Online Advertising: Defining Relevant Markets[1]

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ABSTRACT

This paper provides an overview of the development of Internet advertising. We offer a broad overview of both online and offline advertising and the economic models that allow one to evaluate competition among advertisers. We focus on the extent to which various types of online advertising compete with each other and with offline advertising. We also ask whether various types of online ads are competitive with each other.

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I. INTRODUCTION

The rapid growth of the Internet, and the incredible flow of information that the Internet has made possible, has transformed the business of advertising.[2] Today it is difficult to surf the web without seeing online advertising, often in the form of visual display ads on web sites (including pop-ups and pop-downs) and textual ads on search sites.[3] There is little doubt that on-line advertising has taken business away from traditional modes of advertising, such as newspapers, snail mail, and radio. What is less clear is whether the shift is price driven and whether traditional advertising channels constrain the pricing of Internet ads.

This paper provides an overview of the development of Internet advertising. In the process, we describe the nature of advertising competition as it currently exists online. We focus on the extent to which various types of online advertising compete with each other and with offline advertising. While our goal is not to reach a definitive opinion as to how relevant markets ought to be defined, we do suggest a number of core empirical questions whose answers will help to clarify questions surrounding market definition.[4]

The paper proceeds as follows. In Section II, we describe the birth and growth of the Internet and online advertising. Section III offers a broad overview of both online and offline advertising and the economic models that allow one to evaluate competition among advertisers. In Section IV, we focus on online advertising and distinguish the various types of online ads and the means by which those ads are marketed. Section V focuses on competitive issues. We evaluate the extent to which online and offline ads compete and we also ask whether various types of online ads are competitive with each other. In Section VI, we offer some brief concluding comments and suggestions for further research.

II. THE ORIGIN AND GROWTH OF ONLINE ADVERTISING

A. The Birth and Commercialization of the Internet

The intellectual and technical underpinnings of the Internet go at least as far back as the very early 1960s, when MIT's J.C.R. Licklider coauthored a trilogy of memos describing the "Galactic Network" concept[5] and Leonard Kleinrock, also of MIT, published the seminal paper on packet-switching theory.[6] These cornerstones led in 1972 to the first public demonstration of the ARPANET (Advanced Research Projects Agency Network)—the precursor of today's Internet—and to the introduction of electronic mail. By 1985, the …[7]

> Internet was already well established as a technology supporting a broad community of researchers and developers, and was beginning to be used by other communities for daily computer communications. Electronic mail was being used broadly across several communities, often with different systems, but interconnection between different mail

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[2] Lower-case-*i* "internet" originally referred to any network of networks. (Debra Littlejohn Shinder, *Computer Networking Essentials*, CISCO PRESS, 37 (2001).) Upper-case-*I* "Internet" refers to "the global information system that is logically linked together by a globally unique address space based on the Internet Protocol (IP)…." (Federal Networking Council, *FNC Resolution: Definition of "Internet,"* (October 24, 1995), *at* http://www.nitrd.gov/fnc/Internet_res.html). Usage has been moving in the direction of using lower-case-i internet to refer to the global network. (See examples at *Internet capitalization conventions, at* http://en.wikipedia.org/wiki/Internet_capitalization_conventions).

[3] The benefits of advertising can also be achieved when information about the business appears on the list of "organic results" displayed by the search engine.

[4] Market definition is a means to an end—to a competitive analysis of a merger or of a non-merger activity. As a result, a market definition exercise outside the merger context will sometimes deviate substantially from the exercise that would be undertaken if there were a merger.

[5] J.C.R. Licklider, *Man-Computer Symbiosis*, (HFE-1) IRE TRANSACTIONS ON HUMAN FACTORS IN ELECTRONICS 4-11 (March 1960) *at* http://groups.csail.mit.edu/medg/people/psz/Licklider.html; J.C.R. Licklider and Welden E. Clark, *On-line man-computer communication*, Proceedings of the May 1–3, 1962, Spring Joint Computer Conference, AFIPS JOINT COMPUTER CONFERENCES, *at* http://portal.acm.org/citation.cfm?id=1460847; J.C.R. Licklider and Robert W. Taylor, *The Computer as a Communication Device*, SCIENCE AND TECHNOLOGY 21-41 (April 1968), *at* http://www.utexas.edu/ogs/lectures/taylor/licklider-taylor.pdf.

[6] Leonard Kleinrock, *Information Flow in Large Communication Nets*, RLE QUARTERLY PROGRESS REPORT (July 1961).

[7] Barry M. Leiner, Vinton G. Cerf, David D. Clark, Robert E. Kahn, Leonard Kleinrock, Daniel C. Lynch, Jon Postel, Larry G. Roberts, Stephen Wolff, *A Brief History of the Internet* (3.32), (December 10, 2003) [hereafter "Leiner *et al*. (2003)"], *at* http://www.isoc.org/internet/history/brief.shtml.

> systems was demonstrating the utility of broad based electronic communications between people.

At this point in time the Internet was literally not open for business. The National Science Foundation (NSF) operated the Internet's national-scale "Backbone" and enforced an "Acceptable Use Policy" (AUP) which prohibited usage for purposes "not in support of Research and Education."[8] Not until 1993, when the NSF reinterpreted the AUP, was the Internet fully opened to commercial traffic.[9]

B. The Importance of the World Wide Web, the GUI and the Browser

The early-1990s Internet provided connections between sites, and individuals at various sites had information and resources that would be useful to others. But discovering and sharing that information was a daunting challenge. There was no easy or systematic way to uncover what information was available where or how to access it. Collections of information were balkanized, uncataloged and unindexed, and cloaked behind cryptic file names. Users maintained personal lists of what they had found, or learned of through word of mouth, in their imperfect views into the Internet.[10]

New information management systems such as Gopher and Wide Area Information Servers (WAIS) were created and were significant improvements—but fell short of what was needed.[11] It was Tim Berners-Lee's conception and development of the World Wide Web as a decentralized, scalable system of hypertext links that catalyzed the revolution that the Internet has become.[12]

Marc Andreessen and Eric Bina from the National Center for Supercomputing Applications (NCSA) at the University of Illinois released the Mosaic web browser in 1993—the first browser that allowed for the display of photographs and graphics positioned within a page of text. Andreessen cofounded Netscape in mid-1994, releasing what became the Mosaic Netscape (later, Netscape Navigator) browser for all major platforms on October 13, 1994.[13] Millions of users took advantage of Netscape's browser, which quickly grew to be the most popular browser in the market.

C. Directories and Search Engines Increased the Value of the Web

The development of the web and of browsers did not by itself solve an older problem: consumers could become aware of other sites on the Web only by word of mouth (*e.g.*, sharing "hot lists") or through recommendations from other sites (*e.g.*, Cool Site of the Day). WebCrawler, launched in 1994, was perhaps the first search-engine service that embodied the three fundamentals we now expect: it was crawler based (to discover new sites), indexed, and able to search the full text (not just titles or summaries) of sites.[14] There rapidly followed a proliferation of search engines, such as Lycos, Magellan, Excite, Infoseek, Inktomi, and AltaVista. Yahoo! took a different approach, using its "staff of experts" to categorize web sites into a hierarchical structure to build a directory around subject-based, demographic, and geographic content.

In 1996, Stanford graduate students Larry Page and Sergey Brin began a research project that ultimately became a patented innovation in search and the beginnings of Google.[15] Google remains the most-popular search site today. In September 2009, Americans conducted almost 14 millions searches. Almost 65% of these searches were conducted on Google's sites. Yahoo had the second most popular search engine,

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[8] Leiner *et al*. (2003).

[9] Worldwide Web Consortium (W3C), *A Little History of the World Wide Web*, *at* http://www.w3.org/History.html.

[10] J.R. Okin, THE INFORMATION REVOLUTION: THE NOT-FOR-DUMMIES GUIDE TO THE HISTORY, TECHNOLOGY, AND USE OF THE INTERNET (Ironbound Press, 2005).

[11] Neither Gopher nor WAIS used hypertext. WAIS connected only search engines together. Gopher's prospects were damaged when the University of Minnesota announced it would charge a license fee for Gopher to certain classes of users. [Tim Berners-Lee and Mark Fischetti, WEAVING THE WEB 72-74 (HarperCollins 1999) (hereafter "Berners-Lee (1999)"].)

[12] For the story of the development of the World Wide Web, see Berners-Lee (1999). To avoid the mistake made with Gopher, CERN pledged that the Web protocol and code would be available free of charge to all users and uses.

[13] The Netscape browser was "free but not free." It was free for students and educators and theoretically $39 for all others, though this was not enforced. *Internet Pioneers: Marc Andreesen, at* http://www.ibiblio.org/pioneers/andreesen.html.

[14] *WebCrawler Timeline at* http://www.thinkpink.com/bp/WebCrawler/History.html.

[15] John Battelle, THE SEARCH: HOW GOOGLE AND ITS RIVALS REWROTE THE RULES OF BUSINESS AND TRANSFORMED OUR CULTURE Chapter 4 (Penguin Books 2005).

processing almost 19 percent of all searches.[16] Microsoft's new Bing search engine claimed over 9 percent of searches, and its share has been increasing since its launch in May 2009.[17]

D. The History of Advertising on the Internet

There appears to be no consensus on precisely when advertising on the Internet began. Tim O'Reilly, founder of the web portal Global Network Navigator (GNN), claims that the first advertising appeared in 1993 on GNN and required "special dispensation from the National Science Foundation."[18] Others cite a banner ad sold to AT&T and displayed on the HotWired site in 1994.[19]

At first, online ads were sold exclusively on a cost-per-impression ("CPM") pricing model used by offline media, *i.e.,* the advertiser was charged proportionally to the number of times the ad was displayed on a web page. That changed in 1998, when the search engine GoTo.com was launched.[20] GoTo.com broke with cost-per-impression pricing, instead auctioning the top results of its search-result pages, with advertisers' sites appearing in descending order of their bids (on a pay-per-click basis).[21] GoTo used a real-time competitive-bidding process to allocate listing priorities. More specifically, GoTo's process was a "first-price auction" in that the winning bidder paid the amount of its bid for every click.[22] Edelman *et al* (2007) provide an illustration of how GoTo's auction mechanism was "far from perfect." They note that GoTo and its advertisers "quickly learned that the mechanism was unstable due to the fact that bids could be changed very frequently."[23]

Google launched its AdWords service in October 2000; the service placed ads on the search-results pages on google.com. The ads displayed were chosen based on the keywords that appeared in the user's search inquiry. Google aimed for low transaction costs: AdWords was described as "self-service," allowing sign-up, activation with a credit card, and ad design and implementation from the Google web site. These text ads were sold on a cost-per-impression basis, for 1.5¢, 1.2¢, and 1.0¢ per impression "for the top, middle, and bottom ad unit positions, respectively."[24]

Google updated its AdWords program in February 2002, introducing AdWords Select, a program that used cost-per-click pricing.[25] An advertisement's ranking was based on a combination of the advertiser's

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[16] comScore, *comScore Releases September 2009 U.S. Search Engine Rankings*, (October 14, 2009), *at* http://www.comscore.com/Press_Events/Press_Releases/2009/10/comScore_Releases_September_2009_U.S._Search_Engine_Rankings.

[17] eMarketer, *Analyzing the Bing Effect*, (September 29, 2009), *at* http://www.emarketer.com/Article.aspx?R=1007297.

[18] "The first internet advertising appeared in 1993, not 1996. I know, because I did it, under special dispensation from the National Science Foundation, on our pioneering web portal, GNN, or the Global Network Navigator. GNN was sold to AOL in 1995 and soon withered away there, but it was the first commercial, ad-supported web site, and launched the first web ads in late 1993." (Tim O'Reilly, comments on Paul Kedrosky, *Updated: The First Decade of Internet Advertising*, (March 7, 2007), *at* http://paul.kedrosky.com/archives/2007/03/07/the_first_decad.html.) See also *O'Reilly biography, at* http://oreilly.com/oreilly/tim_bio.csp: "1993. O'Reilly's Global Network Navigator site (GNN, which was sold to America Online in September 1995) was the first web portal and the first true commercial site on the World Wide Web." Wikipedia more specifically claims that the first Internet banner ad was sold by GNN to Heller Ehrman LLP. *Global Network Navigator, at* http://en.wikipedia.org/wiki/Global_Network_Navigator.

[19] Barbara K. Kaye and Norman Medoff. *Just a Click Away: Advertising on the Internet*, MASSACHUSETTS: ALLYN AND BACON (2004). (Cited by David S. Evans, *The Online Advertising Industry: Economics, Evolution, and Privacy*, (23:3) JOURNAL OF ECONOMIC PERSPECTIVES, 38 (Summer 2009).)

[20] GoTo renamed itself to Overture Services in 2001 and was acquired by Yahoo in 2003. Danny Sullivan, *GoTo Makes Overture To New Name*, SEARCH ENGINE WATCH (October 2, 2001), *at* http://searchenginewatch.com/2164231; Yahoo, *Yahoo! To Acquire Overture*, (July 14, 2003), *at* http://docs.yahoo.com/docs/pr/release1102.html.

[21] Jeff Pelline, *Pay-for-placement gets another shot*, CNET NEWS (February 19, 1998), *at* http://news.cnet.com/Pay-for-placement-gets-another-shot/2100-1023_3-208309.html; Danny Sullivan, *GoTo Going Strong*, SEARCH ENGINE WATCH (July 1, 1998), *at* http://searchenginewatch.com/2166331.

[22] An alternative is a "second-price auction"—related to the auctions run by Google and Yahoo today—in which the highest bidder wins the auction but, instead of paying its own bid, the winner pays the *second highest* bid.

[23] Benjamin Edelman, Michael Ostrovsky, and Michael Schwarz, *Internet Advertising and the Generalized Second-Price Auction: Selling Billions of Dollars Worth of Keywords*, (97:1) AMERICAN ECONOMIC REVIEW 246 (March 2007).

[24] Google, *Google Launches Self-Service Advertising Program* (October 23, 2000), *at* http://www.google.com/press/pressrel/pressrelease39.html. See also Google, *Google Milestones*, *at* http://www.google.com/intl/en/corporate/history.html.

[25] Google's "Premium ads," that appear on the top of the search-results listing continued to be sold on a cost-per-impression basis for several months. Subsequently, the AdWords Premium and Select programs were merged.

per-click bid as well as the ad's click-through rate.[26] By March 2003, Google had over 100,000 advertisers buying search ads through its AdWords program. Google was then serving 200 millions searches per day on all of its sites worldwide.[27]

In March 2003, Google broadened away from the search-results pages and began offering ads "to the rest of the web." Ultimately called "AdSense," Google's new program was contextually targeted (*i.e.,* it matched advertiser keywords to the "meaning of [the] web page" on which the ads would be displayed) and used the click-through rates of ads as a determinant of the prominence of placement that would be given to the ads. According to Google, "[u]sers see the most relevant advertising first and advertisers are rewarded with average click-through rates at least five times higher than the industry average for traditional banner ads."[28]

Google introduced "Site Targeting" in April 2005. The software was launched as a beta feature that enabled advertisers to aim their ads directly at particular web sites in the Google Network. Advertisers using these site-targeted ads can use animated images (that had not previously been allowed) in their advertisements in addition to text and static-image ad formats.[29]

In March 2009, Google began a beta test of a new ad-targeting system for its non-search, AdSense ads. Until that time, Google had chosen the ads it displayed on a web site owned by an AdSense partner on the basis of a match between the advertiser's selected keywords and the content of the web sites on which the ads were to appear. However, under this new, "interest-based advertising" method, Google takes into account additional information about the user's browsing history. According to Google, "[t]hese ads will associate categories of interest—say sports, gardening, cars, pets—with your browser, based on the types of sites you visit and the pages you view. We may then use those interest categories to show you more relevant text and display ads."[30]

Google introduced AdSense for Mobile in September 2007, which allows owners of web sites optimized for mobile devices to monetize those sites by allowing Google to display AdSense text ads on them.[31] Moving further in the mobile direction—and away from the web—in June 2009 Google released a beta version of AdSense for Mobile Applications that pays developers when ads are shown in iPhone and Android applications.[32]

III. THE ECONOMICS OF ADVERTISING

A. The Objectives of Advertising

Companies typically advertise to achieve one or more of several possible goals: to inform, persuade, or remind, or to build brand awareness or brand loyalty. Successful advertising can lead to increased sales and/or a reduction in the price elasticity of consumers' demands for the advertised product. Either can increase revenues and profits (if the incremental profits outweigh the incremental costs of advertising).[33]

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[26] If ads were prioritized solely on the basis of their bids, an advertiser could bid a high per-click amount on an ad that users were uninterested in clicking. This would result in low revenue for Google. Moreover, it would also be likely that users did not find the low click-through-rate ad relevant. By including click-through rate as a determinant of the ad's positioning, Google increases its revenue, while helping its users to see ads with high relevancy.

[27] Google, *Google Builds World's Largest Advertising and Search Monetization Program*, (March 4, 2003), *at* http://www.google.com/press/pressrel/advertising.html.

[28] Google, *Google Builds World's Largest Advertising and Search Monetization Program,* (March 4, 2003), *at* http://www.google.com/press/pressrel/advertising.html.

[29] Google, *Site Targeting*, (April 25, 2005), *at* http://www.google.com/press/annc/sitetargeting.html.

[30] Susan Wojcicki, *Making ads more interesting*, THE OFFICIAL GOOGLE BLOG, (March 11, 2009), *at* http://googleblog.blogspot.com/2009/03/making-ads-more-interesting.html.

[31] Alex Kenin, *Here comes mobile*, INSIDE ADSENSE, (September 17, 2007), *at* http://adsense.blogspot.com/2007/09/here-comes-mobile.html.

[32] Susan Wojcicki, *Announcing the AdSense for Mobile Applications beta*, THE OFFICIAL GOOGLE BLOG, (June 24, 2009), *at* http://googleblog.blogspot.com/2009/06/announcing-adsense-for-mobile.html.

[33] See Robert Pindyck and Daniel Rubinfeld, MICROECONOMICS § 11.6 (7th ed. Pearson 2009) for an introductory discussion of the strategies involved in making advertising decisions.

The sale of advertising to businesses and the display of advertisements to consumers take place in *a two-sided market* at the hub of which sits the content publisher (and any other intermediaries facilitating the sale and/or display of the advertising).[34,35] The publisher's function is to match consumer eyeballs with the marketing messages of businesses; the publisher profits when it is able to attract the consumer eyeballs at a cost less than the amount the businesses are willing to pay the publisher to display their ads to these consumers.

In many two-sided advertising scenarios, the profit-making side (the advertisers) must subsidize the consumer side, where the subsidy to the consumer is the provision of the non-advertising content—typically for free or at least below the average cost of producing and distributing the content—that attracts the consumers in the first place. The publisher pays for the creation and distribution of the content from the revenue it receives from the advertisers.[36]

B. Targeting of Advertisements

Effective and efficient targeting of ads, whether on- or off-line is important not only to advertisers, but also to those who have advertising opportunities to sell. In a world in which advertising spots are being effectively placed and sold, advertisers and those that place the ads will each profit from the effort. To determine the extent to which advertising is likely to be profitable, advertising must take into account the fact that consumers will vary in their receptiveness to any given advertiser's message. For a given number of ad exposures, therefore, the advertiser can expect to have better outcomes (*e.g.*, sales) the more closely those exposures are targeted to consumers that are receptive to the advertiser's message.

As a general rule, the cost of an advertisement can be expected to be a function of the exposure that the advertisement is likely to get. For offline ads, such as newspaper ads, the price to the advertiser is typically a function of the number of times the ad will run and the number of potential customers that are likely to be exposed to the ad. With online advertising, the same general principle applies, but the firm placing the ad has greater pricing flexibility, being able to charge for example according to the number of customers that either click on an ad or are otherwise exposed to the web page with the advertisement for a significant period of time.

In either instance, if the advertiser pays for *exposures*, for a given price per exposure the *advertiser* prefers targeting those exposures to consumers that are more likely to become customers. The result is that the better targeted the exposures, the greater the willingness to pay of the advertiser. However, for a given price per exposure, the seller of advertising is in the short run indifferent to the advertiser's results (because the seller gets paid for exposure not for results).

Because advertisers have higher willingness to pay for better-targeted ads, in the long run the seller of the ads will prefer being able to better target the ads it sells in order to increase the value to advertisers of the seller's inventory of advertising opportunities. With offline advertising, targeting might involve geographic scope in the case of newspapers, or time of day in the case of radio advertising.

With either offline or online advertising, if the advertiser pays for *results* (*e.g.*, on a per-click basis for online ads), it is the *seller* of advertising that prefers that the ads be well targeted to likely customers.[37] With online advertising, when paying per click, an advertiser may be indifferent between (a) a small number of exposures to a well-targeted group of consumers (*i.e.*, yielding a relatively high click-through

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[34] Simon P. Anderson and Jean J. Gabszewicz, *The media and advertising: a tale of two-sided markets*, HANDBOOK OF CULTURAL ECONOMICS (Victor Ginsburgh and David Throsby, eds. forthcoming).

[35] Other examples of two-sided markets include credit-card networks (matching consumers bearing the network's cards with merchants that accept the network's card) and shopping malls (that match consumers wishing to make a variety of purchases with a variety of merchants wishing to sell their wares). Jean-Charles Rochet and Jean Tirole, *Platform Competition in Two-Sided Markets,* (1:4) JOURNAL OF THE EUROPEAN ECONOMIC ASSOCIATION 990-1029 (June 2003).

[36] The subsidy is necessary in such settings because the advertisements are often insufficient draws for consumers' eyeballs (or the ads are seen by the consumers as a negative that must be endured as part of the deal to receive desirable content for free). Of course, this is not always the case. For example, with "want ads" consumers seek out advertisements precisely in order to obtain the included information. Indeed, there are instances in which advertisers are willing to pay to have their ads displayed *and* consumers would be willing to pay to see those ads.

[37] Here clicks are an imperfect proxy for purchases, which represent the ultimate objective of the advertiser. We are implicitly assuming that purchases derived from the ad are proportional to the number of clicks on the ad.

rate) or (b) a large number of exposures to a less-well targeted group of consumers (*i.e.*, with a relatively low click-through rate).[38] In this way, the advertiser that places an online advertisement is insured against the possibility of a relatively unresponsive group of individuals who receive exposure to the ad.

The seller of advertising, however, faces an opportunity cost for every impression sold to an advertiser. If ads sold to an advertiser deliver a relatively low rate of click-throughs, the seller would have preferred either (a) to have sold those impressions to an advertiser whose message would have produced a higher click-through rate or (b) to have delivered the advertisement to a different group of consumers—consumers that would have generated more click-throughs.

To sum up, whether the advertiser pays for exposure or for results, the seller is better off if it can deliver its ads to a well-targeted group of consumers. Well-targeted ads make advertisers better off if the advertisers pay for exposure; pay-per-click advertisers are at least as well off when ads are better targeted.[39]

Advertisers have the capacity to target consumers on many dimensions. A particular advertiser might be interested primarily in a demographic cross section of consumers, perhaps defined by a range of income, age, gender, or all three. A different advertiser might be strongly interested in consumers with a particular interest or hobby—with only a second-order interest in demographics. A third advertiser might find neither demographic nor interest/hobby targeting effective but would instead want to target consumers with a demonstrated current need for the advertiser's product or service (*i.e.*, the consumer is actively searching right now for that advertiser's product).

Advertisers whose products or services are of broad appeal can be expected to be less interested in targeting the group of consumers to whom they advertise. Advertisers whose products or services are of narrow appeal are more likely to value relatively highly the ability to target specific groups of consumers.

C. Choosing Media Outlets

For a given value of a sale, an advertiser whose product is of broad appeal will likely eschew media that could be highly targeted because such media would be more valuable to advertisers that value that targeting ability (and therefore the broad-appeal advertiser might essentially be outbid by the narrow-appeal advertiser for highly targeted advertising).

There are many different media available for advertising, and many particular vehicles within each class of advertising media.[40] In addition to deciding how much to spend on advertising in general, an advertiser must also decide how to allocate its expenditures among those media and among their vehicles.[41] The allocation decision is a complex one because advertising media vary along several dimensions that reflect differential abilities of ads to achieve the advertisers' desired objectives. For example, a glossy magazine's ability to reproduce high-quality color images, coupled with the "coffee table effect," might make it very well suited to brand building; whereas the magazine's long lead time, and its non-urgent consumption by their readers, could make this medium poorly suited for an advertiser needing a customer response in a

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[38] There may be reasons, likely second order in importance, as to why an advertiser paying on a per-click basis might strictly prefer its ads be shown to a better-targeted audience. For a given textual message in the ad, a click by a less specifically targeted consumer might be a weaker signal of the consumer's propensity to buy the advertised product than would a click by a more targeted consumer; thus a click by a better-targeted consumer would be more valuable. Some consumers may click on an ad out of curiosity but with no interest in purchasing. It is possible that a better-targeted group of consumers would produce a lower incidence of curiosity-driven clicking.

[39] An advertiser may need to broaden its net beyond highly targeted consumers in order to obtain more responses to its ad. For example, a retailer selling a seat back organizer for use on airplane flights bought search ads triggered by the query "airline seat back organizer" for a nickel per click. However, the retailer found that these ads produced few clicks because not enough consumers knew this product category existed. The retailer considered advertising in response to the more-popular search phrase "travel accessories" but found that the higher per-click price to do so, $1.50 at that time, was prohibitive. (Darren Dahl, *Real-Life Lessons in Using Google AdWords*, NEW YORK TIMES (October 14, 2009), http://www.nytimes.com/2009/10/15/business/smallbusiness/15adwords.html.)

[40] We are using the term "vehicle" more narrowly than the term "medium." For example, a medium might be magazines, but a vehicle might be a particular knitting magazine.

[41] Advertisers ultimately care about profits. The optimal advertising strategy will satisfy (a) the return on the chosen level of advertising expenditures is maximized by the choice of media and vehicles and (b) the level of advertising expenditures is chosen at the level that maximizes profit assuming that the choice of media and vehicles is optimal given that level of advertising expenditures.

short time window (*e.g.*, to advertise a short-duration promotion). Magazine ads do not offer that flexibility, since the advertiser must commit to a particular message far in advance.

Television is timely and can be attention getting and effective at generating interest. However, even the most basic television advertising is relatively costly and is not well suited to communicating lengthy technical information. Likewise, newspapers, radio, and outdoor advertising (*e.g.*, billboards) each has its own set of strengths and weaknesses that can be expected to differentially affect that medium's suitability to a particular advertiser's goals.

Because advertising media differ in the degree to which they can target customers, the set of consumers they can deliver to an advertiser differ as well. For example, a skywriting plane cannot target customers with any more precision than to those who are outside with an unobstructed view of the sky. Television and radio cannot geographically target customers more precisely than a given media market. A billboard might target only consumers within a neighborhood. An advertisement inside or on the exterior of a bus might target only consumers who reside or work along a particular thoroughfare.

Advertisers may on occasion choose one medium over all others. However, often an advertiser will find it beneficial to select multiple media; this allows the advertiser to target a broader group of consumers and to utilize their chosen advertising budget optimally.[42] We can expect to see substitution among advertising media as the costs and benefits of each of the media vary over time and as the advertising budget responds to the effectiveness of the advertising program (the more effective the program, the larger the advertising budget).

Furthermore, advertisers also choose within media. To illustrate, magazines are not monolithic. Rather, they differ widely in the audience they deliver. Indeed, magazines are often targeted at niche audiences. An advertiser would select the specific magazine or magazines that appropriately target the advertiser's potential customers.

The set of all television viewers in a Designated Market Area ("DMA") might be quite diverse (and therefore not targeted). The set of viewers for a particular station in a particular DMA might be similarly broad or relatively narrow (if it, for example, is a foreign-language station). A particular program on that station might have a relatively narrow audience and different programs on that station might have very different audiences, due perhaps both to the topic/content of the program as well as the time of day it airs. An advertiser could choose to run ads during a particular program whose audience best matches the profile of the advertiser's desired customers.

There are, however, limitations on how far the set of consumers receiving ads can be refined. For example, the advertiser could choose a particular television program during which to advertise, but typically cannot further select within that audience. Another advertiser could choose a particular niche magazine, a particular issue (*e.g.*, a particular season of the year) of that magazine, and even a particular section of the magazine in an attempt to further refine the audience for its ads. In other media, such as direct mail, an advertiser may be able to more precisely specify the characteristics of the audience it would like to reach.

Advertisers care about the return on their advertising dollars. If an advertiser is paying for exposure, the advertiser would estimate the expected return on its incremental advertising expenditure on a particular advertising vehicle by calculating:

(a) the number of exposures it expects to receive per dollar of incremental advertising expenditure,

(b) the number of incremental sales it expects to receive per exposure, and

(c) its profit, net of all appropriate variable costs, per sale.

[42] As we explained earlier, the optimal advertising budget and the optimal allocation of that budget across media and vehicles are co-determined rather than being separable decisions.

The product of (a) × (b) × (c) is the incremental profit the advertiser expects to receive per advertising dollar for this choice of vehicle.

Note that component (a) of this calculation, *i.e.*, the number of exposures per dollar, is just the inverse of the price of the advertising (expressed in dollars/exposure). Thus the return to a vehicle depends crucially on the price of advertising on that vehicle, as well as on the number of sales per exposure (which is likely to vary across vehicles).[43] If this calculation (of incremental profit per additional dollar of advertising) yields a value greater than one dollar, advertising on that vehicle is profitable. (If not, then the advertiser should not advertise on that vehicle.) Of course, the most pertinent questions are more demanding. First, which choice of vehicle yields the highest return? Second, what should the advertising budget be?[44]

For a given advertising budget, a somewhat simplified analysis would advise that the advertiser spend all of its advertising expenditures on the vehicle that yields the highest return. Assuming that each vehicle choice has a different return, this would imply that the advertiser would spend every advertising dollar on just one vehicle. This result need not hold, however, when we bring in additional considerations: it may indeed be optimal for an advertiser to employ multiple media and multiple vehicles within media in the same advertising campaign.

An advertiser may decide to purchase ads on multiple media and vehicles in the same campaign for several reasons. First, the advertiser might wish to increase its coverage so as to grow the brand equity of its products or to increase the value of its trademark. No single advertising medium will reach all consumers. Some individuals watch little or no television (or they TiVo through the commercials), while still being active money-spending consumers. Others listen to their iPods, but not to commercial radio. Some read traditional newspapers (*i.e.,* on newsprint) while others read newspapers only online or read no newspapers at all.

An advertiser that desired to have a high degree of penetration by its ads into a market would need to advertise through many different vehicles and media in order to reach a high percentage of the public through at least one of them. It is quite possible, therefore, that the return per dollar of expenditure on a single advertising medium may be large up to a point (*i.e.*, for sufficiently small advertising expenditures), but for sufficiently large expenditures in that medium, the return to additional expenditures may fall, even to the point of unprofitability.

Decreasing returns to advertising on a single medium can occur, in particular, when the level of advertising approaches saturation of that medium. Decreasing returns can also arise because ads may become less effective as the number of exposures ("frequency") increases, users may tire of a particular ad and stop noticing it ("ad blindness"), and so on. Furthermore, the return to advertising can decline even if the effectiveness of the advertising itself does not—if the profit per conversion declines. This might occur, for example, if the advertiser faces increasing marginal costs or capacity constraints.

Second, an advertiser might choose its "media mix" so that potential customers receive complementary messages. As discussed above, different media have different strengths and weaknesses. An advertiser may choose to employ multiple media in order to reach the same consumers with messages from multiple media. For example, an attention-getting poster with little or no hard information at a transit stop may

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[43] The incremental profit per sale is unlikely to vary by the advertising vehicle. However, there could be differences in the goods a particular audience buys; *e.g.*, the same airline ad could generate on different vehicles a different mix of business class and tourist class ticket sales.

[44] It is inappropriate to view the advertising budget as fixed; if a new media outlet or an improvement in the effective targeting within a particular media outlet increases the return on advertising, this should lead to an increase in the advertising budget. However, the decision-making process of buyers of advertising may not so closely approximately optimality. Thus, Silk, Klein, and Berndt (2002) interpreted the relatively weak own and cross-price elasticities between different media classes they found for the 1990s as being congruent with a media planning process that "is a sequential one wherein intermedia and intramedia decisions are separated. Intermedia choices are often effectively preempted by judgments about the fit between message strategy and alternative media exercised in the early stages of a campaign's development and prices are frequently a secondary consideration. If intermedia comparisons are undertaken at all, they are likely to be made informally on the basis of criteria of uncertain validity." (Alvin Silk, Lisa Klein, and Ernst Berndt, *Intermedia Substitutability and Market Demand by National Advertisers*, (20:4) REVIEW OF INDUSTRIAL ORGANIZATION 339 (2002).

complement a television, newspaper, or online ad with more details seen later.[45] Or an online ad can increase the effectiveness of a television ad.[46]

This discussion reveals a possibly erroneous implicit assumption in the traditional analysis of returns on advertising expenditure. The traditional analysis implicitly assumes that the incremental revenue flowing from an incremental dollar of advertising expenditure is independent of the level of expenditures on other advertising media. In this example, however, expenditures on one medium (the transit-stop poster) would increase the return on expenditures on the other medium. In defining advertising markets, it is essential to account for the prospect that two or more media may offer complementary benefits, whether or not they are economic substitutes.

IV. TYPES OF ONLINE ADVERTISING

A. Graphic Format

Online ads can vary substantially in their graphical format. The simplest ads are text ads, which are fully described by a string of words, the color and size of the characters, and the dimensions of the ad's bounding text box. These ads allow only the most basic interactivity: the viewer can click on the ad and be transported to the advertiser's web site or, more specifically, the ad's "landing page."

A standard "display ad" has more graphical interest. A display ad is typically one of a standard set of dimensions, with a photograph or other graphic, for example, a logo, and a text message. Like text ads, such display ads also typically allow interactivity through clicking. The graphical element of a display ad is often animated, typically using Adobe's Flash technology.[47]

Beyond standard display ads is a wide variety of more-complex advertisements, referred to as a class as "rich media" ads.[48] Rich-media ads typically allow for a greater range of interactivity than merely a click which causes the user to leave the original site. Instead, a rich-media ad can respond to "mouseovers," keyboard inputs, or other clicks that do not result in a click-through to another site. The "footprint" of the ad can be dynamic rather than fixed: the ad might expand, roll down or roll from the side, peel back, or float. Rich-media ads can also incorporate video.

B. Targeting

Online ads also vary in the dimensions on which they can be targeted to various types of customers. As a result, it is not generally appropriate to say that one type of Internet ad was more or less targeted than another. In reality, different types of online ads emphasize different consumer characteristics. The result is that the magnitude of the targeting of two different online ads need not be comparable.

The decision as to which individuals should be targeted for a particular ad involves an advertising intermediary (which might be a contractual representative of the ad's seller) determining the available current information about the user visiting the web site. If the intermediary has good information about the relevant interests of the web site's visitors, the intermediary can choose to display a particular advertiser's ad if and only if the current visitor matches the desired profile for that ad.

In order to delve into targeting in more detail, it is useful to distinguish between search ads and non-search ads. Search ads are ads that are displayed by a search engine next to the search results in response to the user having specified at least one of a set of keywords that the advertiser has identified. All other ads are characterized as "non-search ads."

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[45] The concept of the "marketing funnel" is relevant here: with a marketing funnel consumers are guided via various forms of advertising from the initial stages of product awareness and consideration to later stages such as purchase and loyalty.

[46] See, for example, Online Publishers Association, "Media Mix Study," March 2002, at p. 14. <http://www.online-publishers.org/media/152_W_opa_media_mix_study_mar02.pdf>

[47] In 2008, static-graphic display ads represented 39% of graphical ad-serving volume (measured by impressions), while simple Flash-animated ads accounted for 55%. "Rich media" ads, discussed next, accounted for the remaining 6% of graphical ad-serving volume. (AdRelevance, 2008. Cited in DoubleClick and Dynamic Logic, *The Brand Value of Rich Media and Video Ads*, 2 (June 2009), *at* http://www.doubleclick.com/insight/pdfs/The_Brand_Value_of_Rich_Media_and_Video_Ads.pdf.

[48] Shamim Samadi and Ari Paparo, *What's a rich media ad, anyway?*, THE OFFICIAL GOOGLE BLOG, (April 30, 2009), *at* http://googleblog.blogspot.com/2009/04/whats-rich-media-ad-anyway.html.

We consider non-search ads first. When a visitor views a web site's page, the intermediary knows at a minimum that the visitor chose to visit that site and that page. (Note that knowledge of the particular page also implies knowledge of the information on that page about the topic discussed.) The amount of information the advertising intermediary has about the visitor might be similar to the information that a magazine has about the individuals who read the magazine. Thus, there is an important sense in which a web site can be like a magazine, newspaper, or radio or television program: the individuals viewing content on a particular site have chosen to view that content. That choice is therefore likely to correlate with other characteristics an advertiser is interested in, such as age, gender, income, education, and interests.

In many cases, the intermediary will also have useful information about the visitor's geographic location—perhaps the city or metro area, which can often be inferred from the visitor's IP address. A visitor's city or metro area by itself will correlate to some degree with education and income, in addition to specifying the visitor's location.[49]

If a reader registers at a site, the seller of advertising (or its intermediary) may have additional information about that viewer based on the viewer's association with the site. If the visitor arrived at the web site from a search engine (*i.e.*, as a result of searching for one or more keywords on the search engine, which resulted in a search result for the web site, and then a click on the link for the web site), the web site will also know the search terms the visitor used at the search engine.[50]

A seller may know more than the simple fact of a visit to the current page: the seller may know the other pages that the visitor visited that day, or even on previous visits, or whether the user clicked on the advertiser's ad at some prior time. This is made possible through the use of "cookies," which can be created on a visitor's computer by a web site. Unless it is deleted or expires, a cookie allows the web site to recognize a visitor as using the same computer as that used by the earlier visitor.[51]

Knowing the set of pages the visitor has viewed can give the seller of advertising additional information about the visitor's interests. These interests may be hobbies, political attitudes, products the visitor is considering purchasing, or places the visitor may consider as travel destinations for business or vacation. Armed with this information, the seller of advertising can display ads chosen because the advertiser for those ads is interested in advertising to consumers with characteristics being signaled by the visitor's browsing history, location, and other data.[52]

A seller of search ads will have similar kinds of information as the seller of non-search ads, for several reasons. First, the search-ad seller will have information about the user's geographic location in the same circumstances as would the seller of non-search ads (*i.e.*, if a user's IP address can be accurately inverted to determine location, a search-ad seller and a non-search ad seller could both do so). Second, if the user is a registered user at a family of sites that includes the search engine, the search-ad seller may have information about the user that might be relevant to the choice of ad to serve, just as in the case of a non–search ad seller. Third, and presumably most significantly, the seller obviously knows the keywords the user specified to arrive at the search-results page. (Recall that in some cases the seller of non-search ads also knows recently specified keywords.)

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[49] To see the information, geographical and otherwise, that can be inferred your IP address, browse to http://www.ip2location.com/.

[50] The search terms are encoded into the URL of the request to the search engine. This URL is passed along to the destination web site as the referrer field of the header of the HTTP request to the destination site.

[51] When consumers register at a web site, the site typically has access to information about the consumer's browsing habits on that site. That information can be expected to be at least as reliable as that provided by cookies in the absence of registration. For example, a user registered at nytimes.com is recognized as that person whether the person visits the site from her home computer, her iPhone, her work computer, or the computer at a Business Center in the hotel where she stays on a business trip. In contrast, cookies would view an unregistered individual's visits from two different computers as if she were two different individuals. Conversely, two different unregistered individuals browsing under the same user account on the same computer would erroneously be interpreted as being the same person.

[52] According to Yahoo!, its behavioral-targeting capability "goes beyond the more common rules-based segmentation or clustering of users by sites visited" to include as well searches and ad interactions. Yahoo!'s "sophisticated modeling technology" then predicts where a user sits in the "Awareness-Consideration-Purchase funnel" in order to deliver the appropriate advertising message. Yahoo! Advertising, *Behavioral Targeting*, *at* http://advertising.yahoo.com/adsolution#product=Behavioral.

Depending on the particular search engine and on the particular user, the seller of search ads may have additional information, as in the case of the seller of non-search ads. With respect to search ads, search engines can be expected to know other search terms that the user has specified in at least the recent past. As we have discussed, Google is beta testing targeting ads based on sites and pages visited over some time period, rather than only the current page being visited. It might also be possible for Google to merge these sources of information about a user to provide a fuller perspective on the user's interest than could be gleaned from contemporaneous search behavior alone.

C. Basis of Payment

In most offline advertising, it is very difficult to track a consumer's reaction to an advertisement.[53] As a result, advertisers pay for radio, television, newspaper, magazine, and billboard advertisements on the basis of consumers' anticipated exposure to the ad rather than their actions as a result of seeing the ads.[54]

In contrast, the inherent interactivity allowed by the hypertext nature of web pages creates the possibility of measuring, and basing the advertiser's payment upon, responses by the visitor; specifically, whether the visitor clicks on the displayed ad. As a result, there is the option in online advertising for advertisers to "pay per click" rather than solely paid by impression.[55] Indeed, search ads are typically sold on a per-click basis, whereas banner display ads are often sold on a per-impression basis.

However, display ads need not be sold on a purely per-impression basis. Display ads are typically clickable (so that clicking on the ad takes you to the advertiser's web site) and some display ads aggressively encourage such interaction. It is quite possible for display ad charges to be made on a hybrid basis, paying both per impression and per click. Indeed, Google's AdWords customers can purchase ads to be displayed on the web sites of any of Google's AdSense partners, and these display ads are charged either on a per-click or per-impression basis.[56]

V. ADVERTISING COMPETITION

A. Defining Relevant Markets

The choice of a relevant market is typically the first decision that is made in the antitrust review of a proposed acquisition or in the litigation of antitrust claims. It is important to note that this question cannot be meaningfully asked in the abstract. Defining a relevant market should be done with respect to a particular acquisition or with respect to specific challenged conduct.

For example, in a case of alleged monopolization of a local market for newspaper advertising, it will be important to understand the degree to which online advertising competes with, and disciplines the prices of, those local newspapers' advertising. Similarly, in a case alleging monopoly power in some Internet-based advertising market, it would be important to understand the degree to which offline advertising competes with, and discipline the prices of, online advertising.

The answers to these two questions need not be the same. It is quite possible that that online advertising disciplines the exercise of market power by sellers of offline advertising in one context, but that in another context offline advertising would not discipline the exercise of market power by sellers of online advertising. Of course, the converse could be true in other situations.[57] Whatever the context in which the relevant market question is asked, however, the answer requires an understanding of the nature and extent of the competition between different forms of advertising.

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[53] The effectiveness of some offline advertising can be measured. For example, a manufacturer can monitor how many of its coupons are redeemed. A merchant can advertise "mention this ad to receive your discount."

[54] A department-store merchant, John Wanamaker (1838–1922), is credited with having said: "Half the money I spend on advertising is wasted; the trouble is I don't know which half."

[55] Note that paying per impression for an Internet ad may carry less uncertainty than paying per impression off line. If an advertiser pays for a display ad in a newspaper, the advertiser pays based on the newspaper's circulation and anticipated newsstand sales. However, the advertiser will not know on a given day how many of those subscribers or newsstand purchasers actually open their papers to the page on which the advertiser's ad is located. When a page view is served on the Internet, however, it is highly likely that the consumer explicitly requested it in order to read it.

[56] See Google, *Website Advertising*, *at* http://www.google.com/advertisers/online/website.html.

[57] In other words, for the purposes of market definition, the relation "competes with" need not be reflexive.

We will discuss the specifics of market definition in the sections that follow. We note that the U.S. DOJ/FTC Horizontal Merger Guidelines provides a useful framework for the analysis of relevant markets.[58] The Guidelines begin with a demand-side analysis, asking whether a monopolist of a hypothesized product market could profitably raise prices a small but significant amount above the "competitive level" for a significant period of time. If the answer is yes (and the conjectured market is the smallest such market for which the answer is yes), the hypothesized market is a relevant market; if the answer is no, the market is expanded in its breadth of products and the exercise continues. Supply side questions relating to entry and competitive responses such as repositioning are treated primarily as informing questions of market power rather than market definition.

It is not always possible in practice to undertake a complete Guidelines analysis of this type for all types of advertising. Nevertheless, the framework poses the right question when mergers and acquisitions are involved. In the non-merger context, the applicability of the Guidelines is less clear. There are at least two reasons for this. First, if an alleged anticompetitive practice involves a firm with substantial market power, current prices may not be competitive.[59] Second, the smallest relevant market may not be the market of interest if the practice at least involves a broader set of competitive products or services.

B. Competition between Offline and Online Advertising

Online and offline advertising serve the same broad advertising goals. Advertisers are typically trying to inform, persuade, remind, or motivate consumers by delivering information, rhetoric, and/or imagery to those consumers. This is true whether the advertiser chooses to advertise offline, online, or both. Online advertising is capable of accomplishing these goals just as is offline advertising—keeping in mind that every medium and vehicle has its own peculiar set of strengths and weaknesses.

1. Does Online Advertising Competitively Constrain Offline Advertising?

If one had looked at competition for offline ads a decade ago or perhaps even five years ago, online advertising would not have provided a significant competitive threat. Indeed, before the rise of the Internet, anyone but a hermit was reachable by offline advertising and unreachable by the not-yet-born medium of online advertising.

However, as the Internet developed and consumers started spending time online, the audience for online ads developed. Ultimately, the important question with respect to whether online advertising disciplines the pricing of offline ads is whether advertisers would be willing to shift sufficient advertising expenditures from offline to online in response to a hypothetical across-the-board increase in the prices of offline ads to render such price increases unprofitable.

The answer to this "critical loss" question is informed but not answered by information about the growth of Internet advertising. There is no doubt that in the past five years the growth of the Internet has made online advertising more of a competitor to offline advertising. Yet, it remains the case now and for at least several or more years that online advertising represents and will represent only a small part of total advertising spend. Aggregated into broad categories, the largest part of total US advertising spend (37.2%) in 2008 went to print.[60] The next largest part (30.3%) went to TV advertising.[61] In 2008, online advertising accounted for only 10.6% of all US advertising spend.[62]

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[58] U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, (April 8, 1997), http://www.usdoj.gov/atr/public/guidelines/hmg.htm.

[59] See discussions of the associated "cellophane fallacy" in, for example, Jonathan Baker, *Market Definition: An Analytical Overview*, (74:1) ANTITRUST LAW JOURNAL, 162-165 (2007) and Lawrence J. White, *Market Power and Market Definition in Monopolization Cases: A Paradigm is Missing*, ISSUES IN COMPETITION LAW AND POLICY (Wayne D. Collins, ed., 2008), http://www.usdoj.gov/atr/public/hearings/single_firm/docs/222104.pdf.

[60] Here, the print category contains newspapers, custom publishing, consumer magazines, and B2B magazines, but not Yellow Pages.

[61] Here TV consists of local and national spot TV, cable network TV, broadcast network TV, local and regional cable TV, and broadcast syndication TV.

[62] eMarketer, *Online Ad Spending Slows but Grabs Market Share*, (September 21, 2009), *at* http://www.emarketer.com/Article.aspx?R=1007283. The data cited are from the Jack Myers Media Business Report, "Advertising & Marketing Investment Forecast 1998–2012."

The same source forecasts the shares of total advertising spend of the various types of advertising through 2012. The rate of increase of online advertising's share of total US advertising spend is forecast to slow dramatically. The rate of growth of online advertising's share from 2007–2008 was almost 18%.[63] By 2012, in contrast, the annual rate of change of online advertising's share is forecast to be less than 2%, reaching 13.6% by 2012.

Whether online advertising is sufficiently competitive to discipline offline ad pricing generally is an open question, whose answer will almost certainly change over time.

A look at various types of offline advertising yields a number of interesting questions. It is plausible to think that online advertising, coupled with other forms of offline advertising, might discipline the exercise of market power in some particular form of offline advertising that is alleged to be a relevant market.

Looking more specifically at one particular subset of offline advertising—newspaper advertising—provides a timely and pertinent example.[64] The decline of newspapers has been prominently in the news. Newspaper Death Watch keeps a running tally of US metropolitan dailies that have closed since Death Watch began publication in March 2007. That list includes papers such as the Baltimore Examiner, the Rocky Mountain News, and the Tucson Citizen. There are also newspapers that have ceased offline publication or moved to a hybrid online/print model. Examples of these include the Seattle Post-Intelligencer, the Detroit News/Free Press, and the Christian Science Monitor.[65]

From 2007 to 2012, newspapers' share of total advertising spend is forecast to drop 6.6 percentage points, from 18.7% to 12.1%—a 35% decrease in share.[66] This decline in newspaper ads has been precipitous, and does not characterize offline advertising generally. Over the period 2007–2012, newspapers' share of total US ad spend is forecast to decline more quickly than online advertising's share of spend is forecast to increase, showing that non–newspaper offline advertising is also increasing its share of total advertising spend.[67]

It is not clear, however, that merely observing a shift in advertising expenditures from newspaper advertising to online advertising is sufficient to support the argument that online advertising competes with and disciplines the prices of newspaper advertising. The confounding fact is that, not only is newspaper advertising declining, but newspaper *readership* is declining as well. For example, daily print newspaper circulation is down 13.5% from 2001 to 2008. (Sunday circulation is down 17.3% over the same period.)[68] Weekday circulation averaged over 395 daily newspapers was recently reported to be down 7.1% relative to a year prior.[69]

Thus the eyes that advertisers need are themselves moving from newspapers to online content. It would be natural for advertisers to follow the flow of eyeballs with their own advertising expenditures. The question of whether online advertising disciplines newspaper advertising prices is more narrow and, to our knowledge, not resolved: would an increase in newspaper-advertising prices above the competitive level be

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[63] To avoid any misunderstanding, this means that the *share* as a percent changed by almost 18%, not by 18 percentage *points*. In 2007, online advertising represented 9.0% of total US advertising spend; in 2008, it represented 10.6% of total US advertising spend. Thus from 2007 to 2008, online advertising's share of total US advertising spend increased by almost 18% (10.6%–9.0%)/9.0%.

[64] When we refer to newspaper advertising or readership, we are referring to advertising in, or readership of, the traditional newsprint editions of newspapers; we are excluding newspapers' web editions.

[65] Newspaper Death Watch, *at* http://www.newspaperdeathwatch.com/.

[66] eMarketer, *Online Ad Spending Slows but Grabs Market Share*, (September 21, 2009), *at* http://www.emarketer.com/Article.aspx?R=1007283. The data cited are from the Jack Myers Media Business Report, "Advertising & Marketing Investment Forecast 1998–2012."

[67] Over that same period that newspaper advertising is forecast to lose 6.6 percentage points, the share of online advertising is expected to increase by only 4.6 percentage points, from 9.0% to 13.6%. Therefore other offline advertising categories are gaining at newspapers' expense.

[68] Pew Project for Excellence in Journalism, *The State of the News Media 2009*, citing data from the Newspaper Association of America through 2007 and adjusting it for further losses in 2008, *at* http://www.stateofthemedia.org/2009/narrative_newspapers_audience.php.

[69] Tim Arango, *Fall in Newspaper Sales Accelerates to Pass 7%*, THE NEW YORK TIMES, (April 27, 2009), *at* http://www.nytimes.com/2009/04/28/business/media/28paper.html. The figures reflect the six-month period ending March 31, 2009, compared to the same period a year prior.

unprofitable as a result of advertisers' consequently more-rapid defection to online advertising vehicles? Given consumers' shift from newspapers to online, some part of the corresponding shift of advertising cannot be attributed to price competition.

Notwithstanding the above uncertainties, courts have recognized the existence of competition that the online world poses the offline one. For example, in a hotly contested case involving the acquisition of the San Francisco Chronicle newspaper by the Hearst Corporation, the Court commented in dicta that, from newspaper readers' perspectives, there are many other information sources, including online sources that compete.[70] In a more recent case involving the Gazette Newspapers, the alleged newspaper advertising market was deemed to be too narrow because it improperly excluded other forms of print and non-print media advertising.[71]

2. Does Offline Advertising Competitively Constrain Online Advertising?

A separate question is the extent to which offline advertising continues to be a competitive constraint on most or all forms of online advertising. It is quite possible that offline ads will constrain some, but not all, online ads. For some advertisers and for some consumers, offline advertising may not be a competitive option. To make sense of this issue, we need to evaluate the specific objectives of the advertisers (*e.g.*, their target audience) and we need to estimate the number of "marginal advertisers" who would find it profitable to increase their reliance on offline ads if the price of online advertising were to increase (the "actual loss"). Depending on the margins generated by the advertising, only a relatively small number of advertisers may need to be willing to switch (the "critical loss") to make a price increase unprofitable. If the actual number who would switch is greater than the critical-loss number, it would be appropriate to put offline and online advertising of this particular type in the same relevant market.[72]

We believe that both online and offline advertising are likely to remain robust into the foreseeable future, suggesting that the two will compete quite generally. Offline advertising is diverse in the very many different media it involves, everything from direct mail, to television ads, to promotional swag, to illuminated dirigibles. There is no reason that—as a class—offline advertising will become unimportant in the foreseeable future notwithstanding the increased (and increasing) levels of online activity. For that reason online and offline advertising can be expected to compete actively for advertisers' dollars for the foreseeable future.[73]

The decline of the American newspaper discussed previously raises the question of whether this particular offline advertising medium will continue to discipline online advertising. Although offline advertising—largely because it subsumes television and radio advertising—shows no sign of going away, the same cannot be said for the American newspaper. As traditional hardcopy newspaper readers shift to reading news on the Web (whether from online versions of traditional newspapers or from online-only sources such as the Huffington Post) and as newspapers continue to close, it would be reasonable to

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[70] *Reilly v. Hearst Corp.*, 107 F. Supp. 2d 1192 (N.D. Cal. 2000). Note, however, that the plaintiff was not alleging an advertising market but rather a market for the provision of "daily newspaper news, features and opinion." Thus Judge Walker's dicta did not speak directly to whether online *advertising* competes with newspaper *advertising*.

[71] *Berlyn Inc. v. Gazette Newspapers*, 73 Fed. Appx. 576, 582-83 (4th Cir. 2003). The Court also concluded that the alleged relevant market was too broad because it combined legal advertising (*i.e.*, notices) and commercial advertising in the same market.

[72] However, these advertisers might still be protected by the competition between offline and online advertising if sellers of advertising could not identify and price discriminate against these advertisers' ads aimed at these discrete offline-only customers.

[73] In its investigation of Google's acquisition of DoubleClick the European Commission declined to define a broad market for all advertising media in which the "internet would be just one of the several media channels—among which TV, newspapers, etc.—that can be chosen by advertisers wanting to promote their goods or services." The EC so found "primarily because the market investigation revealed that offline and online advertising are perceived as separate markets by the majority of respondents." Additionally, the EC cites that "online advertising is used for specific purposes," can be better targeted, "has a unique reporting system" to better measure ad effectiveness, and has unique advantages of both the pay-per-impression and pay-per-click payment mechanisms. (Commission of the European Communities Decision of 11/03/2008 declaring a concentration to be compatible with the common market and the functioning of the EEA Agreement. Case No COMP/M.4731 – Google/DoubleClick, Regulation (EC) No 139/2004 Merger Procedure, Article 8(1). C(2008) 927 final. Public Version. at ¶¶ 44–46) We note that these arguments by the EC suffer the same basic problem as the arguments of the FTC we discuss below: Merely identifying differences in characteristics between two products does not constitute a valid argument for placing them in separate relevant product markets. The EC leaves the central question unanswered: whether offline and online advertising are sufficiently close economic substitutes that each disciplines the prices of the other.

conclude that offline newspaper advertising will decline in importance as a possible competitive constraint on online advertising.

This possible effect on competition is worth mentioning—even though there are many other sources of offline advertising—because offline newspaper advertising may be the closest substitute for online advertising of all the offline advertising media. Offline newspaper advertising would appear to be very similar to text and non-video graphic display ads at web sites (particularly so at online newspaper web sites). Furthermore, offline newspaper advertising may be best suited among offline advertising media to deliver the same type of information to the same type of consumers as does online advertising.

C. Competition between Online Search and Online Non-Search Advertising

In this section, we assume for purposes of discussion that some or all forms of online advertising are not disciplined by offline advertising. In other words, we assume that the relevant antitrust market or markets are no broader than all online advertising. We now ask whether online search and non-search advertising are sufficiently separable so as to be placed in separate markets, or whether they are sufficiently competitive with each other so as to be seen as representing one market.

We have discussed both similarities and distinctions between search and non-search ads. The characteristics-based analysis we have described thus far is by itself not clearly determinative with respect to market definition.

The best evidence might come from historical studies of past quasi-experiments in which there was variation in the relative price of search versus non-search advertising. Because of the rapid evolution of the online advertising industry, this exercise would be a difficult one. Indeed, we are aware of little direct econometric evidence pertaining to this important question.

One contribution is an econometric study by Avi Goldfarb and Catherine Tucker of a "natural experiment" that arises from variation across states in regulations limiting whether lawyers can contact clients by mail.[74] Forbidding marketing *via* mail can be interpreted as an artificial barrier to any competition that otherwise exists between offline (*e.g.*, snail mail) and online advertising. Interestingly, the authors found that in areas where lawyers could not market by mail prices were on average 7 percent more for relevant search-ad keywords such as "tax lawyer." The authors' interpretation of these results is that competition from offline advertising disciplined the price of online advertising, reducing the price of online advertising by 7 percent; they say their results suggest "that online context- advertising competes in a broader advertising market that includes offline marketing communications channels."[75]

However, the scenario these authors study is extreme and therefore of doubtful relevance to determining the boundaries of a relevant market. Market definition is typically conceptualized by considering a modest price increase (*e.g.*, 5 percent) and whether there is substitution driven by the change in relative price. A prohibition of snail-mail marketing is, in contrast, equivalent to an infinite (or at least a very large) price increase. That such a large price increase might cause substitution from offline to online says little or nothing about whether a small price increase typically used in relevant-market analysis would lead to substitution.

It is relevant to review the analysis of the Federal Trade Commission ("FTC") in its evaluation of the relatively recent Google-DoubleClick acquisition. In closing its investigation of the acquisition, the FTC found that there could not be a relevant product market that contained both search and non-search advertising.[76] According to the FTC:

> [T]he evidence in this case shows that the advertising space sold by search engines is not a substitute for space sold directly or indirectly by publishers or vice versa. Or, to

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[74] Avi Goldfarb and Catherine Tucker, *Search Engine Advertising: Pricing Ads to Context*, NET INSTITUTE WORKING PAPER #07-23 (September 2007), (hereafter "Goldfarb and Tucker (2007)"), http://ssrn.com/abstract=1021451.

[75] Goldfarb and Tucker (2007) at p. 18.

[76] Federal Trade Commission, *Statement of Federal Trade Commission Concerning Google/DoubleClick*, (FTC File No. 071-0170) 3 and 7 (December 20, 2007), (hereafter "FTC (2007)"), http://www.ftc.gov/os/caselist/0710170/071220statement.pdf.

> put it in terms of merger analysis, the evidence shows that the sale of search advertising does not operate as a significant constraint on the prices or quality of other online advertising sold directly or indirectly by publishers or vice versa.

A review of the factual basis and reasoning behind the FTC's finding will be instructive.

1. The FTC claims that search engine marketing is not for branding

According to the FTC,

> Businesses purchase search ads for different purposes than businesses purchase non-search ads and "one type does not significantly constrain the pricing of another" … "For instance, advertisers primarily purchase search advertising space to implement direct response ad campaigns, while directly sold ad inventory is generally purchased for brand advertising campaigns."[77]

The FTC repeats a common stereotype of the search *vs.* non-search advertising distinction: that non-search display advertising is for branding and that search advertising is not. However, market research challenges this claim. The most-recent State of Search Engine Marketing survey, conducted by SEMPO (the nonprofit Search Engine Marketing Professional Organization) gathered detailed responses on many topics from 890 search engine advertisers and search engine marketing (SEM) agencies.[78]

Among other questions, the survey asked "What is your company using search engine marketing to accomplish?" There were six possible responses, plus "other;" multiple responses were allowed.[79] In contrast to the FTC's position, a supermajority (63%) of all respondents stated that they used search engine marketing "[t]o increase/enhance brand awareness." Among respondents with greater than 500 staff, 70% responded they were using search engine marketing in order to increase/enhance brand awareness. Moreover, this brand-building response *received the most mentions out of all seven possible answers*.[80]

This result is consistent with an IAB/Nielsen study demonstrating "that sponsored text advertising in the search environment works for an array of branding objectives." Sponsored text ads had the biggest impact on the "unaided brand awareness" metric, where the strength of the effect was related to the prominence of the position of the text ad.[81] Of course, this dynamic works in the other direction as well—not only are search ads increasingly being used for branding purposes, but advertisers are also becoming aware of the ability to use display for direct-response campaigns.

2. The FTC claims that the uniqueness of search engines' characteristics put search in a separate relevant market from non-search advertising

The FTC points to characteristics of search ads:

> "[S]earch engines provide a *unique opportunity* for advertisers to reach potential customers" and "users visiting a content page do not declare their interests in the *same way* they do when they type in a keyword on a search engine."[82]

We have pointed out previously that the intermediary that decides what ads to serve to which user on which web page has different information available to it when serving a search ad than when serving a non-search ad. As we pointed out, search and non-search ads are differently targeted. However, it cannot be said that one is more or less targeted than the other.

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77 FTC (2007) at p. 7.

78 SEMPO, Executive Summary, *The State of Search Engine Marketing 2008*, (February 2009), (hereafter "SEMPO (2009)"), http://www.sempo.org/learning_center/research/2008_execsummary.pdf.

79 The other allowed responses were "[t]o sell products, services or content directly online," "[t]o generate leads that we ourselves will close," "[t]o drive traffic to our ad-supported web site," "[t]o generate leads for a dealer [or] distributor network," and "[t]o provide informational/educational content only."

80 SEMPO (2009), at slide 8.

81 IAB and Nielsen//NetRatings, *IAB Issues New Research From Nielsen//Netratings On Branding Value Of Sponsored Text Advertising*, (July 15, 2004), *at* http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/4742.

82 FTC (2007) at p. 3. [emphasis added]

Based on the publicly available evidence cited by the FTC, their conclusion that search and non-search do not compete is not compelling. In its essence, the FTC is suggesting that the two classes of ads do not compete because they have different characteristics and in particular are differentially targeted. However, the ultimate market definition question depends on whether the two products are sufficiently close economic substitutes so that each constrains the pricing of the other. This central question remains unanswered.

3. *The FTC claims that pay-per-click and pay-per-impression advertisements cannot be in the same relevant market*

The FTC argues that contextually targeted ads sold through intermediaries are not substitutes for directly purchased display ads. The FTC reaches this conclusion not only because the ads are sold through two different channels, but also seemingly because the FTC believes ads sold on a pay-per-click basis cannot discipline the prices of ads sold on a pay-per-impression basis, and *vice versa*.[83]

This argument is not compelling, for two reasons. First, advertisers *can* weigh the tradeoffs between an ad sold on a pay-per-click basis and an ad sold on a pay-per-impression basis In each case, the advertiser can estimate the cost of running the ad and decide which of the two ads has the better prospect.[84,85]

Second, the FTC does assert that contextual and non-contextual ads—*when sold by an intermediary*—*are* in a single relevant market:[86]

> However, the evidence shows that the prices and quality of contextual ads are constrained by other forms of display ads sold by ad intermediaries (and vice versa). We therefore determined that contextually targeted ads do not constitute a separate market; rather they are part of a broad market that includes all ads sold by intermediaries.

We have no reason to disagree with the FTC's conclusion with respect to intermediary-sold ads. We simply note that contextual ads are pay-per-click and non-contextual display ads are not. We agree with the point that is implicit in the FTC's analysis: the fact that the two types of ads currently rely on different pricing mechanisms is in itself not supportive of the conclusion that search and directly sold display ads are not in the same market.[87]

As is likely the case with offline advertising, there will almost certainly be some convergence over time between the types of search and non-search ads. The result will be that some of the differences commonly associated with search *vs.* non-search ads will become inessential distinctions, if they are not so already.

For example, search ads today usually involve text and not graphics, whereas many non-search display ads involve graphics. Graphically rich display ads, even video, could be displayed above, below, and next to search results. The choice to use only text-only ads on search-results pages might be motivated by the desire of search-engine companies to keep the response speed of their search engine as high as possible. As broadband speeds increase, and as high-speed broadband Internet access achieves greater penetration, richer content will likely begin to be displayed as search ads. Yahoo! has tested and initiated a limited

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[83] FTC (2007) at p. 5.

[84] A cost per click can be translated into a cost per impression, and *vice versa*, by first estimating the ad's click-through rate. Indeed, advertisers make such a calculation when buying AdSense ads. We understand that Google also sells search ads using cost-per-impression pricing in China, since the complementary factors for pay-per-action advertising (credit cards and package delivery) are not as mature as in some other countries.

[85] We note, however, that the need for a trade off here only arises if there is some kind of advertising budget. Otherwise the change in the return of ad opportunity *A* should not change how much one spends on ad opportunity *B* (as long as the price of ad opportunity *B* doesn't change and the conversion rate of ad opportunity *B* is not affected by changes in the level of spend on ad opportunity *A*. We previously discussed factors that could give rise to the existence of a budget, such as increasing costs or capacity constraints.

[86] FTC (2007) at pp. 5–6.

[87] It also noteworthy that pay-per-click and pay-per-impression ads compete in the same ad auctions in Google's AdSense program.

rollout of its Rich Ads in Search program "that lets advertisers add video, images and custom search boxes to their search ads."[88]

Today, many non-search ads are text-only like search ads. For example, ads served on Google's AdSense networks are not search ads—they appear on traditional web sites—but they are primarily text-only. The salient distinction seems to be that search ads are targeted on the basis of the consumer's most-recent search request.

It is important to ask about the competitive significance of the difference between search and non-search ads. Search ads and non-search ads are both targeted, but with different emphases as we explained above. While the targeting dimensions are different, there are many similarities between the information about visitors held by search-ad sellers and the information held by non-search ad sellers. Both have equal access to geographic information about the visitor. Both may have additional information about a visitor if the visitor is registered at the site. Both may have information about some of the recent browsing behavior of the visitor, depending on the breadth of the site visited and on the site's policies.

Sellers of search ads have information about the search query the consumer is conducting literally right that moment. Sellers of non-search ads have information about the content of the web page the visitor chose to view and is viewing that moment. Further, sellers of non-search ads would know the search keywords the visitor used in the case that the visitor arrived at the site *via* a search at a search engine. Therefore sellers of both types of ad inventory have some information about the visitor, the visitor's browsing, and about products, activities, or topics the visitor may be interested in as signaled by her browsing and search activities.

Although there is some overlap between these two sets of types of information, there are also distinctions. These distinctions are in different dimensions—non-search ad sellers may have more information about what a visitor's general interests over time are, whereas a search-ad seller may know more about what is on the visitor's mind at a moment when the visitor is searching for something in a focused way—as opposed to simply being a more precise estimate of some customer characteristic. Therefore it cannot be sensibly said that either search or non-search ads are "more targeted" than the other. They are *differently targeted*.

It may be that—for a particular advertiser—one type of information about visitors better corresponds to the advertiser understanding of her own customers. That customer *might* then *in some sense* prefer either non-search over search ads or search ads over non-search ads. The qualifier *might…in some sense* is necessary because one cannot meaningfully discuss an advertiser's preferences between two types of advertising without also specifying the prices of the advertising types.

Note that two types of ads can compete even though they are differently targeted. Even if it were the case that one type (search or non-search) was unambiguously better targeted than the other, this would not imply that the two types of advertising are not close substitutes or do not compete. In fact, in such a case search and non-search can strongly price compete because the price of non-search ads can adjust to make the advertiser indifferent between the two types of ads.

To see this, we first compare (a) a pay-per-click search ad *vs.* (b) a pay-per-click non-search ad, where we assume that the non-search ad is targeted toward the advertiser's customers only half as well as is the search ad (*i.e.*, it takes twice as many impressions of the non-search ad to generate a single click as the number of impressions of the search ad required to generate a single click). As we have discussed earlier, because the advertiser is paying per click, the advertiser is no worse off buying the non-search ad as buying the search ad. It is the seller of the advertising space (*e.g.*, the publisher of the content web site) who is unable to monetize its inventory as well as the search site is, because—according to our assumption—the search site is able to better target its ads. Thus, pay-per-click non-search ads can strongly price compete with search ads.

[88] Jeff Sweat, *Your Ads, Richer*, YAHOO! SEARCH MARKETING BLOG, (February 18, 2009), *at* http://www.ysmblog.com/blog/2009/02/18/your-ads-richer/.

Now we compare (a) a pay-per-click search ad *vs.* (b) a pay-per-impression non-search ad. Recall the earlier point that advertisers ultimately care about the return on their advertising expenditure. The rate-of-return calculation is different depending on whether the advertiser pays per click or per impression. The return for advertisers that pay per impression (such as many non–search ad advertisers) is a function of

(a) the price per impression, call this p_I;

(b) the impression-conversion rate (the rate at which visitors viewing the ad actually purchase the product), call this K_I; and

(c) the incremental profit from an incremental sale, call this π.

However, the return for advertisers that pay per click (such as search advertisers) is a function of

(a) the price per click, call this p_C;

(b) the click-conversion rate (the rate at which visitors clicking on the ad actually purchase the product), call this K_C; and

(c) the incremental profit from an incremental sale; this is the same π in the per-impression case.

Suppose the advertiser spends B on the non-search pay-per-impression ad and B on the search pay-per-click ad. The resulting gross profit for the advertiser will be, for the non-search ad:[89]

and for the search ad:

The gross profits from spending B dollars on the non-search ad will equal the gross profits from spending B dollars on the search ad if:

i.e., if the ratio of price per impression to price per click is the same as the ratio of the conversion rate per impression to the conversion rate per click. For example, if the number of sales per impression of the non-search ad were one-tenth of the number of sales per click of the search ad, then the per-impression price for the non-search ad that would make the advertiser indifferent between the non-search ad and the search ad would be one-tenth of the per-click price for the search ad.

At its most fundamental, an advertiser buys sales. The advertiser only cares about how much she pays for each sale. She does not at the end of the day care whether she paid for the sales on a per-click or a per-impression basis or whether it required many impressions or only a few. If the non-search ad is less well targeted than the search ad, the implication is that the advertiser requires a larger number of impressions of the non-search ad to achieve the same sales as with the search ad. The advertiser can achieve the same level

[89] The first factor (B/p_I) is the number of impressions that B dollars can purchase. The second factor is the number of sales that result from each impression. The product of the first two factors is the number of sales that result from spending B dollars on the non-search ad. Multiplying by π yields the gross profit from spending B dollars on the non-search ad.

of sales using the non-search ad and at the same cost as long as the non-search ad's price adjusts to compensate for its lower specificity of targeting.[90,91]

It has been suggested that the fact that the prices of search ads are set by auction removes any competitive concern. Google co-founder Larry Page, in the context of explaining why advertisers would benefit from a proposed Google-Yahoo advertising partnership, said:[92]

> AdWords is an auction. We're not setting prices. Auctions are determined by supply and demand.

Similarly, the Economist has asserted that "[o]n antitrust, the price that Google charges its advertisers is set by auction, so its monopolistic clout is limited."[93]

There is no doubt that the auction process does add an important competitive element to the advertising business. However, auctions are not a cure-all for concerns about exercise of market power. In general, auctions determine a price that clears supply and demand. For a given demand, the lower the supply the greater will be that market-clearing price. Auctions move any concern about the exercise of market power from a concern about the direct setting of prices to a concern about a restriction of output that could have the effect of raising prices.

Suppose it was the case that search advertising is not effectively disciplined by non-search advertising.[94] Would the auction mechanism itself prevent a hypothetical monopolist of search advertising from raising search-ad prices above competitive levels? First, such a hypothetical monopolist would have some discretion over the total quantity of search-ad inventory offered for sale. By, for example, reducing the number of search-results pages on which it sold ads or by reducing the number of ads per page, the hypothetical monopolist could raise the prices set by the auctions.[95] Furthermore, the hypothetical monopolist could set minimum bids, which could also have the effect of raising auction prices generally.[96,97]

In an auction for a particular search term, the winning bidder pays a price related to the bid of the next-highest bidder rather than to the winner's own bid. Thus within a search term the auction cannot fully price discriminate by charging an advertiser more as a result of that advertiser having a higher value for the ad. However, the partitioning of search-ad placements into hundreds or thousands of keyword groupings, followed by the separate auctions and separate resulting prices for these keyword groupings, creates the

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[90] The judge in *KinderStart v. Google* rejected plaintiff's claimed search-ad market, saying that "there is no logical basis for distinguishing the Search Ad Market from the larger market for Internet advertising. Because a website may choose to advertise via search-based advertising or by posting advertisements independently of any search, search-based advertising is reasonably interchangeable with other forms of Internet advertising. The Search Ad Market thus is too narrow to constitute a relevant market." (*KinderStart.com LLC v. Google, Inc*., No. C 06-2057 JF (RS), March 16, 2007. Not reported. 2007 WL 831806 (N.D.Cal.))

[91] Before a seller of non-search advertising would be willing to adjust the per-click price of its inventory to compensate for any targeting deficit relative to search ads, the advertising seller would have to take into account the opportunity cost of selling its inventory on a per-click basis: the revenue it would forego from the per-impression sale of the ads displaced.

[92] Stephen Shankland, *Google addresses antitrust issue on Yahoo ad deal*, CNET NEWS (May 8, 2008), http://news.cnet.com/8301-10784_3-9939473-7.html.

[93] *Who's afraid of Google*, THE ECONOMIST (August 30, 2007).

[94] Our review has not found compelling evidence that search and non-search advertising do not compete; moreover, we have offered affirmative arguments suggesting that they in fact do.

[95] Benjamin Edelman, *Google-Yahoo Ad Deal is Bad for Online Advertising*, HARVARD BUSINESS SCHOOL WORKING KNOWLEDGE, (August 12, 2008), http://hbswk.hbs.edu/item/5995.html.

[96] Benjamin Edelman and Michael Schwartz, *Optimal Auction Design in a Multi-unit Environment: The Case of Sponsored Search Auctions*, mimeo (2006). Edelman and Schwarz (2006) show that minimum bids also affect the bids of higher-ranked advertisers (*i.e.*, advertisers whose bids absent the minimum would exceed that minimum). However, a search-ad seller also faces a constraint on the magnitude of the reserve price it sets, if an increase in the reserve price would dissuade potential bidders from participating. Jeremy Bulow and Paul Klemperer (1996) show that the expected revenue from an auction with $N + 1$ bidders and no reserve is at least as great as the revenue from the same auction with N bidders and the revenue-maximizing reserve price. Jeremy Bulow and Paul Klemperer, *Auctions versus Negotiations*, (86:1) AMERICAN ECONOMIC REVIEW 180-194 (1996). (See also Paul Milgrom, *Putting Auction Theory to Work*, CAMBRIDGE UNIVERSITY PRESS § 4.4.2 (2004).

[97] Note, however, that the existence of a minimum bid can increase social welfare, notwithstanding an increase in revenue to the search engine. Susan Athey and Glenn Ellison, *Position Auctions with Consumer Search* § 4 (May 2008).

opportunity for keyword-specific search-ad prices to reflect differences in valuation between advertisers seeking particular search terms and advertisers seeking different search terms.[98]

We note that some researchers have found that better targeting ads increases consumer welfare.[99] More fundamentally, the type of differential pricing such keyword-based partitioning allows is almost certainly vital to the viability of the online-advertising industry and thus is procompetitive. As in many or most Internet industries, the delivery of online advertising is associated with extremely low marginal costs but substantial fixed and sunk costs. Although in many contexts sunk costs are treated as essentially irrelevant—because by definition they have already been sunk—sunk costs are not irrelevant here or in many industries characterized by rapid innovation. In rapidly innovating industries costs are not sunk once but rather are *repeatedly sunk*. Thus, if innovation is to continue, there must be an expectation that sunk costs, as well as fixed and marginal costs, will be recovered. Baumol and Swanson argue that, even under highly competitive conditions, firms in industries with this type of cost structure "will be *forced* to adopt discriminatory pricing whenever that is feasible."[100]

For many advertisers, free "organic search results" are a close substitute for paid search ads. The higher in the search-results listing a link to the advertiser's product appears, the more likely a searcher will find that link. When this occurs, the advertiser does not need to pay for a sponsored position on the search-results page.

VI. CONCLUDING REMARKS

Internet advertising has grown very rapidly over the past decade as consumers have shifted their attention online. That growth will undoubtedly continue for at least another decade, although the rate of growth will slow. At the same time, it appears likely that there will be continuing convergence between search and non-search ads. In terms of market definition, we have posed a series of important questions and we have suggested some possible answers. In the end, however, much more work needs to be done before we can determine those answers with confidence.

There is little doubt that offline advertising has been in decline. Moreover, it is plausible to expect that the pricing of online advertising is partially responsible for that decline. To the extent that offline advertising has faced substantial competition from online advertising, there may no longer be separate markets for offline advertising for media such as newspapers and radio. We are less confident that offline advertising constrains the price of online advertising; the answer may well vary depending on the particular goals of the advertisers and the media that offer the closest competition.

Within the sphere of online advertising, the issue is whether search and non-search advertising are sufficiently competitive so as to properly be placed in the same relevant market. The relevant question is: Would enough search advertisers shift advertising volume from search to non-search advertisements to defeat the profitability of an across-the-board price increase for search ads? We argue that, because advertisers ultimately are purchasing sales, many types of advertising with varied characteristics can nevertheless compete with each other on price. Further analysis and empirical study are needed before we have a definitive answer to this question. That study would hopefully assist us in understanding the extent to which there is overlap between businesses that buy search ads and those that buy non-search ads. Overlap itself does not necessarily imply substitutability, but it should nevertheless provide some insight into the key question regarding switching. Specifically, it would also tell us whether non-search ad

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[98] Goldfarb and Tucker (2007), discussed above, also reported their analysis of a different natural experiment that arises from state-to-state variation in "ambulance-chaser" regulations, which in some states limit attorneys' contingency fees. Goldfarb and Tucker examined advertising prices paid by lawyers for 174 Google search terms in 195 different locations. They found that lawyers in areas where contingency fees were limited (and thus the value of a referral is presumably lower) paid approximately 17% less per click than lawyers in areas where contingency fees were not limited by regulation.

[99] Esther Gal-Or and Mordechai Gal-Or, *Customized Advertising via a Common Media Distributor*, (24:2) MARKETING SCIENCE 241–253 (2005). Yongmin Chen and Chuan He, *Paid Placement: Advertising and Search on the Internet*, NET INSTITUTE WORKING PAPER #06-02, (September 2006), http://www.netinst.org/Chen-He.pdf. Asim Ansari and Carl Mela. *E-Customization*, (40:2) JOURNAL OF MARKETING RESEARCH 131-145 (2003).

[100] William J. Baumol and Daniel G. Swanson, *The New Economy and Ubiquitous Competitive Price Discrimination: Identifying Defensible Criteria of Market Power*, (70:661) ANTITRUST LAW JOURNAL (2003). (emphasis in original)

inventory would be switched from pay-per-impression to pay-per-click in order to serve search advertisers who need pay-per-click ad in response to an increase in search-ad prices.

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