings.

10. First, the Applicants, like all Multichannel Video Programming Distributors (“MVPDs”), are intermediaries between video programmers and households. They provide access and distribution services that enable video programmers to reach households and for households to reach video programmers. The price for access and distribution is part of the exchange of value between MVPDs, including the Applicants, and video programmers. A higher access and distribution price paid to video programmers by MVPDs results in a lower video programming price paid by MVPDs to video programmers. Larger MVPDs pay lower prices to video programmers because the MVPDs can charge higher prices, because of increased bargaining power over video programmers. This situation is analogous to the situation the FCC addressed in the proposed merger between Comcast and Time Warner Cable in which these Internet Service Providers (ISPs) were intermediaries between Internet content providers and subscriber households.

11. Second, the Transaction would significantly increase the market power of the Applicants over the distribution of video programming to households. As a result, it would significantly increase the prices that video programmers would pay the Applicants to distribute their content to subscriber households. There is no dispute that the Transaction would significantly increase the bargaining power of the Applicants, and that they would use that

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bargaining power to obtain substantially better terms from the video programmers. Unlike the proposed Comcast-TWC merger, Charter agrees that that the merger with TWC will result in a significant increase in bargaining power which would enable the merged entity to extract better terms for providing access and distribution to the Applicant's households.

12. Third, Professor Katz's claim that the merger increases economic efficiency by reducing the prices the Applicants pay for video programming is wrong. He ignores the increase in intermediation fees, for access and distribution, paid by video programmers and incorrectly claims the partial pass through of the price increase to subscriber households as a merger-specific efficiency.⁵ In fact, based on the empirical evidence he has presented, the Transaction results in an increase in the total price paid by video programmers and households for intermediation services because the increase in the price of access and distribution to video programmers is only partly offset by a decrease in price paid by households according to his analysis. According to his analysis, the increase in the total price is the result of an increase in bargaining power from the Transaction.

13. Fourth, there is a significant market failure in the provision of local broadband service. This market failure results, in part, from the fact that broadband providers must provide video programming and compete as MVPDs, in addition to offering broadband service to attract customers. Video programming accounts for a significant portion of operating costs, and smaller MVPDs pay significantly more for video programming than larger MVPDs.

14. Fifth, the lower video programming costs for the Applicants would reduce investment in the entry and expansion of smaller broadband providers and thereby reduce competition in

⁵ It would be analogous in the Comcast TWC merger to claim that one could ignore the impact of charging higher prices to Internet content providers on the grounds that some portion of those higher prices would be passed on to households.

the provision of local broadband in the areas served by the Applicants.⁶ Recent entry into local broadband markets demonstrates that entry of additional broadband providers results in significantly lower prices and higher quality of broadband and more innovation.⁷

15. I thus conclude that the Transaction would harm competition in the provision of intermediation service to video programmers for access and distribution and in the provision of competitive local broadband services.

1. The Transaction Would Raise Prices Paid for Distributing Video Programming

16. The Applicants are MVPDs that operate cable systems in many parts of the country. MVPDs are intermediaries that provide “access and distribution services” to video programmers and a source of video programming to households. Video programmers use MVPDs to distribute their programming, including advertising, to MVPD household subscribers.⁸ MVPDs then provide households access to that programming as part of bundles or, in some select instances, standalone video choices. An MVPD earns a margin based in large part on the difference between what it collects from its subscribers and what it pays the video programmer.

17. There is no dispute in this matter that larger MVPDs pay substantially lower prices than smaller MVPDs for video programming.⁹ This relationship occurs because MVPDs are often the most efficient, and sometimes the only feasible, way for video programmers to reach

⁶ For the purposes of this report “broadband” refers to broadband delivered over a fixed wire and does not include mobile wireless or satellite unless indicated otherwise. We report broadband use below based on download speeds of either 10 Mbps or 25 Mbps.

⁷ See *infra* at Section IV. D (discussing beneficial effects of increased competition from new broadband entrants).

⁸ See, e.g., Katz Declaration at ¶¶ 76 and 77, nn. 86 & 89.

⁹ See Katz Declaration at Section II.A.1.

households and for households to obtain video programming short of switching to another MVPD. Larger MVPDs can deny video programmers' access to more households and thereby impose significant harm on them.¹⁰

18. MVPDs and video programmers negotiate complex distribution contracts. The MVPDs get valuable programming for which they can charge households. The video programmers get access to those households, are able to sell advertising spots for them, and benefit from having the MVPD, in effect, collect payments for them from the households. The contracts usually result in a net payment from the MVPD to the video programmer. That net payment, however, reflects an implicit payment paid by the video programmer for access and distribution to the MVPD's households. That is, after all, what the video programmer is buying from the MVPD and is the reason larger MVPDs get lower prices, as I discuss in more detail below.

19. The Transaction would substantially increase the bargaining power of the Applicants over video programmers. In terms of MVPD subscribers, New Charter would be 57 percent larger than TWC and 302 percent larger than Charter.¹¹ New Charter would be able to *pay less*

¹⁰ The economic logic for this statement is similar to that accepted by the FCC and the U.S. Department of Justice concerning ISPs. See Jon Sallet, General Counsel, FCC, Prepared Remarks at the Telecommunications Policy Research Conference: "The Federal Communications Commission and Lessons of Recent Mergers & Acquisitions Reviews," at 13 (Sept. 25, 2015) ("Sallet Remarks"); Bill Baer, DOJ, Keynote Address at the Future of Video Competition and Regulation Conference, (Oct. 9, 2015) ("Baer Keynote"). In his recent speech on the Comcast/TWC and ATT/DIRECTV mergers, Justice Department Assistant Attorney General Bill Baer explained, "Cable companies are essential gatekeepers to what customers watch, and how they watch it. If content companies don't think they have a way to get their product to consumers, they won't invest and won't innovate. Or if cable companies use control over the broadband pipe to increase the charges streaming services must pay to reach customers, then those new services may be less effective in competing with traditional video services." See Baer Keynote at 5. Video programmers collect revenues indirectly from households from the payments they receive from MVPDs and pay large MVPDs for access and distribution. See *infra* at Section III.A.

¹¹ MVPD subscriber counts are based on data from Public Interest Statement, MB Docket No. 15-149, Public Application of Charter Communications, Inc., Time Warner Cable Inc., and Advance/Newhouse Partnership For Consent to the Transfer of Control of Licenses and Authorizations, June 25, 2015 at p. 29. As of 2014 Q4, TWC, Charter, and Bright House Networks had 11 million, 4.3 million, and 2 million video subscribers respectively.

to video programmers under its contracts because it would be able to *charge more* to video programmers for access and distribution. New Charter would be able to use its increased bargaining leverage to increase the access and distribution fees to video programmers substantially. Although I do not have the data to calculate this price increase with precision, a rough estimate suggests the Transaction could increase the price that video programmers pay New Charter for access and distribution by { **BEGIN CI** **END CI** } percent.¹²

20. Professor Katz states that New Charter would pass through about half of the benefits it gets from its increased bargaining power to households in the form of lower prices.¹³ If we accepted his finding¹⁴ then even after accounting for the partial pass through to households, the Transaction would result in a significant increase in price charged by New Charter for video distribution. There is no basis in antitrust economics or merger analysis for the approach taken by Professor Katz, which ignores the price increase to one set of customers of an intermediary and then counts a partial offsetting price decrease to another set of customers as an efficiency gain. Under that approach, the merger to monopoly of intermediaries would be pro-competitive so long as the monopoly passes on some of its higher fees to one group of customers. Indeed, under Professor Katz's analysis, the proposed merger of Comcast and TWC would have been pro-competitive even if it was shown that the merged entity would increase prices significantly

¹² See *infra* at Section III.D.

¹³ Katz Declaration at Section II.B.2.

¹⁴ Professor Katz's analysis of the pass through to subscribers is, however, deeply flawed. His analysis depends critically on an economic model that assumes that New Charter sells a single product at a single price. In fact, the Parties offer many products, engage in product bundling of broadband, video programming and telephone services, and charge different prices based on the bundle of services provided and the household situation (including whether they have risk losing the household to a rival). I would expect that New Charter would do the same. He has not offered any reliable evidence that Charter, or the other Parties, has in fact made across-the-board price changes in response to changes in costs to the degree he claims. See *infra* at Section V.

to Online-Video Distributors (OVDs) so long as some of the price increase was passed on to households.

2. The Transaction Would Harm Broadband Competition as a Result of the Increased Market Power over Video Programmers

21. The higher access and distribution fee per subscriber, or lower price paid for video programming per subscriber, would increase New Charter's operating margin for video programming. That would enable New Charter to engage profitably in more aggressive strategies to deter entry and expansion by smaller, competitive broadband providers.¹⁵ In particular, TWC and Charter already use their higher margins on video programming to engage in pricing and product strategies to suppress competition by new and existing broadband providers.¹⁶ The Transaction would further increase those margins and enhance the ability of the Applicants to engage in these strategies.¹⁷ As a result, the Transaction would stifle

¹⁵ These smaller broadband providers include new and innovative entrants, smaller telcos, and various competitive broadband providers that are investing in fiber and in some cases offering very fast speeds. I will sometimes refer to these smaller broadband providers as broadband entrants even though some of them are incumbent firms that are replacing DSL with fiber and thereby dramatically increasing the quality of their service offerings.

¹⁶ See *infra* at Section V.B. I am not asserting that Charter or TWC are currently engaging in anticompetitive strategies or would do so following the Transaction. The focus of my analysis is on the merger-specific impact of the Transaction on competition, and consumer welfare, in the related market for broadband. I show that the Transaction would enhance the ability of New Charter to engage in strategies that could reduce consumer welfare but that would not obviously violate the antitrust laws. My analysis hinges on the presence of a significant market failure in the provision of local broadband services today.

¹⁷ Ford and Jackson, who Professor Katz relies on for his estimate of a 50 percent pass through rate, also raised the possibility that increased bargaining power over video programming would reduce local MVPD competition and that the harm from reduced competition could outweigh the benefit from partial pass-through of some savings ("Second, while the results of this simple welfare analysis suggest that increased ownership concentration of cable systems by large MSOs enhances social welfare, we also found that such concentration can result in substantial programming discounts. These discounts are large enough so as to potentially constitute an absolute cost advantage for incumbent cable systems vis-a-vis potential entrants and thus a barrier to entry. If so, welfare calculations must take into account the effect on competitive entry. Such entry has been found to have substantial welfare enhancing properties through lower prices and higher quality of service. Since direct competition between cable companies has been shown by numerous studies to reduce basic cable prices by over 20 percent, the relatively modest increase in social welfare due to increased concentration (derived from our estimates) suggests that limits on such concentration may be warranted. However, more evidence that such concentration does indeed restrain competitive entry is needed.") George Ford & John Jackson, "Horizontal Concentration and Vertical Integration in the Cable Television Industry," *Review of Industrial Organization*, 12

competitive broadband investment and deployment by smaller, competitive broadband providers and thereby harm broadband competition.

22. The conclusion that the Transaction would harm local broadband competition is based on five specific findings.

23. First, there is a significant market failure in the provision of local broadband services in the areas served by the Applicants. The households in what would be New Charter's footprint would have an average of only 0.9 broadband providers other than the Applicants that offer a download speed of at least 10 Mbps and on average only 0.15 alternative providers that offer the same or faster download speeds as the Applicants. Only 14.3 percent of the households in Applicants' footprint have an alternative that offers the same or faster download speeds as the Applicants. There are significant obstacles to entry and expansion of competing systems. Charter and TWC, like other large cable companies, have very low ratings for customer service compared to other U.S. companies.

24. Second, the ability of large MVPDs, which operate many local cable systems, to secure lower video programming prices through their market power over distribution increases the barriers to local broadband competition and thereby exacerbates this market failure. Broadband entrants have to offer video programming services to compete for households.¹⁸ They therefore have to compete as MVPDs as well as broadband internet service providers ("ISPs"). The

at 517 (1997). My focus, however, is on the cross-market impact between MVPD and ISP competition while Ford and Jackson focused on the within-market competition among MVPDs.

¹⁸ See Frontier Communications Corp., Response to Information Request, MB Docket No. 15-149 (Oct. 23, 2015) ("While broadband pricing is important, the ability to offer video and voice services, in tandem with high speed Internet – a "triple-play" offering – is a key competitive factor in the market for high speed Internet We agree with the FCC's observation that broadband adoption increases significantly when it is offered together with video services, and that enhanced video competition and broadband deployment are interrelated."). See also, The Federal Communications Commission, "Connecting America: The National Broadband Plan," March 17, 2010, <https://www.fcc.gov/general/national-broadband-plan> ("the vast majority of consumers purchase broadband bundled with voice, video or both.").

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significantly higher video programming distribution fees received, and lower video programming prices paid, by larger cable systems make it difficult for smaller, competitive broadband providers to compete for households and reduce the incentives of these smaller providers to invest in new and faster broadband plant. That is the case now in the areas served by the Applicants and as discussed below the proposed merger would significantly exacerbate this problem.¹⁹

25. Third, the Transaction would significantly decrease the video-programming prices paid, increase the implicit video-programming access and distribution fees earned, and increase the margins on video programming received by the cable systems operated by the Applicants. After the Applicants renegotiate their existing contracts, I estimate, roughly, that the Transaction would reduce the programming costs by 17.0 percent for cable systems operated by Charter and 4.3 percent for cable systems operated by TWC or Bright House Networks.²⁰

26. Fourth, the Transaction would reduce the incentives for smaller broadband providers to compete in local areas served by cable systems operated by the Applicants through, in particular, investing in new competitive fiber that meets or exceeds the broadband speeds of the Applicants. The incentives to invest in fiber pre-Transaction are low because of the video-programming cost advantage held by each of the merging Applicants. The Transaction would further reduce this and likely deter smaller, competitive broadband providers from entering new areas and laying new fiber.²¹

¹⁹ See *infra* at Section IV.

²⁰ As I discuss below, at Section III.C, about {{BEGIN HCI END HCI}} percent of the contracts, weighted by revenue, will come up for renewal in {{BEGIN HCI END HCI}} and almost all within {{BEGIN HCI END HCI}} years.

²¹ See *infra* at Section III.C.

27. Fifth, by suppressing competition the Transaction would, as a result of deterred entry and expansion, likely result in households in local areas served by the Applicants having slower broadband, facing higher prices, getting poorer service, and having no equal or better alternative to the provider operated by one of the Applicants. Where entry has taken place households have received much faster and more innovative broadband service. Moreover, entry has forced large national cable systems to invest in and offer much faster broadband service.²²

28. The FCC should consider the possible adverse effect of the Transaction on competition in the provision of local broadband in the areas served by New Charter in evaluating whether the Transaction is in the public interest. New Charter would account for 19.4 million of the 92.9 million (21 percent) broadband ISP subscribers in this country.²³ Furthermore, in areas where New Charter offers broadband download speeds at 10 Mbps or greater, 22.5 percent of the population does not have access to an alternative broadband provider and only 14.3 percent of the population has access to a broadband provider with equal or faster speeds.

D. Organization of Declaration

29. This declaration consists of four main sections in addition to this Introduction. Section II presents background on the Applicants, their products, and their pricing strategies that I rely on in the subsequent sections. Section III shows that the Transaction would result in a significant increase in the prices that video programmers pay for distribution to MVPD

²² See *infra*, at Section IV.D.

²³ As of 2014 Q4, the top cable and telephone companies had 87,340,878 broadband subscribers, which represented 94% of all internet subscribers. Therefore, there were roughly 92.9 million internet subscribers in 2014 Q4 ($87,340,878 / 0.94 = 92,915,828$). New Charter would have 19.4 million of the 92.9 million broadband subscribers in the country, giving it a 21 percent share of all broadband subscribers, based on publicly available data ($19,400,000/92,900,000 = 0.21$). See Charter Communications Inc. Public Interest Statement, In the Matter of Public Application of Charter Communications, Inc., Time Warner Cable Inc., and Advance/Newhouse Partnership For Consent to the Transfer of Control of Licenses and Authorizations, June 25, 2015 at 29; Leichtman Research Group, "Research Notes 1Q 2015," http://www.leichtmanresearch.com/research/notes03_2015.pdf.

households. Section IV shows that the Transaction would likely result in consumer harm resulting from decreased broadband investment and competition. Section V explains why Charter is wrong that lower video programming costs should be counted as an efficiency and why Professor Katz has not provided credible economic evidence of the portion of video programming cost savings that Charter would pass through to consumers. Section VI makes brief concluding remarks.

30. My analysis is ongoing, and I reserve the right to supplement my analysis. The fact that I have not responded to claims made by Charter or its economists does not mean that I agree with those claims.

II. Background on Transaction and the Applicants

31. The Transaction would merge Charter Communications, Time Warner Cable, and Bright House Networks.²⁴ Each entity provides broadband service operating as an ISP; video programming operating as an MVPD; and Voice-over-IP (VoIP) telephone service. Each entity offers bundles of the various services, including stand-alone broadband and stand-alone video programming, at various prices depending on the broadband speed and the video channels and options included.

32. The proposed merged entity has been referred to as New Charter in these proceedings. Table I shows the number of broadband and MVPD subscribers for each system in 2014 Q4 and the ranks of each system among all wired broadband providers in terms of number of

²⁴ Bright House Networks has a relationship with TWC under which TWC negotiates with video programmers on behalf of both companies. See Application at 12; See Katz Declaration at fn 114 (“With respect to Bright House’s video services, Bright House has the contractual right to rely on TWC to purchase third-party programming and routinely takes advantage of that opportunity with respect to cable programming networks and many broadcast stations.”). Therefore, when I discuss the price of video programming below my references to TWC also refer to Bright House Networks.

subscribers. New Charter would be the second largest wired ISP in the country and the third largest MVPD.²⁵

Table 1: New Charter U.S. Video and Internet Subscriber Rank

Company	Video Subscribers		Internet Subscribers	
	Number of Subscribers	Rank	Number of Subscribers	Rank
Time Warner Cable	11,000,000	4	12,300,000	3
Bright House Networks, LLC	2,000,000	7	2,100,000	8
Charter	4,300,000	5	5,100,000	6
New Charter	17,300,000	3	19,400,000	2

Sources: Charter Communications Inc. Public Interest Statement, In the Matter of Public Application of Charter Communications, Inc., Time Warner Cable Inc., and Advance/Newhouse Partnership For Consent to the Transfer of Control of Licenses and Authorizations, June 25, 2015 at p. 29; Leichtman Research Group, "Research Notes 1Q 2015," http://www.leichtmanresearch.com/research/notes03_2015.pdf;

33. The Applicants face limited competition in the provision of local broadband service. I have examined the alternatives available to individuals in the census blocks served by each of the Applicants as of December 31, 2014 and report the results in Table 2.²⁶ Individuals in their service areas have an average of about 0.89 choices of a broadband provider in addition to the Applicants with a broadband download speed of at least 10 Mbps.²⁷ Almost all individuals lack access to an alternative broadband provider that offers an equal or faster download speed. The alternative provider is usually a telco provider offering DSL or a slower fiber offering than one

²⁵ Post-transaction, New Charter will be the second largest wired ISP, trailing only Comcast, which had 22 million broadband subscribers in 2014 Q4, and the third largest MVPD behind Comcast and DirecTV, which had 22 million and 20 million subscribers respectively in 2014 Q4.

²⁶ Broadband provider counts are based on the FCC and NTIA's broadband availability data. See Federal Communications Commission, "Broadband Deployment Data from FCC Form 477," <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>; National Telecommunications and Information Administration, "National Broadband Map Datasets," <http://www2.ntia.doc.gov/broadband-data>. Appendix B describes my methodology and data sources in detail.

²⁷ If we limited attention to census blocks with access to broadband speeds at the FCC's current benchmark, individuals in the New Charter service areas have an average of about 0.34 broadband providers in addition to the merging party. The FCC's current broadband benchmark speeds are 25 megabits per second (Mbps) for downloads and 3 Mbps for uploads. See FCC, "2015 Broadband Progress Report," (Feb. 4, 2015), <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2015-broadband-progress-report>.

of the merging parties. Approximately 101 million individuals, accounting for roughly one-third of the US population, would be in census blocks served by ISPs operated by the Applicants that offer broadband download speeds of at least 10 Mbps.

Table 2: Population Weighted Average Number of Competing ISPs in Census Blocks Served by Each of the Applicants

Company	Average Number of Competing ISPs	Average Number of Competing ISPs with Equal or Faster Download Speeds
Time Warner Cable	0.89	0.16
Bright House Networks	0.97	0.01
Charter	0.87	0.17
New Charter	0.89	0.15

34. Each of the Applicants is the dominant provider of broadband and MVPD services in most of the geographic areas they serve. The three systems do not operate, with minor exceptions, in each other's territories and therefore do not compete directly with each other for household subscribers.²⁸ As a result, the Transaction, by itself, does not directly alter competition among the Applicants for households served by the Applicants.

III. Impact of the Transaction on Access and Distribution Fees for Video Programmers

35. The agglomeration of household subscribers across the Applicants' service areas into a much larger entity does, however, enhance the bargaining position of New Charter (relative to that of each Applicant as they are organized today) over video programmers that want to reach

²⁸ See Letter from John L. Flynn, Charter Communications, Inc., to Marlene H. Dortch, FCC, MB Docket No. 15-149, at 1-2 (July 2, 2015).

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MVPD subscribers and Internet content providers that want to reach broadband subscribers.²⁹

There appears to be no dispute that the Transaction, as a result of the increased size of the Applicant's combined systems, would significantly increase the bargaining power of New Charter over video programmers, and that the increased bargaining power would enable New Charter to secure significantly lower prices for video programming.³⁰

36. That decrease in the prices paid to video programmers results from an increase in the access and distribution fee that video programmers pay to New Charter. The Transaction would therefore result in a significant increase in the price of video programming distribution charged by the Applicants to reach their household subscribers. Charter agrees that only a portion of that price increase would be passed on to subscriber households so that the overall price of providing access and distribution services to video programmers and households combined would increase as well.

37. Part A shows that the video programmers pay MVPDs for access and distribution to households and that this access and distribution fee is reflected in the net price that MVPDs pay video programmers. Part B explains why an increase in control over households enables larger MVPDs to demand and obtain higher access and distribution fees. Part C summarizes the evidence that large MVPDs pay significantly lower prices for video programming and implicitly earn significantly higher access and distribution fees. Part D explains why this

²⁹ Although the precise details differ, the increased bargaining power over video programmers is analogous to the increased bargaining power over Internet content providers that U.S. Department of Justice and FCC considered in the proposed merger of Comcast and TWC. See Sallet Remarks at 8-9, 10-14; Baer Keynote at 3-5. I analyzed the horizontal effect of the Comcast and TWC merger on edge providers in several submissions to the FCC. See Evans Comcast Declaration at 12-17, 52-99; Evans Comcast Reply Declaration at iii-v; 59-70, 70-88.

³⁰ See Katz Declaration at pp. 9-29. Charter and INCOMPAS agree that the merger will enhance the bargaining position of the Applicants and result in lower video programming costs. To my knowledge, there is no dispute over this in the submissions to date. See, e.g., INCOMPAS, Petition to Deny, MB Docket No. 15-149, at 8-13 (Oct. 13, 2015); INCOMPAS, Reply, MB Docket No. 15-149, at 12 (Nov. 12, 2015); Letter from Markham C. Erickson, Counsel to INCOMPAS, to Marlene H. Dortch, FCC, MB Docket No. 15-149, at 1-2 (Dec. 4, 2015).

amounts to a significant increase in price and substantial lessening of competition in video programming distribution under either a traditional single-sided merger analysis or a two-sided platform analysis.

A. The Economics of the Relationship between MVPDs and Video-Programming Providers

38. Video-programming costs include licensing for a wide variety of content types that are often referred to as linear programming. These include among others: (1) local broadcast stations such as WBZ in Boston offering variety of content; (2) cable programming networks offering a variety of content such as Fox News (live news content), ESPN (live sports and commentary), and USA (prerecorded and syndicated content); and (3) premium and pay-per-view channels such as HBO. Video programming also includes the content for video on-demand-services, including TV series, movies, and some live sporting events. Video programmers typically make money from fees paid by MVPDs that are proportional to the number of subscribers who have access to their programming and from advertising that they insert at various points in the programming.³¹

39. Video programmers are interested in maximizing the size of the audiences for their programs and reaching the most valuable demographics for advertisers. They value having their programming placed in popular tiers, on a low channel number, and near other desirable

³¹ See Katz Declaration at 10 (“Content costs are determined as a result of negotiations between a programmer and a video service provider that wants to transmit the content to its customers. For a multichannel video programming distributor (“MVPD”), the license fees usually take the form of a per subscriber, per-month payment from the MVPD to the programmer”). *Id.* At pp. 10-11 (“service provider’s profits decline to the extent that it loses subscribers and advertising revenues when it cannot transmit the programming.”).

channels. They also value having their programming distributed to geographic areas or demographic groups that are more desirable to them.³²

40. Video programmers have various ways of distributing their programming including increasingly over the Internet through streaming. However, although streaming is increasing, the primary way that American households obtain linear programming is through wired or satellite MVPDs. According to eMarketer, as of the end of 2015, there were 100.7 million pay-TV households, compared to 4.9 million cord-cutting households and 15.9 million cord-never households. It projected that by the end of 2019, the number of pay-TV households would remain above 96.4 million, while the number of cord-cutter households and cord-never households would rise to only 8.4 million and 19.8 million, respectively.³³

41. Video streaming services are partial substitutes for the distribution of linear programming at this time. For example, a 2013 survey by eMarketer found that 37 percent of U.S. Internet users strongly disagreed with the question “Would you consider Replacing Cable TV with a Streaming Media Subscription in 2013,” while 21 percent of respondents somewhat disagreed. A recent study by Leichtman Research found that the percentage of households that subscribe to pay-TV service was higher in 2015 compared to 2005. It noted, “[t]he misdirection that people take with cord cutting is the idea that there’s been a significant acceleration.”³⁴ As a

³² See Katz Declaration at ¶¶ 29-30; SNL Kagan “Economics of Basic Cable” December 4, 2014 at p. 93 (“ESPN’s advertising revenues benefit largely from the network’s exclusive sports content, which draws the coveted demographic group of males aged 18 to 49.”).

³³ eMarketer, “Americans Cutting the Cable TV Cord at Increasing Pace,” Dec. 10, 2015, <http://www.emarketer.com/Article/Americans-Cutting-Cable-TV-Cord-Increasing-Pace/1013327>.

³⁴ Ad Week, “With So Many Americans Dropping Cable, Will Cord Cutting Doom TV as We Know It? Observers argue the pace of change is greatly exaggerated,” October 27, 2015, <http://www.adweek.com/news/television/so-many-americans-dropping-cable-will-cord-cutting-doom-tv-we-know-it-167749>.

result, MVPDs remain important avenues of distribution for video programmers and a major source of programming for many households.

42. MVPDs and video programmers enter into complex contracts that govern the distribution of video programming and the intermediation services received by the video programmers.³⁵ Typically, the exchange of value between MVPDs and video programmers involves the following terms. The MVPD pays the video programmer fees based on the number of individuals who have access to the video programmer's programming.³⁶ The video programmer has the ability to insert advertisements into that programming and earn the revenue from selling those spots.³⁷ And sometimes the MVPD gets the ability to insert advertisements into spots and earn some of that revenue. As a result of these contract terms, the MVPDs typically pay video programmers.

43. {{ BEGIN HCI

³⁵ See Katz Declaration, ¶ 29.

³⁶ See *Id.* at p. 14 ("Content costs are determined as a result of negotiations between a programmer and a video service provider that wants to transmit the content to its customers. For an MVPD, the license fees usually take the form of a per subscriber, per-month payment from the MVPD to the programmer"). {{BEGIN HCI

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³⁸ Katz Declaration at ¶ 30.

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44. As these contract terms indicate, MVPDs, including Charter and TWC, provide access and distribution services to video programmers. They assist the video programmers in securing viewers for their programs and the embedded advertisements. They collect money from their subscribers on behalf of the video programmers. Roughly speaking, the MVPD makes a margin on the difference between what it charges households and what it pays video programming providers plus maybe some advertising revenue for spots the MVPD sells.⁴⁰ MVPDs carefully track the average revenue per subscriber and the average video programming cost per subscriber. That business model is common for distributors and other intermediaries.⁴¹

45. The fact that Professor Katz refers to this economic relationship, on occasion, as the purchase of “video programming distribution rights” doesn’t change the reality of what is going on. As his own description makes clear⁴² the video programmers use MVPDs as intermediaries that can connect them with households and pay them for promoting their programs. The video-programmer and the household have a relationship. People watch A&E, not Charter, and

³⁹ Id.

⁴⁰ More precisely the MVPDs’ expected margin per subscriber for a video programming contract is the difference between the incremental revenue from including the video programming in its packages and the incremental costs of that programming.

⁴¹ It is a standard model for multi-sided platforms. See David Evans and Richard Schmalensee (2014) “The Antitrust Analysis of Multisided Platform Businesses,” in Blair and Sokol, ed, *The Oxford handbook of International Antitrust Economics, Volume 1* at pp. 411-413 discussing Jean-Charles Rochet and Jean Tirole (2003) “Platform Competition in Two-Sided Markets” *Journal of the European Economic Association* 1(4) and Mark Armstrong (2006) “Competition in Two-Sided Markets” *Rand Journal of Economics* 37(3); Andrei Hagiu “Strategic Decisions for Multisided Platforms” *MIT Sloan Management Review*, December 19, 2013 Andrei Hagiu (2009) “Two-Sided Platforms: Product Variety and Pricing Structures,” *Journal of Economics & Management Strategy* 18(4).

⁴² See, e.g., Katz Declaration at ¶¶ 29-31.

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whether they like A&E or not has a direct impact on how much money A&E will make. This is not at all like an automobile maker buying vinyl for car seats.

46. The fact that contracts between MVPDs and video programmers result in a payment from the MVPD to the video programmers does not mean that the MVPDs are buying inputs. In fact, video programmers are paying MVPDs for collecting money from households and for providing access and distribution to the subscribers on the systems operated by the MVPDs. To see this, it is useful to consider Internet distribution of video programming.⁴³

47. An Online Video Distributor ("OVD") enters into a direct relationship with a household that agrees to pay the OVD \$10 per month. (The dollar figures I use here are made up just to illustrate the point.) The household then sends requests for OVD content to its ISP, which results in OVD video streams being distributed over the Internet. The ISP might charge the OVD a access and distribution fee per subscriber, d_s , of \$1 per month to obtain access to the household and distribute its content to that household; some very large ISPs have effectively done so. The ISP collects \$1 per subscriber, which is its margin m , and the OVD receives a net payment of $\$9 = \$10 - \$1$.

48. There is a different way this business could be organized. The ISP could provide the OVD service to its customers for \$10 and pay the OVD \$9. The ISP would get to keep $\$1 = \$10 - \$9$, which is its margin. That difference reflects the services the ISP provides for billing and collecting revenue from the subscriber and a possible access and distribution fee.

49. That economic result is the same as in the previous arrangement. In both cases the OVD gets a fee per subscriber, P_s , of \$9 and the ISP gets \$1. In the first case, the ISP charged the

⁴³ Professor Katz points to Internet distribution as a substitute for MVPD distribution. See Katz Declaration at ¶ 76. It is therefore particularly useful to compare the business models for these methods of distribution for video programmers.

access and distribution fee of $\$l$ explicitly. In the second case, the ISP took the distribution fee as the margin between what it charged the household and what it rebated to the OVD.

50. Suppose now that larger ISPs were able to charge significantly higher access and distribution fees. In the first arrangement that would be seen directly in the access and distribution fee of $\$d_s$ per subscriber increasing significantly with the number of subscribers. Larger ISPs would be paid more per subscriber for access and distribution. In the second arrangement this would be seen in the ISP paying a lower price to the OVD for the service and getting to keep a higher margin $\$m$ per subscriber. Either way the larger ISP realizes a higher margin per subscriber for providing access and distribution services.

51. We know from the public record in the proposed Comcast/Time Warner Cable merger that smaller ISPs do not have sufficient market power to charge access and distribution fees to OVDs⁴⁴ and that larger ISPs charge greater access and distribution fees.⁴⁵

⁴⁴ See David S. Evans, *Economic Analysis of the Impact of the Comcast-Time Warner Cable Transaction on Internet Access to Online Video Distributors* (Aug. 25, 2014) (submitted with Netflix, Inc., Petition to Deny, MB Docket No. 14-57 (Aug. 27, 2014) (“Evans Comcast Declaration”) at ¶ 142 (“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.”)).

⁴⁵ *Id.* at ¶28 (“Further research I have conducted has found consistent and substantial evidence that, in fact, larger ISPs charge higher terminating access fees on a per unit of traffic basis.”). See Evans Comcast Declaration ¶¶ 135-41 (“[L]arger ISPs have more bargaining leverage and can therefore likely demand and receive higher prices for terminating access.”); Declaration of Joseph Farrell, MB Docket No. 14-57, ¶ 13 (Aug. 25, 2014) (“Larger ISPs showed themselves more willing and able to adopt tough bargaining positions than did smaller ISPs in certain recent disputes and negotiations with Netflix and with Cogent. . . . Subsequently, Comcast, Verizon, AT&T, and TWC appear to have reached more lucrative agreements with Netflix than did the smaller ISPs. Information from Cogent also indicates that larger ISPs are less likely to pay for interconnection and likely to pay less if they do so. All this suggests that larger ISPs have greater bargaining power than smaller ISPs, as evidenced both by the adoption of tougher tactics and in the financial outcomes.”); Netflix, Inc., Petition to Deny, MB Docket No. 14-57, at 52 (Aug. 27, 2014) (“[L]arge access ISPs’ market power depends on the size of their subscriber base and also on their ability to route traffic through many settlement-free and paid interconnection points. Smaller access terminating access networks have neither the subscriber base nor the plethora of routing options to exercise power in this way.”).

See also Declaration of Joseph Farrell, DPhil, *In the Matter of Applications of Comcast Corp. and Time Warner Cable, Inc. for Consent to Transfer Control of Licenses and Authorizations*, MB Docket No. 14-57 (Aug. 25, 2014), at ¶ 13 (“Third, it appears that larger ISPs showed themselves more willing and able to adopt tough bargaining positions than did smaller ISPs in certain recent disputes and negotiations with Netflix and with

52. MVPDs and video programmers follow the second model described above. The MVPD collects money from household subscribers, rebates a portion of that to the video programmers, and takes its access and distribution fees as the difference between the two. Smaller MVPDs do not have sufficient market power to charge significant access and distribution fees.⁴⁶ Larger MVPDs are able to charge increasingly higher access and distribution fees, which they realize as increasing differences between the incremental revenues and costs from video programming.

B. MVPD Bargaining Power over Video Programmers

53. In the short run, and unless the household switches MVPDs, the MVPD is the primary way the video programming provider can reach the household and is the primary way the household can obtain access to the programming.⁴⁷ All else being equal, larger MVPDs can impose far greater damage to a video programmer than smaller MVPDs by denying them access to households. Video programmers have incurred fixed and sunk costs in developing the programming. For most video programming, the video programmer has limited opportunities to earn revenue from a household that it cannot access. Therefore, preventing a video programmer from obtaining access to a large number of households can impose devastating consequences.⁴⁸ Of course the MVPD would incur costs too if it did not carry

Cogent. Larger ISPs were less willing to agree to Netflix's Open Connect offer and less willing to upgrade interconnection ports with Cogent even at the risk of degrading their users' experience. Subsequently, Comcast, Verizon, AT&T, and TWC appear to have reached more lucrative agreements with Netflix than did the smaller ISPs. Information from Cogent also indicates that larger ISPs are less likely to pay for interconnection and likely to pay less if they do so. All this suggests that larger ISPs have greater bargaining power than smaller ISPs, as evidenced both by the adoption of tougher tactics and in the financial outcomes.")

⁴⁶ See, *infra*, at Section IV.B.

⁴⁷ There is no dispute in the record that larger MVPDs pay significantly lower prices to video programmers and therefore no plausible dispute that the availability of alternative methods of distribution, including streaming, does not prevent larger MVPDs securing additional bargaining power.

⁴⁸ The view of how bargaining takes place is consistent with the findings of regulatory authorities on the impact of an increase in ISP size on the bargaining power over Internet content providers. See Sallet Remarks at 13 (naming increased bargaining power as "the central concern" in the Commission's evaluation of the Comcast/TWC merger); Baer Keynote at 6 (naming the risk of "disproportionately increasing the merged firm's

“must-have” programming. But most programming is not “must have” and would not have devastating consequences to the MVPD if it did not offer that programming.⁴⁹

54. The larger MVPDs can demand lower effective prices from video programmers because, as intermediaries between the video programmers and households, they can demand higher implicit access and distribution fees. That results in lower video programming paid by the MVPD to the video programmer or, equivalently, a lower cost incurred by the MVPD for video programming.⁵⁰

55. Following the arithmetic described above, the payment per subscriber by the MVPD consists of an amount that reflects the collection of payments from the MVPD’s subscribers (P_S) per subscriber minus the access and distribution fee d_S per subscriber. The net payment per subscriber by the MVPD is $N_S = P_S - d_S$. Since d_S *increases* with number of MVPD subscribers, the net payment per subscriber N_S *decreases* with the number of MVPD subscribers. The “cost savings” realized by larger MVPDs results from charging higher access and distribution fees.

C. Larger MVPDs Charge Significantly Higher Access and Distribution Fees

56. To my knowledge, all of the participants to these proceedings that have opined on the issue agree that, among the largest MVPDs, larger MVPDs pay video programmers considerably less per subscriber than smaller MVPDs. Figure 1 shows the programming costs

bargaining leverage” as a primary reason for taking “tough stands” on the Comcast/TWC merger); *Comcast/AT&T Order*, 17 FCC Rcd. at 23259 ¶ 36 (“MVPDs can negotiate substantial discounts based on the number of subscribers to which the network will be transmitted, as well as other factors such as the network’s placement on a particular tier. Ultimately, the more concentration among buyers, the more likely buyers will possess some market power over programming.”); *id.* at ¶ 34 (explaining “[b]ecause programmers incur high fixed costs associated with the development of programming, programming networks must have access to a critical number of viewers to avoid financial loss.”).

⁴⁹ For programming to have such “competitive significance,” it must feature “marquee programming, such as popular sports events.” See *Comcast/AT&T Order*, 17 FCC Rcd. at 23287 ¶ 102 n. 285.

⁵⁰ See *Comcast/AT&T Order*, 17 FCC Rcd. at 23259 ¶ 36.

per subscriber per month and the number of subscribers for multiple MVPDs using the data equivalent to that used by Professor Katz for his chart, updated to the year ending 2015 Q3.⁵¹ I have also included Cablevision, for which SNL Kagan reports estimates of video programming costs.⁵² The figure shows a strong negative relationship between fees per subscriber and system size.

57. I do not have detailed data on video programming contracts to conduct a careful econometric study of the relationship between MVPD size and video programming prices. However, to get a rough idea of the relationship I performed some simple univariate regression analyses.⁵³ Using a linear regression, I have found that there is a statistically significant (at the 5 percent level) negative relationship between average video programming cost per subscriber and the number of subscribers. Each additional million video subscribers is associated with a reduction of {BEGIN CI END CI} in monthly per subscriber programming costs.

58. The regression line is shown in Figure 1, along with the point corresponding to the projected size of New Charter. Based on this regression, New Charter is projected to have monthly per subscriber programming costs of {BEGIN CI END CI} percent less than Charter, {BEGIN CI END CI} percent less than TWC, and {BEGIN CI END CI} percent less than their weighted average costs.⁵⁴ I will use these figures to illustrate the

⁵¹ Katz Declaration at Figure 1.

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⁵³ Due to the limited number of data points, this regression does not control for all potentially important covariates, such as the differing quality of video programming purchased by different MVPDs.

⁵⁴ I have also explored the robustness of these results to alternative functional forms. Using a semi-log model yields results that are qualitatively and quantitatively similar: the effect of video subscribers on per subscriber monthly programming costs remains negative and statistically significant at the 5 percent level, with predicted costs for New Charter of {BEGIN CI END CI} per subscriber per month, which is {BEGIN CI

points made below; to provide more reliable econometric evidence I would need access to video programming contracts, and the detailed terms, across a large number of MVPDs spread across the size distribution of MVPDs.⁵⁵

Figure 1 {BEGIN CI

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END CI} percent less than Charter {BEGIN CI END CI} percent less than TWC, and {BEGIN CI
END CI} percent less than the Applicants' weighted average. I have focused on the linear functional form in order to be conservative.

⁵⁵ The cost data I use in this regression are calculated using the same data source and methodology as Professor Katz used in Figure 1 of his declaration, except using more recent data (programming costs for the year ending 2015 Q3). The programming cost per subscriber per month I use are slightly lower than the figures reported by Professor Katz in Table 1 of his declaration. The main difference in methodology is that Professor Katz's Table 1 divides by "equivalent basic units" rather than raw counts of video subscribers.

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59. Table 3 shows the ratio of the average price per subscriber for each system relative to Cablevision. (I use Cablevision in my report as an example of a smaller MVPD, as video-programming costs for Cablevision are reported by SNL Kagan. My understanding is that smaller competitive broadband providers members have rates that are comparable to, or higher than, those of Cablevision.) Comcast, the largest MVPD, pays 28 percent less than the system with the highest costs (Cablevision). TWC pays 20 percent less and Charter 8 percent less than Cablevision.⁵⁶ As I explain in more detail below, the difference between the video programming prices paid by each of these large systems and the typical smaller MVPD reflects the access and distribution fee earned by that MVPD as a result of its control over access to the subscribers on its system.

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60. Professor Katz reports an analysis by Charter that its average per subscriber video programming costs will decrease by {{ BEGIN HCI

END HCI }}.⁵⁷

⁵⁶ Bright House Networks has a contractual agreement with Time Warner Cable to rely on TWC to purchase third party programming. *See supra* at fn 24.

⁵⁷ Professor Katz reports estimates by Charter that its average per video subscriber costs per month would decrease by {{BEGIN HCI

END HCI}}. *See* Katz Declaration at Table 1. Katz reports both average

The decrease in average programming costs of {{ BEGIN HCI END HCI }} is larger than, and generally consistent with, the difference of { BEGIN CI END CI } that the regression estimate I report above would predict based on the difference in video subscribers between Charter and TWC.

61. Professor Katz also observes that, as TWC contracts come up for renegotiation, New Charter would be able to negotiate lower prices per subscriber.⁵⁸ Using data provided by the Applicants I find that {{ BEGIN HCI

END HCI }} Therefore, assuming the Transaction were approved on July 1, 2016 {{ BEGIN HCI

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62. To provide a reliable estimate of the decline in the video programming fees paid by New Charter it would be necessary, as noted above, to have detailed contract data for multiple MVPDs and video programming providers because my understanding is that the actual price schedules and other consideration exchanged between the Applicants can vary substantially. To provide a rough estimate, however, I have used a projection of the New Charter monthly programming cost per subscriber based on the simple linear regression of the data included in

cost savings and a marginal cost savings, with the marginal cost calculation excluding from both Charter's and TWC's programming costs all programming costs associated with {{ BEGIN HCI END HCI }}. In order to focus on the cost savings once existing programming contracts have been renegotiated, I use his estimate for the average cost savings.

⁵⁸ See Katz Declaration at ¶ 21.

⁵⁹ {{ BEGIN HCI END HCI }} for TWC video programming contract data. I use Television Network 2015 net operating revenue data from SNL Kagan as a proxy for TWC's programming contracts' cost. See SNL Kagan, TV Network Summary, available at https://www.snl.com/interactivex/tv_NetworksSummary.aspx.

Figure 1 discussed above. Based on that analysis, New Charter would be able to secure average video programming prices that are { BEGIN CI END CI } percent lower than TWC and { BEGIN CI END CI } percent lower than Charter. Nothing I say, however, depends on these numbers precisely, only the proposition that the decline in video programming prices would be quite significant, which it clearly is.

63. The fact that New Charter would pay significantly *lower* video programming prices, because of its increased bargaining power, implies that it would charge significantly *higher* access and distribution fees because of its increased bargaining power.

D. The Unilateral Effect of the Merger on Video Programmers

64. The fact that the Transaction would lead to significantly higher access and distribution fees for the video programmers is a source of competitive concern. Distributors and intermediaries, like MVPDs, provide services that enable two different types of customers to interact with each other.⁶⁰ They charge for providing that service. They may collect fees from either or both customers. From the standpoint of antitrust analysis, there is no basis for considering one type of customer served by the intermediary and ignoring the other type.

65. I have calculated rough estimates of the average access and distribution fee charged by the Applicants before and after the Transaction. I estimate the average distributed fee charged before the Transaction by taking the difference between the average price per subscriber paid to video programmers for the Applicants and for Cablevision, the provider with the highest programming costs among large cable MVPDs. As I noted above the evidence suggests that

⁶⁰ For a discussion of intermediaries see David Evans and Richard Schmalensee (2014) "The Antitrust Analysis of Multisided Platform Businesses," in Blair and Sokol, ed, *The Oxford handbook of International Antitrust Economics*, Volume 1; Marc Rysman (2009) "The Economics of Two-Sided Markets" *Journal of Economic Perspectives*, 23(3).

smaller MVPDs do not have sufficient bargaining power to charge access and distribution fees.

That difference gives a distribution fee of { BEGIN CI END CI } per subscriber per month for Charter, { BEGIN CI END CI } for TWC, and a weighted average of { BEGIN CI END CI } Based on the rough estimates I reported above, New Charter would pay { BEGIN CI END CI } per month per subscriber. That gives an access and distribution fee of { BEGIN CI END CI } per subscriber per month for New Charter.

66. As a result, the access and distribution fees charged by cable systems operated by Charter would increase by { BEGIN CI END CI } and the access and distribution fees charged by cable systems operated by TWC and Bright House Networks would increase by { BEGIN CI END CI } The average increase in the access and distribution fee for New Charter, weighted by the number of subscribers in 2014 Q4 would be { BEGIN CI END CI } percent. That estimate implies an increase of the access and distribution fees of { BEGIN CI END CI } per year.⁶¹ I therefore conclude that the Transaction would result in a significant increase in the price paid by video programmers for access and distribution to New Charter's subscribers.⁶² Therefore, under a standard single-sided analysis, the Transaction would result

⁶¹ As a robustness check, I have also computed the fee increase under the semi-log model. With that functional form assumption, New Charter would pay a predicted { BEGIN CI END CI } per month per subscriber, giving an access and distribution fee of \$13.01. This amounts to an increase of { BEGIN CI END CI } percent for Charter, { BEGIN CI END CI } percent for TWC and Bright House, and { BEGIN CI END CI } percent for their weighted average. The total access and distribution fee would increase by { BEGIN CI END CI } million per year.

⁶² My analysis, however, does not depend on these precise numbers, which I'm offering only as rough estimates based on the available data, but on the likelihood that the Transaction would decrease video programming prices paid by New Charter significantly (a proposition that is not in dispute) and that would increase video programming access and distribution fees charged by New Charter significantly (which follows directly from the video programming price reduction).

in a significant increase in price to video programmers that are buying access and distribution services from the Applicants.⁶³

67. To evaluate the overall impact of the Transaction, under a two-sided platform analysis, we need to account for changes that the Applicants would make to prices charged to its subscribers.⁶⁴ Professor Katz claims that New Charter would pass through 50-60 percent of the higher price it receives to subscribers. Taking his figure implies that the Transaction would result in an increase in the total price paid for distribution by video programmers and households of between { BEGIN CI } percent.⁶⁵ I therefore conclude that the Transaction would result in a significant increase in the total price charged by the Applicants for providing access and distribution to their households taking both video programmers and households into account.

68. As I discuss in more detail below, Professor Katz's approach of looking at the pass-through of a price decrease to one side of an intermediary but ignoring the price increase to the other side of the intermediary is wrong as a matter of economics and is inconsistent with standard merger practice.⁶⁶

⁶³ See US Department of Justice and the Federal Trade Commission (2010) "Horizontal Merger Guidelines," at Section 6.1 Pricing of Differentiated Products, <https://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf>.

⁶¹ David Evans and Richard Schmalensee (2014) "The Antitrust Analysis of Multisided Platform Businesses," in Blair and Sokol, ed, *The Oxford handbook of International Antitrust Economics*, Volume 1; Eric Emch and T. Scott Thompson (2006), "Market Definition and Market Power in Payment Card Networks," *Review of Network Economics*, 5(1).

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⁶⁶ See *infra* at Section V.A.

IV. Impact of the Transaction on Competition in Local Broadband Markets

69. The Transaction would result in the Applicants securing additional market power over video programmers, significantly raising the access and distribution fees charged to video programmers, and significantly reducing New Charter's costs of video programming. That increased market power in video programming access and distribution flowing from the Transaction would have knock-on effects in the provision of local broadband. The Transaction would likely reduce actual or potential broadband competition in the local areas served by the cable systems operated by New Charter.

70. Section A discusses the well-known problems in the provision of wired, high-speed broadband in the United States. Section B examines how smaller broadband providers make decisions to invest in entry and expansion of fiber. Section C shows that the increased margins obtained by the Applicants would reduce broadband competition. Section D shows that reduced broadband competition would likely harm consumers through higher prices, slow speeds, and less innovation.

71. I do not have sufficient data to quantify the extent to which the Transaction would reduce competition by smaller broadband providers and the impact on consumer welfare. Nevertheless, I believe that the evidence presented below demonstrates that the Transaction poses a serious risk to local broadband competition, which the FCC should consider in its deliberations.

A. Market Failure in the Provision of Broadband

72. Most American households have limited choice when it comes to obtaining broadband service. They are often forced to deal with large cable systems that have persistently low

customer service ratings. Typically, they cannot readily substitute another provider if they are dissatisfied with service or prices.

73. Table 4 presents data on the state of competition for the 10 largest ISPs in the country. It reports the average number of ISPs available to households in the areas served by the largest ISPs with a broadband download speed of at least 10 Mbps and the percent of households that have access to an ISP that offers equal or superior speed. On average, for each of these ISPs, most households have less than one alternative and the preponderance of households do not have access to an ISP that offers equal speed.

**Table 4 Population Weighted Average Number of Competing ISPs in US
Census Blocks Served by Each Company⁶⁷**
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⁶⁷ When computing the average number of competing ISPs with Equal or Faster Download Speeds, I restrict the both the ISP and competitors' offerings to those with download speeds of 10 Mbps or greater. A competitor is considered to have an equal or faster download speed if its max download speed offering is greater than or equal to the ISP's max download speed offering. Appendix B describes my methodology and data sources in detail.

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Sources: Charter Communications Inc. Public Interest Statement, In the Matter of Public Application of Charter Communications, Inc., Time Warner Cable Inc., and Advance/Newhouse Partnership For Consent to the Transfer of Control of Licenses and Authorizations, June 25, 2015 at p. 29; Leichtman Research Group, "Research Notes 1Q 2015," http://www.leichtmanresearch.com/research/notes03_2015.pdf; SNL Kagan, "Top Cable MSOs," <https://www.snl.com/interactivex/TopCableMSOs.aspx>.

74. Table 5 reports the American Customer Satisfaction Index ("ACSI") average customer satisfaction ratings for the 10 largest national ISPs (which includes the Applicants), as well as rankings for other US industries.⁶⁸ The average ACSI rating for the 10 largest ISPs is 81 percent of the average ACSI rating for all industries. Excluding Comcast, Charter and TWC are the worst rated ISPs in terms of ACSI rating out of the 10 largest ISPs. These results are not surprising. The ISPs face so little competitive pressure from consumers choosing alternative providers or switching to other providers, especially ISPs that have equal or faster broadband speeds, that they make little effort to provide reasonable service to their customers. The abuse of customers by large cable systems is well known.⁶⁹

⁶⁸ The American Customer Satisfaction Index is a national cross-industry measure of customer satisfaction in the United States. The Index measures the satisfaction of U.S. household consumers with the quality of products and services offered by both foreign and domestic firms with significant share in U.S. markets. Each year, roughly 70,000 customers are surveyed about the products and services they use the most. The survey data serve as inputs to an econometric model that benchmarks customer satisfaction with more than 300 companies in 43 industries and 10 economic sectors, as well as various services of federal and local government agencies. See ACSI, "About the American Customer Satisfaction Index" available at <http://www.theacsi.org/about-acsi>.

⁶⁹ Charter was ranked as having the third worst customer service by The Huffington Post. See "15 Companies With Impossibly Terrible Customer Service" *The Huffington Post*, January 1, 2013 (available at http://www.huffingtonpost.com/2013/01/09/worst-customer-service_n_2434067.html). See also "Charter Customers Say Bigger Isn't Likely to Mean Better," *The New York Times*, May 27, 2015 (<http://www.nytimes.com/2015/05/28/business/charter-customers-say-bigger-isnt-likely-to-mean-better.html>); CNET "Time Warner Cable gets in on the 'curse out your customer' trend," February 20, 2015, <http://www.cnet.com/news/time-warner-cable-gets-in-on-the-curse-out-your-customer-trend/>; "Customers give dismal scores to TV providers," *CNN Money*, May 20, 2014 (<http://money.cnn.com/2014/05/20/news/companies/cable-customer-satisfaction/>); Ars Technica "Survey says: Comcast, Time Warner Cable customers are still the angriest," (May 19, 2014), <http://arstechnica.com/business/2014/05/comcast-time-warner-cable-still-have-the-angriest-customers-survey-finds/>).

Table 5 Customer Service Scores for Internet Service Providers in the United States

Company	ACSI 2015 Rating
Comcast	56
AT&T	69
Time Warner Cable	58
Verizon	68
CenturyLink	60
Charter	57
Cox Communications, Inc.	58
Cablevision Systems Corporation	61
Frontier	61
Bright House Networks, LLC	63
All Internet Service Providers Average	63
Subscription Television Service	63
Municipal Utilities	73
Cooperative Utilities	80
Cellular Telephones	78
ACSI Average Ranking For All US Industries	75

Sources: American Customer Satisfaction Index, "Benchmarks by Company: Comcast," http://www.theacsi.org/index.php?option=com_content&view=article&id=149&catid=&Itemid=214&c=Comcast&i=Internet+Service+Providers; American Customer Satisfaction Index, "Benchmarks by Industry," http://www.theacsi.org/index.php?option=com_content&view=article&id=148&Itemid=213.

75. This situation results from significant market failures in the provision of broadband in local areas across the country, and in particular in those areas in which the Applicants operate as the dominant ISP. There are numerous barriers to infrastructure investment in broadband as the Commission has found in the last four of its reports on broadband competition.⁷⁰ There are five main problems:

⁷⁰ *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*, GN Docket No. 11-121, Eighth Broadband Progress Report, 27 FCC Red 10342, at 10403-10, ¶¶ 139-54 (2012); *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*, GN Docket No. 10-

76. First, there are political and regulatory barriers to entry in local areas.⁷¹ My discussions with small, competitive broadband providers made available to me by INCOMPAS (“Competitive ISPs”) has confirmed that one of the most important factors in deciding where to expand is the extent to which it is possible to surmount these non-economic barriers to entry.⁷² The large cable companies, including the Applicants, have participated in lobbying campaigns to block entry including lobbying for legislation to do so.⁷³ For example, a lobbying group whose members include TWC 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.”⁷⁴

159, *Seventh Broadband Progress Report and Order on Reconsideration*, 26 FCC Red 8008, at 8040 ¶ 65, (2011); Connecting America: The National Broadband Plan, GN Docket No. 09-51, at 167-90 (2010).

⁷¹ See, e.g., *Hearing on “Promoting Broadband Infrastructure Investment” Before the House Committee on Energy and Commerce Subcomm. on Comm’cns and Tech.* at 3-4 (July 22, 2015) (testimony of Michael Slinger, Google Inc.) (“One of the biggest challenges facing new broadband entrants such as Google Fiber is gaining access to utility poles and conduits.”); Declaration of John Tocalino, Google Fiber Inc., Case No. 15-1063, ¶¶ 6-10 (May 21, 2015) (attached as Exhibit 6 to Opposition of Intervenor to Petitioners’ Motion for Stay, *U.S. Telecom Assoc. v. FCC*, Case No. 15-1063 (May 22, 2015)).

⁷² In preparing this declaration, my team and I were able to interview five small, competitive ISPs that provide bundled video programming and high-speed, broadband Internet access services. Due to marketplace sensitivities, our team agreed to keep our discussions and review of their financial data anonymous. Consequently, I have anonymized references to their data or to discussions with them by referring to them as Competitive ISPs.

⁷³ See, e.g., Jon Brodtkin, *ISP Lobby Has Already Won Limits on Public Broadband in 20 States*, ArsTechnica (Feb. 12, 2014), Big Cable may have felled Seattle’s mayor, but it couldn’t stop this Colo. Project,” *Washington Post*, November 6, 2013 (available at <http://www.washingtonpost.com/blogs/the-switch/wp/2013/11/06/big-cable-helped-defeat-seattles-mayor-mcgin-but-they-couldnt-stop-this-colorado-project/>); CityLab, “How the Telecom Lobby is Killing Municipal Broadband—Companies like Comcast are spending big bucks to prevent competition from local governments,” November 4, 2011 (available at <http://www.citylab.com/tech/2011/11/telecom-lobby-killing-municipal-broadband/420/>); Consumerist, “How ISPs “Compete” With Municipal Networks: Lobbying and Campaign Donations That Block Them,” Aug. 28, 2014 (available at <http://consumerist.com/2014/08/28/how-isps-compete-with-municipal-networks-lobbying-and-campaign-donations-that-block-them/>) <http://arstechnica.com/tech-policy/2014/02/isp-lobby-has-already-won-limits-on-public-broadband-in-20-states/>; *Municipal Broadband Roadblocks*, BroadbandNowReport, <http://broadbandnow.com/report/municipal-broadband-roadblocks/> (last visited Jan. 6, 2016).

⁷⁴ ArsTechnica, “Who wants competition? Big cable tries outlawing municipal broadband in Kansas, January 31, 2014, <http://arstechnica.com/tech-policy/2014/01/who-wants-competition-big-cable-tries-outlawing-municipal-broadband-in-kansas/>).

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77. Second, there are high sunk capital costs of entry. For example, it took Google Fiber almost twenty months to lay enough fiber to pass (but not connect) 149,000 households in Kansas City.⁷⁵ As the US Department of Justice observed, “[w]ithin a given locale, wireline broadband involves very substantial sunk costs to reach a customer’s location and rather low marginal costs to provide incremental services to connected households.”⁷⁶ Building the last mile of a broadband network involves substantial fixed costs. Unlike the middle-mile and core network, there is only one potential customer for a line going into a single home, so the investment generates no return when and if the potential customer does not actually subscribe.⁷⁷ Entrant ISPs would not be able to recover much of their investment if they decided to withdraw from the market because, for example, they could not operate profitable systems.

78. Third, to be viable, broadband providers have to enter the MVPD business in addition to the ISP business because most households want to purchase both video programming and Internet access together.⁷⁸ In addition, they are competing directly against incumbent cable operators that offer both MVPD and broadband ISP services. Competitive ISPs confirm that it is currently not possible to secure enough household subscribers for stand-alone broadband

⁷⁵ See “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/>); TechCrunch, “Analyst: Google Will Spend \$84M Building Out KC’s Fiber Network to 149K Homes; \$11B If It Went Nationwide,” April 8, 2013 (available at <http://techcrunch.com/2013/04/08/google-fiber-cost-estimate/>).

⁷⁶ US Department of Justice, Ex Parte Submission of the United States Department of Justice Before the Federal Communications Commission, In the Matter of Economic Issues in Broadband Competition: A National Broadband Plan for Our Future, GN Docket No. 09-51, January 4, 2010.

⁷⁷ Jeffrey A. Eisenach (2012), “Broadband Competition in the Internet Ecosystem,” AEI Economic Studies, https://www.aei.org/wp-content/uploads/2012/10/broadband-competition-in-the-internet-ecosystem_164734199280.pdf, p. 5,7; Herman Wagner, “Fiber-to-the-X: The Economics of Last-Mile Fiber,” *Ars Technica*, March 30, 2011, <http://arstechnica.com/tech-policy/2010/03/fiber-its-not-all-created-equal/>.

⁷⁸ See Declaration of Mark Scully, Case No. 15-1063, ¶¶ 7-8 (May 21, 2015) (“ComSpan Declaration”) (attached as Exhibit 2 to Opposition of Intervenor to Petitioners’ Motion for Stay, *U.S. Telecom Assoc. v. FCC*, Case No. 15-1063 (May 22, 2015)); *AT&T/DIRECTV Order*, ¶¶ 57-59 (“Subscribers are increasingly buying video services as part of a bundle. . . . Although the number of customers who are relying only on OVD services to access video programming is growing, it is still a small fraction of the consumers purchasing video services.”).

service to have profitable businesses. Because a substantial proportion of consumers want to purchase broadband and video together, it does not make sense for small providers to offer standalone broadband. Out of the 17 broadband providers that have made significant entry and expansion with new fiber plant in the last four years, 15 offered both broadband and video programming.⁷⁹

79. Fourth, as discussed above, the incumbent cable systems typically pay significantly lower prices for video programming, largely as a result of earning higher access and distribution fees, than actual or potential rivals, including competitive ISP entrants. As a result, the incumbent cable systems can, and do, lower prices selectively to deter entry and expansion while keeping prices high enough to cover costs and earn a profit.

80. Fifth, it is difficult to persuade households to switch broadband providers because cable providers often engage in tactics to make it difficult for households to switch. As the FCC has noted, “Among the costs that consumers may experience are: high upfront device installation fees; long-term contracts and early termination fees; the activation fee when changing service providers; and compatibility costs of owned equipment not working with the new service. Bundled pricing can also play a role, as ‘single-product subscribers are four times more likely

⁷⁹ In December 2014, seventeen providers offered residential broadband fiber in footprints covering at least 0.5 percent of the US population with access to fiber-based broadband. Of these, eleven (Puerto Rico Telephone, RCN, PenTeleData, AT&T, Harbor Communications, CenturyLink, Google Fiber, Consolidated Communications, Metronet Hawaiian Telecom, and FairPoint Communications) had no fiber-to-the-home coverage in the US in December 2010. The other six (Verizon, Frontier, Cincinnati Bell, En-Touch, Electric Power Board, and West Wisconsin Telecom Cooperative) each more than doubled the population covered by their fiber-to-the-home networks between December 2010 and December 2014. Calculations based on data from National Telecommunications and Information Administration’s State Data Initiative (2014), National Broadband Map, December 31, 2010, *available at* <http://www.broadbandmap.gov/data-download>; FCC, “Broadband Deployment Data from FCC Form 477,” Version 1.0 (data as of December 31, 2014), October 16, 2015. Of these 17 fiber providers, only two (PenTeleData and Harbor Communications) do not offer video service. One of these ISPs (West Wisconsin Telecom Cooperative) relies on a third party, another small ISP, to provide video service.

to churn than triple-play subscribers.’ These costs may limit consumers’ willingness and ability to switch carriers, if such a choice is indeed available.”⁸⁰

81. Historically these barriers were sufficient to discourage new broadband providers from entering and competing with the incumbents. Several developments in the last several years have emboldened firms to make investments in new fiber plant in competition with the incumbent cable systems.

82. First, there is an increased consumer demand for high-quality high-speed broadband service making it easier to persuade households to switch where a high-speed alternative provider is available. In fact, {{BEGIN HCI

END HCI}}⁸¹ A White House report noted that, “In 2011, 77 percent of American Internet users ages 25 and older reported relying on the Internet for personal communications, while 66 percent relied on it for general information – and about half depended on the Internet for financial services, for consumer services and for entertainment.”⁸² More Americans view high speed broadband Internet access as essential.⁸³

⁸⁰ FCC, “Protecting and Promoting the Open Internet, Report and Order on Remand, Declaratory Ruling, and Order,” 30 FCC Red. 5601, 5631-32 ¶ 81 (Mar. 12, 2015).

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⁸² “Four Years of Broadband Growth,” The White House Office of Science and Technology Policy, and The National Economic Council, June 2013.

⁸³ *Id.*

83. Second, there is an increased recognition that high-quality high-speed broadband is important for local economic development. That recognition has increased municipal involvement in the development and promotion of broadband and has softened political and regulatory barriers to entry.⁸⁴

84. As a result, a number of companies have cautiously increased investment in new fiber plant in competition with dominant cable systems including those operated by the Applicants. They include new players such as Google Fiber as well as smaller telcos that are replacing DSL with fiber and extending fiber into new areas. Table 6 identifies several of the major players, where they have made investments, and the extent to which they compete with the Applicants. Thus far, these smaller broadband rivals have laid new fiber plant in a relatively small portion of the United States and have garnered a very small share of household subscribers.

⁸⁴ “Community-based Broadband Solutions, The Benefits of Competition and Choice for Community Development and Highspeed Internet Access,” The Executive Office of the President, January 2015. A January 2015 report from The Office of the White House said, “hundreds of towns and cities around the country have developed their own locally-owned networks.” These communities have “developed a variety of strategies for building locally-owned broadband networks and promoting higher-speed Internet access” which has “emerged as a critical tool for increasing access, encouraging competition, fostering consumer choice, and driving local and regional economic development.” The report also said, “[t]he President is calling for the Federal Government to remove all unnecessary regulatory and policy barriers to broadband build-out and competition, and is establishing a new Broadband Opportunity Council of over a dozen government agencies with the singular goal of speeding up broadband deployment and promoting adoptions for our citizens.” *See also*, Vice Motherboard “101 Cities Have Pledged to Secure High Speed Internet,” July 9, 2015 (available at <http://motherboard.vice.com/read/101-us-cities-have-pledged-to-build-their-own-gigabit-networks>; The Verge, “FCC Overrules State Laws to Help Cities Build Out Municipal Broadband,” February 26, 2015 (available at <http://www.theverge.com/2015/2/26/8114205/fcc-decision-municipal-broadband-internet>).

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85. These companies, as well as potential new entrants, could increase broadband competition in this country. Importantly, they have already forced large incumbent broadband providers to offer dramatically faster broadband speeds to compete.

B. Economics of Investments in New Broadband Plant

86. I have interviewed several competitive ISPs, and collected information from them, to determine how they make decisions to invest in new broadband plant including upgrading existing DSL plant, entering in contiguous areas, and entering into new areas. In making these investment decisions, like any business, these broadband providers project future operating margins, assess the competitive responses of other firms, and weigh risks. They make significant capital investments in new plant only when the expected rate of return is high enough to compensate for the opportunity cost of capital and for risk.

87. Video-programming costs are one of the most important determinants of whether an investment is profitable. For Competitive ISPs that also serve as MVPDs, video-programming costs, which are approximately {{BEGIN HCI END HCI}} on average for four Competitive ISPs I have interviewed, comprise approximately {{BEGIN HCI END HCI}} percent of the overall variable operating costs.⁸⁵ On a subscriber-weighted average basis, Charter and TWC video programming costs are currently {{BEGIN HCI END HCI}}, in comparison, for an approximate {{BEGIN HCI END HCI}} cost advantage. This cost disadvantage in the MVPD business makes it harder for small broadband entrants to compete in terms of the prices and bundles they offer households.⁸⁶

88. Policy makers and industry participants have long recognized that the higher programming costs faced by entrants puts them at a competitive disadvantage.⁸⁷ When their video programming costs are significantly higher than the dominant cable system, Competitive ISPs face three challenges. First, the national rack prices being charged by the dominant cable system may be sufficiently low, as a result of the cable system passing on some of its higher access and distribution fees in the form of lower prices for various bundles of broadband,

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⁸⁶ Generally, merger efficiencies, including reductions in costs, are procompetitive even if they disadvantage competitors. That is not the situation posed by this merger for two reasons. First, the “cost advantage” secured by New Charter results from an increase in bargaining power over video programmers. Second, that exercise of market power exacerbates a significant market failure in a related market as a result of the integration of MVPDs and ISPs. As I discuss in this section, the combination in those factors could significantly harm consumer welfare in the provision of local broadband.

⁸⁷ GAO, “Video Marketplace: Competition Is Evolving and Government Reporting Should Be Reevaluated,” GAO-13-576, June 2013, <http://gao.gov/assets/660/655476.pdf>, p. 22 (“A new provider in the video market needs to secure access to a large portfolio of broadcast and cable networks to compete for customers... [N]etworks generally offer significant discounts based on the number of subscribers a provider has. Thus, a substantial disadvantage that an entrant has relative to a large provider is that it will likely have higher programming costs, making entry challenging.”).

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video, and VoIP, that the Competitive ISPs would earn a relatively low margin if it matched the national rack prices for those bundles.⁸⁸ Second, the Competitive ISP entrant runs the risk that the dominant cable system will lower its prices across-the-board in the local area in which it faces competition. Third, the Competitive ISP broadband entrant runs the risk that the dominant cable system will lower its prices, selectively, to customers who are most likely to switch to the smaller broadband entrant to levels that the entrant cannot match profitably.

89. The Competitive ISPs I have interviewed have encountered these three issues. Those that compete with a dominant cable system generally earn much lower profits from providing video-programming services than the dominant cable system in the local area when they roughly match the incumbent's rack prices.

90. Like other large cable systems, the Applicants have reduced prices selectively in response to actual or potential competition. For example, TWC was very concerned about competition from {{BEGIN HCI END HCI }} As an internal presentation stated, {{BEGIN HCI

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response, TWC offered various customer service improvements and pricing promotions. For example, in **HC1**

⁵⁸ Katz Declaration, ¶¶ 49-55, 61, 63.

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91. In addition, TWC employed a combination of across-the-board price cuts and selective retention efforts targeted at subscribers most likely to deactivate, which harmed Competitive ISP1's profitability and significantly reduced Competitive ISP1's planned geographic expansion of a smaller provider. Section IV.C below describes this example in detail. Section IV. D provides examples of how dominant firms have responded to geographic expansion and increased speed offering by local Competitive ISPs.

92. The Transaction would concomitantly substantially increase the video-programming margin for the cable systems operated by the Applicants and increase their ability to make selective price reductions to deter entry. Table 7 shows the video margins of Charter, TWC and Bright House Networks pre-Transaction against the estimates for New Charter. New Charter's margins would increase from {{BEGIN HCI END HCI }}percent to {{BEGIN HCI END HCI }}percent. By comparison, according to four Competitive ISPs I have interviewed, the median margin was approximately {{BEGIN HCI END HCI }} percent and the average margin, weighted by 2015 video subscribers, was about {{BEGIN HCI END HCI }}percent.

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93. Based on the rough estimates I reported above, as a result of increased market power over video programmers, the Applicants' average video programming cost would fall from

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after the renegotiation of contracts (and using current video programming costs as a benchmark). The Applicants would be able to lower prices selectively by up to { BEGIN CI

END CI } while still covering their incremental operating costs. Based on the experience of Competitive ISPS, the dominant parties would likely engage in this sort of selective price-cutting.

94. As shown in Table 8, if all of this increased margin realized by the Applicants were passed on in the form of selective price cuts in areas they face competition, the median Competitive ISP, of the four I have interviewed, would see its margin on video programming decline from negative {{BEGIN HCI END HCI }}percent to negative {{BEGIN HCI
END HCI }}percent; the subscriber-weighted average margin would decline from {{BEGIN

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95. The Competitive ISP's ability to invest in new broadband is directly linked to its profitability. If video profitability shrinks because of targeted pricing efforts and competitive responses, this will reduce the return on investment and increase the likelihood that the ISP cannot meet its hurdle rate for investments that is necessary to cover its cost of capital and risk.

C. The Impact of the Higher Access and Distribution Fees on the Entry and Expansion of Fast Broadband

96. The increases in the price disparities, resulting from the merger-specific exercise of market power over video programmers, are large. They would significantly increase the abilities of the Applicants to raise barriers to entry and expansion. By increasing the profit margins earned by the Applicants, they would also increase the incentives of the Applicants to

⁹⁴ The Competitive ISPs included in the average had video subscriber bases ranging from just over a thousand to over a hundred thousand.

raise barriers to entry and expansion to protect their ISP and MVPD profits. As the expected returns of entry decline and the risks increase, I would expect that broadband providers would reduce their investments in laying new fiber and upgrading existing plant. In some local areas dominated by the cable systems operated by the Applicants, the Transaction would make it too risky or unprofitable to enter de novo, to replace DSL with new fiber, or extend fiber into adjacent areas. Given the short history of entry into local broadband markets, the heterogeneity of the circumstances of these areas (including the precise nature of the competitive response by New Charter and its local cable systems), and the lack of data, I am not able to provide a precise estimate of the amount of entry, and investment in new fiber, that would be deterred by the Transaction. However, my analysis of Competitive ISPs illustrates the potential competitive harm arising from the Transaction.

97. I have estimated that New Charter will save an additional { BEGIN CI END CI} on video programming costs relative to the subscriber-weighted average programming costs of the Applicants. The past experience of Competitive ISPs indicates that margin changes of this magnitude can have large effects.

98. As mentioned above, according to Competitive ISP1, TWC's aggressive pricing practices and targeted retention efforts negatively affected Competitive ISP1's financial performance and significantly harmed the business case for a planned fiber investment. TWC's aggressive pricing strategy included broad price reductions to attract new customers and targeted efforts to retain existing customers that were most at risk of deactivating their service to switch to the competition. In order to stay competitive, Competitive ISP1 had to match TWC's prices. Competitive ISP1 estimated that TWC's efforts amounted to a {{BEGIN HCI END HCI}} price reduction, averaged across all product offerings. Because Competitive

ISP1 matched TWC's prices, this in turn reduced the video margin of Competitive ISP1's new activations, including those it had anticipated acquiring as part of the planned expansion, by {{BEGIN HCI END HCI}}. This led to the reduction in total revenue from ISP1's current subscriber base as well as a reduction in anticipated revenue for future activations, which substantially weakened the business case for Competitive ISP1's planned investment. Such actions resulted in a {{BEGIN HCI END HCI}} percent decline in the internal rate of return (IRR) of Competitive ISP1's business, measured over a ten-year forward-looking period, and caused Competitive ISP1 to reduce its fiber build investment plans for the 2015 period, which included several thousand homes, representing approximately {{BEGIN HCI END HCI}} percent of ISP1's existing footprint.

99. Competitive ISP2 provides another example of how higher access fees would impede investment. Competitive ISP2 does not directly compete with the Applicants. Competitive ISP2's video product results in negative margins. In fact, Competitive ISP2's video ARPU is {{BEGIN HCI END HCI}} and its video-programming cost are {{BEGIN HCI END HCI}}. This leaves only {{BEGIN HCI END HCI}} for non-programming variable carrying costs of video. According to the Competitive ISPs that I interviewed, non-programming variable carrying costs are approximately {{BEGIN HCI END HCI}}, excluding capital expenditure, sales commission and installation. Thus, if programming and non-programming variable carrying costs are included, Competitive ISP2 operates its video service at a loss of approximately {{BEGIN HCI END HCI}} per month/user, a loss that it makes up for to some extent in its high-speed broadband product.

100. Competitive ISP2 said it has to offer video in order to satisfy the demand of its subscriber base. Indeed, the video "take rate" of Competitive ISP2's subscribers (i.e., the

fraction of its subscribers that also subscribe to video product) is {{BEGIN HCI END HCI}}percent. Competitive ISP2 said, “our model is based on the fact that we cannot win customers away from traditional cable broadband service without offering a comparable video package.”

101. Competitive ISP2 noted that if its costs were to rise by as little as {{BEGIN HCI END HCI}}, this would have a significant impact on profitability and on investment decisions. A small price impact like this on a per user basis would result in a large decline in the operating free cash flows that Competitive ISP 2 could use to invest in new broadband.

102. Interviews and documents provided by Competitive ISP3 and Competitive ISP4 indicate that (1) the difference in video programming costs between themselves and large incumbents are already a cause for reduced investment and (2) a further increase in that difference would harm the business case for future broadband investment by a greater extent. An executive at Competitive ISP3 noted in written comments to my staff:

For small- and medium sized providers, it is becoming increasingly challenging to continue to provide video programming services because video programming costs for these providers continue to escalate. Video programming costs have been increasing faster for small-and medium-sized multichannel video programming distributor. Most importantly, small- and medium-sized providers pay more for video programming than larger MVPDs, which can demand far more favorable terms and prices from video programmers because of their scale.

...

This disparity between the cost paid by large incumbents and smaller competitive broadband providers naturally creates markets in which new deployments simply do not make commercial sense. In other words, a large delta like the one Charter seeks here makes it less likely those competitive broadband providers will be willing or even able to deploy into New Charter’s territory—delaying or even foregoing opportunities for meaningful competition in those markets.

The Chief Executive Officer of Competitive ISP4 noted in written comments to my staff:

High video programming costs related to providing linear video distribution services (i.e., cable television) are already among the most significant impediments to broadband deployment for small providers. Large incumbents have a significant advantage in the video market. Video is a game of scale, and small operators like ours simply have none.

...

Our company is concerned about the proposed merger. We already compete with [Charter and TWC in many of our markets]. Because of our lack of scale on the video side, we already have difficulty competing against [Charter and TWC] in the market place today. This already makes it difficult for us to expand our deployments into more of their territory. That relative disadvantage will be significant exacerbated if Charter and TWC are permitted to combine. As a result, the proposed transaction would [not only inhibit the ability of our company and other smaller providers to invest in broadband deployment in New Charter's footprint, but also threaten our existing investments in broadband].

103. The loss of investment would be unfortunate for consumers in the areas served by New Charter's cable systems as the beneficial results of recent entry, reviewed next, demonstrates.

D. Impact of Decreased Broadband Entry and Competition on Consumers

104. The response of incumbents to entry by Google Fiber and other ultra-high-speed broadband providers shows the large consumer benefits from entry and competition. TWC upgraded its 100 Mbps Internet plan to 300 Mbps after Google Fiber decided to offer service in Austin, Texas.⁹² In Kansas City, AT&T moved to match Google Fiber's speed and price, while Comcast and TWC increased its speeds by up to three times at no price increase.⁹³ Shortly after

⁹² Martyn Williams, "Aha! Time Warner Cable Ups Austin Broadband Speeds as Google Fiber Looms," PCWorld, February 20, 2014, <http://www.pcworld.com/article/2099908/aha-time-warner-cable-ups-austin-broadband-speeds-as-google-fiber-looms.html>.

⁹³ Jacob Davidson, "AT&T Just Showed Us the Only Way We'll Get Better Internet Service," Time, February 17, 2015, <http://time.com/money/3712151/att-google-competition-internet/>; Bobby Burch, "The Google Effect: Fiber Breeds Innovation, Competition," Kansas City Business Journal, December 12, 2014, <http://www.bizjournals.com/kansascity/print-edition/2014/12/12/the-google-effect-fiber-breeds-innovation.html?page=all>; Conner Forrest, "Comcast, Time Warner Take On Google Fibre in Kansas City; Can

Google Fiber announced plans to enter in Provo, Utah, Comcast increased speeds for existing customers and offered a new triple play bundle at 105 Mbps.⁹⁴ AT&T matches Google's \$70 price for Gigabit service in Google Fiber cities, but charges higher prices elsewhere.⁹⁵ TWC increased its speeds in Charlotte six fold at no additional charge after Google Fiber announced plans to expand there.⁹⁶ These reactions are exactly what the academic literature on broadband competition would lead us to expect. In a 2010 econometric study, two FCC economists found that broadband competition leads to higher speeds and lower prices, particularly for slower speeds.⁹⁷

105. This entry has also pushed incumbents to expand their own Gigabit offerings.⁹⁸ AT&T has announced plans to launch gigabit fiber in 56 cities in total, many of which are the same cities that Google Fiber is exploring.⁹⁹ Near the beginning of 2013, Cox Cable's CEO dismissed the idea of upgrading to Gigabit speeds, saying that the upgrade would cost multiple

the Incumbents Compete?" TechRepublic, Aug. 12, 2014, <http://www.techrepublic.com/article/comcast-time-warner-take-on-google-fiber-in-kansas-city-can-the-incumbents-compete/>.

⁹⁴ Ross Lindsay, "Only Good Can Come from Google Fiber," Technique, February 3, 2015, <http://nique.net/opinions/2015/02/03/only-good-can-come-from-google-fiber/>.

⁹⁵ Bill Snyder, "Google Fiber Competition Makes AT&T Cut Cost of Gigabit Service in Some Areas," PC World, October 5, 2015, <http://www.pcworld.com/article/2989109/networking-hardware/google-fiber-competition-makes-att-cut-cost-of-gigabit-service-in-some-areas.html>; Chris Morran, "AT&T Expands High-Speed Fiber Network, Still Overcharges in Areas without Competition," Consumerist, November 9 2015, <http://consumerist.com/2015/11/09/att-expands-high-speed-fiber-network-still-overcharges-in-areas-without-competition/>.

⁹⁶ Karl Bode, "The Mere Threat of Google Fiber Has Time Warner Cable Offering Speeds Six Times Faster at the Same Price," TechDirt, April 1, 2015, <https://www.techdirt.com/blog/netneutrality/articles/20150413/08435930635/mere-threat-google-fiber-has-time-warner-cable-offering-speeds-six-times-faster-same-price.shtml>.

⁹⁷ Scott Wallsten and Colleen Malahan (2010), "Residential Broadband Competition in the United States," Working Paper, http://works.bepress.com/cgi/viewcontent.cgi?article=1105&context=scott_wallsten.

⁹⁸ Marguerite Reardon, "Google Fiber's Effect: Fuel for a Broadband Explosion," CNET, April 30, 2014, <http://www.cnet.com/news/googles-fiber-effect-fuel-for-a-broadband-explosion/>.

⁹⁹ AT&T, "AT&T Plans to Reach 38 More Metros with Blazing Fast Gigabit Internet Speeds," December 7, 2015, http://about.att.com/story/plans_to_reach_38_more_metros_blazing_internet_speeds.html. A comparison of the proposed coverages of AT&T Gigapower and Google Fiber reveals substantial overlap. AT&T, "Where is U-Verse with AT&T Gigapower?" <https://www.att.com/shop/internet/gigapower/coverage-map.html>; Google Fiber, "Expansion Plans," <https://fiber.google.com/newcities/>.

billions.¹⁰⁰ About a year later, in May 2014, Cox announced its plans to launch Gigabit service in Phoenix, Las Vegas, and Omaha, three cities targeted for Gigabit service by Google Fiber and CenturyLink.¹⁰¹ FCC Chairman Tom Wheeler has attributed these expansions to increased competition, even as he recognized the limited scope to-date of this competitive deployment.¹⁰²

106. These benefits from broadband entry and competition are threatened by the Transaction. In sum, the Transaction would result in the merging parties acquiring increased market power over video programming distribution that would enable them to secure significantly lower costs for providing video programming and higher margins. That would exacerbate existing market failures in the provision of local broadband and, in particular, would tend to discourage the entry and expansion of smaller ISPs in competition with the ISPs operated by the merging parties. That in turn would suppress competition and harm consumers in the local broadband markets.¹⁰³

¹⁰⁰ Shalini Ranachandran, "Speedier Internet Rivals Push Past Cable," Wall Street Journal, January 2, 2013, <http://www.wsj.com/articles/SB10001424127887324731304578193390432321484>.

¹⁰¹ Angela Moscaritolo, "Cox Details Gigabit Internet Rollout," PC Magazine, May 23, 2014, <http://www.pcmag.com/article2/0,2817,2458484,00.asp>; Google Fiber, "Expansion Plans," <https://fiber.google.com/newcities/>; CenturyLink, "CenturyLink Expands its Gigabit Service to 16 Cities, Delivering Broadband Speeds Up to 1 Gigabit per Second," Aug. 5, 2014, <http://news.centurylink.com/news/centurylink-expands-its-gigabit-service-to-16-cities-delivering-broadband-speeds-up-to-1-gigabit-per-second>.

¹⁰² Tom Wheeler, "The Facts and Future of Broadband Competition," September 4, 2014, https://apps.fcc.gov/edocs_public/attachmatch/DOC-329161A1.pdf.

¹⁰³ ISPs are also intermediaries between Internet content providers and households. By reducing competition in the provision of local broadband the Transaction could also increase market power of the merging parties over Internet content providers. {{ BEGIN HCI

V. Charter's Economic Analysis of the Efficiency Gains from Lower Video Programming Prices

107. Professor Katz and I agree on a number of key points that are relevant for evaluating the Transaction. The Transaction will result in a significant increase in the bargaining power of the Applicants over video programmers.¹⁰⁴ The Transaction will reduce the average total cost of video programming for New Charter as a result of Charter stepping into TWC's contracts initially¹⁰⁵ and as a result of New Charter negotiating lower rates over time.¹⁰⁶ Although some of the video programming contracts have fixed, upfront fees for subscribers, those payments are a function of number of subscribers and are therefore variable in the longer run.¹⁰⁷ As a general matter firms, even monopolists, tend to pass on some portion of marginal cost decreases to their customers.¹⁰⁸ Charter would, however, pass on substantially less than 100 percent of the marginal cost decreases and keep the remainder as increased margin.¹⁰⁹

108. Professor Katz also agrees that the Applicants provide access and distribution services to the video programmers. He notes, "[p]rogrammers' demand for content is derived from the demand for programming. To realize the latter demand, programmers require distribution."¹¹⁰ As discussed above, the terms of the contracts negotiated between Charter and TWC {{BEGIN

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¹⁰⁴ Katz Declaration at Section II.A.1.

¹⁰⁵ Katz Declaration at Section II.A.2.

¹⁰⁶ Katz Declaration at pp. 11-12, 22, 26. "It should be noted that this projection is conservative in that it assumes that the combined entity will benefit from the application of the rates in TWC's current contracts with programmers but assumes neither that New Charter will be able to obtain lower rates than TWC would, nor that legacy TWC systems will be able to take advantage of any instances in which Charter has negotiated more favorable programming prices than has TWC"

¹⁰⁷ Katz Declaration at p. 19.

¹⁰⁸ Katz Declaration at p. 31.

¹⁰⁹ For instance, Professor Katz estimates New Charter will pass on 50-60 percent of its marginal cost savings on to its customers. See Katz Declaration at Section II.B.2.

¹¹⁰ Katz Declaration at ¶ 76.

END HCI} MVPDs aren't

purchasing programming using it as an input into a production process. They are acting as intermediaries between video programmers and households.¹¹¹

109. Professor Katz and I also agree that it is not appropriate to analyze the Transaction using the monopsony model in which a monopoly buyer uses its power to force down the price of an input.¹¹² Unfortunately, Professor Katz has made a fundamental mistake in analyzing the impact of the Transaction. Despite having rejected the monopsony model he essentially treats the Transaction the same way economists would treat the purchase of an input by a buyer.

A. Professor Katz's Analysis of the Economic Efficiency of the Transaction is Wrong

110. Professor Katz simply replaces the classic monopsony model in which a monopoly buyer purchases an input with a Nash bargaining model in which a buyer purchases an input. He treats MVPDs and video programmers in the same way as economists would treat automobile companies and steel manufacturers engaging in bilateral negotiations over input purchases. As a result, his analysis of the impact of the Transaction on consumer welfare is wrong as a matter of economics and of standard merger practice.

111. To see the mistake starkly consider the implications of Professor Katz's analysis in the following hypothetical situation. Suppose there is a relatively competitive video programmer industry. The video programmers want to buy access and distribution to households served by a relatively large number of small MVPDs spread across the country. In this hypothetical situation, the MVPDs collect payments from households for the video programming services

¹¹¹ This point is seen most clearly in the fact that the MVPDs enable video programmers to access households for the purpose of presenting advertisements to them. That situation is analogous to other intermediaries between advertisers and consumers such as newspapers and radio stations.

¹¹² Katz Declaration at Section II.D.1.

and pay that back to the video programmers minus a commission. MVPDs also charge an access and distribution fee for providing access to their subscriber households. However, the smaller MVPDs lack market power to demand significant fees for providing access to their customers.

112. Now suppose the MVPDs merge to monopoly. They increase the price of access and distribution services to the video programmers. According to widely accepted merger practice, we would treat this as an increase in the access and distribution price to the video programmers.¹¹³ The fact that the monopoly MVPD passes on some of the cost savings to households in the form of lower fees would not save this hypothetical merger from condemnation.

113. In a traditional single-sided analysis antitrust authorities would not credit the savings as an efficiency gain since the households would not be in the relevant market for the purchase of video programming intermediation services.¹¹⁴ It would be sufficient to show an anticompetitive effect on one side of the intermediary and no consideration would be given to the other side.¹¹⁵ In a modern two-sided analysis one would look at the impact of the merger on

¹¹³ See, e.g., Complaint, *U.S. v. Daily Gazette Co., and MediaNews Group, Inc.*, ¶ 26 (“Accordingly, the sale of local daily newspapers to readers, and the sale of access to those readers to advertisers in those newspapers, each constitutes a line of commerce and a relevant product market within the meaning of Section 7 of the Clayton Act and for purposes of Sections 1 and 2 of the Sherman Act.”); *U.S. v. NAT, L.C. and D.R. Partners d/b/a Donrey Media Group*, ¶ 8 (“Local daily newspapers sell two products (services) to two sets of customers. To readers, they sell daily newspapers. To advertisers, they sell access to their readers. Each of these products constitutes a line of commerce and a relevant product market within the meaning of Section 7 of the Clayton Act.”).

¹¹⁴ See US Department of Justice and the Federal Trade Commission (2010) “Horizontal Merger Guidelines,” at § 10 n. 14 (“The Agencies normally assess competition in each relevant market affected by a merger independently and normally will challenge the merger if it is likely to be anticompetitive in any relevant market.”)

¹¹⁵ See *supra*, n. 113. I disagree with this approach and recommend considering both groups of customers.

the total price of video distribution and therefore net out the savings to consumers.¹¹⁶ But since the MVPD only passes back a portion of its higher access and distribution fees to consumers the merger still results in an increase in the total price of video distribution.

114. An economic analysis that followed Professor Katz's line of reasoning would focus entirely on the pass-through of the monopoly price increase to households, ignore the impact on video programmers, and claim that the merger generates efficiencies. That is clearly wrong as a matter of economics and merger practice. Yet there is no substantive economic distinction between the merger I have just described and the one considered by Professor Katz. There are only accounting differences in how access and distribution fees are paid by the video programmers as I showed above.

115. This mistake sends Professor Katz's analysis far off course. One would ordinarily define the relevant markets in which intermediaries compete, assess the extent to which they have market power as intermediaries, assess the extent to which the merger of intermediaries would increase prices to the two groups of customers they are providing intermediation services to in those markets, assess the overall impact on prices for the two groups of customers, and then consider offsetting efficiencies.

116. In fact, Professor's Katz has reached two empirical findings that, taken together, show that the Transaction would tend to significantly increase the prices paid by video programmers for intermediation services, for access and distribution, and the total price paid by video programmers and households for intermediation services. First, he finds that New Charter would pay significantly less for video programming. Therefore the video programmers would

¹¹⁶ David Evans and Richard Schmalensee (2014) "The Antitrust Analysis of Multisided Platform Businesses," in Blair and Sokol, ed, *The Oxford Handbook of International Antitrust Economics, Volume 1* at pp. 413-414, and 438.

pay significantly more for access and distribution. Second, he finds that New Charter would only pass on about half of its reduced cost for video programming. The Transaction would, under his analysis, therefore increase the total price for video programming access and distribution. After netting out the lower prices to subscriber households the increase in the total price for video programming access and distribution would equal about half of the increase in the price paid by video programmers. As I showed above, using Professor Katz's pass-through estimates the Transaction would result in about a { BEGIN CI END CI } percent increase in the price charged by the merging parties for providing access and distribution to their households.

117. Based on standard merger practice at the U.S. Department of Justice and the Federal Trade Commission we can conclude the following from the Professor Katz's findings on the impact of the Transaction on video programming costs and consumer pass-through:

- a. Examining the direct effect of the merger on prices, without conducting a market definition analysis, we would conclude that the Transaction results in a significant increase in market power and prices based on a single-sided analysis (just video programmers) or two-sided analysis (video programmers plus households).
- b. Examining the effects of the merger on prices in a relevant market that consists of the local areas served by the Applicants, we would conclude that the Transaction results in a significant increase in market power and prices based on a single-sided analysis (just video programmers) or two-sided analysis (video programmers plus households)

118. I am not, however, endorsing either of these approaches or presenting any opinion on the appropriate relevant markets for assessing this Transaction.

B. Professor Katz's Analysis of Pass-Through Is Wrong

119. Professor Katz also claims that Charter would pass on 50-60 percent of the marginal cost decreases to consumers. His analysis is based on a standard textbook economic model in

which a company produces a single product and charges a single price.¹¹⁷ He has accurately described and implemented that model. However, that simple model is not directly applicable for analyzing cable companies that engage in price discrimination through selling bundles of multiple products, which are themselves bundles of other products, at multiple prices and engage in extensive selective price cutting.¹¹⁸

120. Charter engages in product bundling.¹¹⁹ It is well known that product bundling enables firms to engage in price discrimination by providing a distribution of offers that track the distribution of the willingness to pay.¹²⁰ These bundles include more than {{BEGIN HCI
END HCI}} different combinations of various subsidiary bundles of different levels of MVPD, ISP, and VoIP services.¹²¹ Charter also engages in selective pricing through promotional discounts, which vary across local areas and across households within local areas.¹²²

¹¹⁷ Katz Declaration at Section II.B.1.b and Appendix V.B.3.

¹¹⁸ To see the importance of price discrimination consider the standard textbook model, relied on by Professor Katz, of a monopolist that charges a single price for a single product. In that case, with linear demand, the monopolist would pass on 50 percent of a marginal cost decrease. By contrast, consider a monopolist that engages in first-degree price discrimination where it charges each customer their maximum willingness to pay through different prices and bundles. In that case, the monopolist wouldn't reduce prices at all following a marginal cost decrease since the maximum willingness to pay for each consumer remains the same.

¹¹⁹ Professor Katz invokes the "multidimensional nature of MVPD pricing" as a reason why it is "difficult or even impossible to determine a specific pass-through rate from Charter's recent pricing behavior." See Katz Declaration at ¶51. The same point applies to his logit simulation model.

¹²⁰ See George Stigler (1968) "A Note on Block-Booking," in George Stiger, ed, *The Organization of Industry*; William Adams and Janet Yellon (1976) "Commodity Bundling and the Burden of Monopoly" *The Quarterly Journal of Economics*, 90(3) at pp. 475-498; Yannis Bakos and Eric Brynjolfsson (1999) "Bundling information goods: Pricing, profits and efficiency," *Management Science* 45(2) at pp. 1613-1630.

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¹²² For instance, internal documents describing Charter's pricing strategy {{BEGIN HCI

121. Professor Katz's logit simulation model, however, assumes a firm that offers a single product at a single price.¹²³ It is therefore not relevant for assessing how Charter would respond to a decrease in cost. In addition, Professor Katz has provided no econometric evidence that this demand specification, and the Bertrand pricing model that underlies it, is consistent with how Charter, or MVPDs generally, compete. These are simply assumptions.

122. His logit simulation model results in a simple formula that shows the relationship between the single price charged by a single-product firm and its market share. Market share is the only factor that determines pass-through under this model. The formula, and that conclusion, depends on various assumptions. Some of those assumptions are clearly wrong in this particular case (that the firm charges a single price for a single product) and others are untested (that cable companies engage in differentiated market Bertrand competition). Therefore I would not put much weight on his "simulated" pass-through rates. They are driven entirely by assumptions and not by any empirical analysis.

123. Professor Katz admits that the "it is difficult or even impossible to determine a specific pass-through rate from Charter's recent pricing behavior" because of the "multidimensional nature of MVPD pricing." He provides other indirect evidence in support of his simulated pass-through rates.¹²⁴ None of it provides credible support for his simulated pass-through estimates based on the logit formula.

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¹²³ See Katz Declaration at Section V.B.3.

¹²⁴ Katz Declaration at ¶ 50 citing George Ford and John Jackson (1997), "Horizontal Concentration and Vertical Integration in the Cable Television Industry," *Review of Industrial Organization*, 12 at pp. 501-518. He also cites a recent paper by Crawford and Yurokoglou which he says "suggests that consumers ultimately benefit through lower prices from programming cost savings." Crawford and Yurokoglou do not report an estimated pass-through rate. See Gregory Crawford and Ali Yurokoglou (2012), "The Welfare Effects of Bundling in Multichannel Television Markets," *American Economic Review*, 102(2) at pp. 643-685.

124. He cites a study conducted by Ford and Jackson based on data for the cable industry in 1994.¹²⁵ Ford and Jackson found a pass-through rate of about 50 percent. I would not place much weight on this study. It is based on analyzing competition in the cable industry in 1994. That was before cable systems bundled broadband and VoIP, which were not yet available, and at a time when the cable industry was much less concentrated at a national level than it is today.

125. The Ford and Jackson analysis, in fact, does not support Professor Katz's thesis that lower video programming costs for larger distributors increases consumer welfare. The authors conclude that the programming cost reductions from merger could *decrease* consumer welfare because the benefits from the partial pass-through of cost savings are outweighed by the costs of reduced competition resulting from the heightened barrier to entry.¹²⁶

[W]hile the results of this simple welfare analysis suggest that increased ownership concentration of cable systems by large MSOs enhances social welfare, we also found that such concentration can result in substantial programming discounts. These discounts are large enough so as to potentially constitute an absolute cost advantage for incumbent cable systems vis-à-vis potential entrants and thus a barrier to entry. If so, welfare calculations must take into account the effect on competitive entry. Such entry has been found to have substantial welfare enhancing properties through lower prices and higher quality of service. Since direct competition between cable companies has been shown by numerous studies to reduce basic cable prices by over 20 percent, the relatively modest increase in social welfare due to increased concentration (derived from our estimates) suggests that limits on such concentration may be warranted.

126. Professor Katz also reports some evidence that Charter has "raised its rates in response to increased programming costs." This evidence highlights the complexity of pricing by

¹²⁵ Katz ¶50, citing George Ford and John Jackson (1997), "Horizontal Concentration and Vertical Integration in the Cable Television Industry," Review of Industrial Organization, 12 at p. 514. He also cites a recent paper by Crawford and Yurokoglou which he says "suggests that consumers ultimately benefit through lower prices from programming cost savings." Crawford and Yurokoglou do not report an estimated pass-through rate.

¹²⁶ George Ford and John Jackson (1997), "Horizontal Concentration and Vertical Integration in the Cable Television Industry," Review of Industrial Organization, 12 at p. 514.

Charter and the mistake in assuming that it follows the simple single price for a single product model assumed by the logit demand formula. According to Katz, Charter “has pursued a policy of generally passing retransmission-consent cost increases through to consumers on a one-for-one basis in the form of the Broadcast TV Surcharge.”¹²⁷ Even though the retransmission charges are sometimes incurred at a local level, Charter imposes the surcharge on a national level.¹²⁸ Between July 2012 and January 2015 the surcharge increased by {{ BEGIN HCI ND HCI }} while the retransmission cost per subscriber increased by {{ BEGIN HCI ND HCI }}. Therefore, Charter passed on in the form of higher surcharges {{ BEGIN HCI END HCI }} times the increase in retransmission costs at a national level.¹²⁹ That high pass through rate is inconsistent with Katz’s logit simulation formula and other studies cited by Katz that show partial pass-through. There is no obvious reason why the two would be different.

127. Professor Katz claims that the Broadcast Surcharge is part of a broader strategy of “partially passing through all programming costs” but does not provide any factual support for that statement or any discussion of what that strategy is. To reconcile the {{ BEGIN HCI ND HCI }} percent pass-through rate with his estimates of pass through he identifies a particular price increase, for set-top boxes, by imposed by Charter. He does not show that these price increases were the only price changes made by Charter or that they are tied to changes in video programming costs versus some other business strategy. He takes the price increases for the set-top boxes, adds them to the broadcast surcharges, and says that the overall

¹²⁷ Katz Declaration at ¶51.

¹²⁸ Although some agreements may overlap local markets due to common station ownership, the surcharges are assessed on a local, station-by-station basis.

¹²⁹ That average masks enormous variability in the relationship between each increase in the surcharge and the corresponding increase in retransmission costs. The four individual pass-through rates reported by Katz in Table 2 are {{ BEGIN HCI END HCI }}

portion of video programming cost increases (including retransmission) was {{ BEGIN HCI
END HCI}} percent. That is simply an arbitrary calculation that happens to yield a number closer to what Katz has calculated from his logit simulation model.

128. Professor Katz does not provide *any* evidence based on the historical pricing behavior by the Applicants that they would pass 50-60 percent of lower video programming marginal costs on in the form of lower prices. He did not have to restrict his analysis to Charter. He has advanced a general proposition concerning pass-through of cost changes for cable systems. He could have tested that proposition with data from TWC and Bright House Networks. In particular, his general proposition predicts that TWC should charge significantly lower prices than Charter because it has significantly lower video programming costs. Professor Katz might have been able to test that proposition through a careful examination of their prices.

129. Based on my review, I do not believe Professor Katz has presented credible or reliable economic evidence that New Charter would 50-60 percent of the reductions in its video programming costs on to consumers. I agree that New Charter would pass on some portion. Based on my review, and discussions Competitive ISPs, I think it is more likely that New Charter would use the increased margins to engage in primarily targeted price cuts to limit local competition.

VI. Conclusion

130. Based on the analysis above, I conclude that the Transaction would increase the intermediation fees paid by video programmers for access and distribution and would reduce competition for the provision of local broadband.

APPENDIX B

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

1. This appendix describes the methodology I used when performing calculations using the FCC/NTIA's National Broadband Map.

A. Calculations Related to the Number of Competing ISPS in Census Blocks Served by Each Company

2. Start with the FCC data for December 31, 2014.¹ Limit the data to Census blocks whose populations are reported in the 2010 Census Summary File 1.² This excludes American 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, restrict the data to wired broadband offerings (TechCode not equal to 60 or 70) with download speeds greater than or equal to 10 Mbps (MaxAdDown greater than or equal to 10) and that are available to residential consumers (consumer equal to 1).
4. Use the holding company name (HocoFinal) to identify distinct providers. In each block, find the highest maximum advertised speed for each holding company offering service in that block.
5. For each block, get the population from the 2010 Census Summary File 1.

¹ Federal Communications Commission, "Broadband Deployment Data from FCC Form 477" available at <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>.

² U.S. Census Bureau, 2010 Census, Summary File 1, available at <http://medc.missouri.edu/cgi-bin/uexplore?/pub/data/sf12010>.

6. For each block, count the number of broadband providers other than Applicants that provide service with a maximum advertised download speed greater than or equal to 10 Mbps. If a competing provider has a download speed at least as great as the Applicants in that block, count it as providing an equal or faster download speed. Set a flag indicating whether the number of such competitors in that block is zero.
7. Then, aggregate over blocks. Specifically, calculate the population-weighted average number of wired alternatives, and count the total population in blocks where the number of such competitors equals zero. Limit the sample to blocks where the Applicants are present.

B. Calculations Related to Fiber Development

8. Start with the FCC data for December 31, 2014 and the NTIA data for December 31, 2010.³ Limit the data to Census blocks whose populations are reported in the 2010 Census Summary File 1.
9. For the NTIA data, unless otherwise stated, use both of the two fixed broadband provider datasets (the one for large Census blocks and the one for small Census blocks), and exclude the mobile wireless broadband provider dataset. Restrict the data to fiber-based broadband offerings (transtech equal to 50) with download speeds 10 Mbps or greater (MaxAdDown between 7 and 11).

³ Federal Communications Commission, "Broadband Deployment Data from FCC Form 477" available at <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>; National Telecommunications and Information Administration, "National Broadband Map Datasets," available at <http://www2.ntia.doc.gov/broadband-data>.

10. For the FCC data, unless otherwise stated, restrict the data to fiber-based broadband offerings (TechCode equal to 50) with download speeds greater than or equal to 10 Mbps (MaxAdDown greater than or equal to 10) and that are available to residential consumers (consumer equal to 1).
11. Use the holding company name (HocoFinal/Hoconame) to identify distinct providers. In both the 2010 and 2014 datasets, sum the number of individuals with access to fiber-based broadband for each of the distinct providers.
12. Merge the 2010 and 2014 datasets by holding company name and take the difference between the 2014 and 2010 number of individuals with access to fiber-based broadband.