CASE X

ECONOMIC THEORIES OF HARM RAISED BY THE PROPOSED COMCAST/TWC TRANSACTION (2015)

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by

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I. INTRODUCTION

In February 2014 Comcast Corporation (Comcast) announced its intention to purchase Time Warner Cable Inc. (TWC). Comcast was the largest cable company, the largest Internet access provider, and the largest pay-TV provider in the United States. TWC was the second largest cable company, the third largest Internet access provider, and the fourth largest pay-TV provider in the U.S. After a 14-month regulatory review by the Antitrust Division of the U.S. Department of Justice (DOJ) and the U.S. Federal Communications Commission (FCC), Comcast ultimately withdrew its merger proposal in April 2015 after both agencies expressed serious concerns with the proposed transaction.

One of the main arguments that the applicants offered in defense of the transaction was that the two companies essentially served completely separate geographic areas, and that the transaction would therefore not directly diminish head-to-head competition in any retail pay-TV or Internet access service market. While government reviewers[1] acknowledged this point, they nonetheless determined that the increased size of the merged entity at the national level did raise significant competitive issues.[2]

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[1]This paper will use the term "government reviewers" to refer collectively to both federal government agencies that reviewed the merger.

[2]In addition to being a cable operator, Comcast was also vertically integrated into the programming industry that produces content networks and licenses these networks to pay-TV providers, through its ownership of NBCU. TWC did not own significant programming assets. (TWC was spun off from Time-Warner Inc. in 2009 and Time Warner Inc. retained all of the entity's programming assets including Warner Brothers.) In a sense then, one could view the merger of Comcast and TWC as consisting of two different mergers or asset combinations: The first merger was the horizontal combination of the companies' distribution assets. The second merger was the vertical combination of Comcast's programming assets with TWC's distribution assets. Although government reviewers considered the competitive effects of both types of asset combinations and developed separate theories of harm that applied to each, their primary concern

The transaction was proposed at a time when on-line video distributors (OVDs) were just beginning to emerge as potentially significant new competitors to the traditional providers of pay-TV services, which are usually referred to as multi-channel video programming distributors (MVPDs). While early OVDs, such as Netflix, had initially offered only libraries of on-demand material, newer entrants - such as Sling TV and Playstation Vu - were now beginning to offer or were planning to offer live streaming channels just like traditional pay-TV providers, but often with much smaller bundles of channels and other novel features.

Government reviewers viewed the emergence of these new competitors as a very desirable development for consumers. However, the reviewers were concerned that traditional MVPDs viewed these new entrants as threats to their existing pay-TV business, that they had both the ability and incentive to attempt to disadvantage these new entrants while the latter were still small and vulnerable, and that the transaction would exacerbate this problem.

Cable providers, such as Comcast and TWC, were significant players in the two markets where OVDs obtained access to their two key inputs: programming and the transport of their content over the Internet access networks that served consumers. The cable providers were significant competing purchasers of programming in the programming market; and in addition OVDs relied on them to transport their content to consumers over cable providers' Internet access networks. Government reviewers' concern with the competitive effects of the proposed transaction focused on its effects in these two key input markets.

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in this transaction was with the horizontal combination of distribution assets, and this chapter will focus on the competitive issues surrounding the horizontal combination of distribution assets. The vertical theories of harm relevant to this transaction were similar to those that arose in the earlier merger of Comcast and NBC Universal. See Rogerson (2014) for an analysis of these

In particular, government reviewers' key concern with the proposed transaction was that the increased size of the merged entity at the national level would create both an increased incentive and an increased ability for the merged entity to take actions that would limit OVDs' access to these two key inputs, which would thus disadvantage OVDs and discourage or depress the development of a vibrant and competitive OVD industry.[3]

There are three separate but related theories of harm that fall under the general rubric of "increased ability and incentive to disadvantage OVDs." Two of them are based on the idea that a cable operator that is larger at the national level will have more bargaining power in the two input markets - programming and interconnection - that are critical to OVDs and will thus have a greater *ability* to harm OVDs. The third theory is quite different and instead explains why a cable operator that is larger at the national level will have a greater *incentive* to take actions in both of these input markets that harm OVDs, because the larger operator will internalize a greater share of the externalities that one MVPD creates for the MVPD industry as a whole when it takes

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issues.

[3]In addition to directly increasing the level of competition in pay-TV markets, the development of a vibrant and competitive OVD industry had the potential to reduce barriers to entry in Internet access markets and thus also increase the level of competition in these markets. Since many consumers prefer to purchase Internet access services and pay-TV services as a single bundle, in order to compete effectively with incumbent cable companies and telephone companies, new entrants that provide Internet access services -- such as Google Fiber or municipally-sponsored fiber networks -- had to offer pay-TV services that were comparable in quality to those that are offered by the incumbent cable companies and telephone companies. However, incumbent pay-TV providers with large subscriber bases generally faced much lower programming costs than did new entrants with very small subscriber bases, which created a barrier to entry for new providers of Internet access services. The development of a vibrant and competitive OVD industry promised to reduce this barrier to entry by reducing the need for new entrants into Internet access markets to offer pay-TV services of their own.

actions that disadvantage OVDs.

Since these three theories of harm were the core theories of harm for this case, it will be useful to name and describe each of them separately.

> **Theory #1: Increased Bargaining Power in Interconnection Negotiations**
> This theory posits that larger Internet access providers have more bargaining power in negotiations over the interconnection fees that Internet access providers charge OVDs and their transit providers, and thus have a greater *ability* to disadvantage OVDs by negotiating higher interconnection fees.

> **Theory #2: Increased Bargaining Power in Negotiations with Programmers**
> This theory posits that larger MVPDs have more bargaining power in negotiations over programming carriage terms and thus have a greater *ability* to disadvantage OVDs by negotiating contract terms with third party programmers that limit the availability of programming to OVDs.

> **Theory #3: Internalization of Externalities**
> This theory posits that when an individual MVPD takes actions that disadvantage OVDs, this creates a positive externality for the entire cable industry. The post-transaction entity will internalize a greater share of these externalities and thus have a larger *incentive* to take actions that disadvantage OVDs.

This chapter will describe each of these three theories of harm in more detail. It will critically discuss their strengths and weakness on a theoretical level as well as the extent to which the theories can be applied to the particular factual situation that was presented by this transaction. It will also briefly review the main theories of efficiencies for the transaction.[4]

II. BACKGROUND

The Structure of the Pay-TV and Internet Access Industries

We can distinguish between two primary vertical levels within the pay-TV industry. The upstream video programming industry produces individual television shows, aggregates these

[4]See Baer (2015a, b), Bring et al. (2015), Hill et al. (2015), and Sallet (2015, 2016) for other published accounts of government reviewers' analysis of this transaction.

shows into networks, and then licenses these networks to the downstream video distribution industry. These upstream firms will be referred to as "programmers." Examples of major programmers (and the pay-TV networks that they produce) include Disney-ABC (ESPN, A&E, Disney Channel), Time Warner (HBO, CNN, TBS), Viacom (Comedy Central, MTV, Nickelodeon), and NBC Universal (USA, Bravo, MSNBC). The four major broadcast networks (ABC, NBC, Fox, CBS) can also be considered to be programmers since they provide their networks to pay-TV providers and charge them so-called retransmission consent fees for the right to carry their networks.

The three traditional groups of firms in the downstream video distribution industry are: cable companies, such as Comcast and TWC; direct broadcast satellite (DBS) companies, such as DirecTV and DISH; and telephone companies (telcos), such as AT&T and Verizon. In a few areas of the country new entrants - such as Google Fiber and municipally sponsored entities - are building all-fiber networks and also provide video services. Firms in all four groups are generally referred to as MVPDs.

As was discussed in the introduction, a significant development in the pay-TV industry that was just beginning to occur at the time that the parties announced their transaction was the emergence of OVDs as disruptive new competitors.

A key distinction between MVPDs and OVDs is that MVPDs all own their own distribution systems, while OVDs instead rely on their subscribers separately to purchase Internet access service from an Internet access provider. The relationship between OVDs, Internet access providers and pay-TV viewers is further complicated by the fact that Internet access providers frequently have direct contractual relationships with OVDs or their transit providers and charge

interconnection fees to these entities.[5] Thus Internet access providers are best thought of as operating in a two-sided market[6] where they sell Internet access service to households but also sell interconnection to OVDs and their transit providers.

The vertical structure of the pay-TV industry is illustrated in Figure X-1. It shows that programmers directly license programming to both MVPDs and OVDs. MVPDs directly sell pay-TV service to viewers of pay-TV services. However, viewers of pay-TV services from OVDs must also purchase Internet access service from Internet access providers to receive pay-TV service from OVDs. Finally the line between OVDs and Internet access providers denotes the fact that the Internet access providers may directly charge interconnection fees to OVDs in addition to directly charging subscribers for Internet access.

An important characteristic of an Internet access service is its transmission speed, which is usually measured in megabits per second (Mbps). Higher speeds are necessary for data intensive applications - such as watching streaming video, online gaming, and fast downloading of video files - and become even more necessary to the extent that multiple users in the same household wish to use the Internet simultaneously for data-intensive applications.

The two primary providers of Internet access service are cable companies and telcos. At the time of the transaction almost all cable networks had been upgraded or were in the process of

[5]Smaller Internet access providers often either exchange traffic with other networks on a cost-free basis or actually pay certain transit providers to deliver traffic to them. By 2014, however, it had become fairly common for larger Internet access providers to charge interconnection fees to OVDs and transit providers that wished to interconnect with them and deliver large amounts of content to their subscribers.

[6]See Armstrong (2006) and Rochet and Tirole (2003, 2006) for some of the seminal papers on two-sided markets.

being upgraded to provide minimum download and upload speeds of 25 Mbps/3Mbps, respectively. This download speed was generally thought to be unambiguously fast enough to support the Internet access needs of consumers using the Internet to download video and other data intensive applications.

The situation with respect to telcos was more complex. Telcos use a combination of three different technologies to provide Internet access services. In large segments of their service areas, particularly less dense and lower income areas, telcos provide Internet access service over their existing copper lines with the use of a first-generation technology: "legacy DSL." Legacy DSL generally provides speeds in the neighborhood of 3 Mbps/.768 Mbps. Telcos have upgraded their systems either by using fiber to the premises of the user (FTTP) or by using fiber to the local node (FTTN). Of the two technologies, FTTP is more expensive but is also faster and provides transmission speeds that are comparable to the speed of upgraded cable networks. At the time of the transaction, upgraded Verizon systems generally employed FTTP, while upgraded AT&T systems generally employed FTTN.[7]

A key factor that shapes the competitive environment for both pay-TV services and Internet access services is that there are a limited number of competitors that serve any particular local area due to the fact that there are large economies of scale that are involved in installing a wireline network in any given geographic area. The two DBS providers -- DirecTV and Dish -- are generally capable of providing service anywhere in the United States. However, most

[7]At around the time that the transaction was announced, AT&T's upgrade strategy changed from using FTTN to using FTTP.

households are served by a single telco and a single cable operator.[8] Therefore the typical urban or suburban household in the United States generally can choose between three or four providers of pay-TV service: the incumbent cable operator; the two DBS providers; and the incumbent telco if the household is in an area in which the telco has upgraded its service to either FTTN or FTTP. However, the typical urban or suburban household generally can choose between only two providers of Internet access service: the incumbent cable operator, and the incumbent telco.

Furthermore, a significant share of households only have access to a single provider of Internet access service at higher speeds because the incumbent telco is not capable of providing these higher speeds. In its review of the transaction, the FCC published data on the number of Internet access providers at various minimum speeds to which households within the post-transaction Comcast footprint had access. These data are reported in Table X-1. For Internet access service of any speed, 87% households had access to two or more providers. However, for internet access service at a speed of 10 Mbps/.768 Mbps or faster, only 71% of households had access to two or more providers. The situation was even more dramatic for Internet access service at a minimum speed of 25 Mbps /3 Mbps. At this minimum speed, only 31% of households had access to two or more providers.

The Effect of the Proposed Transaction on National Subscriber Shares

[8]In rare cases, a second cable operator (usually referred to as a cable over-builder) may serve an area and/or an area may be served by a new entrant with an all-fiber network, such as Google Fiber.

Table X-2 presents the national shares of MVPD subscribers for the largest ten MVPDs prior to the transaction and the corresponding pro-forma post-transaction market shares.[9] Table X-3 presents the national shares of Internet access subscribers for the largest ten Internet access providers prior to the transaction and the corresponding pro-forma post-transaction market shares.[10] Comcast was already the largest MVPD and Internet access provider in the country before the transaction and its lead over the next-largest providers would have increased significantly because of the transaction. Before the transaction Comcast served 21.6% of the nation's MVPD subscribers and 22.8% of its Internet access subscribers. After the transaction these shares would have increased, respectively, to 28.9% and 31.4%.

The effect of the transaction on Comcast's share of Internet access subscribers at higher speeds is also of interest. As was discussed above, cable operators play a much more significant role in providing higher speed Internet access than do telcos, and we would therefore expect both the pre-transaction and post-transaction national market shares for higher-speed Internet access subscribers to be significantly larger. The parties reported that, for Internet access subscribers

[9]As part of the transaction, Comcast proposed to sell 3.9 million subscribers to another cable operator, Charter Communications (Charter). Therefore the post-transaction number of MVPD subscribers for Comcast is set equal to the sum of pre-transaction MVPD subscribers for Comcast and TWC minus 3.9 million. Similarly, the post-transaction number of MVPD subscribers for Charter is set equal to the pre-transaction number of MVPD subscribers for Charter plus 3.9 million.

[10]To reflect the sale of subscribers to Charter, the post-transaction number of Internet access subscribers for Comcast is set equal to the sum of the pre-transaction Internet access subscribers for Comcast and TWC minus 3.8 million. (The ratio of pre-transaction Internet access subscribers to pre-transaction MVPD subscribers for Comcast and TWC combined is .96. The estimated number of Internet access subscribers sold to Charter is therefore set equal to .96 of 3.9 million, which is equal to 3.8 million.) The post-transaction number of Internet access subscribers for Charter is set equal to the pre-transaction number of Internet access subscribers for Charter plus 3.8 million.

who received speeds of at least 10 Mbps /.768 Mbps, the transaction would have increased Comcast's national subscriber share from 32.2% to 40.0%. They reported that, for Internet access subscribers who received speeds of at least 25 Mbps/3 Mbps, the transaction would have increased Comcast's national subscriber shares from 54.2% to 54.9%.[11,12] Another estimate that was released by both DOJ officials and FCC officials after the transaction was abandoned was that post-transaction Comcast would have had close to a 60% share of Internet access subscribers at speeds of 25 Mbps /3 Mbps or faster.[13]

The Role of the TWC/Charter Transaction in Providing a Public Record of Government Reviewers' Analysis of Issues Relevant to the Comcast/TWC Transaction

Shortly after the Comcast/TWC transaction was withdrawn, Charter and TWC announced that they had reached an agreement to merge, and government reviewers ultimately approved this transaction subject to conditions.[14] Although the Charter/TWC transaction was somewhat smaller than the Comcast/TWC transaction, both transactions raised similar economic issues because both involved the merger of two large non-overlapping cable operators. The fact that a

[11]See Israel (2014b, Table 1, p. 38, and Table 2, p. 39).

[12]The small change in subscriber shares for subscribers receiving speeds of 25 Mbps/3 Mbps or faster was due to the fact that, although TWC had plans underway to upgrade most of its cable system to be able to provide speeds of at least 25 Mbps/3 Mbps, much if its system had not yet been upgraded. The change in share for subscribers receiving speeds of 25 Mbps/ 3 Mbps due to the transaction would have been larger if TWC's soon-to-be-upgraded systems were included. Government reviewers likely would have argued that these soon-to-be-upgraded systems should be included when assessing the competitive effects of the merger, if the case had gone forward.

[13]See Baer (2015a, p. 3; 2015b, p. 3), and Sallet (2016, p. 5).

[14]The author also served as Senior Economist overseeing analysis of the Charter/TWC transaction for the Federal Communications Commission.

second similar but smaller transaction to the Comcast/TWC transaction was approved by government reviewers is informative and interesting because it provides some indication of how large a merger of two non-overlapping cable operators needed to be before government reviewers would determine that the potential harms created by such a merger could not be addressed by conditions.

More importantly for purposes of this paper, it provides a public record of the FCC's and DOJ's analysis of the economic issues that arise when two large cable operators propose to merge. When government reviewers complete their analysis of a transaction, they normally file various public documents that explain their analysis and conclusions. Because the Comcast/TWC was withdrawn, no such documents were ever filed for this case. However, because such a record does exist for the Charter/TWC transaction, this record can be used to gain some insight into how the agencies analyzed the similar issues that arose in this case.

III. THE ECONOMICS OF BARGAINING POWER AND SIZE

In the business world, it is common wisdom that when two parties bargain with one another, if one party grows "larger" in the sense that it provides the other party with a larger share of the latter's total business, this will generally result in the larger party having more bargaining power and will enable the larger party to negotiate more favorable price and non-price terms. This relationship between bargaining power and size can occur for both buyers and sellers. It is commonly observed that as buyers grow larger and are therefore responsible for a larger share of a seller's business, they gain more bargaining power and are able to negotiate a lower price and/or more favorable non-price terms.

For example, large retailers such as Walmart are generally thought to be able to negotiate

significantly better terms from product suppliers than are smaller retailers. Similarly larger health insurance networks are generally thought to be able to negotiate better terms from hospitals and other health care providers than are smaller health insurance networks. As a final example, in the market for pay-TV programming it is a well-accepted "stylized fact" that larger MVPDs are able to negotiate significantly lower per-subscriber license fees from programmers than are smaller MVPDs.

However, this same type of phenomenon can also occur for the case of sellers of different sizes, if the sellers are selling access to customers. If a firm needs access to customers in order sell its product and different intermediary sellers control access to different groups of customers, an intermediary seller that controls access to a larger share of customers is able to threaten the access-seeking firm with the loss of a much greater share of the latter's business and should therefore be able to charge a higher per-subscriber price for access and/or negotiate more favorable non-price terms.

Both theories of harm for this transaction that predict increases in bargaining power are based on this type of phenomenon. Theory #1, which predicts that the merged entity will have greater bargaining power as an intermediary seller of interconnection when it controls access to a larger national share of Internet access subscribers, is a case of a seller that gains bargaining power as it grows larger. Theory #2, which predicts that the merged entity will have greater bargaining power as a purchaser of programming when it serves a larger share of the nation's subscribers, is a case of a buyer that gains bargaining power as it grows larger.

Perhaps surprisingly, existing economic theory cannot be used as a basis for supporting an unambiguous prediction that larger entities will generally have more bargaining power than do

smaller entities. The most commonly accepted model of bargaining in the economics literature is the Nash bargaining model.[15] This model is able to produce the result that whether larger entities have more (the same, less) bargaining power than do a smaller entities when bargaining with a given party, depends on whether the marginal cost to the latter of losing business is increasing (constant, decreasing) as it progressively loses more business.[16]

The problem with using this theory to derive an unambiguous prediction about the relationship between bargaining power and size is that there does not appear to be any basis for drawing any general conclusions about the curvature of firms' payoff functions. While some firms may experience an increasing marginal cost of losing business, economists generally believe that it is also possible that firms may experience a constant or decreasing marginal cost of losing business. Therefore, the relationship between size and bargaining power in real situations is an empirical issue that must be investigated on a case-by-case basis.

Furthermore, the theory that larger distributors have more bargaining power than smaller distributors also depends on the assumption that the customers of distributors are somewhat "sticky" and will not all switch to another distributor if content becomes unavailable through their existing distributor. (Subscribers are "stickier" to the extent that they experience high switching costs and/or distributors offer differentiated products and individual distributors

[15]See Chipty and Snyder (1999) and Horn and Wolinsky (1988).

[16]The result is intuitive: If the marginal cost/disruption to an entity of losing business grows larger (stays constant, decreases) as the entity progressively loses more of its business, this means that a firm that provides the entity with a larger share of its business will create more (the same, less) surplus per unit of business and thus be able to demand more (the same, less) compensation per unit of business.

therefore have some market power.) Distributors' bargaining power over content providers will be limited to the extent that their subscribers will switch to another distributor if content becomes unavailable from their existing distributor. Thus, even if we accept the theory that, conditional on the assumption that customers of distributors are somewhat "sticky," larger distributors have more bargaining power than smaller distributors, whether or not this relationship exists to a significant extent in any particular situation will still be an empirical issue because it will depend on the extent to which the customers of distributors are "sticky".

In light of both of the above issues, all parties to the transaction were largely in agreement that the question of whether larger entities have more bargaining power in the two situations of interest to this transaction was largely an empirical issue that should be directly investigated by measuring the relationship between firm size and bargaining outcomes. As will be discussed further below, this agreement as to methodological approach did not produce agreement on final conclusions, since there was disagreement on what the evidence actually showed.

IV. THE THREE MAJOR THEORIES OF HARM

As was discussed in the introduction, there are three separate but related theories of harm that fall under the general rubric of "increased ability and incentive to disadvantage OVDs." This section will discuss each of these theories in detail.

Theory #1: Increased Bargaining Power in Interconnection Negotiations

Internet access providers may charge interconnection fees to entities such as OVDs or their transit providers that wish to terminate traffic on the access providers' networks. This theory of harm posits that Internet access providers that have more subscribers have more bargaining power and are thus able to charge higher interconnection fees. Because the merged

entity would have more subscribers, this means that it would be able to charge higher interconnection fees. The theory posits that these higher interconnection fees would be passed along to OVD subscribers in the form of higher subscription prices and/or would reduce OVD profits and that both of these results would limit the growth and competitive viability of OVDs.

This section will describe the most important issues that were debated.

First, and perhaps most important, was the empirical issue of whether existing data showed that larger Internet access providers were able to charge higher interconnection fees and, if this effect existed, how large it was. Both the DOJ and the FCC conducted empirical analyses that they interpreted as showing that such a relationship did exist and was significant.[17] However, there were many other important factors that needed to be controlled for in such an analysis and not that many data points because there were only a handful of medium-size or larger Internet access providers that were suitable to include in an empirical study.[18] Economists who represented the merging parties argued strongly that the data, when properly interpreted, did

[17]In a review of the transaction published after the transaction was withdrawn, DOJ economists reported that "[u]nder a wide range of specifications, the relationship between size and fees was found to be positive, statistically significant, and economically meaningful" (Hill et al., 2015, p. 428). The FCC never published any findings for the Comcast/TWC transaction; but when it studied the same issue soon thereafter in its analysis of the Charter/TWC transaction it reported that "[o]ur economic analysis suggests that the ability of a[n Internet access] provider to charge for access to subscribers increases with the number of subscribers; the greater the number of subscribers the more the [Internet access] provider can charge on a per-subscriber basis" (FCC, 2016, para. 115).

[18]Smaller Internet access providers generally paid transit providers to deliver traffic to their networks and thus had a very different set of incentives when negotiating interconnection fees with edge (content) providers. Namely, the smaller access providers could avoid paying transit fees if they were able to induce an edge provider to interconnect directly with them on a settlement-free basis and thus had a much weaker bargaining position than did the larger Internet access providers.

not show that such a relationship existed.[19] Whether or not the data could be interpreted as showing that such a relationship existed likely would have been a major issue of contention had the case been litigated.

A second issue was related to the fact that the merged entity would be significantly larger than any existing Internet access provider. Some opponents of the transaction argued that there was reason to believe that the increase in size between Comcast and the merged entity might cause a much more significant increase in bargaining power than did comparable percentage increases in size of the sort that could be found in a cross-section of existing firms. Thus an estimate of the relationship between size and bargaining power based upon variations in the size of existing Internet access providers might significantly understate the impact of the increase in size that would be caused by this particular transaction.

[19]Israel (2014b, pp. 132-144).

In particular Dish argued in its FCC submissions that, while a new OVD service would likely still be viable if either TWC or Comcast withdrew access to its customers, it would likely not be viable if both withdrew access to their customers.[20] Thus an Internet access provider that was the size of the merged entity might have significantly more bargaining power than either Comcast or TWC would have alone, because it could unilaterally threaten to shut down an OVD's business. No such extreme effect would exist for variations in size that could be observed among existing Internet access providers.[21]

A third issue that was raised by the merging parties was that the over-all magnitude of interconnection fees at the time of the transaction was relatively small.[22] For example, according to one public estimate, under its newly negotiated interconnection agreement with Comcast, Netflix would likely pay approximately $12 million dollars per year to Comcast: approximately 0.3% of Netflix's 2013 annual revenues.[23] It could be argued that interconnection fees were so low that even large percentage increases would have a trivial impact on either the profits of edge providers or the subscription fees that edge providers charged their customers.

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[20]"The projections indicate that a new OTT [Over The Top] 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" (Sappington, 2014, para. 54).

[21]Dish was essentially arguing that the relationship between percentage increases in size and bargaining power was non-linear.

[22]See Israel (2014b, paras. 134-135).

[23]See Rayburn (2014), who also reports that Comcast's total revenue from interconnection fees in 2013 was less than 0.1% of its total revenues.

Had the case been litigated, government reviewers' main reply to this argument would likely have been that the practice of Internet access providers charging interconnection fees was relatively new and that, while fees were currently low, they were likely to climb to significantly higher levels over the next few years given the importance of interconnection to edge providers and the magnitude of revenues of edge providers that depended upon interconnection.[24]

As a fourth issue, the parties to the transaction argued that Comcast and TWC both engaged in significant amounts of settlement-free interconnection with a number of large Internet transit providers that edge providers could use to deliver their content to Comcast, and that this would limit the ability of Comcast to charge significant interconnection fees to edge providers or their transit providers.[25] Critics of the transaction suggested that Comcast in actuality provided very little settlement-free interconnection. They also argued that many of the settlement-free interconnection agreements that Comcast entered into had so-called traffic ratio limits that limited the amount of incoming traffic that Comcast would accept from an entity on a settlement-free basis to some small multiple of the outgoing traffic that Comcast sent to the entity. They argued that settlement-free interconnection was therefore essentially not available to entities such as edge providers or the transit providers that served them, because almost all of the traffic between Comcast and one of these entities would be one-directional traffic from the entity to

[24]A parallel might have been drawn to the case of retransmission consent fees that broadcast stations charge MVPDs for the right to carry their networks. While these fees were extremely low when the practice began, over a period of a few years they climbed to very high levels of more than $1.00 per subscriber per month and became a very significant cost to MVPDs.

[25]See Israel (2014b, para. 133).

Comcast and thus be above the traffic ratio limit.[26] Very little data on this issue was ever made publicly available.

A fifth issue concerned the impact of competition from other Internet access providers. The parties to the transaction argued that the merged entity's bargaining power over OVDs was very limited because Comcast faced intense competition from other broadband providers. They argued that the merged entity's customers would switch to an alternate broadband provider if it refused to interconnect with a significant OVD and that this dramatically reduced its ability to bargain for higher interconnection fees with OVDs or their transit providers. This argument clearly depends on households in the Comcast footprint having the ability to choose an alternate Internet access provider to Comcast that they viewed as providing a reasonable substitute for Comcast's service. As was discussed in more detail in the background section, while most households in the United States could generally choose between two Internet access providers - the incumbent cable provider and the incumbent telco - the incumbent cable operator generally provided faster service than did the incumbent telco unless the incumbent telco had upgraded its service to FTTP. Thus, while it was clear that households that could receive FTTP service from their incumbent telco had two high-speed alternatives that were good substitutes for one another, this was less true for households that could receive only FTTN service or legacy DSL service from their incumbent telco.

Recall from the background section that ever smaller fractions of households had access to multiple internet access providers at higher speeds. Government reviewers generally remained

[26]See Evans (2014, para. 90-99; 2015, Section II pages 3-10), and Farrell (2014, para. 48-49).

concerned that many households did not view legacy DSL or even FTTN service as adequate substitutes for the high-speed service that cable systems and FTTP systems were capable of providing. This meant that the concerns about Comcast's bargaining power could not be dismissed by appealing to the argument that Comcast faced intense competition in most local Internet access markets.

An additional potential concern was that switching costs could reduce the extent to which subscribers would switch providers in response to the unavailability of a specific OVD, particularly if subscribers thought that the unavailability was simply a temporary issue that would ultimately be resolved when the parties reached an interconnection agreement.

One piece of empirical evidence was available to shed some light on the extent to which a cable provider's subscribers would leave in response to the unavailability of a popular OVD. As part of a dispute with Netflix over interconnection fees that began in early 2013 and lasted for approximately nine months, Comcast allegedly allowed its interconnection points with Cogent and other transit providers that delivered Netflix traffic to Comcast to become congested, which severely deteriorated the ability of Comcast subscribers to view Netflix content.

As part of its analysis of the transaction the FCC asked Comcast to provide data on its churn rates[27] before during and after the Netflix incident so that the effect of the unavailability of Netflix content on Comcast subscribership could be measured. Both the FCC itself and economists who were hired by a number of third parties that submitted comments on the transaction analyzed these data. While detailed results of the regression analysis were never

[27]The churn rate is defined to be the percentage of a company's subscribers that discontinue service for a specified period. MVPDs typically calculate churn rates on a monthly

reported publicly because the churn data were confidential, it was publicly reported in an economic report that was filed by one of the economists who was hired by a third party that the conclusion of the study was that "the data provide no support whatsoever for Comcast's claim."[28]

The FCC never published an order because the transaction was withdrawn, and thus never published even a qualitative finding of its own on this issue. However, when it considered the same issue shortly thereafter in its analysis of the Charter/TWC transaction, the FCC reported that "[t]he available evidence suggests that consumers . . . do not switch [Internet access] providers when confronted with poor edge provider performance"[29] and cited Sappington (2014) as one source of evidence for its conclusion. It also cited another economic study that was submitted in the Charter/TWC proceeding that examined the same issue with the use of TWC data[30] and reported that "the evidence in the record indicates that consumers did not abandon Time Warner Cable during the time period when Netflix's service was degraded on Time Warner Cable's network."[31]

The merging parties responded to these studies by arguing that some of the telcos that were the alternate providers of Internet access service for Comcast and TWC customers may

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basis.

[28]Sappington (2014, para. 12) describes the Comcast claim as follows "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."

[29]See FCC (2016), para. 111.

[30]TWC had also allowed interconnection points with transit providers to Netflix to congest as part of its own interconnection fee dispute with Netflix.

[31]See FCC (2016, para. 111).

have also have engaged in conduct that slowed delivery of Netflix content to subscribers of their own networks over at least part of the same time period (as part of their own attempts to induce Netflix to agree to pay them interconnection fees) and that this might explain why so few customers left Comcast or TWC when Netflix service was degraded. More granular and complex empirical analysis could potentially have addressed this issue[32] and likely would have played a role in the debate if the case had been litigated.

Theory #2: Increased Bargaining Power in Programming Negotiations

MVPDs must negotiate license fees and other contractual terms with the programmers that produce networks in order to be able to make these networks available to their subscribers. This theory of harm posits that MVPDs that control access to a larger national share of subscribers - as the merged entity would have - possess more bargaining power than do smaller MVPDs and are thus able to negotiate licensing agreements that have lower license fees and other more favorable non-price terms.

OVDs often seek to license the same programming from the same programmers as does Comcast. This theory of harm posits that the merged entity viewed OVDs as rivals that threatened its existing MPVD business and that it would therefore use a substantial share of its increased bargaining power to negotiate contractual terms that limited the availability of programming to OVDs and thus discourage or depress the development of a vibrant and competitive OVD industry.

[32]A more granular analysis could have attempted to control more carefully for the identity of the telco that was the alternate provider for a household and whether or not Netflix service was degraded on the alternate provider.

This concern was not merely hypothetical. At the time that the Comcast/TWC transaction was announced, it had become a fairly common practice in the industry for licensing agreements between an MVPD and programmer to contain terms that directly restricted the ability of the programmer to license programming to OVDs. Such terms had become common enough that they had been given a name of their own by industry participants and were generally referred to as alternate distribution methods (ADM) terms. While it could be argued that the ADM terms that appeared in programming contracts had efficiency-enhancing pro-competitive justifications, government reviewers were concerned that they could also be used simply to deny OVD competitors access to programming and that OVDs would be particularly vulnerable to such anticompetitive actions when they were just attempting to enter and had relatively small market shares.[33]

Just as for theory #1, here the parties again agreed that a key issue was whether the data showed that larger MVPDs exercised more bargaining power than did smaller MVPDs. Not

[33]It is also possible that "most-favored nation" (MFN) contract terms could be used to limit the access of OVDs to programming. An MFN term in a licensing agreement between a programmer and MVPD requires the programmer to make any terms that it makes available to other MPVDs or OVDs available to the original MVPD that has obtained the MFN. In particular certain types of MFNs that the industry referred to as "unconditional MFNs" allowed an MPVD to "cherry pick" agreements with other MVPDs and OVDs by taking only the advantageous terms of other contracts even if the advantageous terms came bundled with other less advantageous terms. Unconditional MFNs would clearly inhibit the ability of programmers to experiment with new business models in their relationship with OVDs that involved a bundle of changes in contract terms, some of which were more advantageous and some of which were less advantageous. However, it could be argued that even so-called "conditional MFNs," which did not allow cherry picking, could still inhibit experimentation with new business models or could prevent a programmer from offering different terms to OVDs than MVPDs even if there were efficiency-based reasons to do so based on technological differences between the industries. The FCC expressed concern over the potential anti-competitive effects of both ADMs and MFNs in its review of the Charter/TWC transaction (FCC 2016, paras. 206-223).

surprisingly, there was a dispute over what the evidence showed.

However, the nature of the dispute was somewhat different for theory #2 than for theory #1. For theory #1 the main dispute regarded whether or not the data really showed that larger Internet access providers charged higher interconnection fees. For theory #2, there was less dispute over whether or not larger MVPDs were able to negotiate lower license fees for programming: It was a widely accepted stylized fact among almost all industry participants and observers that larger MVPDs generally paid significantly lower per subscriber fees than did smaller MVPDs, and both agencies conducted empirical analyses that confirmed that this stylized fact was correct.[34]

The main dispute over the empirical evidence for theory #2 instead concerned the issue of how larger MVPDs appeared to use this extra bargaining power: The evidence about the relationship between MVPD size and license fees could be interpreted as showing that larger MVPDs have more bargaining power and that they use their extra bargaining power to negotiate lower license fees. However, this second theory of harm focused on the possibility that the merged entity would decide to take advantage of its increased bargaining power by devoting a substantial share of this increased bargaining power to negotiating non-price contractual terms

[34]After the transaction was withdrawn, DOJ economists summarized their finding as follows: "Antitrust division staff assembled a database of the per-subscriber fees that programmers charge distributors for the right to distribute the former's content. Per-subscriber fees were then regressed on the size of video distributors (i.e., each distributor's number of subscribers) and contract-specific variables. Across a wide range of regressions the relationship of interest was consistent and statistically significant: larger video distributors pay meaningfully lower per-subscriber fees to programmers" (Bring et al., 2015, p. 429). While no similar report of FCC results was ever made publicly available, the FCC considered the same issue when it considered the Charter/TWC transaction one year later and, in its order approving that transaction, publicly announced the same finding based on evidence presented and considered

that limited the ability of programmers to make their programming available to OVDs.

The concern about the evidence therefore was that it did not directly show that larger MVPDs had historically taken advantage of their increased bargaining power by negotiating deals with programmers that placed more restrictions on programmers' ability to make programming available to OVDs. Thus the existing evidence of the relationship between MVPD size and license fees left open the possibility that even if the merged entity would have more bargaining power, it would use this bargaining power mainly to negotiate lower license fees and would not use it to negotiate contract terms that further restricted the availability of programming to OVDs.

In principle one could settle this debate by directly gathering evidence on whether larger MVPDs had historically negotiated contract terms that placed more restrictions on programmers' ability to make programming available to OVDs. However, evidence on this issue was difficult to gather for at least two different reasons:

One problem was that actual programming contracts were extraordinarily complex and there was no simple way unambiguously and objectively measure of the extent to which programming contracts contained restrictive contract terms. Thus any analysis that attempted to document whether larger MVPDs imposed more restrictive contract terms that were primarily intended to disadvantage competing OVDs would necessarily be qualitative rather than quantitative and would require extensive analysis of the conditions and terms that were specific to each specific situation and some assessment of whether the specific term in question had some justifiable economic function or was anti-competitive.

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during the analysis of that transaction. (FCC 2016, para. 215).

A different complicating concern was that, as part of the deal it negotiated with government reviewers to have them approve the Comcast/NBCU merger that had taken place a few years earlier, Comcast had agreed to abide by a set of conditions that limited its ability to negotiate contracts with programmers that restricted the availability of programming to OVDs.[35] Even if these conditions were not fully effective, they may have prevented Comcast from adopting some of the most obvious and easily observed types of restrictions that a qualitative study by the regulatory agencies could most easily identify.[36] Thus the largest MVPD could not be used as a data point in any study that attempted to determine if larger MVPDs use their increased bargaining power to negotiate more restrictive contract terms.

Because the transaction was withdrawn, very little information on government reviewers' findings on this issue was made publicly available; but as before, some insights can be found in the public record for the subsequent Charter/TWC transaction. In particular, DOJ reported its finding that TWC was much more aggressive in negotiating ADM clauses with programmers than were smaller cable operators and interpreted this as suggesting that larger cable operators negotiated more restrictive conditions than did smaller operators.[37] The extent to which the

[35]See DOJ (2011) for a discussion of these conditions; see also Rogerson (2014).

[36]Whether or not the conditions on Comcast had been fully effective would likely have received further consideration if the parties had not withdrawn their transaction and government reviewers would have had to consider the issue whether conditions could be used to address the harm or whether the only way to avoid the harm would be to block the transaction altogether.

[37]"TWC has been the most aggressive MVPD at seeking restrictive ADM clauses in recent years. The Department's review of hundreds of programming contracts and ordinary course of business documents revealed that TWC has obtained numerous ADMs that limit distribution to paid OVDs. Other distributors, by contrast, have rarely, if ever, sought or obtained such clauses, or have only obtained ADMs that are much more restrictive. TWC's success in seeking and obtaining ADMs is likely attributable in part to its bargaining leverage

evidence showed that larger MPVDs had historically negotiated programming contracts with conditions that imposed greater restrictions on OVDs' access to programming would likely have been a major issue of contention if the Comcast/TWC case had been litigated.

Two final points should be noted about the issue of how the merged entity would use its increased bargaining power over programmers: First, this was an important issue for evaluating the welfare effects of the merger. To the extent that increased bargaining power was used to negotiate more restrictive contract terms, the increased bargaining power would unambiguously harm competition and be undesirable for consumers. However, to the extent that it was used to negotiate lower license fees, the welfare impact on consumers might be reversed or at a minimum was ambiguous. To the extent that lower license fees were passed through to consumers in the form of lower MVPD subscription fees, this would increase consumer welfare. A reduction in license fees might also affect investment incentives on each side of the market,[38] and it would generally be much more difficult to estimate the magnitude of these effects or the magnitude of the net effect.

Second, parties to the merger advanced at least one theory that could potentially explain why larger cable operators might not be inclined to use their increased bargaining power to negotiate contracts with terms that disadvantaged OVDs but would rather be more inclined simply to negotiate lower license fees. They argued that because cable operators are both MVPDs and Internet access providers, their incentive to disadvantage OVDs was greatly reduced

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over video programmers" (DOJ, 2016b, p. 12).

[38]The transfer of profits from programmers to MVPDs might decrease the incentives of programmers to invest in creating programming but might also increase the incentives of MVPDs to invest in their distribution facilities.

because they would earn higher profits on their Internet access service if consumers viewed the service as more valuable. Of course consumers would view their Internet access service as more valuable if they could subscribe to a greater variety of high-quality OVDs at lower prices. Thus, while disadvantaging OVDs might increase a cable operator's MVPD profits, it might also decrease its Internet access profits; and the net effect on the incentive to disadvantage OVDs would be lower. While models that attempted to quantify the relative magnitudes of these competing effects could be built, their results were necessarily very sensitive to various difficult-to-measure parameters, such as the elasticity of Internet access demand to the availability of a particular OVD.

Another approach to assessing the nature of the parties' incentives would have been to review the parties' own internal strategic planning documents to determine if these documents tended to cast OVDs as potential allies that need to be encouraged and supported to increase the demand for Internet access service or rather as potential enemies that would reduce MVPD profits and whose entry and expansion should be thwarted to extent possible. Once again, because the transaction was withdrawn, very little information on whether such documents existed and what they showed was ever made public. However, when government reviewers subsequently considered the same issue in the Charter/TWC transaction, they publicly reported that the internal documents of the parties to that transaction suggested that the parties viewed OVDs more as competitive threats than as potential partners.[39]

[39]For example, the DOJ complaint for the Charter/TWC transaction reports that "[i]n numerous internal documents, Defendants show a keen awareness of the competitive threat that OVDs pose. In fact, a TWC board presentation from February 2014 illustrated the threat posed by such emerging online competitors as a meteor speeding toward earth." It then presents what

Theory #3: Internalization of Externalities

The third theory of harm is quite different from the first two. Whereas the first two theories focused on the greater ability of the merged firm to inflict harm on OVDs through its increase in bargaining power in two key input markets, the third theory explains why a cable operator that is larger at the national level will have a greater *incentive* to take actions in both of these input markets that harm OVDs: It will internalize a greater share of the externalities that one MVPD creates for the MVPD industry as a whole when it takes actions that disadvantage OVDs.

The theory posits that when a cable operator takes an action to disadvantage an OVD in its own region and thus limits the OVD's ability to compete with the cable operator in its own region, it will generally also limit the OVD's ability to compete with other cable operators that serve other regions: a positive externality for other cable operators that serve other regions. Of course when an individual cable operator decides whether to engage in some action that will disadvantage an OVD it will ignore the externalities that it creates for other cable operators. However if two cable operators merge, they will now "internalize the externality" - take account of the benefits they create for one another - and the merged entity will therefore have a greater incentive to take actions that disadvantage OVDs and is likely to therefore engage in such actions to a greater degree than occurred before the merger.[40]

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appears to be a page from a TWC slide deck with the following text: "We face increased competition from both traditional and new video providers," together with a picture of a meteor crashing into the earth (DOJ, 2016a, pp. 11-12).

[40]The theory that a horizontal combination of distributors serving disjoint footprints might increase incentives to harm rivals by allowing the merging firms to internalize geographic spillovers was not entirely new to this transaction. A similar theory had been raised in the FCC

One can distinguish among five different types or categories of actions that the merged entity could engage in to disadvantage OVDs and would thus have a greater incentive to engage in because of the transaction. These are: (i) charging higher interconnection fees to OVDs; (ii) degrading transmission of OVD content; (iii) introducing data caps and usage-based pricing (USB) plans that make it more expensive for Internet access subscribers to receive large amounts of content from OVDs; (iv) negotiating deals with third-party programmers that restrict the availability of programming to OVDs; and (v) making programming that is owned by the merged entity less available to OVDs.

Each of the five categories of actions limit OVD access to one of the two key inputs that are required by OVDs. Categories (i), (ii), and (iii) are different ways of limiting OVD access to the last-mile Internet access connection. Categories (iv) and (v) are different ways of limiting OVD access to programming.

Comparing the Three Theories of Harm

One way to compare and contrast the three main theories of harm is by classifying them according to which of the above five categories of actions each theory applies and the nature of the effect: Theory #1 increases the *ability* of the merged entity to engage in actions in category (i); Theory #2 increases the *ability* of the merged entity to engage in actions in category (ii); and Theory #3 increases the *incentive* of the merged entity to engage in actions in all five categories.

V. EFFICIENCIES

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proceeding that considered the merger of SBC and Ameritech in 1998. See Katz and Salop (1998).

The parties to the transaction identified a number of different categories of efficiencies that the transaction would produce. These included: savings in operating costs due to elimination of duplicative overheads; faster rollout of high speed Internet access service in the TWC footprint; increased incentives to invest in innovation and new products and services because the merged firm would earn profits from these investments over a larger base of customers; adoption of certain desirable Comcast products/services, such as Comcast's X-finity platform, across a wider footprint; increased ability to compete for national business services clients; efficiencies from geographic rationalization of the Comcast/TWC/Charter footprints; and an increased incentive for the company to offer wi-fi services due to the internalization of geographic spillovers between the two firms.[41]

While the transaction would have likely have generated some efficiencies, they were likely relatively modest in magnitude. In particular, if the major theories of harm identified by government reviewers were correct and as significant in magnitude as government reviewers believed them to be, the magnitude of these competitive harms would likely have overwhelmed the magnitude of any possible modest efficiencies. Therefore the question of whether or not the transaction was in the public interest basically revolved around the issue of whether or not the major theories of competitive harm identified by government reviewers were correct and of the magnitude that government reviewers believed them to be, and not over whether or not the parties could prove that there were extremely significant efficiencies that could potentially outweigh even relatively large competitive harms.

[41]See Carlton (2014, Section II), Israel (2014a, Sections III and IV; 2014b, Section VIII) and Rosston and Topper (2014a, Section IV; 2014b, Section II) for fuller discussions of these efficiencies.

VI. CONCLUSION

The Comcast/TWC transaction involved the merger of two cable companies with non-overlapping geographic footprints. Therefore the transaction would not have directly reduced the number of Internet access or pay-TV providers available to any household. Nonetheless, based on the set of theories that were described above, government reviewers determined that the transaction threatened serious competitive harms.

The transaction was proposed at a time when OVDs were just beginning to emerge as potentially significant new competitors to the traditional providers of pay-TV services and were thus particularly vulnerable to attempts by traditional competitors to disadvantage them. Cable companies were significant players in the two markets where OVDs purchased their two key inputs: programming, and interconnection to last-mile Internet access services. The main concern of government reviewers was that the merged entity would have both a greater ability and incentive to disadvantage OVDs by limiting their access to these two key inputs.

It will be interesting to see if the types of theories of harm raised in this case turn out to be relevant to, and continue to be raised in, cases that arise over the next few years.

FIGURE X-1
THE VERTICAL STRUCTURE OF THE PAY-TV INDUSTRY

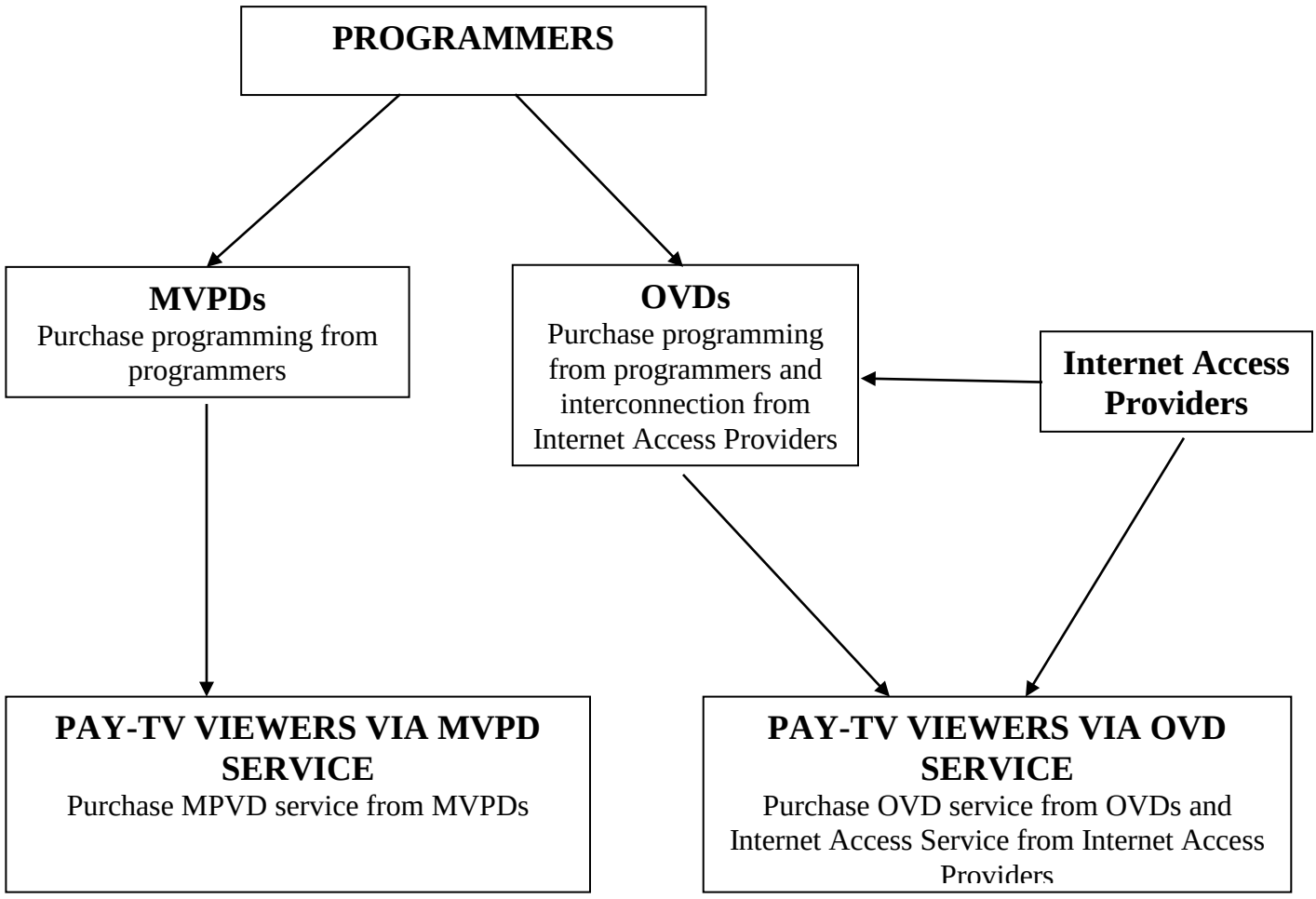

TABLE X-1
PERCENT OF HOUSING UNITS BY NUMBER OF BROADBAND PROVIDERS AT DIFFERENT SPEEDS: POST-TRANSACTION COMCAST FOOTPRINT (DEC 2013 DATA)

Number of	**Minimum Speed (Mbps)**		
Providers	**3/.768**	**10/.768**	**25/3**
3	17%	12%	3%
2	70%	59%	29%
1	13%	29%	63%
None	0%	0%	5%

Source: FCC (2004, Exhibit 3a).

TABLE X-2
MVPD SUBSCRIBERS FOR THE TEN LARGEST MVPDS
(DEC 2013 DATA)

Rank	Name	Pre-Transaction		Post-Transaction	
		Millions	Share	Millions	Share
1.	Comcast	21.7	21.6%	29.1	28.9%
2.	DirecTV	20.3	20.2%	20.3	20.2%
3.	DISH	14.1	14.0%	14.1	14.0%
4.	Time Warner Cable	11.4	11.3%		
5.	AT&T	5.5	5.5%	5.5	5.5%
6.	Verizon	5.3	5.3%	5.3	5.3%
7.	Cox	4.5	4.5%	4.5	4.5%
8.	Charter	4.3	4.3%	8.2	8.2%
9.	Cablevision	2.8	2.8%	2.8	2.8%
10.	Bright House	2.4	2.4%	2.4	2.4%
	Others	8.3	8.3%	8.3	8.3%
	Total	100.6	100%	100.6	100%

Note: Post-transaction Comcast subscribership is set equal to the sum of pre-transaction Comcast and TWC subscribership minus 3.9 million. Post-transaction Charter subscribership is set equal to pre-transaction Charter subscribership plus 3.9 million. See footnote 10.

Source: All subscriber data except for Cox and Bright House from Leichtman Research Group (2014a.) Cox subscriber data from Jelter (2014). Bright House subscriber data from Ramachandran (2014).

TABLE X-3
INTERNET ACCESS SUBSCRIBERS FOR THE TEN LARGEST IAPs
(DEC 2013 DATA)

Rank	Name	Pre-Transaction		Post-Transaction	
		Millions	**Share**	**Millions**	**Share**
1.	Comcast	20.7	22.8%	28.5	31.4%
2.	AT&T	16.4	18.1%	16.4	18.1%
3.	Time Warner Cable	11.6	12.8%		
4.	Verizon	9.0	9.9%	9.0	9.9%
5.	Century Link	6.0	6.6%	6.0	6.6%
6.	Charter	4.6	5.1%	6.0	6.6%
7.	Cox	4.3	4.7%	4.3	4.7%
8.	Cablevision	2.8	3.1%	2.8	3.1%
9.	Bright House	2.3	2.5%	2.3	2.5%
10.	Frontier	1.8	2.0%	1.8	2.0%
	Others	11.2	12.3%	11.2	12.3%
	Total	90.7	100%	90.7	100%

Note: Post-transaction Comcast subscribership is set equal to the sum of pre-transaction Comcast and TWC subscribership minus 3.8 million. Post-transaction Charter subscribership is set equal to pre-transaction Charter subscribership plus 3.8 million. See footnote 11.

Source: All subscriber data except for Cox and Bright House from Leichtman Research Group (2014b.) Cox and Cablevision broadband subscribers are set to be 95.6% of firms' MVPD subscribers as reported in Table 1. (Leichtman (2014a, b) reports broadband and MVPD subscribers for a group of cable companies it refers to as "other major private cable companies," which includes Cox and Brighthouse, and broadband subscribers is equal to 95.6% of MVPD subscribers for this group.)

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