

The purpose of the workshop was to provide input to the future of broadband regulation among scholars and decision makers. The paper that we present is titled *Economic Perspectives on the Future of Broadband Regulation*. We attach a copy of our presentation slides and a copy of our presentation titled *Future of Broadband Regulation*. We are pleased to have you and your colleagues at the workshop. We hope you will find the workshop a successful one. We are looking forward to seeing you at the workshop.

The following abstract of our paper summarizes the economics of the online video market and how it affects the entertainment industry. We explore the economics of the online video market and how it affects the entertainment industry. We explore the economics of the online video market and how it affects the entertainment industry. We explore the economics of the online video market and how it affects the entertainment industry.

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The Future of Online Video: An Economic Perspective¹

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Abstract

We explore the economics of the online video entertainment industry to provide a foundation for understanding its economic future and how regulation may affect it. We first document recent development of online video, including market structure, prevailing programming windows, and content aggregation patterns. In spite of its remarkable efficiencies, we identify four potential obstacles to online video's future growth: competition from increasingly efficient MVPDs, including advantages they have in large scale aggregation of online content via TV Everywhere services; limited availability of high quality content, especially windowed programming; limited development of successful online business models, especially advertising; and ISP pricing strategies that may raise effective consumer prices of video consumption. In conclusion, we discuss the role that FCC regulation or other government policies can play to ensure future competition and open entry in the online video industry.

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I. Introduction

Over the past decade, as both broadband adoption by consumers and Internet bandwidth capacity have rapidly grown, the online distribution of television, movies, and other video programming has emerged as a viable industry. The high proportion of Internet traffic now accounted for by online video streaming signals the importance of online video entertainment to the future of the Internet and its regulation. Netflix and YouTube together accounted for 45% of total peak North American fixed Internet traffic in the second half of 2013 (Sandvine, 2013, p. 6). Nielsen reports online video to have a monthly reach of over 150 million Americans (Nielsen, 2014b, p. 11), and there has been a great proliferation of reception devices. Especially in an environment where leading ISPs and multi-channel video distributors (MVPDs) have substantial national market shares and ownership of content supply, the online video market highlights the importance of FCC policies that promote competition and robust entry.

In this paper, we explore the economics of the online video entertainment industry, with an objective of understanding its economic prospects and how regulation may affect them. Our main focus is on professionally-produced television, movies, and similar forms of video entertainment, or what is widely regarded as the “over-the-top” video industry.⁵ Finally, our geographic focus is the United States, although we recognize that Internet technology falls international boundaries, and that similar changes to those in the U.S. are occurring in many other countries (Simon, 2012). Our answers to the questions posed will necessarily be incomplete or speculative. We stop short of policy prescription. The basic premise of our paper is that the path to good policy is paved with a sound economic understanding of industry incentives and outcomes.

In the first part (Sections I-III), we document recent development of online video, including market structure of its major segments, prevailing programming windows, and content aggregation patterns through both portals and devices.

The online video entertainment industry has great promise, but also faces some imposing obstacles to its economic future. In the second part (Section IV), we explore four of these factors that will affect the industry’s future.

1. *Competition from MVPDs (including IP-based delivery) and the potential development of large scale online aggregation of over-the-top suppliers:* Can the slow development of over-the top delivery of individual cable networks without MVPD subscription “authentication” be attributed to straightforward economic incentives? Why have attempts to aggregate over-the-top delivery been slow to develop?

⁵ “Over-the-top” video usually refers to the delivery of video over the internet without involvement of multiple cable system operators (“MSO’s”) in the control or distribution of the content. After the entry of these MSOs into online video via their TV Everywhere programs and their potential to control the transmission of video after *Verizon Comm. Inc. v. FCC*, 740 F.3d 623 (D.C. Cir. 2014) in January, the term’s meaning has become ambiguous, no longer drawing a clear line between different market participants. Thus, we will generally favor the term “online video”, and use “over-the-top” sparingly.

2. *The willingness of program suppliers to grant online distribution rights (in effect, the development of programming windows and programming exclusivity)?* What conditions are required for online windows to be simultaneous with, or perhaps before, offline delivery?
3. *Development of effective online business models, especially video advertising.* How is the evolution of online video industry segments likely to depend on business model, as well as window development?
4. *ISP pricing models and their interface with online video pricing.* How will bandwidth-sensitive ISP pricing influence the effective price to consumers of online video services? Is it likely that online video prices will in the long run reflect the true cost of delivery?

In the conclusion (Section V), we summarize and briefly discuss the role that FCC regulation or other government policies can play to ensure competition and open entry in the online video industry’s future.

II. A brief literature review

Among earlier scholarly works involving the economics of online video media are Owen (1999), Shapiro & Varian (1999), HBS (2000), and the authors in several edited books, including Kahn & Varian (eds., 2000), Noam, Groebel & Gerbarg (eds., 2004), Gerbarg (ed., 2008), and Noam (ed., 2008).⁶ For a number of years, the Federal Communications Commission’s “Annual Assessment[s] in the Market for the Delivery of Video Programming” (1994-2013) have provided valuable data and insights into the economic development of the video industries, including online video in later years.

Among more recent works are several from a European perspective. Fontaine, Le Borgne-Bachschmidt & Leiba (2010) study alternative scenarios for the European television transition. Evens (2013) reviews the online video industry as a newly evolving value chain of platforms controlled by incumbents from offline video and new online players. Baccarne, Evens & Shaurman (2013) assess the evolution of online video services in Flanders, an analysis with useful parallels to the present study due to high cable penetration in that region. Donders & Evens (2011) focus on the transition of broadcasting in Europe. Simon (2012) reports on an extensive IPTS study about the digital transition of media industries in the 27 countries of the European Union.

Among some other policy-specific recent works involving online video, Minne (2012) portrays ISP data caps as devices for stunting the growth of online video. A series of recent reports by the New America Foundation (Hussain, Kehl, Lennett & Lucey, 2012; Hussain, Kehl, Lennett & Li & Lucey, 2012; and Hussain, H., Kehl, Lucey & Russo, 2013) present extensive data on ISP employment of data caps worldwide, with commentary on their effects. Bremner and Maxwell (2013), Frieden (2013), and Nooren, Leurdjik, & van Eijk (2012) analyze network neutrality issues with applications to video distribution. Waterman, Sherman & Ji (2013) offer

⁶ A more detailed literature review up to 2012 is available in Sherman & Waterman (2014a & 2014b) and Waterman, Sherman & Ji (2013).

economic and policy analysis of the online video industry, focusing on incentives of cable operators and other MVPDs to offer “TV Everywhere” (TVE) services.

We acknowledge that the above citations are but a fraction of the recent works relevant to the work in this paper. There is a large more general literature, for example, on the economics of network neutrality.

III. Development of the online video industry

a. History and current status

Although the online video industry dates to the mid-1990s, few of its pioneers survived the ‘dot.com’ bust of 2000-01. By the mid-2000s, however, broadband household adoption and speeds had become sufficient to usher in a period of vibrant entry and competition that has formed today’s online television industry.

In 2005, iTunes began offering some recent TV series episodes for direct payment. Also in that year, YouTube was created to enable Internet users to upload and distribute videos from their digital video recorders. Full episodes of major network series programs, however, were soon being illegally posted by YouTube users. After an initial period of tolerance, the networks and program suppliers issued “takedown” orders under the Digital Millennium Copyright Act, and lawsuits followed. It was not until 2008 and 2009 that NBC and Fox (later joined by ABC) launched Hulu and CBS started TV.com (later part of CBS Interactive),⁷ primarily as online outlets for some of their regular series programming.

In 2009 and later, entry into online video entertainment has proliferated, with subscription or video on demand (VOD) services developed by Amazon, Sony, and others. Beginning in 2010, several cable operators and other MVPDs also launched “TV Everywhere” video, an umbrella concept for services that give offline subscribers free access to a menu of online programming they already receive with their monthly subscription. YouTube made a move toward the top-down professional production model by financing “channels” of niche programming in late 2011 (Bond & Szalai, 2011), a practice it has continued. Though begun experimentally at an early date, multi-cast streaming of live television programming over the Internet has also become increasingly viable as network capacity has expanded, as evidenced by the ESPN3’s streaming of specialized sports events after 2007, and the first streaming of the Super Bowl by NBC in 2012.

The state of the online video entertainment industry as of early 2014 is summarized in Table 1. The list of providers is not comprehensive. Rather, it is a snapshot in Internet time intended to illustrate the variety of business and content models offered by leading industry players.

⁷ CBS Interactive is the umbrella company for CBS.com, which primarily distributes long form TV programming, and TV.com, which distributes short form content and also recent episodes of major broadcast network series.

Table 1: Some major online commercial television suppliers.

Service	Primary Content	Primary Business Model(s)
iTunes	Broadcast & cable programs; movies	Pay to download/rent
Amazon	Broadcast and cable programs; movies	Subscription; pay to download/rent
Netflix	Broadcast and cable programs; movies	Subscriptions
Hulu	NBC, ABC, & Fox TV series; some cable network content/web-only video	Advertising and subscriptions
CBS Interactive	CBS broadcast programs	Advertising
Viacom Digital	Viacom cable networks (MTV, Comedy Central, BET, Nickelodeon, etc.)	Advertising and MVPD authentication
Crackle	Sony-owned movie and TV content	Advertising
YouTube	User-generated content; funded professionally created ‘channels’, other professional content	Advertising; subscription
Comcast Xfinity (and other major cable operators)	Broadcast and cable programs; movies; Netflix-like ‘Streampix’ premium content service offered beyond MVPD geographic areas	MVPD authentication; Subscription (Streampix)
Verizon FiOS (and other telcos)	Broadcast and cable programs; movies	MVPD authentication
HBO-Go	HBO exclusive series and licensed movies	MVPD authentication
TNT	TNT television programs	MVPD authentication
USA	USA television programming	MVPD authentication or advertising, depending on individual programming

No significant players in the current market were present before 2005. The industry’s novelty is also reflected by sobering comparisons between the usage and the economic resources of online video and offline television. According to Nielsen (2014b), the average adult in 2014 watched more than 40 hours of traditional or time-shifted television per week, compared to 60 minutes of “watching video on the Internet,” and 8 minutes “watching video on a mobile phone.”⁸ Worth noting, however, the amount of time spend watching video on the internet has doubled in the three years since 2011.

⁸ Online viewing is relatively concentrated among a small group, but offline TV viewing is pervasive among a broad majority of the population. Nielsen reported that the top 10% of US adults watched an average of 2 hours and 34 minutes of streaming online video per week, but this group also watched roughly 11 times as much offline TV per

their MVPD subscription. For example, Comcast’s TVE service, Xfinity, offers programming from TNT and other Turner Broadcasting System ad-supported channels to all Comcast subscribers whose subscriptions include those channels. In some cases, users access TVE programming through the specific channels’ web pages. A prominent example is HBO-Go.com, a website that mostly offers the same movies and TV programming that the familiar HBO monthly subscription channel provides. HBO-Go is available only to users who also subscribe to HBO via participating offline MVPD services.

In terms of content diversity, TVE systems of larger MVPDs tend to offer the most programming, but even the largest MVPDs offer only a subset of the programming available with the subscribers’ MVPD packages. A likely reason for these contrasts is that MVPDs have reportedly encountered a snare of contracting problems that limit their online program distribution rights.

While the 5 segments we identify have distinct features, they are not mutually exclusive. For example, Hulu offers both a free, ad-based service and a premium subscription service with an expanded selection of content. Amazon offers a streaming service comparable to Netflix but also a la carte VOD sales.

Of course, the providers in all five of these industry segments compete with each other, and they often differentiate themselves with their programming content, including a growing number of Internet-original programs. The great majority of these original programs, along with obscure foreign movies and TV shows, are surely part of the long tail of programs too narrow in appeal or too low in quality to be profitably supported offline. Netflix, Amazon, and other subscription services, however, have recently announced relatively expensive exclusive programming deals in a heated battle to differentiate themselves for competitive advantage, such as Netflix’ \$100 million investment for two seasons of its exclusive the “House of Cards” series. Most economically viable television content offered by online video services, however, is “windowed” programs that have already appeared, or that appear at about the same time, on offline media.

In the movie case, the online VOD window is generally simultaneous with the MVPD VOD window, usually a few months after theatrical release. In the TV program case, the windowing model is in flux, but most programs on ad-supported Internet services such as Hulu, CBS, and Viacom Digital appear with a delay of one day to a few weeks, with more complex windowing strategies occasionally used. For online VOD (and the advertiser and subscription supported Hulu Plus), delays are often shorter, and live streaming of major network programming to mobile devices (though with a different set of commercials), is emerging. For most subscription services such as Netflix and Amazon, however, windows are generally several months later for both TV programs and movies, comparable to the movie release windows of monthly subscription cable networks like HBO and Showtime. However, Netflix or other subscription services have occasionally obtained exclusive rights to exhibit theatrical films or TV programs months earlier.

b. Content aggregation and disaggregation

At least for the leading online providers, aggregation of commercial television and other programming from multiple creators or copyright owners appears to be a dominant business model. For example, Hulu aggregates mainly programs from the three major broadcast networks that co-own the site, but also from many other “content partners,” now including major broadcasters CW and Univision, selected shows from several cable networks, and a variety of online-only niche programming. Netflix’s subscription service offers a large menu of TV programs and movies that come from many different owners. iTunes and Amazon offer comprehensive menus of TV programming from numerous broadcast and cable networks, as well as theatrical movies distributors. At the other end of the spectrum, a number of online video businesses are essentially standalone networks, such as HBO-GO, ESPN3, and several individual basic cable TV networks, although they often also have elements of content aggregation. In addition to HBO-Go’s significant back catalog of exclusive programming,¹⁰ for example, that service also offers subscribers access to a large selection of recent and older movies. Viacom Digital, CBS, and Disney are intermediate cases; they offer numerous broadcast or cable programs, although mainly those produced or distributed by the website’s corporate owner.

In some cases, there are also agreements between the aggregators, with some programming being distributed at additional, downstream portals. In addition to CBS content, for example, CBS Interactive’s TV.com has at times been Hulu’s content distribution partner. That relationship has allowed TV.com to distribute a subset of Hulu content or embed a Hulu video player within TV.com’s portal, effectively increasing Hulu’s in-video advertising revenue as well as TV.com’s ad views. Similarly, Viacom’s Comedy Central has used Hulu as a distribution partner for some of its more time-sensitive programming (*e.g.*, “The Daily Show” and “Cobert Report”), which is also available through Comedy Central’s own website.

The efficiencies of online content or product aggregation have been studied by several authors, notably Bakos & Brynjolfsson (1999, 2000). They showed that the extremely low marginal carriage or capacity costs of Internet distribution allow content aggregators to average consumers’ demands over a great many different products at once, enabling more accurate pricing to extract consumer surplus.¹¹ Bakos & Brynjolfsson’s model, however, appears to presume a collection of products sold at one price, such as AOL and other ISPs offered in early days of the Internet. While that model applies to subscription services discussed above, a more apparent source of economic efficiencies of online aggregation is analogous to well-established reasons that brick and mortar department stores exist. Consumers have a one stop shop, minimizing search costs. Other authors, notably Shapiro & Varian (1999) and Harvard Business School (2000), have recognized that Internet architecture offers unusual efficiencies of

¹⁰ While its programs have been available through Amazon’s VOD menu for some time, HBO has recently licensed many of its original programs to Amazon’s Prime streaming service (Spangler, 2014). Notably, HBO has saved some of its recent programming (*e.g.*, “Game of Thrones” and recent seasons of “True Blood”) and a few classic hits (*e.g.*, “*Sex and the City*”) for its own service (Spangler, 2014).

¹¹ Conceptually, their model is similar to the empirically-based explanations by Crawford and Cullen (2007) and Crawford and Yurukoglu (2012) for why cable TV systems bundle programming into various packages for different prices.

aggregation; links to a virtually unlimited amount of programming content can be offered by a single seller at extremely low marginal costs.

On the other hand, the Internet also makes *disaggregation* of content more efficient. As we discuss further below, for example, individual networks can potentially bypass -- and thus potentially “unbundle” -- MVPDs simply by making themselves available online as standalone services.

Whether content aggregation or disaggregation by online video providers eventually dominates is simply an empirical question. An evident advantage of online aggregators is a strong brand identity among a vast number of competing websites, clearly one objective of providers such as iTunes and Hulu (Yao, Queiro & Rozovsky, 2010). A look at online video suppliers at the other end of the range, such as early entrants HBO-Go and ESPN3, suggests that suppliers which already have well-established names are prominent among successful content disaggregators.

Online content aggregation also can be seen downstream in the devices used to display videos. As a definitively open platform, the PC web browser offers easy access to many smaller video distribution companies’ web pages, but the more restrictive operating systems of many devices have given rise to a different pattern. Generally, only the more successful content aggregators are able to develop polished apps for the variety of set-top boxes and mobile device operating systems. Most offer apps for Google’s Android and Apple’s iOS platforms, but many have been slow to migrate to devices’ potentially smaller user bases. Netflix’s early app development for Microsoft’s X-box 360, Sony’s PlayStation 3, and Nintendo’s Wii led to a significant portion of Netflix streaming through these game consoles. Overall, online streaming and VOD services now comprise more than 1/5th of these consoles’ usage time (Nielsen, 2013, p. 21). This device platform competition extends to a battle between set-top online app devices, Smart TVs, and Blue-Ray players, powered by competing operating systems of device manufactures. Hulu, Netflix, and YouTube, for example, are available on nearly all devices, but the number of apps supported on each device appears to be generally proportional to the number of adopters of the device’s operating system. This relationship suggests another advantage of content aggregation: sufficient scale to provide support and access through device platforms with low adoption bases.

These observations leads us to the role that TVE, at least potentially, may play in the aggregation of online video content. As we noted above, TVE systems currently accomplish only limited levels of aggregation, but they can be viewed as nascent attempts to achieve large scale, MVPD-like levels of online content aggregation. MVPDs are aggregators not only of a great variety of programming but also of business models, including advertiser and fee support, monthly subscription, and VOD. In that respect, TVE can be seen as a potentially comparable large-scale aggregation of the still-developing online TV components of subscription (e.g., Netflix), advertiser-support (e.g., Hulu) and VOD services (e.g., iTunes). Also, the largest MVPDs’ TVE systems have tended to develop the most widespread device support and authentication opportunities with networks’ online portals.

Whether MVPD-level aggregation will prove in the long term to be a sufficiently differentiated or valuable option for consumers is uncertain, but the history of the television industry indicates that to be a plausible outcome. We discuss this issue further in Section IV.1. b. below.

IV. Some questions and tentative answers about the future of online video

The technological marvels and vibrant entry into online video entertainment may seem in sharp contrast to its small audiences and revenues compared to standard television. One possible explanation for these contrasts is that at this moment, offline MVPD television is simply more convenient and familiar to the great majority of households. It offers a large selection of content with relatively low search costs, with on-screen program information grouped by familiar channels on a single device specifically designed to be plugged into any TV or home entertainment system. In contrast, online video often requires additional devices to be displayed on a home entertainment system, like a Roku or a game console. Many have not adopted these devices, and many adopters may be unwilling to switch between different programs across different devices on any regular basis. For most people, changing the cable channel is simply easier than switching from Hulu through a game console to an iTunes library on a personal computer. The very range of different online services available on different devices can lead to a confusing and time-consuming search process that may discourage all but the most price-sensitive or tech-savvy from regular use.

As the speed and quality of online video transmission continues to rise, as broadband diffusion grows, as more efficient and portable media players continue to proliferate, and as the interaction between consumers and video content providers becomes more seamless, the economic viability of the online video entertainment industry seems bound to improve.

The transition from offline to online video entertainment cannot, however, be viewed simply in terms of some presumed rate of viewer migration from offline to online. Even as technological constraints of online video fall away, and as inevitable demographic shifts occur, the online video entertainment industry faces major constraints and uncertainties. We now turn to discussion of the four obstacles, and accompanying questions, that we set out in the introduction.

1. Competition from MVPDs and the potential development of large scale aggregation of online video entertainment suppliers.

Beyond their familiarity and ease of use, MVPDs have some important technological and economic advantages over online video entertainment providers. Just as technological advances have driven rapid growth of the online video market, MVPDs are themselves becoming more cost-efficient and robust competitors. Large scale online video entertainment aggregation is also plausible, but MVPDs have strategic advantages in accomplishing that aggregation themselves in the form of TVE.

a. MVPD competition

Multi-channel providers, including not only cable operators, but DBS, telcos, and most recently Google Fiber, are very efficient systems for the downstream, water pipe delivery of television programming to consumers. This includes IP-delivery, which is the basis for telco TV's and Google Fiber's entry into Kansas City and a few other U.S. markets. Cable systems are converting to more efficient IP delivery as well. While online video delivery is improving rapidly, MVPDs also continue to be better suited to simultaneous real time delivery of television programming, such as sports. Note that Google's Kansas City prototype offers download and upload speeds of one GBPS, which allows a typical HD movie to be downloaded in less than 30 seconds as well as rapid subscriber-to-subscriber video transfer.

MVPDs have also been able to improve their technology within the home to compete with some of the most valuable features of online video. These include more efficient and convenient DVRs and distribution of live television signals to digital devices over home Wi-Fi systems. A related innovation is the recent set-top box carriage deal between Netflix and three MVPDs (Fung, 2014). In effect, Netflix or other online video services can be added to MVPD programming menus, avoiding the hassle of switching between different devices.

We referred above to the efficiency of large scale MVPD program packaging and pricing. Their dedicated video systems bring together hundreds of networks, often thousands of VOD programs, many in HD, and deliver them to a majority of the U.S. population, leading to considerable economies of scale. Since ad supported networks generally desire to have the widest possible reach, they compete to be aggregated onto the most popular basic tiers of MVPD services. Advertisers thus gain access to the most consumers, along with a fairly clear understanding of how ratings and viewer demographics influence the value of commercial slots.

MVPD programming is bundled into various packages or tiers for extra charges, which effectively serve as price discrimination devices (Crawford and Cullen, 2007). Although a constant source of complaint on the margin, consumers as a whole generally desire and benefit from these systems of aggregation. In general, most consumers prefer to have large packages of communications goods or services for predictable prices per month (Fishburn, Odlyzko & Siders, 2000). Overall, though sometimes dismissed in the popular press as fading dinosaurs, it would be mistake to discount the long term competitive potential of MVPD technology.

b. Potential large scale aggregation of online video delivery

The evident appeal to business and consumers of large scale aggregation by MVPDs leads to this question: Would similar aggregation improve the competitive prospects of online video entertainment? As our discussion above indicated, however, apart from some device-based online aggregation, the largest aggregators of new video content online in the U.S. are currently the TVE services of MVPDs themselves.

The major broadcast networks and a few basic cable networks offer at least some of their programming without requiring authentication. The programs on these networks, which on the cable side include Comedy Central's The Daily Show and The Colbert Report, are distributed on

VOD or ad support basis through a variety of online sites (such as Hulu and CBS Interactive). Relatively very few basic cable networks, and apparently no premium networks, however, are made available outside the MVPD authentication model or as licensed content for a subscription service. An October, 2013 Media & Technology Digest (formerly *Screen Digest*) survey of 73 basic and premium cable networks that make their services available online indicated that all of them required some type of authentication of an offline MVPD subscription.

These strategy choices introduce a second question: Can the very limited development of online delivery of individual cable networks without MVPD authentication be attributed to straightforward economic incentives?

Consider first the cable network case. Individual basic or premium networks have a unilateral incentive to distribute their content online without authentication if their total offline revenues (from advertising and/or per-subscriber fees) plus online revenues (from advertising and/or VOD) are higher than revenues from offline distribution only. In large part, this tradeoff is a matter of substitution effects. If substitution effects are large—that is, if online viewers are mostly potential offline viewers as well, economic incentives for early (or any) online distribution are lessened if the revenues per viewer are *lower* for online viewing than for offline viewing. If the substitution effects are small—that is, if online and offline viewers are essentially different groups, then the network faces no impediments to online distribution as long as online revenues at least cover marginal costs. Among other factors, the size of these substitution effects depend on windows, audience demographics, and the type of programming.

The current pattern of market behavior clearly suggests that there are significant substitution effects (or that networks believe that there are); that is, online viewing *reduces* offline viewing and thus offline revenues at least to some extent. In that case, authentication is likely to be more profitable for an individual cable network to the extent that an online viewing without authentication makes the network *less valuable* to the MVPD—thus tending to reduce per subscriber fees that MVPDs are willing to pay the network.

Consider the case of HBO-GO, for example, one of the more popular online premium networks that requires authentication. In the absence of authentication, those who substitute HBO-GO for an offline HBO subscription directly reduce HBO's revenues from those offline subscribers (which are usually split with cable operators). However, there is another loss to the MVPD: the incentive of an HBO subscriber to buy a basic MVPD package necessary in order to get access to HBO is reduced.¹² Of course, if HBO-GO did not require authentication, it could earn additional revenues from online monthly subscribers who would otherwise not subscribe to HBO offline, so that incremental revenue is sacrificed due to HBO's authentication requirement.

With advertiser supported basic cable networks, say TBS, the calculus is similar but involves a dual revenue stream of advertising plus per subscriber fees from MVPDs. These potential revenues are weighed against the combined advertising and VOD revenues that could be earned online without authentication. As we discuss further, online advertising revenues per hour appear to be substantially *lower* than offline advertising revenues per hour, and the offline

¹² Although this component of the MVPD's loss is not directly suffered by the network-- in this example, HBO-Go--, at least some of that loss may be borne by HBO-Go.

vs. online total revenue contrasts may be even greater—thus encouraging authentication in order to move as much overall viewing of the network to its more lucrative offline exhibition.

Although perhaps less important than in the premium network case, MVPD carriage of basic cable networks not requiring authentication also become less lucrative to those MVPDs. On the margin, some of those people who can now access TBS online, for example, will no longer find it worthwhile to subscribe to the MVPD service (along with its other tiers) at all.

In the case of the major broadcast networks, incentives to forgo authentication might be explained by the relatively small proportion of their total revenues that are earned by retransmission payments vs. advertising, and by their advertising business model that depends on maximum audience reach. In some of the cable network cases, like Comedy Central’s satire news programs, quick erosion of value and the publicity gained from broader reach, may also be factors in forgoing authentication.

In sum, a programming network’s choice to require authentication purely on its own is an empirical question. It is quite plausible that this strategy is a profitable unilateral decision by individual cable networks. Other factors, however, also tilt the balance toward the TVE authentication model.

First, MVPDs have a strategic advantage over other potential online video aggregators because they can employ free TVE as a price discrimination device to reduce incentives of the lower value (and tech-savvy) offline subscribers to disconnect their MVPD service (Waterman, Sherman & Ji, 2013). These authors also find that that this price discrimination strategy can restrain the entry of standalone competing non-MVPD online aggregators.

In addition, although its practical significance is uncertain, some authors have claimed that TVE is an anticompetitive device intended to pressure networks to require authentication in order to prevent their offline business from unraveling, or possibly to facilitate their own entry into the online video market (Cooper, 2010; Singer, 2010).

As online video usage continues to increase, and thus becomes a relatively more valuable market compared to offline media, MVPD incentives to give away TVE for free should diminish, encouraging the prospect of successful entry and competition among unaffiliated standalone aggregators. Such providers, for example, may be able to offer market aggregations of cable and broadcast networks, as well as various “over-the-top” online video services, in single large packages. At least in the shorter term, however, MVPDs have a natural economic advantage in aggregating online content via “free with authentication” TVE, and anticompetitive motives are at least plausibly involved.

2. The willingness of program suppliers to grant online distribution rights: windows and programming exclusivity

The availability of attractive programming is a major driver of viewer migration from offline to online, and thus the economic development of online video. Because economically viable online entertainment content is dominated by windowed programming—TV programs or movies that have already appeared, or appear at the same time, on offline media—how windows evolve is critical to the online industry’s future. We have also mentioned a rapid recent growth of high quality original online video content, virtually all of which is exclusively licensed by Netflix, Amazon, or other online video subscription services. Thus, the volume of exclusively licensed original content should also influence online video industry growth.

a. Windows

What are the prospects that typical online TV or movie windows will advance—that is, make high quality programming available sooner? In the case of major TV programs, could the window be simultaneously with, or in advance of, offline broadcast or cable network exhibition?; or in the case of monthly subscription services (such as Netflix), could windows be simultaneous with or in advance of monthly subscription cable networks such as HBO or Showtime—or perhaps even in advance of VOD?

Before online video began to influence the pattern, a typical major film would be released in theaters, then after a delay, released to paid MPPD VOD and retail-based Blu-ray/DVD, then to premium subscription networks, then basic cable or broadcast network exhibition. This movie windowing model has been widely recognized as a method of inter-temporal price discrimination by which high and low value consumers are segmented by waiting time and transmission quality of the medium (Waterman, 1985; Owen & Wildman, 1992; Wildman, 2008). Though still in flux, the various online video revenue models (a la carte, ad-support, and monthly subscription) have now become integrated into this model, presumably driven by the same general price discrimination calculus.¹³ In this context, several factors appear to drive online window placement and pricing, notably these: potential revenue per viewer, the number of potential viewers, how readily consumers are willing to substitute between the media, and shelf life of the programming.

Bundled services, such as the monthly subscription premium cable networks or Netflix and its online competitors, are generally less efficient for extracting money from high value consumers with intense demand for particular programs, and thus usually have assigned time

¹³ Online video’s very low marginal costs of carrying additional programming has apparently given online subscription services new ways to extract value from the windowing model. Hulu’s freemium model, for example, gives paying subscribers access to a larger catalog of older content, thereby extracting higher value from users.

Prior to online technologies, individuals with these longer-term demands either had to buy their desired shows and movies from retail or, if the programming was out of circulation, could not have their demands met at all outside of the resale market. Similarly, Netflix gives consumers access to a library of older or niche content not otherwise available on subscription basis. Even services like HBO Go provide subscribers with a catalog of older movies and their award-winning series.

slots months after paid VOD release, or in the case of TV series, months after standard TV or initial online exhibition. As online video usage increases, the online video subscription window for TV and movies is likely to move toward a position simultaneous with, or perhaps in advance of HBO, Showtime, and other premium cable networks. It is difficult, however, to compare a major determinant of those window outcomes: program supplier revenue potential of online vs. offline subscription services.¹⁴ In any case, although online subscription services are proving to be highly popular, their bundled nature suggests they have limited potential to attract movies or TV programs that are close to offline VOD exhibition windows.

While it is difficult to predict how the offline to online broadcast and cable network series programming window may evolve, a likely explanation for the current delays of one day or more is simply the reportedly higher net revenues per viewer for standard television audiences, combined with significant substitution effects between online and offline viewing. With variations to account for program shelf life (*e.g.*, news vs. drama), demographic, and other factors, the various networks presumably choose an array of delay times that maximize total combined revenues from these interdependent media.

Working in favor of a disappearance or a flipping of offline to online TV and movie delays will be the relative growth of broadband subscriptions and quality of the online video experience, including device proliferation. Most fundamental, however, will be the viability of online revenue models, especially online advertising, which we consider further in Section IV.3. below.

b. Programming exclusivity

High quality, Internet-original, exclusively licensed video programming offered by Netflix or other subscription services in their intense battles to gain competitive advantage, is likely to accelerate the migration of viewers to online video. What is the longer term potential of online video subscription services as providers of high quality, original programming?

The still small, but growing quantities of original high quality programming offered by online subscription services brings to mind remarkable parallels with the early development of monthly subscription cable movie services in the 1970s and 1980s. HBO was the first monthly subscription pay cable network to enter the market in 1972, followed by its satellite debut in 1975. Its main rival to be, Showtime, was launched in 1976. These and some other pay networks that entered later, including Cinemax and The Movie Channel (“companion” networks to HBO and Showtime respectively), specialized in movies, primarily theatrical films released about a year after their premiere, and also “made-for-pay” movies they produced. The battles for exclusive rights to theatrical features were intense, and spawned a private antitrust suit against HBO’s parent company by the parent company of Showtime networks, claiming that HBO

¹⁴ Even with their larger libraries of content, monthly prices for online subscription services such as Netflix and Hulu Plus are generally lower than those of HBO and other premium cable TV networks, and the gateway price of broadband Internet access is lower than that of a basic MVPD subscription usually required for access to premium services. Online distribution, however, is probably cheaper.

excessively used exclusive film rights in an attempt to drive Showtime out of business. (The suit was settled in 1992).¹⁵

The history of premium cable network competition suggests how exclusive rights can be used as a competitive weapon, especially by a first mover, to enhance its competitive advantage. The larger a service's subscriber base, the cheaper are exclusive rights on a per subscriber basis. If the majority of online users are willing to subscribe to only one competing service, the largest network—in the online market, Netflix—has a major competitive advantage and can potentially entrench its dominant position. Economic welfare may be reduced to the extent that competing networks all pursue exclusive rights and subscribers have to pay for two or more networks to get a full menu of available programming. It seems likely, however, that the competitive forces driving the exclusive programming wars among online video subscription services will enhance viewer migration to online.

Anecdotal evidence appears to support these expectations. With “House of Cards,” Netflix has developed an exclusive award-winning drama, and has focused on underserved niches, like anime and low budget horror films. In limited competition with HBO, Netflix has also acquired a few key theatrical movies in about the same window as HBO's. Hulu has funded its own original programming and has acquired US exclusive licenses to several British shows, advertising each heavily in its service. While YouTube is already the leading destination for amateur content, it has funded its own professionally produced programming. Amazon has begun to develop its own exclusive series, and has acquired exclusive streaming rights to a few series originally shown or scheduled to show on PBS and other broadcast and cable networks.

3. The development of effective online business models, especially video advertising.

The economic future of online video entertainment depends on development of successful business models, especially to support Internet-original programming, or comparably, to induce content suppliers to grant earlier windows for high quality programs that have appeared on other media. Especially at issue, as suggested in our commentary on windows above, is the effectiveness of online advertising.

To the advantage of television content suppliers, the within-program video ad model transfers directly to online. Moreover, CPM rates for video entertainment on Hulu and other sites are reportedly above those of prime-time broadcast TV. The number of commercials sold, however, has to date reportedly been much lower, resulting in relatively low advertising income per program online. Convergence Consulting Group (2012) estimated that compared to the above-cited viewing proportion of about 5% in 2010, the broadcast networks earned only 2.7% of their advertising revenues from online exhibition.

¹⁵ The history of premium movie competition during this period is discussed in Chapter 5 of Waterman and Weiss (1997).

The viability of video advertising is apparently increasing, but the rate of improvement will have an important effect on window decisions, given that about two-fifths of total television industry revenues come from advertising.

4. ISP pricing models and their interface with online video pricing.

How does bandwidth-sensitive ISP pricing influence the effective price to consumers of online video services? Is it likely that online video prices will in the long run reflect the true cost of delivery? It is especially hard to answer these questions because of regulatory as well as demand and technological uncertainties. Assuming that the voracious video appetites of users continue to rise, however, it is likely that marketplace outcomes will put upward pressure on effective video entertainment prices.

Over the past decade, some ISPs (*e.g.*, Comcast in 2008) began charging “hard caps” to heavy bandwidth (*i.e.*, heavy video) users (Hussain, Kehl, Lennett & Lucey, 2012; Hussain, Kehl, Lennett & Li & Lucey, 2012). In this regime, users are prohibited from greater data usage, usually over a month, than the cap; degraded service or disconnection can result. Industry reports indicate a recent trend toward “soft caps,” a regime in which heavy users are charged a higher monthly rate (*See* Hussain, Kehl, Lennett & Lucey, 2012; Hussain, Kehl, Lennett & Li & Lucey, 2012; and Hussain, Kehl, Lucey & Russo, 2013). Soft caps can be explained as an attempt to move toward ISP price discrimination,¹⁶ with heavy online video users often likely to be higher value consumers with a higher willingness to pay for ISP services. This is analogous to the higher willingness to pay of heavy television users for MVPD services; MVPD price discrimination takes place because these high value users choose more expensive programming packages (Crawford & Yurkoglu, 2012).

By employing soft data caps, MVPDs effectively raise the total price that heavy using video consumers pay for video services. On the one hand, higher ISP prices for heavy video usage tend to limit the “over-the-top” price levels that the online video providers can themselves charge to consumers. The latter prices are unlikely, however, to fall as much as the soft caps increase ISP charges to heavy users.

Bargaining between ISPs and online video services over the quality of “last mile” access to consumers is also a route by which ISPs might be able to indirectly extract value from online video subscribers that will result in increased effective video prices. For example, if Netflix is forced to pay the ISP for downstream access to consumers (*e.g.*, for co-location of servers, faster

Thus far, industry reports indicate that data caps, hard or soft, affect relatively small percentages of ISP customers.¹⁷ That could, of course, change if soft caps turn out to be effective revenue generators for ISPs.

The Dec. 2012 New American Foundation report also claims that hard or soft data caps are anticompetitive devices by which ISPs who are also MVPDs (*e.g.*, Comcast/NBC Universal) discourage online video usage and thus help preserve their offline MVPD businesses. The NAF report also alleges that data caps serve to limit over-the-top video competition and entry.

Whether or not this potential antitrust concern has practical impact, ISPs generally have strong incentives to figure out ways to extract value both from online video providers and from the consumers who use them heavily. Success with either group of consumers will tend to increase user prices to consume video.

Finally in qualification, however, if the incredible technological advances that have been steadily reducing costs of online video delivery continue, downward pressure on consumer video prices will result. In addition, some have argued that the ISPs' inability to date to charge higher prices to online video content providers has restricted the expansion of broadband infrastructure and required over-the-top providers to build out their own delivery systems. In that case, the creation of a market for preferential treatment of content distribution companies may improve the quality of service.¹⁸ The net long term path of effective video prices could thus be negative in spite of the upward pressure of economic forces that we have identified.

V. Conclusion and Policy Issue Highlights

In the past decade, the online video entertainment industry has rapidly blossomed. Entry and competition has apparently been robust; online content providers using a variety of different business models have proliferated. The leading suppliers aggregate great quantities of programming content, much more than offline suppliers can offer. The most economically viable content is generally windowed movies and TV programming that has already appeared or appears at about the same time, on other media. High quality original programming, however, especially exclusively licensed dramas offered by online subscription services, has been expanding.

¹⁷ "In North America, the top 1% of subscribers who make the heaviest use of the network's upstream resources account for 39.8% of total upstream traffic. At the opposite end of the usage spectrum, the network's lightest 50% of users account for only 6.8% of total monthly traffic" (Sandvine, 2013, p. 6). With median and mean North American home internet usage at 17.6 and 44.5 GB, respectively (Sandvine, 2013, p. 5), the average user falls well short of the 250-300 GB data caps in use by some of the ISPs.

¹⁸ For example, the University of Chicago --- Booth Graduate School of Business's "Initiative on Global Markets" Economists' Panel--considered the question of whether it is a "good idea to let companies that send video or other content to consumers pay more to Internet service providers for the right to send that traffic using faster or higher quality service" (IMG Forum, May 6, 2014). Few disagreed with the statement, with roughly a third expressing general uncertainty. Those who did believe it was a good idea generally claimed that the creation of this additional market for Internet resources would improve overall allocative efficiency.

The online video entertainment industry has remarkable technological and economic advantages over its offline counterparts: apparently low delivery costs, virtually unlimited content capacity, targeted advertising and efficient direct payment business models, and perhaps most remarkably, computer and other device functionality and interactivity. These advantages offer tremendous future potential, although at this writing, the online video industry remains small, both in viewing and revenue terms relative to its offline counterparts, standard television and movie exhibition.

We identified four obstacles or uncertainties potentially limiting online video's future growth: competition from increasingly efficient MVPDs, including their strategic advantages in large scale online content aggregation; limited availability of high quality content, especially windowed programming; limited development of successful online business models, especially advertising; and ISP pricing strategies that may raise effective consumer prices of video consumption. Overcoming at least the first three of these obstacles will be facilitated by continuing migration of viewers from offline to online video media. Yet it is these constraints themselves that act to slow the rate of that migration—rendering the outcome uncertain.

A major goal of FCC and other communications policies has been to encourage robust entry of online video suppliers in order to compete with established MVPDs. Industry history suggests that a key determinant of successful competition with MVPDs over the long term is likely to be large scale aggregation of online content. To date, however, MVPDs appear to have a competitive advantage in online aggregation, in part because they can use “free with an MVPD subscription” authentication as a price discrimination device to prevent offline disconnections. As online audiences grow relative to offline, incentives for MVPDs to unbundle TVE and for standalone providers to enter the large scale online aggregation market will increase. Nevertheless, monitoring the behavior of large MVPDs, which also have plausible incentives to preserve their offline video businesses as well as to gain advantage over other entrants in the online video market, is clearly advisable.

It is notable also that since the online and offline video supply markets are national in scope, policy actions, such as merger reviews which can potentially limit national market shares of either MVPDs or ISPs, serve to reduce the potentially negative competitive impacts on content supply of virtually any MVPD or ISP action. In the ISP case, effectively enforced FCC network neutrality rules may also limit any negative effects on content suppliers of actions that ISPs may take in their various local markets. As we also discussed in Section IV, network neutrality rules may also limit effective consumer video prices, although we stopped short of welfare analysis in that case.

Finally, we acknowledge the speculative nature of some of our analysis in this paper. For example, understanding the profit-maximizing tradeoffs between cable network incentives to require or not require MVPD subscription authentication calls for more rigorous analysis. Similarly for the effects of ISP pricing on effective consumer video prices. More generally, further analysis of the properties of this complex multi-sided market would improve the positive impact of regulatory decision-making. These are important topics for further research.

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The Future of Online Video: An Economic Perspective

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INDIANA UNIVERSITY

Overview I: Online Video's Future - Overview

- ❑ **Part 1 - Recent development of online video entertainment**
 - Major types of players & content aggregation patterns

- ❑ **Part 2 - The future of online video entertainment:**

Many technological/economic advantages....

but 4 main obstacles:

- competition with MVPDs
- availability of high quality content
- development of successful business models
- effects of ISP pricing

- ❑ **Brief summary and policy discussion**



Overview II: Main Points about Online Video's Future

- ❑ Online video growth not a natural result of offline to online viewer migration → significant obstacles.**
- ❑ MVPDs have significant economic advantages over online competitors.**
- ❑ ISP pricing incentives and relaxed net neutrality regulation may increase effective consumer prices for online video.**
- ❑ The importance of monitoring MVPD and ISP size and behavior**



The Economics of Online TV: Some Prior Research

- **Earlier works**
Owen (1999); Bakos & Brynjolfson, (1999); Shapiro & Varian (1999); Kahin & Varian, eds (2000); Noam, Groebel & Gerbarg, eds., (2004); Yoo (2006); Noam, ed. (2008); Wildman (2008)

- **More recent studies**
Donders & Evens (2011); Frieden (2013); Evens (2013); Brenner & Maxwell (2013); Simon (2012); Nooren, Leurdijk, & van Eijk (2012); Baccarne, Evens & Shuurman (2013)

- **Reports**
FCC Annual Assessments on the Market [...] of Video Programming (1994-2013); New America Foundation (2013, 2014); FCC: The Comcast-NBCU Order (2011)



Online Video Matures: Media Use

- ❑ The avg. US adult watches 34 hours of traditional TV per week and 6 hours of time-shifted TV, but only about 1 hour of online video.
- ❑ The top 10% of US adults account for 86% of online video streaming, watching on average 2 hrs., 34 min. per week.
- ❑ Netflix and YouTube together accounted for 45% of total peak North American fixed Internet traffic in 2013.



The Prevalence of Online Video Aggregation

- ❑ The suppliers of a large amount of content via one website or app, typically from multiple creators or content owners

- ❑ Aggregators appear to dominate online video distribution

- ❑ Economic advantages of aggregation:
 - one-stop shopping/viewing
 - low marginal capacity costs
 - enables economies of scale



Main Online Video Business Models

Ad based

- Amateur content (YouTube)
- Professional content (Hulu, CBS)

Direct Payment:

- Rental Services & Electronic Sell-Through (iTunes)
- Subscription streaming services (Netflix)

Authentication of Offline MVPD subscription:

- “TV Everywhere” MVPDs (Comcast Xfinity)
- Verification-based TV network portals (HBO-Go)



Part 2: The Future of Online Video

- **Many economic advantages....**
 - **Low delivery costs**
 - **Unlimited content capacity**
 - **Targeted advertising potential**
 - **Direct payment systems**
 - **Device functionality and interactivity**

- **But..... 4 main obstacles**
 - 1) **Competition from MVPDs**
 - 2) **Availability of high quality content**
 - 3) **Development of successful business models**
 - 4) **Effects of ISP pricing**



Part 2: The Future of Online Video

□ The 4 main obstacles

1. **Competition with MVPDs**
2. **Availability of high quality content**
3. **Development of successful business models**
4. **Effects of ISP pricing**



Competition from MVPDs

- ❑ **Very efficient delivery systems for large-scale aggregations of programming, especially live events.**
 - **IP conversions, with very fast download/upload speed (*e.g.*, Google Fiber)**

- ❑ **Within-home tech advances similar to online functionality**
 - **DVRs, on-demand, home wi-fi rebroadcast; set top box carriage of Netflix, other services**

- ❑ **Both advertisers and consumers benefit from bundling.**

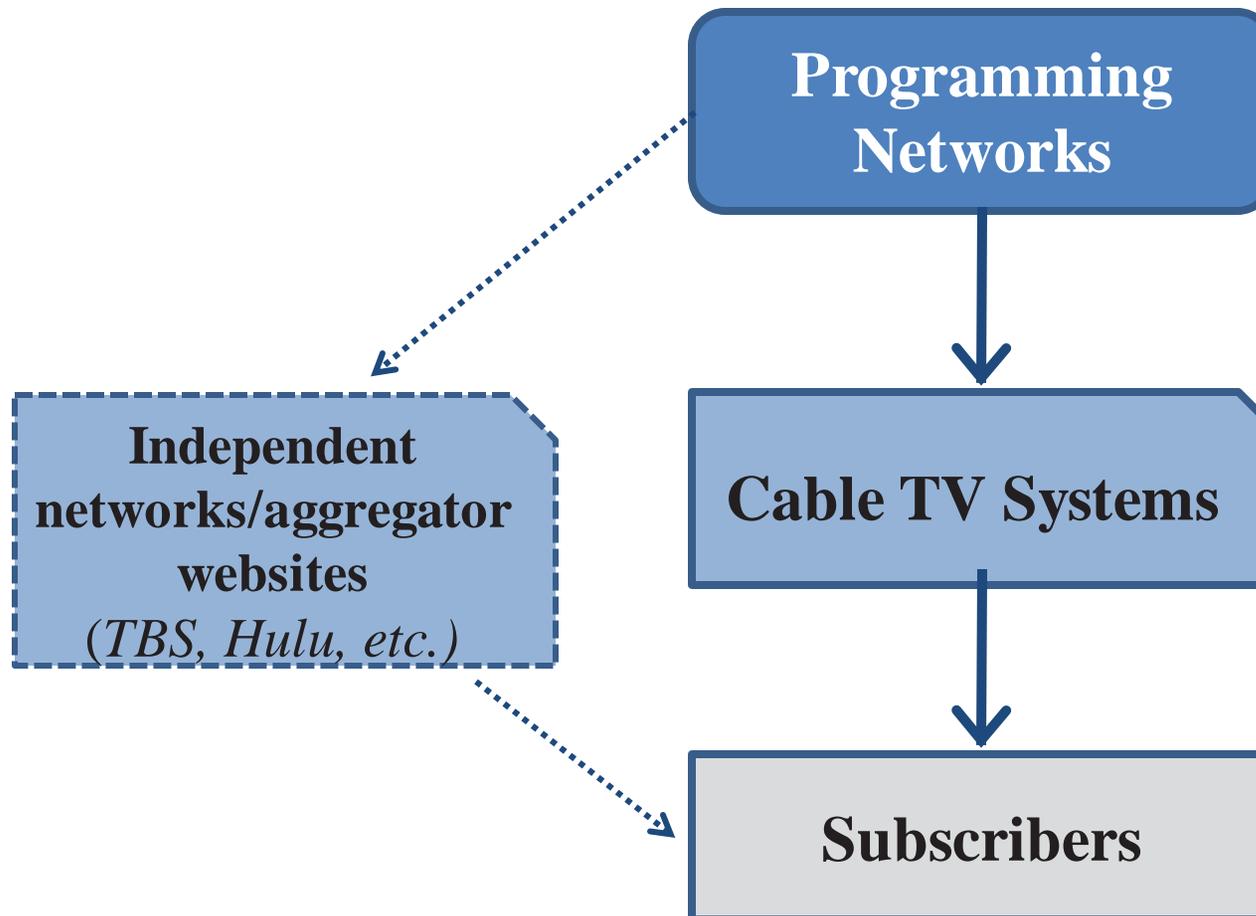


The potential for large-scale online content aggregation to compete with MVPDs

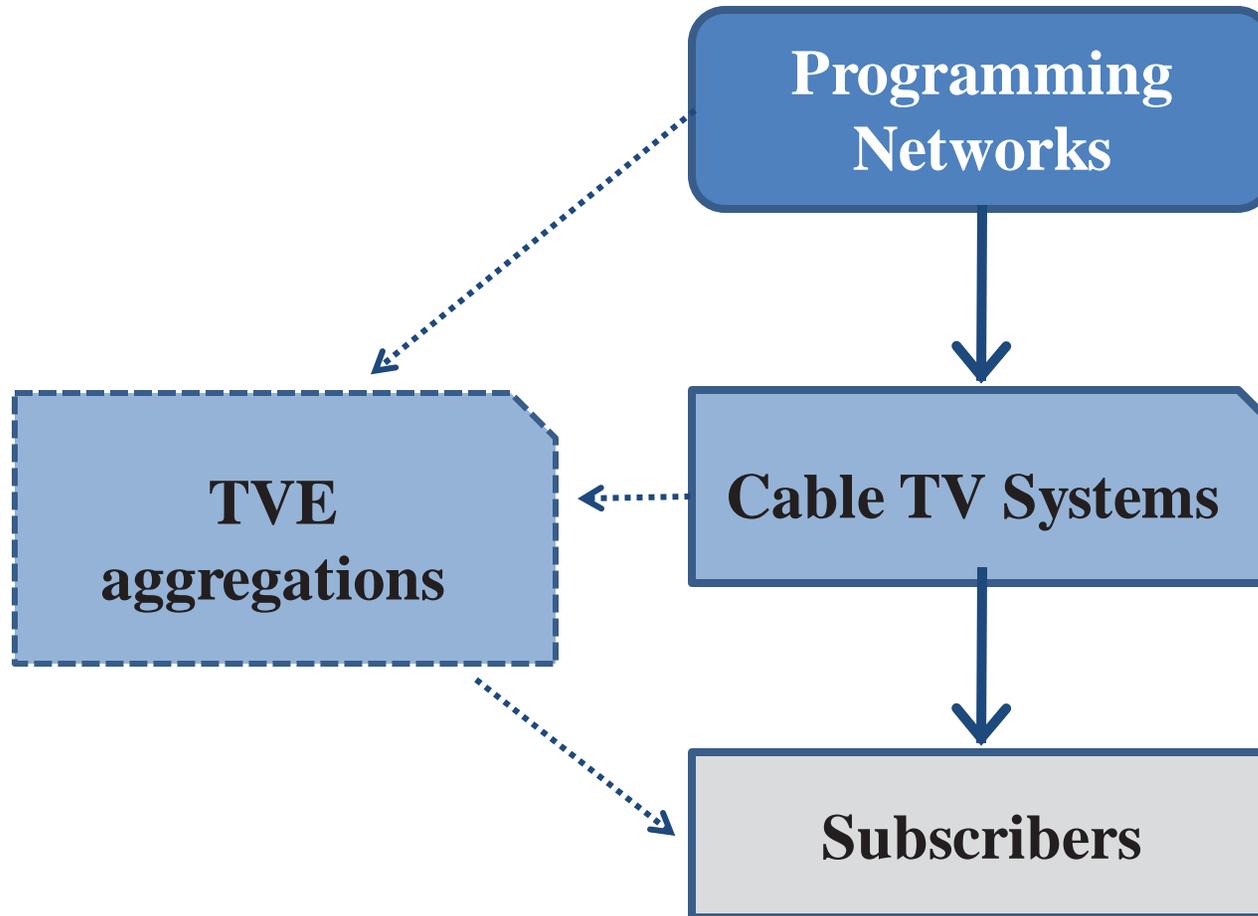
- ❑ Could comparable assemblies of broadcast/cable network programming, plus online services (eg, Netflix, Hulu, etc.) be marketed as competing online packages?**

- ❑ Possibly yes, but MVPDs have an apparent advantage in large scale aggregation via “TV Everywhere” (TVE) or similar services**

Potential Cable TV Disaggregation



TV Everywhere Business Model



Prevalence of MVPD Subscription Authentication

- ❑ Major broadcast networks do not require authentication.

- ❑ Most major basic and premium cable networks offer programming online, but only with authentication.
 - 2013 Screen Digest survey of 73 cable networks that all require some type of authentication

- ❑ Most of the larger MVPDs centralize TVE services.



Cable network incentives for 'Free-with-Authentication' requirements

- ❑ Individual networks have plausible economic incentives to require authentication on their own if:

gains in online advertising
+ direct payment revenues without authentication

are less than

gains in offline advertising
+ per sub fees with authentication

- ❑ Pro-authentication factors include:
 - offline rev per sub > online rev per sub
 - higher total value to MVPD from carrying the network

- ❑ Examples: HBO-Go; TBS



MVPD incentives to offer TVE

- MVPDs have an advantage over independent online aggregators in using TVE as a price discrimination device to prevent offline disconnections.
 - The result can be restricted entry of competing online aggregators (Waterman, Sherman, and Ji, 2013)
 - *Intuition:* If a MVPD has a price-cost margin of $\$100 - \$70 = \$30$, it pays to subsidize ‘free’ online TVE up to \$30 per sub to prevent the marginal (online-using) sub from ‘cutting the cord.’
- MVPDs also have a potentially anti-competitive incentive to preserve their offline business and advantage their own entry into online video (Singer, 2010).



Part 2: The Future of Online Video

□ The 4 main obstacles

1. Competition with MVPDs
2. **Availability of high quality content**
3. Development of successful business models
4. Effects of ISP pricing



Prevailing online windows as price discrimination devices

- Online movie VOD simultaneous with MVPD VOD**
 - **VOD appeals to highest value viewers**

- Ad supported broadcast/cable programs delayed by 1 day or more**
 - **appears to reflect lower online revenues per viewer hour.**

- Subscription window (eg, Netflix) occurs months later, generally comparable to HBO/other premium cable networks.**
 - **Bundled services cannot extract value from higher specific demands.**

- Prospects for earlier online windows depend on:**
 - Continuing offline to online viewer migration**
 - Higher online revenues per viewer, especially advertising**

Part 2: The Future of Online Video

□ The 4 main obstacles

1. Competition with MVPDs
2. Availability of high quality content
3. **Development of successful business models**
4. Effects of ISP pricing



Development of Successful Business Models

- ❑ Successful models essential for growth and development of early windows and high quality original programming**
- ❑ To date, revenues per viewer apparently lower for online exhibition, justifying offline/online delays (windows)**
- ❑ Uncertain prospects for advertising model improvements**



Part 2: The Future of Online Video

□ The 4 main obstacles

1. Competition with MVPDs
2. Availability of high quality content
3. Development of successful business models
4. **Effects of ISP pricing**



The Effects of ISP Pricing

- ❑ Recent industry transition toward soft caps (*e.g., Comcast*)
- ❑ Soft caps as ISP price discrimination
 - Heavy video users tend to have higher willingness to pay
- ❑ Payments to ISPs by content suppliers; the potential role of network neutrality
- ❑ Results: higher effective consumer prices for online video services



Summary and Tentative Conclusions I

- ❑ Online video has important technological/economic advantages ...but there are obstacles to online video growth.**
- ❑ MVPDs have significant advantages as competitors to online, and also as large scale aggregators of online content.**
- ❑ ISP pricing strategies and relaxed network neutrality rules may increase effective consumer prices for online video.**



Summary and Tentative Conclusions II

- **The FCC's goal of robust online video entry and competition with MVPDs requires**
 - **active monitoring of MVPD and ISP behavior, especially those with high national market shares.**
 - **control of national market shares of MVPDs and ISPs via the merger review process.**



The Future of Online Video

Thank you.....

Please check out our workshop paper for a more in-depth analysis and exploration.



Slidedeck

Business Models of Some Online Video Aggregators

Service	Primary Content	Primary Business Model(s)
iTunes	Broadcast & cable programs; movies	Paid download/rental
Amazon	Broadcast/cable programs	Subscription; paid download/rental
Netflix	Broadcast/cable programs/movies	Subscription (also DVDs by mail)
Hulu	NBC, ABC, & Fox TV series; some cable network content; web-only video	Adv/subscription
TV.com	Hulu, CBS, and other cable network content already available online for free	Advertising
Comcast Xfinity*	Broadcast & cable programs; movies; Netflix-like 'Streampix' premium service offered beyond MVPD geographic areas	Authentication of offline cable subscription; Subscription
YouTube	User-generated content; funded professionally created 'channels' and content partnerships	Advertising

*Similar "TV Everywhere" services offered by other leading cable operators



Business Models of Some TV Networks' Online Programs

Service	Primary Content	Primary Business Model(s)
HBO-Go	HBO exclusive series and licensed movies	Authentication of offline cable subscription
CBS Interactive	CBS TV programs	Advertising
TNT	TNT TV programs	MVPD authentication
USA	USA TV programs	MVPD authentication or advertising, depending on individual programming
Viacom Digital	Viacom cable networks (MTV, Comedy Central, BET, Nickelodeon, etc.)	Advertising or through TVE system, depending on individual programming



Online Video Matures: Zero TV Household?

GLOSSARY

TV HOUSEHOLD: Nielsen now defines a TV household as a home with at least one operable TV/monitor with the ability to deliver video via traditional means of antennae, cable STB or Satellite receiver and /or with a broadband connection.

□ Online video has become a viable alternative to broadcasting and MVPD subscriptions to a sizable group of users, which focuses the analysis in two different directions.

- **Dependence on broadband for distribution**
- **Dependence on a broader range of display platforms**



Online Video Aggregation at the Platform Level

- While the game consoles have been a popular way to watch online video conveniently on televisions, the adoption of variety of cheap devices and smart televisions has eased access.**
 - Game Consoles – 46% of US households**
 - Smart TVs – 16% of US households**
 - Set-top boxes are very affordable:**
 - Google’s \$35 Chromecast, Apple TV, Roku, etc.**
 - Portable computing**

- Is there an app for that?**
 - Only the leading aggregators and networks tend to have apps for more niche technology platforms, and vice versa.**

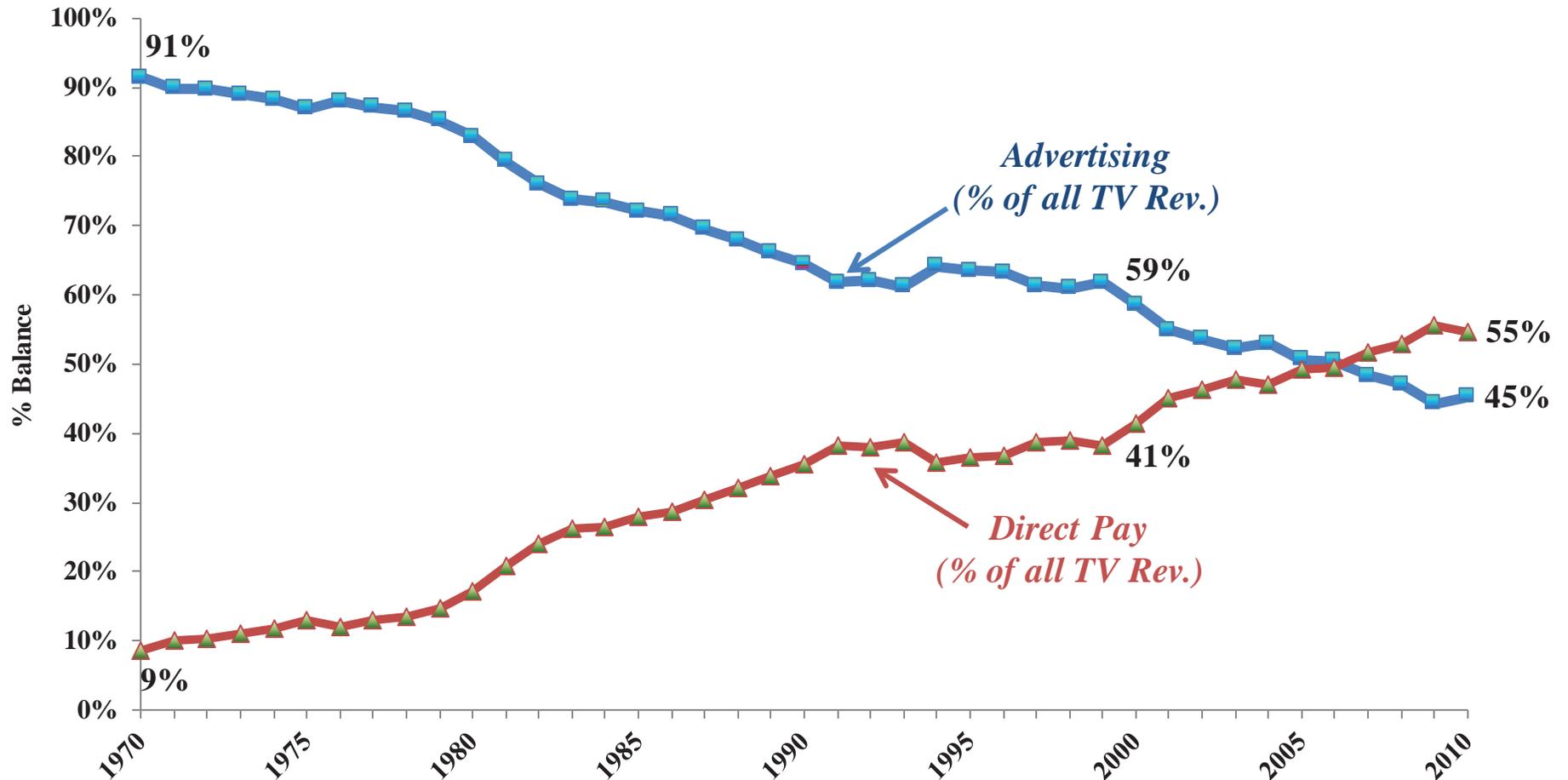


MVPD TV Everywhere Taxonomy, June. 2012

<u>Company</u>	<u>Rank</u>	<u>Subs.</u> (<u>'000's</u>)	<u>Channels</u>
Comcast Corporation	1	22,343	Expansive On Demand
Dish Network	3	13,967	Expansive On Demand
Cox Communications	5	4,761	Limited On Demand
Verizon Communications	7	4,173	Expansive On Demand
AT&T	8	3,791	Expansive On Demand
Suddenlink Communications	11	1,252	Expansive
Mediacom Communications Corp.	12	1,069	Limited Hidden Access
WideOpenWest Networks, LLC (WOW!)	15	428	Limited Hidden Access
Atlantic Broadband Group (ABB)	18	255	Limited Hidden Access
Buckeye Cable System	25	134	Limited Hidden Access
CableOne, Inc.	14	621	Snyacor Announced
Knology Holdings	17	257	Snyacor Announced
Armstrong Cable Services	19	239	Snyacor Announced
Midcontinent Communications	20	227	Snyacor Announced
Blue Ridge Communications	23	168	Snyacor Announced
DirecTV	2	19,880	Network Portals
Bright House Network	10	2,092	Networks' Portals & Live TV
Cablevision Systems Corporation/Optimum	9	3,250	Networks' Portals & Live TV
Time Warner Cable	4	12,061	Limited Live TV

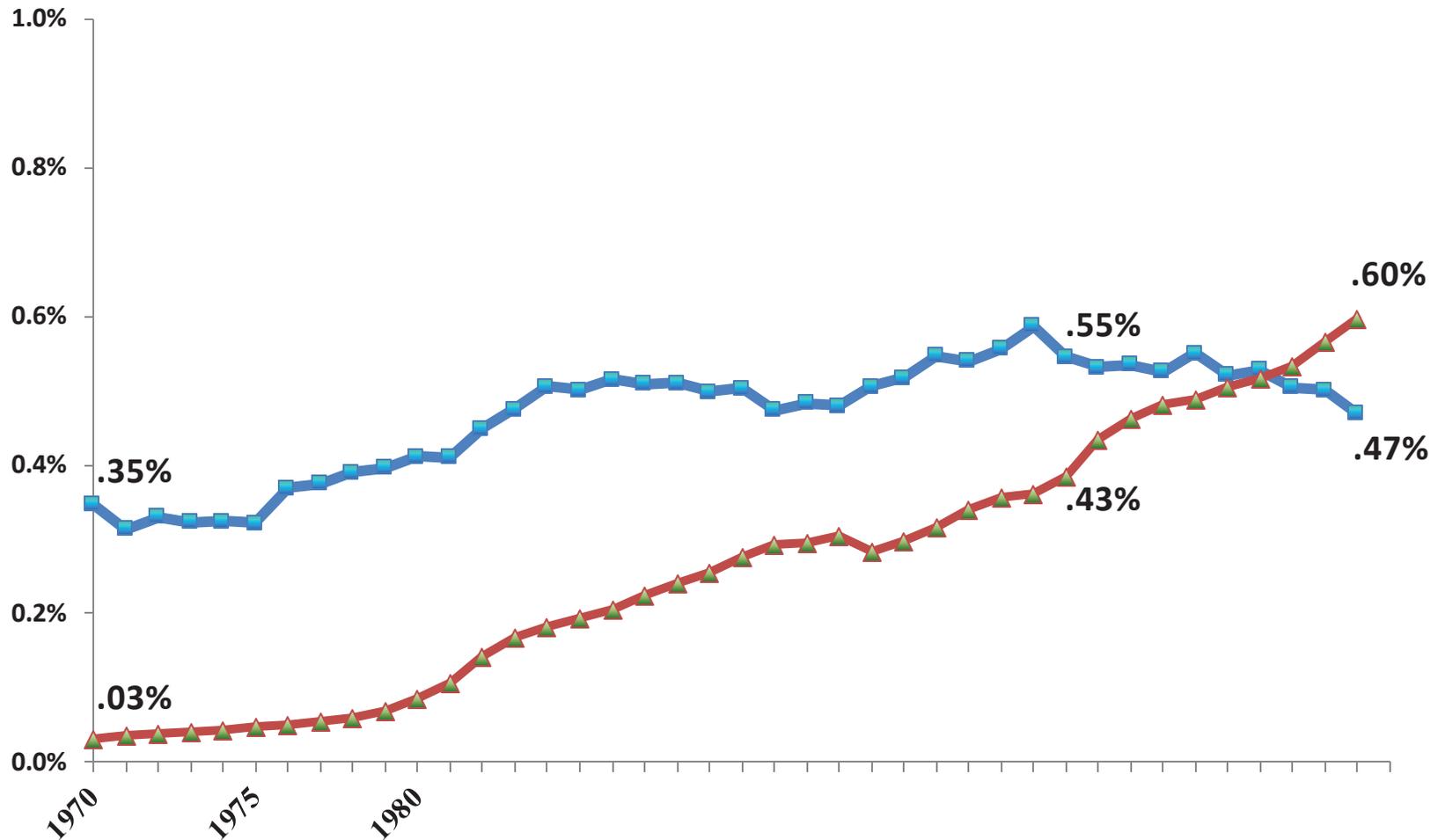


Advertising vs. direct pay support % balance: Television, 1970-2010



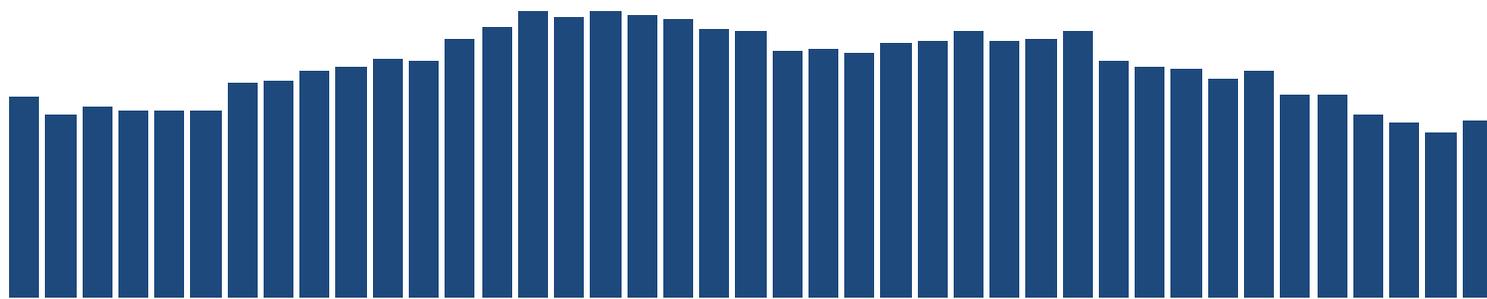
Sources: U.S. Census; trade associations; industry analysts; 10-K reports; author estimations
Preliminary data (Waterman/Ji/Sherman, March, 2012)

Advertising vs. direct pay support as % of GDP: Television, 1970-2009



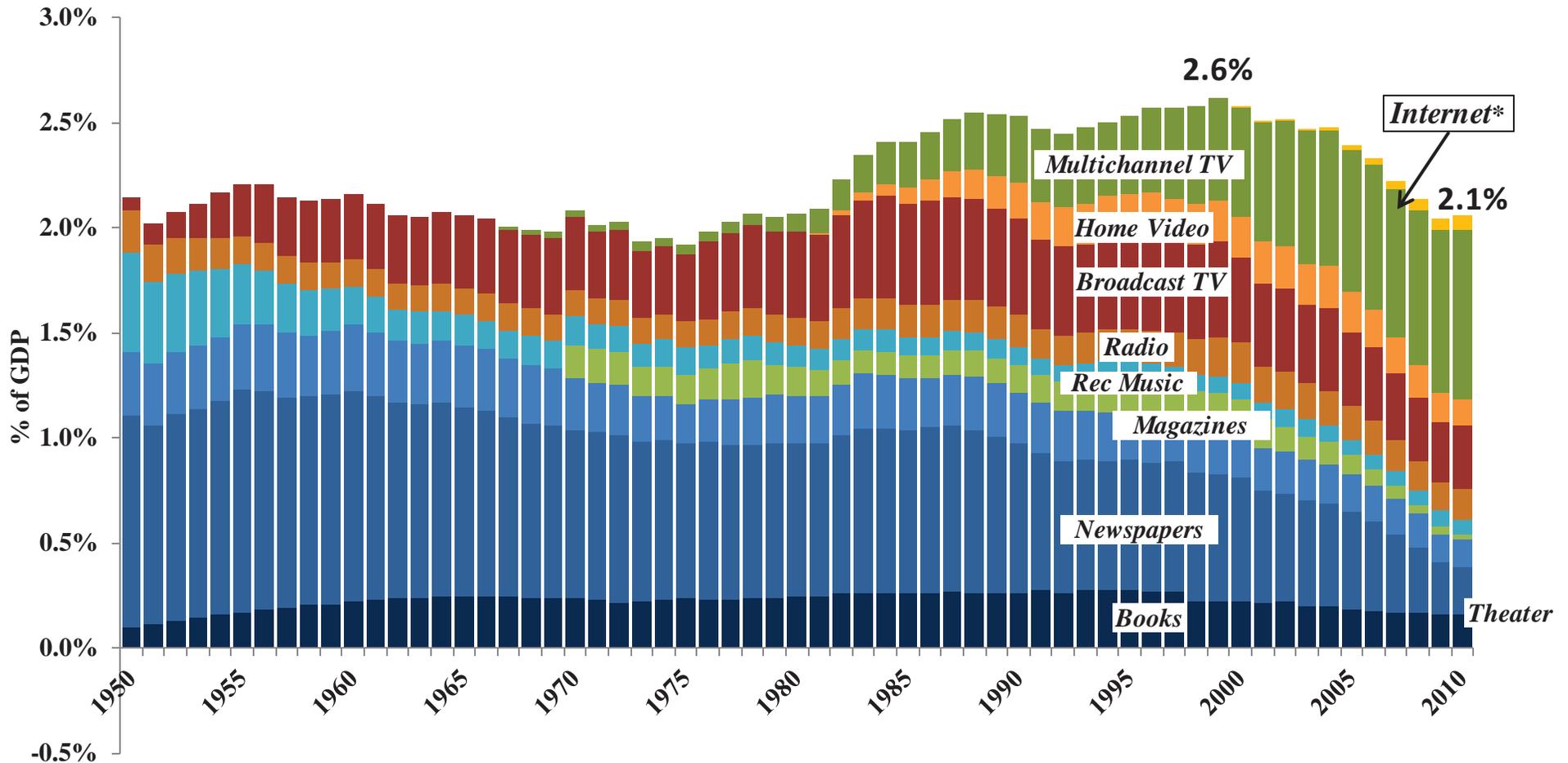
Sources: U.S. Census; trade associations; industry analysts; 10-K reports; author estimations
Preliminary data (Waterman/Ji/Sherman, March, 2012)

Television: Total Revenue by Category, as % of GDP, 1970-2010



Sources: U.S. Census; trade associations; industry analysts; 10-K reports; author estimations
Preliminary data (Waterman/Ji/Sherman, March, 2012)

Total Revenue of US Commercial Media, as % of GDP; 1950-2010



* includes: newspaper websites; digital music/movies; television station/network websites; Internet radio; e-books

Sources: U.S. Census; trade associations; industry analysts; 10-K reports; author estimations

Preliminary data (Waterman/Ji/Sherman, March, 2012)



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Potential Anticompetitive Behavior to Prevent or Dominate Online TV

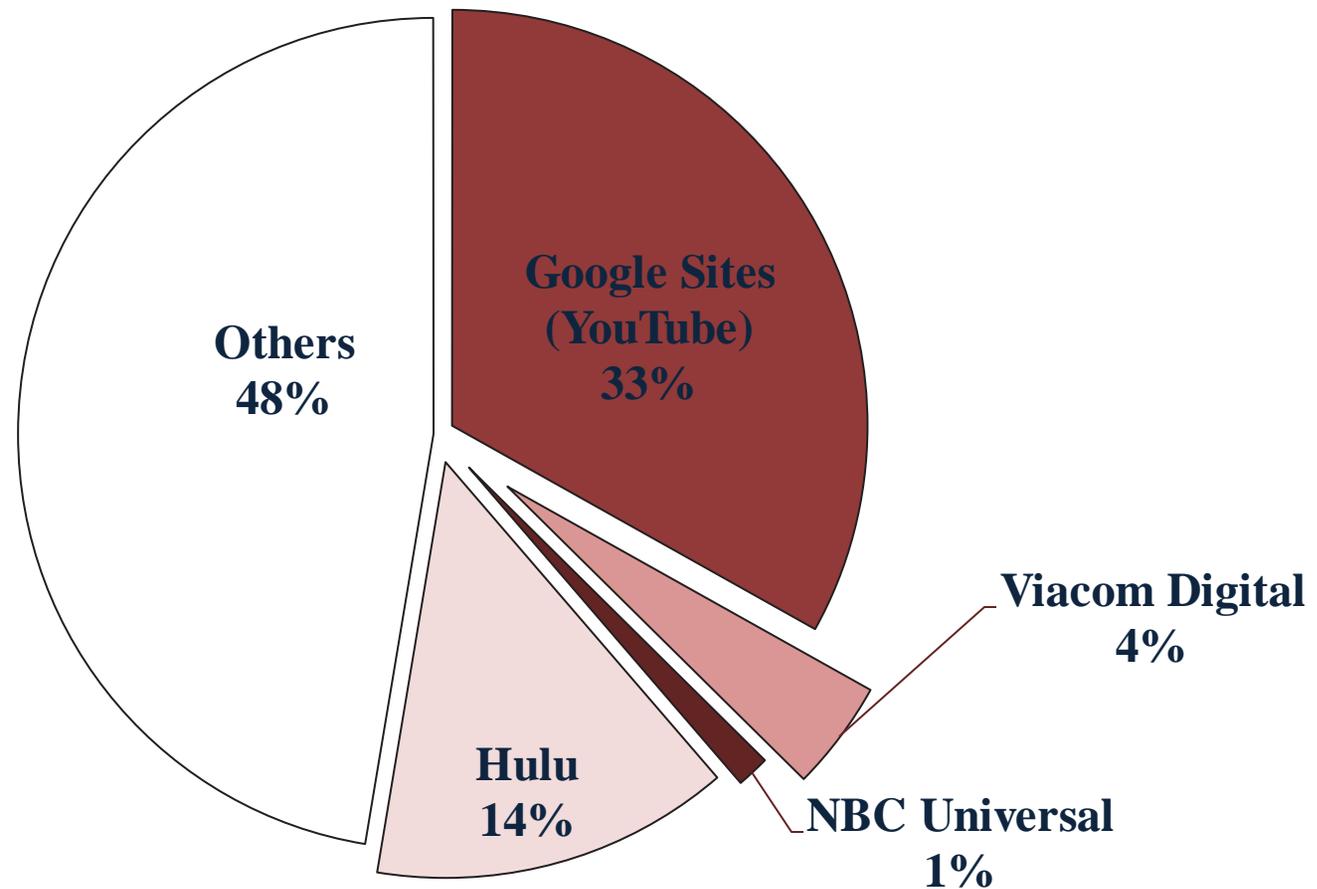
- Content starvation**
- Access to offline system used as leverage to influence networks' online strategies**
- Cross-subsidization to compete with online-only services**

- All of these depend upon national and local market power.**

- However, anticompetitive intent is not necessary to slow the development of standalone online TV.**



Online Video Market Shares: Minutes Per Viewer per Month, January 2012



Total = 22.6 hours per month

Source: Authors' compilation from Comscore.com



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Industry Development to Unfold

IPTV

- No capacity constraints
- Low distribution costs
- Copyright vulnerability
- Potentially effective advertising model
- Efficient direct payment system
- Growing fast, threatening television business model

vs.

Cable Operators

- High bandwidth content
- Efficiently advertised, bundled, packaged
- Offering broadband and telephone service
- Co-opting of Internet video distribution



Summary and conclusions II

- ❑ **The FCC goal of robust online entry and competition with MVPDs**
- ❑ **The MVPD advantages in TVE aggregation**
- ❑ **Monitoring of MVPD behavior and the merger review powers of the FCC**
- ❑ **The effects of network neutrality rules**
- ❑ **The importance of MVPD and ISP national market shares**



Economic Drivers of Offline TV Growth After 2000

- ❑ The continuing shift from broadcast to paid TV models**
- ❑ Digital diffusion & growing channel capacity**
 - avg. # of channels increased 60%+ from 2000 to 2011**
- ❑ Continuing rise in standard TV viewing**
 - Avg. of 12 minute annual increases to 34hrs., 12 min. in 2011**
- ❑ Relatively low impact of online TV thus far**



Comcast Cable TV Tier Pricing - Bloomington, IN, 2011

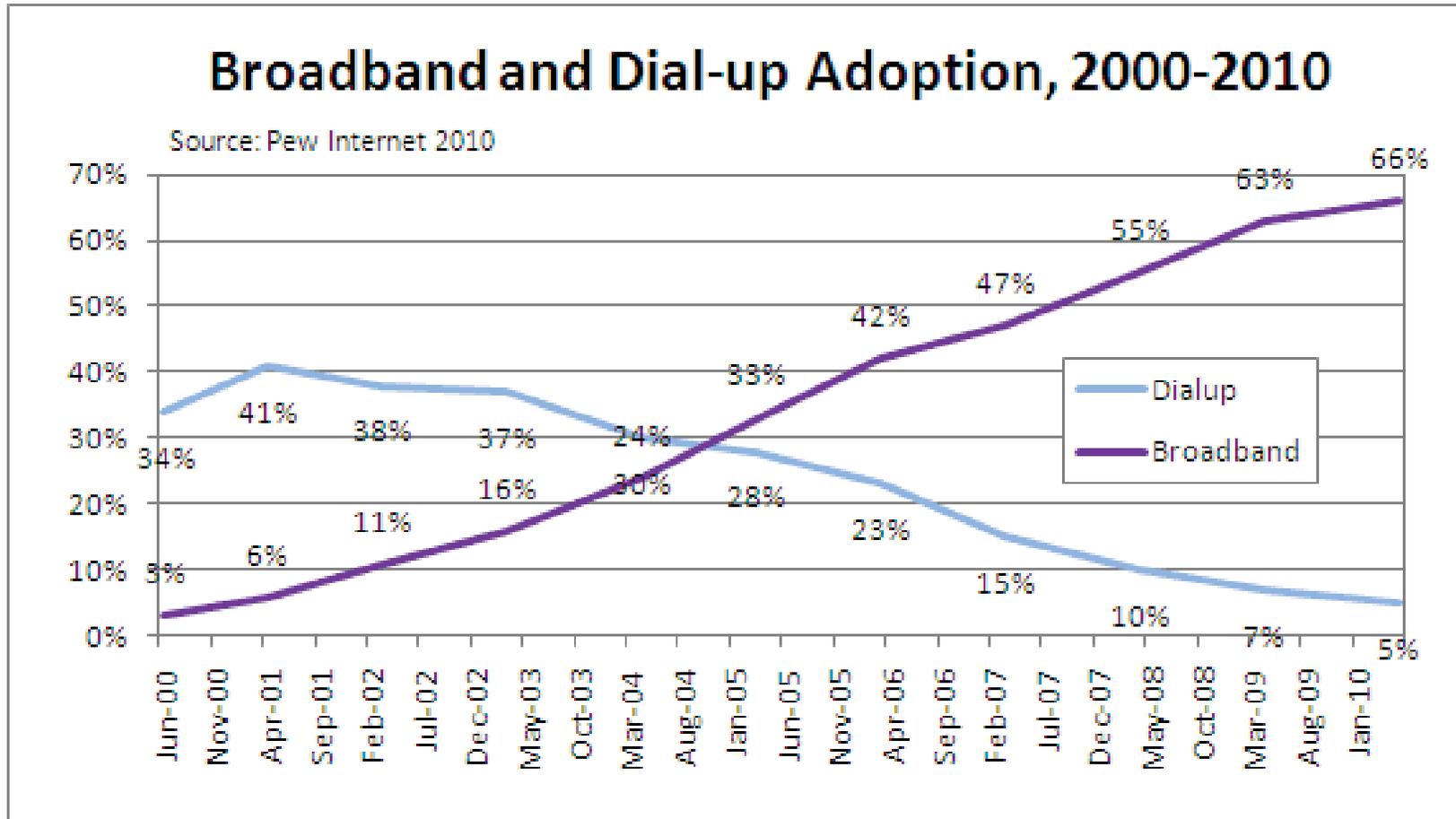
Packages	Number of Channels	Price per month**
Basic	21	\$19.99
Digital Economy	43	\$39.95
Digital Starter*	178	\$64.99
Digital Preferred*	243	\$81.94
Digital Premier*	295	\$137.00

* 158 HD Channels are available from Digital Starter with HD Box(\$8/month)

** published full rates after 2 years; reduced rates for some packages for first 2 years;

Source: Comcast website, Program Lineup by Zip code: 47401, Consult with customer center

Broadband and Dial-up Adoption



Sources: Pew Research
 Preliminary data (Waterman/Ji/Sherman, March, 2012)

