ONLINE ADVERTISING AND ANTITRUST: NETWORK EFFECTS, SWITCHING COSTS, AND DATA AS AN ESSENTIAL FACILITY

BY CATHERINE TUCKER[1]

1 Catherine Tucker is the Sloan Distinguished Professor of Management Science at MIT Sloan School of Management, Cambridge, MA, and Research Associate at the NBER. This paper was created in preparation for CPI Antitrust Chronicles. Please see http://mitmgmtfaculty.mit.edu/cetucker/disclosure/ for a disclosure statement.

CPI ANTITRUST CHRONICLE
APRIL 2019

I. INTRODUCTION

One of the most rapid shifts in the digital economy has been a shift in the regulatory approach of many governments, from a focus on protecting consumers from false claims in advertising to considering digital advertising in the context of antitrust discussions and policy.[2]

Given the fact that online advertising companies are in the "crosshairs" of antitrust authorities, it is important to examine where their market power (if any) originates. Critics suggest that a combination of network effects, switching costs, and access to large amounts of data would give economics-based explanations for the rise of digital advertising platforms, and that the combination of these factors means that such markets will not "self-correct."[3] In this essay, I evaluate the extent to which such claims hold up from an economics perspective.

II. NETWORK EFFECTS IN ONLINE ADVERTISING MARKETS

Network effects occur when the value of a product depends on others that are using the product. Network effects can be same-sided; that is, there is a performance benefit for users as more of the same type of users use the network, such as is the case for a social media platform. Network effects can also be cross-sided where the presence of one group of users (such as viewers of content on YouTube) benefits another group of users (such as people who produce content on YouTube).

Network effects are a potential source of market power in online advertising, because they imply that larger firms may have larger network effects and therefore have increasingly attractive services. This could reinforce incumbency and make it difficult for new firms to challenge them.

Same-sided network effects are unlikely to be that important in online advertising markets. Typically, consumers of content do not benefit from the presence of other consumers of content. In the few forums where there are same-sided network effects, such as social media websites, my research suggests that these type of network effects are quite local. This means that they depend only on the user's smaller friend-group and do not depend on the user base of the entire

2 "Europe's antitrust cop, Margrethe Vestager, has Facebook and Google in her crosshairs," https://www.washingtonpost.com/world/europe/europes-antitrust-cop-margrethe-vestager-has-facebook-and-google-in-her-crosshairs/2018/05/10/519eb1a0-47cd-11e8-8082-105a446d19b8_story.html.

3 See Maurice E. Stucke, "Here Are All the Reasons It's a Bad Idea to Let a Few Tech Companies Monopolize Our Data," Harvard Business Review, https://hbr.org/2018/03/here-are-all-the-reasons-its-a-bad-idea-to-let-a-few-tech-companies-monopolize-our-data.

platform.[4]

Cross-sided network effects occur largely when advertisers benefit from the presence of large clusters of eyeballs on the other side of the platform. However, one of the most striking characteristics of the development of digital advertising has been to actually undermine such network effects in the provision of advertising. To understand this, it is useful to revisit an older marketing phenomenon called the "relevance-reach" tradeoff. The relevance-reach tradeoff suggested that, as an advertiser, it was possible to achieve relevance with consumers in advertising or reach, but not both. The underlying idea was that with television advertising an advertiser could achieve reach, but there would be many viewers of the ad for whom the product would not be relevant. On the other hand, with an ad in a specialized periodical such as "Crochet Today,"[5] you could reach viewers for whom your product would be relevant, but you couldn't reach many of them.

The relevance-reach tradeoff is, of course, relevant to network effects. If an advertiser was prioritizing reach then this would suggest the advertiser would be attracted to online platforms with large user bases, which is suggestive of a cross-sided network effect. Indeed, this might explain why in the early days of the internet, popular websites such as *Yahoo!* were so successful at attracting advertisers, as they could offer large audiences in a manner that other websites could not.

Since the heyday of *Yahoo!*, however, a whole new host of consumer tracking and collation technologies have evolved to mean that websites with large audiences such as *Yahoo!* no longer have an advantage. The way these tracking technologies work is that an advertising network collates information from many different publishers (websites) about people who might be interested in a topic from their browsing behavior. It is then possible using cookies to track these consumers as they browse different websites, and show ads to them across the internet. It is no longer necessary to focus an ad campaign on a single website. Furthermore, these technologies mean it is possible to achieve relevance, even while achieving reach, due to the use of targeting technologies to identify the right audience from users' browsing behavior.

Because these so-called targeted ads no longer require potential consumers to visit a specific website, and instead can be shown on any website, advertisers have gained the ability to achieve reach across the web, without sacrificing relevance. As a result, the services of these data brokers and advertising platforms mean there is no longer a relationship between the viewership of any one website and its attractiveness to advertisers.

Recently, it has been suggested that there might be "data-based" network effects in online advertising, which appear to be similar to what economists refer to as "economies of scope or scale."[6] The basic idea is that as a firm, an online advertising platform could improve its ad performance if it has access to data on what types of ads perform well and could attract more advertisers as a result. This is similar to the idea that a train line could improve its performance if it had access to data on when consumers chose to take trips, and that if the train line improved its performance, it could then attract more consumers. This latter example suggests that such data-based economies of scope or scale are certainly not a phenomenon which would be unique to online advertising, or even to digital markets. The key question, though, is whether this is self-reinforcing as a process and could therefore give rise to a sustainable source of competitive advantage to larger firms. To answer this, it is necessary to understand whether there are increasing returns to data, such that as a firm gets more data it improves its performance proportionally more. Most studies suggest there are, at best, concave returns to data — that is, initially data can indeed provide performance advantages, but these performance advantages quickly decline as the firm obtains more data.[7]

4 Catherine Tucker, (2017), Network Stability, Network Externalities, and Technology Adoption, in (ed.) Entrepreneurship, Innovation, and Platforms (Advances in Strategic Management, Volume 37) Emerald Publishing Limited, pp.151 – 175.

5 https://www.librarything.com/series/Crochet+Today+Magazine.

6 Grunes, Allen & Maurice Stucke, Big data and competition policy, Oxford University Press, 2016.

7 See for example, Schaefer, Maximilian, Geza Sapi & Szabolcs Lorincz, "The effect of big data on recommendation quality: The example of internet search," (2018).

III. SWITCHING COSTS IN ONLINE ADVERTISING MARKETS

Switching costs occur when it is costly or difficult for users of a service to switch to a cheaper alternative. Switching costs can reinforce incumbency by making it more expensive or difficult for new entrants to attract consumers away from existing providers.

In platform markets, such as online advertising, the key question is whether switching costs make it likely that advertisers will not use multiple advertising platforms or will not switch to another advertising platform should it potentially offer higher return on investment. In general, in digital markets, we observe users of platforms incurring switching costs when they would face costs of leaving behind their data (or trying to convert it into a new format). Therefore, often the question becomes whether or not advertiser data that is already integrated into the online advertising platform is itself valuable enough that the advertiser is reluctant to leave. In general, unlike in other markets, there is little value to historic data on advertising performance, simply because advertising tends to be a short-lived and tactical part of firm strategy. This is in contrast to something like health records, where there is large value to patients or a hospital having access to historic data.

Reflecting this fluidity, many technologies, known as cross-channel attribution technologies, have evolved precisely to facilitate advertisers switching between platforms. These platforms provide dashboards which allow advertiser to measure exactly how spending on one particular venue for reaching eyeballs affects conversions and profits. Recently, the advent of digital television and radio and expanded tracking facilities have enabled such services to expand into offline advertising too. Other services also offer the potential for real-time optimization, where the software automatically adjusts ad campaigns to focus on the advertising venue that is delivering the highest return on investment.[8]

As well as data, another potential source of switching costs in digital markets is standards. If an advertiser has invested in a particular standard format for an ad, then there is the risk that it would be difficult to port that creative design to another advertising platform that used a different format. However, online advertising has been characterized by increasing standardization of formats, led by institutions such as the IAB, which mitigate this concern somewhat.[9]

IV. BIG DATA AS AN ESSENTIAL (FACILITY) INPUT INTO ONLINE ADVERTISING MARKETS

Data has revolutionized online advertising by allowing platforms to "target" consumers who are likely to respond well to an ad with the right ad at the right time, and then measure the effectiveness of the ad. Digital data has been credited with transforming the online advertising industry, so a natural question is whether a hoard of digital consumer data could itself become an essential facility in such industries.

Standard economic models of vertical competition suggest three main criteria for evaluating whether data is an essential facility in online advertising markets. First, is it a valuable input in the production process? Second, are there other means by which rivals can gain access to the input? Finally, can a firm actually control who has access to it? Though this is an economist's perspective, it echoes the analysis of Abrahamson in the context of litigation, who suggests that for data to be an essential facility, the following should hold: (1) The monopolist must control and deny access to the data; (2) competition must fail without access to the data; (3) the plaintiff must lack means to duplicate the data; (4) the monopolist – in principle – must be able to share the data; and (5) the essential facility plaintiff must demonstrate the monopolist's power in the market.[10]

A. Is Data Valuable?

Unsurprisingly, the answer to the question of whether data is valuable for the targeting of online advertising is that it depends. Perhaps more surprising, though, is the answer that most of the time, the data that users create when browsing the internet is not that valuable.

8 https://www.adition.com/en/product-solutions/attribution-automation/.

9 Goldfarb, Avi & Catherine E. Tucker, "Standardization and the effectiveness of online advertising," Management Science 61.11 (2014): 2707-2719.

10 Abrahamson, Zachary, "Essential Data," Yale Law Journal 124 (2014): 867.

Let us take the example of a valuable piece of data, such as evidence that a business person is thinking about chartering a jet. This is valuable because such leads are profitable, but also rare in the sense that not many people can afford to charter a jet, and even then, they only do so occasionally, and there tends to be only a very small window to get charter jet company alternatives before them.

On the other hand, most data that is created online is done so in the pursuit of activities which are inhospitable to advertising. For example, if I am watching movies online, that data is not particularly valuable as it doesn't inform advertisers about any products I am likely to buy in the near term. Furthermore, while I am watching the movie, I am likely to feel unkindly towards any ad that intrudes on my experience.

In the analysis of the value of data in online advertising, perhaps the best general approach is to begin with the baseline assumption that most online advertising is not effective because it is simply ignored by consumers. In my own research I have documented that, even using reasonably low thresholds of effectiveness, over nine out of ten ad campaigns accomplish nothing.[11] As a result, the right data can greatly improve the performance of advertising, but only because of the baseline assumption that online advertising is rather ineffective.

B. Are There Alternative Sources of Data in Advertising Markets?

The key to examining alternatives to consumer data that large advertising platforms have access to is to understand what job that online data does. To understand this, it is useful to think about two potential ways that online advertising affects consumer behavior. The first way it may affect consumer behavior is to activate awareness among consumers. This may be awareness of a brand, or a new type of product that solves a problem a consumer has. The second way advertising may affect consumer behavior among consumer who are already aware of their needs, is to inform them about various alternative suppliers for meeting those needs.

Marketing professionals sometimes distinguish between "outbound advertising," or ads that try and raise awareness of needs, and "inbound advertising," which tries to provide useful information when consumers are seeking sources or vendors to supply products or services to fulfill these needs.

For inbound ads, there are usually many potential sources of data regarding a consumer's intent. Indeed, an entire industry has arisen that sells segments to advertisers – for example the segment "auto intenders" uses clues from a consumer's browsing behavior to infer that they may be seeking a new car.[12] These data management platforms allow advertisers to purchase data from a variety of data brokers who collate information from browsing behavior and even offline spending. Economists have found that often, though inbound advertising looks very valuable to advertisers, actually the ads weren't needed, as people would have bought anyway if they had already identified a specific supplier.[13]

For outbound ads, there is slightly more controversy about what data is useful. Indeed, there are significant proponents of the idea that marketers should not target ads using digital data, but instead should purposely avoid using data to isolate out audiences and try and reach everyone.[14] In general, though, there are many ways of trying to establish whether someone might be a good target for an ad trying to raise awareness of a need. For example, I might be unaware of the usefulness of a slow cooker. An advertiser might use many pieces of data to identify whether I would be a good target for an ad: Do I visit cooking websites? Do I visit parenting websites? Do I live in an area where people tend to have hectic schedules?

It is also useful to think of instances where perhaps there are no alternative sources of data. For example, suppose that your house's water pipes sprung a leak and you used a search engine, or a single website such as "Angie's List," in order to quickly find a plumber. In that instance, perhaps only one web property would be aware of your need for a plumber and be able to take advantage of the

11 Goldfarb, Avi & Catherine Tucker, "Online display advertising: Targeting and obtrusiveness," Marketing Science 30.3 (2011): 389-404.

12 For example, Audience 360 sells access to "to 91,767 Australians in the market for Toyota Corolla vehicles in the last 30 days, along with more than 200,000 Australians intending to travel to the US in the last 30 days, and 197,479 Australians looking to buy a new home over the same time period." https://www.cmo.com.au/article/574667/how-carsales-improving-audience-targeting-data-management-platform/.

13 Blake, Thomas, Chris Nosko, and Steven Tadelis. "Consumer heterogeneity and paid search effectiveness: A large - scale field experiment." Econometrica 83.1 (2015): 155-174.

14 https://www.cmo.com.au/article/618692/dr-sharp-digital-ad-targeting-has-been-oversold/.

related advertising opportunities.[15] What is crucial here is that it is the limited interaction with the digital environment which leads to the lack of alternative sources of data. If you were looking for a plumber to do more general work (say for a bathroom remodel) without the same sense of urgency, then you would leave a broader digital footprint — for example browsing review sites to try and assess plumber quality, or browsing websites describing different types of showers and bathtubs. The key thing when approaching competition is to articulate the instances where the natural breadth of a digital consumer footprint is likely not to exist. In these cases, there are less likely to be alternative sources of data, and there are more likely to be areas of concern.

C. Can a Firm Control Who has Access to Data?

In general, the presence of multiple digital footprints limits control over a piece of data that reveals consumer intent. This is because they are generating public information in the process. For example, Twitter cannot restrict access to data on retweets so as to prevent rivals or consumers from accessing these data since, by their nature, they are public. However, there are some forms of digital data which are not necessarily public — such as whether I visited a shopping site and abandoned my cart — that is valuable information that will not necessarily be known to any other firm.

Given that the question of control over access is context-specific, I instead highlight a potential risk in such markets which may lead to entrenched control over consumer data by large digital advertising platforms. In earlier research, I suggested that privacy regulation may help reinforce incumbency if consumers are less likely to consent to the use of their data by a new startup if they have to "opt-in."[16] Since that paper was written, we have seen large increases in privacy regulation in the form of GDPR. One incremental concern in the online advertising space in particular is that privacy regulation will prevent the sharing of data between different firms and players. This sharing of data (such as the information that someone visited a charter jet blog) is essential for promoting competition, and any costs that are implied by privacy regulation which reducing sharing could have consequences for effective competition in this sector.

V. FINAL THOUGHTS

In general, the debate about market power in online advertising tends to have a remarkable lack of precision. Commentators talks about network effects without specifying for whom they are envisaging that the network effects apply or why. Commentators talk about how "sticky" online platforms are without being clear about whether they mean they are sticky for advertisers or users. And commentators generally take as given the principle that data is the lifeblood of online advertising, without distinguishing what kind of data they mean, how broadly available it is, or whether such data guarantees the ad's success. However, such precision is necessary in order to have a meaningful discussion about sustainable sources of competitive advantage in online advertising markets.

15 I thank an economist at the Australian Competition Commission for providing this example.

16 Campbell, James, Avi Goldfarb & Catherine Tucker, "Privacy regulation and market structure," Journal of Economics & Management Strategy 24.1 (2015): 47-73.

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