



MULTISIDED PLATFORMS, DYNAMIC COMPETITION AND THE ASSESSMENT OF MARKET POWER FOR INTERNET-BASED FIRMS



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I. Introduction and Summary

Many online businesses operate multi-sided platforms that help different types of participants get together and enter into value-increasing exchanges. Facebook, for example, makes it possible for friends, businesses, advertisers and developers to interact with each other. This business model has ancient roots going back at least as far as the village matchmaker. Many traditional businesses, such as newspapers and shopping malls, use this model. New technologies, particularly mobile and the cloud, however, have turbocharged the multi-sided platform business model. Online platform businesses are forming at a rapid clip and disrupting not only traditional industries but relatively new ones as well.²

Online multi-sided platforms pose a challenge for competition policy analysis. Some have become large national or global enterprises quickly. Competition authorities are, quite properly, vigilant about making sure that these successful firms adhere to sound competition-law principles. In making economically reliable assessments, however, competition authorities, as well as courts, should account for three features of these online platforms that set them apart from many other businesses in evaluating the market power held by these platforms.

First, the demands by the different groups of participants served by multi-sided platforms are interdependent. As a simple mathematical matter, that interdependency renders standard formulas wrong, at least without significant modifications.³ In particular, a price increase, or quality decrease, to one group of participants reduces the demand not only by that group but also by the other groups who then have fewer participants with which to interact. That does not mean that an online platform could not have market power, only that the analysis needs to consider these interdependencies and the resulting feedback effects.

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² See David S. Evans and Richard Schmalensee, *Matchmakers: The New Economics of Multisided Platforms* (Boston, MA: Harvard Business School Press, 2016) Available at [Matchmakers](#).

³ See David S. Evans, "The Consensus among Economists on Multisided Platforms and Its Implications for Excluding Evidence That Ignores It," *Competition Policy International*, April 13, 2013. Available at <http://ssrn.com/abstract=2249817> or <http://dx.doi.org/10.2139/ssrn.2249817>





Second, many online businesses make the platform “free” to one group of participants, or even subsidize those participants, and earn profits from the other groups of participants who they do charge.⁴ Although the basic concepts of competition policy analysis apply to free prices, many of the traditional tools used for competition policy analysis, such as the SSNIP test, do not work, without significant modification, as a straightforward mathematical matter. Most importantly, the existence of a group of customers who are served for free highlights the importance of considering the other interdependent sides in assessing market power. The platform is ordinarily making participation “free” for a group because that group is very important for attracting paid participants. Anything that deters “free” users from participating—such as a decrease in quality—also reduces the incentives for the paid users from participating as well.

Third, online platforms often engage in constant incremental innovation as they seek to obtain advantages over rivals to attract participants on multiple sides and are subject to episodic, but increasingly frequent, disruptive innovation in which new, or seemingly different, firms attract their customers away. This dynamic competition is particularly important for “attention” platforms for which competition is designed to attract the attention of users, which is then resold to marketers, including advertisers, who want to persuade those users to buy things. An attention seeker is under constant threat that someone will come up with an entirely clever new way to grab people’s attention. For competition policy analysis, this means that market power analysis needs to consider the constraints imposed by dynamic competition and in new products and services that may appear very different than the firm under investigation.

Courts and competition authorities have come to recognize these points as they have had the chance to analyze online platforms and absorb the teachings of the new economic literature on multi-sided platforms. Although it did not involve online businesses, the European Court of Justice recognized that the analysis of competitive effects, and therefore implicitly the exercise of market power, needed to consider the linkages between the separate sides of multi-sided platforms.⁵ The Chinese Supreme People’s Court concluded that dynamic competition among platform businesses, including one seeking and selling attention, limited market power.⁶ Antitrust regulators, including those in the European Union and United States, approved Microsoft’s acquisition of Skype and Facebook’s acquisition of WhatsApp because they recognized how fluid market boundaries and dynamic competition would discipline the market power of the merged entities.⁷

None of these judgments or decisions suggests that competition authorities should let their guard down when it comes to online platforms. Taken together, however, with the new economics of multi-sided platforms and the growing body of evidence on the dynamics of online competition over the last two decades, these judgments and decisions do indicate that courts and competition authorities should exercise caution, and adjust their tools, in analyzing market power for online platforms.

This paper describes the new economics of multi-sided platforms in Section II. Then it shows in Section III how new technologies have turbocharged this business model and led to online mobile platforms anchored by websites and mobile apps. Section IV examines the implications of the online multi-sided

⁴ See Evans and Schmalensee, *Matchmakers*, Table 2.1, and the detailed discussion in Chapter 7.

⁵ *Groupement des cartes bancaires v. European Commission*, Judgement of the Court, September 11, 2014, available at: http://curia.europa.eu/juris/document/document.jsf?jsessionid=9ea7d0f130d57c17cb5e4cdc4d5f8196c74dd814db12_e34Kaxilc3eQc40LaxqMbN4Oc3iSe0?text=&docid=157516&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=293160; Federic Pradelles and Andreas Scordamaglia-Tousis, “The Two Sides of the Cartes Bancaires Ruling: Assessment of the Two-Sided Nature of Card Payment Systems Under Article 101(1) TFEU and Full Judicial Scrutiny of Underlying Economic Analysis,” *Competition Policy International Journal*, Autumn 2014, Volume 10 Number 2.

⁶ David Evans and Vanessa Zhang, “Qihoo 360 v Tencent: First Antitrust Decision by the Supreme Court,” October 21, 2014, <https://www.competitionpolicyinternational.com/qihoo-360-v-tencent-first-antitrust-decision-by-the-supreme-court>.

⁷ *Case No Comp/M.6281 - Microsoft/Skype*, Office of the Publications of the European Union, July 20, 2011, http://ec.europa.eu/competition/mergers/cases/decisions/m6281_924_2.pdf and *Case No COMP/M.7217 - Facebook/WhatsApp*, Office of the Publications of the European Union, March 10, 2014, http://ec.europa.eu/competition/mergers/cases/decisions/m7217_20141003_20310_3962132_EN.pdf





platform business model for the analysis of market power for attention seekers. Section V offers some concluding observations.

II. The New Economics of Multi-Sided Platforms

Although multi-sided platforms have ancient roots economists came to understand them as an important and distinct type of businesses in 2000 when a now classic paper by Rochet and Tirole began circulating.⁸ Soon after, economists began exploring the implications of the new economics of multi-sided platforms for antitrust issues.⁹ As this work has become mainstream, courts and competition authorities have gradually absorbed the new learning and applied it to cases.

A. Fundamentals of Multi-Sided Platforms

A multi-sided platform is called “multi” because it provides a way for two, or more, types of participants to get together. It is called a “platform” because it typically operates a physical or virtual place that enables these different types of agents to interact. Each “side” of the platform consists of the participants who have the option of using the platform to connect. A shopping mall is a physical platform. It provides a place where shoppers and stores—the participants on the two sides—can connect. A ride-sharing app is a virtual platform. It uses cloud-based software, accessed through Internet-connected mobile phones, to match up drivers and passengers who are the participants on the two sides.

Multi-sided platforms typically reduce frictions that get in the way of economic agents finding each other, interacting and exchanging value on their own. Buyers and sellers, for example, could find each other in a variety of ways. A marketplace, such as Flipkart in India, makes it easier for them to find each other through posting tools for sellers and search tools for buyers. It also makes it easier for them to engage in a transaction through the use of electronic payment methods and with confidence through Flipkart’s Replacement Guarantees and Seller Protection Fund.¹⁰ Multi-sided platforms also create value by increasing the odds that participants will find counterparties that generate value for value. An online dating site, such as eHarmony, secures many women and men thereby increasing the likelihood that people will find someone they would like to date and perhaps even marry.

Multi-sided platforms face a chicken-and-egg problem when they start as a result of what they are trying to accomplish. Consider a platform that is in the business of getting Type As together with Type Bs. Type As may not want to consider the platform unless they know it has attracted Type Bs, but Type Bs may not want to consider the platform unless they know it has attracted Type As. The platform has to figure out a way to get both types of participants on board, in sufficient numbers, to provide value to either. When YouTube started, it had trouble persuading people to upload videos since no one was coming to the site to watch them and trouble persuading people to come to the site to view videos since there were few videos to watch.¹¹

Typically, Type As value a platform if it has more Type Bs and vice versa.¹² There are, in economic terminology, positive indirect network effects and positive feedback effects. A platform that gets more Type As becomes more attractive to more Type Bs, which in turn makes it more attractive to more Type As, and so

⁸ Jean-Charles Rochet & Jean Tirole (2001) “Platform Competition in Two Sided Markets,” Working Paper, November 26, 2001. An earlier version was in circulation in 2000.

⁹ David Evans, “The Antitrust Economics of Two-Sided Markets,” *Yale Journal of Regulation*, Summer 2003, <http://ssrn.com/abstract=363160>.

¹⁰ Flipkart, “Returns and Cancellations” available at <http://www.flipkart.com/s/help/cancellation-returns>; Flipkart, “Seller Hub: Getting Started” available at <https://seller.flipkart.com/slp/faqs>.

¹¹ For a detailed discussion of how they solved this problem see Evans and Schmalensee, *Matchmakers*, Chapter 5.

¹² As we discuss below ad-supported platforms may have positive externalities in one direction—advertising value more viewers but viewers may not value more advertising.





forth. These positive feedback effects drive platform growth. YouTube persuaded more people to upload videos, more people came to watch those videos, which got people more interested in uploading videos, and that in turn attracted more traffic to the site.¹³

Positive indirect network effects can give bigger platforms economic advantages. These are often limited in practice, however, by platform congestion, or other diseconomies of scale and by platforms differentiating themselves on one or more sides. In most countries, there are several competing payment card networks despite the positive feedback effects between cardholders accepting merchants and despite scale economies in operating the network. Mobile money platforms—where mobile phones are used to send and receive money and provide other financial services—are evolving in the same way. More than 20 mobile wallet providers have started in India.¹⁴ Based on the experience of countries in Africa, where the mobile money markets are more mature, we would expect that, in the long run, the market will have several competing providers.¹⁵

Multi-sided platforms differ fundamentally from the traditional firms described in economic textbooks and business school courses. Traditional firms typically buy inputs, they make products and they sell those products to customers. They operate along linear supply chains. And since they do not have customers with interdependent demands, they are single-sided. Multisided platforms sell participants in each group access to the participants in each other group. As a result, the customers are the main inputs into providing the platform service. A typical retail store, which is a single-sided firm, buys products from wholesale distributors or manufacturers and then sells them to customers. A shopping mall, which is a two-sided firm, recruits stores for its mall, and recruits shoppers to come to its mall, and provides a platform where the stores get access to the shoppers and the shoppers get access to the stores.

B. Pricing Structures and Strategies

The fact that the demand for one group depends on the demand by the other group has interesting implications for how multisided platforms price their services. Platforms have to choose prices that balance these demands. Higher prices for Type As would discourage them from participating in the platform. That would deter Type Bs from participating in the platform since they would have access to fewer Type A participants. In fact, it may make sense to price very low to one group of participants because the other group will pay a high price for access to them. That, in fact, is the secret behind advertising-supported media as we show below.

It could even make sense to subsidize one group by charging them a price less than the incremental cost of serving them, including letting them use the platform for free, or even giving them rewards for participating. Economists have shown that, as a matter of theory, platforms may be able to maximize profits by subsidizing one side of the platform in this way and that many platforms have done just that.¹⁶ A popular restaurant reservation site in the U.S., OpenTable, does not charge people to make reservations with its site and it gives them rewards that they apply to reduce the cost of their meals. Although “free” is popular for online platforms, it is by no means universal. Dating sites, such as Trulymadly in India and FarmersOnly.com in the U.S., charge men and women the same. They contrast with nightclubs which, in the U.S., have “Ladies Night Free” pricing.

¹³ Importantly, positive feedback effects work in reverse as we discuss below. The loss of users on one side leads to losses of users on the other side and so on. Positive feedback effects in reverse can result in a death spiral.

¹⁴ See, <http://letstalkpayments.com/wallet-wars-in-india-intensifies-with-uber-and-others-being-the-battlefield/>

¹⁵ See GSMA, *State of the Industry: Mobile Financial Services for the Unbanked: 2014*. Available at http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/03/SOTIR_2014.pdf

¹⁶ See Evans and Schmalensee, *Matchmakers*, Table 2.1.





C. *Advertising-Supported Platforms*

Some multi-sided platforms connect consumers and advertisers. This might seem odd since in many cases consumers do not like advertising. They even spend money to avoid it by buying DVRs that make it easy to skip over ads and paying for alternative sources of media, such as Pay TV, or ad-free versions of services, such as Spotify Premium.

These platforms, however, have figured out ways to connect consumers and advertisers in ways that make both groups better off. They typically offer valuable content to persuade consumers to come of their platforms where these consumers are exposed to advertising messages. Meanwhile they persuade advertisers to pay for reaching these consumers. The viewers are the subsidy side of the platform and the advertisers are the money side. So long as the advertisers are willing to pay more for delivering messages to these consumers than the platform spends on content the advertisers benefit, the consumers benefit and the platform makes money.¹⁷

One can think of ad-supported platforms as buying eyeballs—usually by paying with valuable content—and selling those eyeballs to advertisers. The Internet has made that far easier as we see next.

III. **Online Multi-Sided Platforms**

Online platforms have become more common and prominent participants in domestic economies, and some have rapidly become global players. Many of these online platforms provide free content or services to people to attract their “attention” and then charge advertisers for delivering messages to these people. These attention seekers engage in dynamic competition in which they are constantly introducing new ways of attracting attention, and copying methods used by others, to persuade people to come to their platforms. Smart mobile phones have accelerated the pace of dynamic competition, the frequency of disruptive innovation, for online platforms.

A. *The Technology Revolutions Behind Online Platforms*

Several mutually reinforcing technologies, and the businesses that make those technologies available, have made multi-sided platforms increasingly powerful methods for reducing frictions and creating valuable new services, on a global basis.

1. **The PC-Web-Browser Revolution**

The first wave of innovation launched the web-economy in the mid-1990s. The Internet provided a physical network and standards for connecting computers around the world, the Web provided a framework and software technologies for creating and linking content on those computers, and the web browser provided an application for personal computers that enabled people to consume Web content.

Businesses could use these technologies to provide content and services on websites. The cost of doing so was relatively low since it involved writing software, using server computers and the small fees for connecting to the Internet. And the company could reach an entire country immediately and much of the world. Almost all the content, data and processing work resided in the cloud and consumers accessed it through using a browser on their Internet-connected personal computers.

¹⁷ In fact this advertising supported media is a clever way of solving the following exchange problem. Rahul would pay \$20 to meet Aditya. Aditya doesn't like Rahul and would pay \$5 to avoid him. Still there is room for trade and an intermediary can make Aditya and Rahul both better off. The intermediary pays Aditya \$12 to meet Rahul and charges Rahul \$14 for the introduction. Aditya is ahead \$7 (-\$5+\$12), Rahul is ahead \$6 (\$20-\$14), and intermediary earns a profit of \$2 (-\$12+\$14). In the case of advertising, instead of paying \$14, the media property provides entertainment or other content that Aditya values at \$14.





The number of web-based businesses and Internet traffic exploded following the launch of the commercial Internet in the 1990s. A number of global online platforms emerged such as Amazon, eBay, Facebook, Google, PayPal and Yahoo. This growth was made possible by the development and expansion of increasingly fast broadband delivered over fixed wires such as coaxial cable, fiber optic line or even a copper wire.

2. The Mobile-App Revolution

Mobile phones were in widespread use in the U.S. and other countries by the late 1990s. Cellular networks, however, were not able to carry enough data fast enough for people to use the Internet from their mobile phones. Innovations in cellular technology starting in the mid-1990s increased the potential capacity and speed of cellular networks and mobile devices for making better use of these faster more capacious broadband technologies. Anticipating the roll out of mobile broadband, a number of companies started investing in developing various components of smart phones, including modem and processing chips, operating systems and handsets in the early to mid-2000s.

Innovations by Apple and Google, in particular, have led to the spread of smart mobile phones around the world, enabling billions of people to consumer Internet-based services and millions of businesses to provide mobile-app based services to them. Apple introduced the iPhone, which consisted of a powerful computer, a mobile operating system and a standard set of applications including a mobile browser in June 2007. Google invested in developing a mobile operating system, Android, which it ran as an open-source project, and developing and organizing an ecosystem of handset makers, mobile network operators and other technology partners. It introduced the first Android phone in October 2008.¹⁸ Apple and Google also stimulated the production of mobile apps by providing software tools for developing apps for their operating systems, creating a quality certification process for these apps and creating “app stores” that provided centralized places for developers to distribute apps and for users to download them on their mobile devices.

Smart mobile phones changed the online game in a number of ways. As they became widely adopted, millions of apps became available for them and faster and more capacious mobile broadband networks were rolled out around the world. People could access the Internet anywhere and anytime using smartphones running on mobile broadband networks. More people could do that because mobile phones and data plans were much cheaper than buying PCs and fixed broadband connections. Businesses could reach billions of people by developing mobile apps and distributing them in apps stores. Apps could exploit the GPS capabilities of phones, which make it possible to know where individuals are in physical space. This, together with the related development of the “Internet of Things” is leading to the deep integration of the online and physical worlds.

3. The Movement from PCs/Browsers to Mobile/Apps

Businesses that want to provide online services, and consumers who want to consume online services now have several choices. App developers can develop websites that people can visit from browsers on their PCs or from their mobile devices. They can develop mobile apps that people use on their mobile phones or mobile browser-apps that try to mimic these apps. Different businesses have adopted different approaches depending on the content and services they provide. Consumers have, however, shifted their use dramatically from PCs to mobile devices and from using websites to using apps.

In the U.S. between 2008 and 2015, the proportion of time spent online using mobile devices increased from 12.7 percent to 54.6 percent. Commerce has moved dramatically from PCs to mobile. Americans made

¹⁸ Kent German, “A Brief History of Android phones,” August 2, 2011, <http://www.cnet.com/news/a-brief-history-of-android-phones/>





57 percent of their online purchases from mobile devices in 2014 compared with likely none before 2010.¹⁹ On Thanksgiving Day, November 26, 2015, around 60 percent of U.S. website visits were made from mobile devices in the U.S.²⁰ Advertising has moved to mobile in response. Facebook earned 78 percent of its global advertising revenue from mobile in 2015Q3²¹ compared with 14 percent in 2012Q3.²² These trends are expected to continue.²³

On mobile devices people typically access Internet-based services using mobile apps rather than using websites with their mobile browser. Mobile apps accounted for nearly 90 percent of the time Americans spend using either mobile apps or browsers on their mobile devices.²⁴ As a result, the proportion of time people spend online using mobile apps has increased from what was likely a very low level in 2008 to 54 percent in 2015.²⁵ This share is likely to increase further as the shift from PCs to mobile continues and as the shift from browser-based to mobile app-based delivery continues.²⁶

Many countries have had low penetration of PCs and fixed broadband because of their early stages of economic development. The adoption of smart mobile phone and mobile broadband are increasing rapidly in those countries because it is cheaper, and even more rapidly in the faster growing ones. More than 90 percent of Facebook's Indian users²⁷ and 60 percent of Amazon's Indian users²⁸ access it through mobile devices. In 2014, leading Indian e-commerce companies, including Flipkart and Snapdeal, derived the majority of their gross merchandise value from mobile devices.²⁹

B. Overview of Online Multi-Sided Platforms

The development of online technologies has made it cheaper and easier to reduce frictions through multi-sided platforms and to do so over large geographic areas. The Internet makes it possible to connect participants over wide geographic areas and in principle from around the world. Software programs running on high-speed computers in the cloud provide powerful technologies for finding good matches and

¹⁹ David Murphy, "IBM: Christmas Day Sales Up 8.3 Percent, Mobile Purchases up 20.4 Percent," PC Magazine, December 26, 2014, <http://www.pcmag.com/article2/0,2817,2474217,00.asp>.

²⁰ Hiroko Tabuchi, "Black Friday Shopping Shifts Online as Stores See Less Foot Traffic," *New York Times*, November 27, 2015, http://www.nytimes.com/2015/11/28/business/black-friday-shopping-shifts-online-as-stores-see-less-foot-traffic.html?_r=0.

²¹ Facebook Inc., "10-Q for Period Ending September 30, 2015," p. 40.

²² Facebook Inc., "10-Q for Period Ending September 30, 2012," p. 27.

²³ Chantal Tode, "M-Commerce Sales to Reach \$142B in 2016: Forrester," *Mobile Commerce Daily*, October 8, 2015, <http://www.mobilecommercedaily.com/mcommerce-sales-to-reach-142b-in-2016-forrester>; Matthew Hobbs, "Internet Advertising," 2015, <http://www.pwc.com/gx/en/industries/entertainment-media/outlook/segment-insights/internet-advertising.html>.

²⁴ Simon Khalaf, "Seven Years into the Mobile Revolution: Content is King ... Again," *Flurry Insights*, August 26, 2015, <http://flurrymobile.tumblr.com/post/127638842745/seven-years-into-the-mobile-revolution-content-is>; <https://www.comscore.com/Insights/Presentations-and-Whitepapers/2015/The-2015-US-Mobile-App-Report>.

²⁵ comScore, "The 2015 U.S. Mobile App Report," September 22, 2015, <https://www.comscore.com/Insights/Presentations-and-Whitepapers/2015/The-2015-US-Mobile-App-Report>.

²⁶ Total time spent on digital media using mobile apps increased at a compound annual growth rate of 38 percent per year between 2013 and 2015, compared to 7 percent for desktops and 24 percent for mobile browsing. The share for mobile apps increased from 43 percent to 54 percent over this period, an increase of 11 percentage points, or a compound annual growth rate of 12 percent. Data are not available back to 2008.

²⁷ BGR, "90% of Facebook's 132 million users from India come from mobile phones," September 27, 2015, available at <http://www.bgr.in/news/90-of-facebooks-132-million-users-from-india-come-from-mobile-phones/>

²⁸ Ashwini Gangal, "'Over 60 per cent of our traffic comes through mobile': Manish Kalra, Amazon India," August 28, 2015, http://www.afaqs.com/interviews/index.html?id=469_Over-60-per-cent-of-our-traffic-comes-through-mobile-Manish-Kalra-Amazon-India

²⁹ BGR, "Smartphone shopping to contribute up to 70 percent of total revenue in online shopping: Experts," November 30, 2014, available at <http://www.bgr.in/news/smartphone-shopping-to-contribute-up-to-70-percent-of-total-revenue-in-online-shopping-experts/>





consummating exchanges. Mobile has extended these capabilities throughout the day and throughout physical space.

Almost immediately after web commerce became viable in the mid-1990s, entrepreneurs started using the new technologies to start multi-sided platforms. Not everyone chose a multi-sided model. Amazon, for example, started with a typical retail model in which it bought wholesale products, initially books, and sold them to people through its online store. Many, though, used a multi-sided approach often because it was the only way to provide the product or service. eBay started an online marketplace for buyers and sellers, Match.com started an online matchmaker for men and women and Yahoo started an online portal that used content to attract viewers and then attracted advertisers who wanted to reach those views.

Many of the established platforms followed the shift from the PC-browser-centric model to the mobile-app centric model. Entrepreneurs, however, discovered that the mobile-app centric model provided new opportunities. Uber, for example, has built a business that connects drivers and riders in real-time and in physical space using mobile apps.

Tables 1 and 2 provide an overview of online multi-sided platforms based on their presence in the U.S., which reflects global platforms, and India, which reflects domestic platforms and global ones. In each country we have selected 20 platforms. We include the largest ones based on the number of times over the space of a month people clicked on pages on those sites (“pageviews”). That is a particularly useful measure for content-oriented sites. We have erred on the side of showing diversity of online platforms and the table is not intended to be an accurate summary of the economically most important online platforms. In each case we summarize the multi-sided business model and the extent to which one side receives service for free.

As these tables show online platforms are highly diverse. However, they often have several of the following features that are relevant for antitrust analysis. First, they are all based on software. They can add new features and introduce new products and services, by modifying or adding software code and related databases. That is much different than physical platforms. Second, the marginal cost of participants to software-based platforms running in the cloud is virtually zero. That increases the normal tendency of multi-sided platforms to allow a group of participants to use the platform for free.

Third, dynamic competition is more intense for online platforms because technological change has reduced the capital cost of starting a platform and the software-based nature of these platforms makes it easier for platforms to offer new products and services in competition with other platforms.³⁰ Fourth, dynamic competition is also more intense for online platforms because the participants have lower switching costs, and face less lock-in, than on physical platforms where they often have to make costly sunk-cost commitments to the platform. Fifth, online platforms are in the midst of a massive technological shift resulting from the move of consumers from the PC-browser to the mobile-app centric way of using online services.³¹ These points are especially true one of the largest categories on online platforms.

³⁰ *Case No Comp/M.6281 - Microsoft/Skype*, Office of the Publications of the European Union, July 20, 2011, http://ec.europa.eu/competition/mergers/cases/decisions/m6281_924_2.pdf ; “FTC Notifies Facebook, WhatsApp of Privacy Obligations in Light of Proposed Acquisition,” *Federal Trade Commission*, April 10, 2014, <https://www.ftc.gov/news-events/press-releases/2014/04/ftc-notifies-facebook-whatsapp-privacy-obligations-light-proposed>; and *Case No COMP/M.7217 - Facebook/WhatsApp*, Office of the Publications of the European Union, March 10, 2014, http://ec.europa.eu/competition/mergers/cases/decisions/m7217_20141003_20310_3962132_EN.pdf.

³¹ See Hemant Bhargava, David S. Evans and Deepa Mani, “The Move to Smart Mobile and its Implications for Antitrust Analysis of Online Market In Developed and Developing Countries,” Forthcoming.





Table 1: Summary of Most Frequented Platforms in the US

Webpage	Category	Page Views in November 2015	Free participants	Paid participants
FACEBOOK.COM	Social Media - Social Networking, Social Media	122,298,603	People and many app developers	Advertisers and some app developers
GOOGLE.COM	Search/Navigation	75,325,987	Searchers and websites	Advertisers
YOUTUBE.COM	Entertainment - Multimedia, Entertainment	38,899,360	Video uploaders and viewers	Advertisers
YAHOO.COM	Portals	25,612,235	Viewers	Advertisers
AMAZON.COM	Retail	11,490,679	Buyers do not pay Amazon MarketPlace	Sellers pay Amazon for sales and advertising
BING.COM	Search/Navigation	9,080,541	Searchers and websites	Advertisers
CRAIGSLIST.ORG	Directories/Resources - Classifieds, Directories/Resources	8,964,010	Viewers and many listers of ads	Certain categories of listers for ads
MSN.COM	Portals	8,483,598	Viewers	Advertisers
EBAY.COM	Retail	6,197,320	Buyers do not pay eBay	Sellers pay eBay for sales and advertising
AOL.COM	Portals	5,363,234	Viewers	Advertisers
ESPN.COM	Sports	3,492,807	None	Viewers pay and advertisers pay
SWAGBUCKS.COM	Services - Coupons, Services	3,131,420	People	Advertisers/marketers
LINKEDIN.COM	Social Media - Social Networking, Social Media	2,722,905	People for basic service	Advertisers and people for premium service
PAYPAL.COM	Business/Finance - Personal Finance, Business/Finance	2,043,564	Receivers of funds	Senders of funds
GROUPON.COM	Services - Coupons, Services	1,966,864	People do not pay Groupon	Groupon is paid by businesses for marketing and advertising services
IMGUR.COM	Social Media	1,892,345	Uploaders of pictures and viewers of them	Advertisers
ANSWERS.COM	Directories/Resources - Reference, Directories/Resources	1,881,808	People looking for information	Advertisers
TWITTER.COM	Social Media - Social Networking, Social Media	1,675,644	People who send and read tweets	Advertisers
INDEED.COM	Career Services and Development - Career Resources, Career Services and Development	1,406,674	People looking for jobs	Employers advertising jobs
CNN.COM	News/Information - General News, News/Information	1,362,865	Viewers	Advertisers

Source: comScore



**Table 2: Summary of Most Frequented Platforms in India**

Company	Category	Free participants	Paid participants
Google.com	Search/Navigation	Searchers and websites	Advertisers
Facebook.com	Social Media - Social Networking, Social Media	People and many app developers	Advertisers and some app developers
Youtube.com	Entertainment - Multimedia, Entertainment	Video uploaders and viewers	Advertisers
Amazon.com	Retail	Buyers do not pay Amazon MarketPlace	Sellers pay Amazon for sales and advertising
Yahoo.com	Portals	Viewers	Advertisers
Flipkart.com	Retail	Buyers do not pay Flipkart MarketPlace	Sellers pay Flipkart for sales and advertising
Indiatimes.com	News/Information - General News, News/Information	Viewers	Advertisers
LinkedIn.com	Social Media - Social Networking, Social Media	People for basic service	Advertisers and people for premium service
Twitter.com	Social Media - Social Networking, Social Media	People who send and read tweets	Advertisers
Snapdeal.com	Retail	Buyers do not pay Snapdeal MarketPlace	Sellers pay Snapdeal for sales and advertising
Stackoverflow.com	Q&A Website	People looking for information related to computer programming	Advertisers
Ebay.in	Retail	Buyers do not pay eBay	Sellers pay eBay for sales and advertising
Ndtv.com	News/Information - General News, News/Information	Viewers	Advertisers
Jabong.com	Retail	Buyers do not pay Jabong MarketPlace	Sellers pay Jabong for sales and advertising
Rediff.com	Portals	Viewers	Advertisers
Quikr.com	Directories/Resources - Classifieds, Directorie	Viewers and many listers of ads	Certain categories of listers for ads
Naukri.com	Employment Recruiting	People for basic service	Advertisers and people for premium service
Pinterest.com	Social Media - Social Networking, Social Media	Viewers	Advertisers
imdb.com	Entertainment - Movies, Entertainment	Viewers	Advertisers
shopclues.com	Retail	Buyers do not pay Shopclues MarketPlace	Sellers pay Shopclues for sales and advertising

Source: <http://www.alexa.com/>

C. Online Attention Seekers

As it has turned out, many online platforms make money primarily by helping businesses sell things to consumers through advertising and marketing.³² As we discussed above, the way they do this is simple but clever. They provide reasons for consumers to come visit them by offering engaging content or services valued by consumers. Consumers typically do not pay for obtaining the content or services. They are free in that sense. But consumers are receiving value by coming to these platforms. In that sense the real price of participating in the platform is even better than free, it is negative, so that platform is paying consumers to come visit. Once they have gotten consumers to spend time on the platform they allow businesses to present advertising or other marketing messages to consumers. They charge businesses for this and that is how they cover their costs and make profits.

Online attention seekers compete to get the attention of consumers and then sell portions of that attention to businesses that aren't able to get it easily on their own. They seldom make any money directly from providing content or services to consumers. Recognizing this is important for understanding the

³²David Evans, "Attention Rivalry Among Online Platforms," *Journal of Competition Law & Economics*, May 14, 2013, Volume 9 Issue 2:313-357, <http://jcle.oxfordjournals.org/content/9/2/313.abstract>.





dynamics of competition. Entrepreneurs compete to come up with clever ideas for attracting eyeballs—say by inventing tweeting or pinning—not so they can charge people for clever content or services they are providing but so they can sell access to those eyeballs to advertisers. Attention seekers may come up with ways to differentiate themselves from the standpoint of attracting consumer attention and selling advertising. But overall they are competing to attract a limited pool of attention and advertising and marketing budgets to reach those consumers. Now consider the five features that we highlighted above.

Attention seekers are all built on software platforms. They do not have printing presses, cable networks or radio towers. When they want to add features to the platforms they hire software engineers to write code. They can often make changes quickly and roll those changes out globally. It took about 5 months, for example, for Facebook to develop Facebook Messenger which is one of the leading apps for smartphones.³³

The marginal cost of another participant on an attention seeker is essentially zero. Google does not incur any significant out of pocket cost when a person conducts another search or when it puts another search ad on a search results page. That is true for virtually all attention seekers with the exception of some, such as Pandora, which have to pay for the content they deliver.

The capital cost of starting an attention seeker is low and that has intensified dynamic competition. That is more so true now as a result of mobile apps. The founders of WhatsApp had to write software code so that messaging app would work for Apple and Android phones and for the cloud-based service those apps were connected with.³⁴ Once they did that they had a platform that could provide messaging services globally to an unlimited number of users with the addition of some cheap server capacity. Many other mobile messaging apps have started. They compete with older messaging PC-based messaging apps as well as the new mobile-based ones.

It is easy for consumers to reduce the amount of attention they provide one platform, or drop it altogether, and increase the amount of attention they provide another platform. Since the platforms are free they can use as many as they want and switch their attention depending upon the relative attractiveness to spending time on one or the other. The consumer bears no cost from shifting time from looking at Yahoo to looking at Flipboard. While some online platforms involve some cost of switching in practice it does not limit people from doing so. In the case of social networks, Americans switched from Friendster to MySpace and then from MySpace to Facebook.³⁵ People in other countries, such as Brazil and India, switched from Orkut to Facebook.³⁶

Finally, the shift of consumers from looking at websites with their browsers to using apps on their mobile phones has resulted in dramatic changes in attention seeking platforms. There has been a dramatic increase in the amount of online attention available as a result of people being able to go online with their mobile devices for much more of the day. The opportunities for connecting businesses with consumers have also changed now that people carry mobile phones all the time and in particular when they go shopping. Search is one of the attention-seeking businesses that is undergoing disruption as a result of this.³⁷ Search engines index websites and allow people to find things on those websites. But now an enormous amount of online activity is happening with mobile apps. At this point, it is unclear how people will be able to find app

³³ Facebook, “Building Facebook Messenger,” August 12, 2011, available at <https://www.facebook.com/notes/facebook-engineering/building-facebook-messenger/10150259350998920/>.

³⁴ One estimate is that it would cost about \$250,000 and take about nine months to build a robust version of an app like WhatsApp. See Courtney Boyd Myers, “How much does it cost to build the world’s hottest startups?” TNW News, December 2, 2013. Available at <http://thenextweb.com/dd/2013/12/02/much-cost-build-worlds-hottest-startups/#gref>

³⁵ Evans and Schmalensee, *Matchmakers*, Chapter 9.

³⁶ Elena Trost, *Social Media Marketing in BRIC Countries* (Zurich, Lit Verlag GmbH & Co., 2013), Chapter 3.

³⁷ Erin Griffith, “Facebook, Google and the battle for mobile intent,” September 8, 2015, available at <http://fortune.com/2015/09/08/facebook-google-mobile-search-advertising/>





based content and which companies will ultimately succeed in doing so. Apple, Facebook and Google are among the companies that are trying to figure this out.³⁸

What should be clear from the discussion so far is that multi-sided platforms are governed by different rules than traditional linear businesses and that competition among online platforms is often more intense and more dynamic than among physical platforms. Both points have important implications for antitrust analysis.

IV. Market Power Analysis of Online Attention Seekers

Economists typically assume that the demand for a product depends on the price of that product, the price of substitute products and the price of complementary products. The demand for a particular brand of beer, for example, depends on the price of that brand, the prices of other kinds of beer and other alcoholic beverages and perhaps the demand for nuts, chips and other things that people eat with beer. Most economic theories relied on an antitrust analysis, such as those involving predatory pricing and economic tools, such as SSNIP tests, are based on this model of product demand.

All of those factors are relevant for considering the demand for product and services provided by multi-sided platforms. But those standard factors do not include the most critical factor that drives the demand for platforms. The demand by members of one group of customers, say Type A, depends, roughly speaking, on the participation of the other group of customers, say Type B, in the platform.³⁹ To avoid being mathematically wrong and unreliable, economic models and tools must account for the interdependent demand and consider all sides of the platforms. The fact that the demands by the various groups of platform participants are interdependent also means that analyses that focus on one group of participants in isolation are not correct as a straightforward mathematical matter.⁴⁰

Antitrust analysis needs to examine the platform overall taking these interdependencies into account.⁴¹ Generally, that requires treating the platform as a whole, rather than focusing on one group of customers or another, or at least carefully considering the inter-linkages between these groups.

Platform competition tends to force overall prices down and reduces the profits the platform can earn. Typically, though, it does not force prices down to incremental costs for all, or even any, sides of the platform. Even with competition, platforms may choose to subsidize one side of the platform and make profits for other sides of the platform.

The magazine business, for example, is highly competitive yet most magazines subsidize readers; the cover price for the magazine often does not cover printing and distribution costs let alone the cost of the

³⁸ Erin Griffith, "Facebook, Google and the battle for mobile intent," September 8, 2015, available at <http://fortune.com/2015/09/08/facebook-google-mobile-search-advertising/>

³⁹ More precisely, platform customers care about the likelihood that they will be able to enter into valuable exchange on the platform; we are using the number of potential trading partners as a short-hand for describing all of the characteristics of one side of the platform that affects the demand by the other side.

⁴⁰ David Evans and Richard Schmalensee, "The Antitrust Analysis of Multi-Sided Platform Businesses," January 30, 2013, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2185373; Roger Blair and Daniel Sokol, eds., Oxford Handbook on International Antitrust Economics, Oxford University Press, 2015; University of Chicago Institute for Law & Economics Olin Research Paper No. 623. Available at SSRN: <http://ssrn.com/abstract=2185373>; David Evans, "The Consensus Among Economists on Multisided Platforms and its Implications for Excluding Evidence that Ignores It," *Competition Policy International*, (April 13, 2013). Available at SSRN: <http://ssrn.com/abstract=2249817> or <http://dx.doi.org/10.2139/ssrn.2249817>.

⁴¹ In *Cartes Bancaires v. European Commission*, the European Court of Justice concluded that to analyze competitive effects it was necessary to consider the two interlinked sides of the platform. See *Groupement des cartes bancaires v. European Commission*, Judgement of the Court, September 11, 2014. In, *Qihoo 360 v. Tencent*, the Chinese Supreme People's Court found that it was necessary to consider platform competition in evaluating market power. See, David Evans and Vanessa Zhang, "Qihoo 360 v Tencent: First Antitrust Decision by the Supreme Court," October 21, 2014, <https://www.competitionpolicyinternational.com/qihoo-360-v-tencent-first-antitrust-decision-by-the-supreme-court>; Charles Rivers Associates, "Qihoo v. Tencent: economic analysis of the first Chinese Supreme Court decision under Anti-Monopoly Law" February 2015, available at http://www.crai.com/sites/default/files/publications/China-Highlights-Qihoo-360-v-Tencent-0215_0.pdf





content that attracts readers. In fact, competition to attract participants to the platform can result in greater subsidies to one side. For example, in the U.S., competition among payment card networks apparently resulted in bidding up payments (called interchange fees) to banks that issue cards to consumers.⁴² As a result, evidence that price is greater than incremental cost on one side provides no meaningful evidence that the platform has market power and evidence that the platform charges a price less than marginal cost on another side provides no meaningful evidence that the platform is engaging in predatory pricing. The analyst needs to look at the platform overall to assess market power and predation. In practice, it often makes sense to look at pricing and competition on both sides but then accounting for the interdependencies.

This section applies these general principles to the analysis of market power for online attention seekers, which is one of the most important categories of online platforms.

A. *Free and Feature Competition*

Traditional antitrust analysis assesses market power by considering whether the firm can increase price profitably. That approach does not make any economic or business sense for online attention seekers. The business is based on paying consumers to use the platform and charging advertisers for access to those consumers. An exercise of market power over consumers could involve increasing the price to them but, more likely, would involve reducing the quality of the content and services the platform is providing to attract their attention.⁴³ Whether that reduction in quality is profitable depends on the extent to which it would decrease the attractiveness of the platform to advertisers. A platform could consider reducing its expenditures on quality improvements by \$1 million. Whether this is profitable depends on whether the lower quality would reduce the amount of advertising, given the lower attention it attracts, by less than \$1 million.

This highlights the importance of feature and quality competition. Online attention seekers do not compete based on price. Therefore, to assess market power, one needs to assess the extent to which a lower provision of quality would divert attention to other online platforms. In considering that diversion there is no business or economic reason to limit the inquiry to online platforms that provide the same service. It is an empirical question whether consumers would turn their attention to completely different services.

In practice market power analysis for online attention seekers can consider substitution possibilities by considering a small but significant increase in price or a small but significant decrease in quality. Either one reduces the value of the platform for users and could induce switching. The SSNIP, however, must consider small absolute increase in price since a percentage increase is undefined when the initial price is zero. The Chinese Supreme People's Court, in *Qihoo 360 v. Tencent*, decided that the SSNIP evidence was not relevant and considered informally how consumers would react to small but significant decreases in quality ("SSNDQ") of the instant message products under consideration.⁴⁴

Since attention makers make virtually all of the revenue and profit from advertisers, the other issue concerning market power is whether they can take actions that increase the price of advertising above competitive level. The analysis of that question needs to consider the extent to which advertisers can get the attention of consumers in other ways and the extent to which the online platform offers some consumer attention, perhaps based on demographic profiles or the context in which they've captured that attention, for which there are limited substitutes.

⁴² OECD, "Competition and Payment Systems," June 28, 2013, <http://www.oecd.org/competition/PaymentSystems2012.pdf>.

⁴³ The decision by online attention seekers to charge fees is quite rare even for ones that are highly successful. Some online newspapers have tried paywalls with mixed success.

⁴⁴ See, David Evans and Vanessa Zhang, "Qihoo 360 v Tencent: First Antitrust Decision by the Supreme Court," October 21, 2014, <https://www.competitionpolicyinternational.com/qihoo-360-v-tencent-first-antitrust-decision-by-the-supreme-court>.





Free pricing, however, shouldn't be analyzed in isolation. In fact, the existence of consumers being offered something for nothing is almost always an indication that the business is a multi-sided platform. That means that the demand by consumers on the "paid side" is linked to the demand by consumers on the "free side" to the demand. The SSNIP and SSDNQ analyses should account for the interdependencies of demand for taking a holistic approach, and considering the platform overall, or by carefully considering the linkages in demand and their implications for competitive constraints.

B. New Entry, Cross-Category Entry and Feature Competition

Market power analysis needs to consider the ease of entry and of feature competition for online attention seekers. As discussed above, the capital cost of entry for online attention seekers is low. The main difficulty is attracting consumers to the platform with persuasive content and services. Importantly, though, the analysis needs to at least consider the impact on the platform of entry by completely different services. For example, suppose Facebook reduced its investment in the quality of its social networking platform. It could lose advertising revenue in part because that increases the likelihood that consumers will more likely to shift attention to "the next new thing"—not necessarily to a social network—and that will cost the company advertising revenues. In addition, market power analysis needs to consider entry from other categories. Because it is easy to change features through software online attention seekers can add features that mimic those of other very different attention seekers. Twitter and Pinterest have both recently introduced "buy buttons" that help businesses make sales on their platforms, like Amazon Marketplace, in addition to just advertising to those consumers. That feature competition is an example of dynamic competition which we turn to next.

C. Dynamic Competition

Dynamic competition has characterized online attention seekers for the last twenty years and shows no signs of abating. Attention seekers have no guarantee that they can hold onto consumers without engaging in persistent incremental feature and disruptive innovation. We see this in a variety of ways.

First, the relative importance of attention seekers changes dramatically over time.⁴⁵ Table 3 shows the 20 largest advertising-supported attention seekers by time spent on the webpage in 2002, 2007 and 2012. Pinterest (8) is a U.S. advertising-supported webpage, that users spent the most time visiting during September 2012, did not exist in September 2007, while several webpages were in the early stages of development including Facebook (1), Youtube (2), The Huffington Post (9) and Tumblr (10). This illustrates how quickly and dramatically the landscape for online advertising can change.

Second, successful attention seekers have declined and in some cases failed when they have not kept up, while new ones have risen quickly. Orkut was the dominant social networking site between 2005 and 2010 in India.⁴⁶ Facebook overtook it in July 2010.⁴⁷ MySpace had a similar experience in the U.S. where it was the largest between 2005 and 2009 and also displaced by Facebook.⁴⁸ Yahoo was a highly successful attention

⁴⁵ See David Evans, "Attention Rivalry Among Online Platforms," *Journal of Competition Law & Economics*, May 14, 2013, Volume 9 Issue 2:313-357.

⁴⁶ Sahil Shah, "Social Networking War in India: Facebook vs Orkut," January 25, 2011, <https://www.techinasia.com/indian-social-networking-wars-facebook-vs-orkut-2>

⁴⁷ comScore, "Facebook and Orkut Growth in India," November 4, 2010. <http://www.comscore.com/Insights/Data-Mine/Facebook-and-Orkut-Growth-in-India>

⁴⁸ Pete Cashmore, "MySpace, America's Number One," July 11, 2006, <http://mashable.com/2006/07/11/myspace-americas-number-one/#tqA37Md.SggA>; Cholo Albanesius "Home/News & Analysis/More Americans Go To Facebook Than MySpace More Americans Go To Facebook Than MySpace," June 16, 2009, <http://www.pcmag.com/article2/0,2817,2348822,00.asp>.





seeker for many years. While it still attracts a large number of pageviews, the market value of the portion of advertising-supported business is negligible according to various reports.⁴⁹

Third, mobile apps have provided opportunities for the creation of new attention seekers and have reduced the relative importance of incumbent attention seekers. Facebook, for example, has become one of the largest online advertising platforms in the world through its success in attracting attention of mobile device users and selling that attention to advertisers. It now provides three of the ten mobile apps that attract the largest number of pageviews.⁵⁰ Traditional search advertising, while still important on mobile, is much less significant than it is on the web.

D. Market Shares as Indicia of Market Power

A number of commentators have pointed out that market shares must be used with care in assessing market power.⁵¹ This advice is particularly sound when it comes to measuring market power on the consumer side of online attention platforms. In traditional markets, sound practice involves measuring market shares based on value to account for quality differences between products. It also makes sense to focus on price because it is an important dimension of competition. Most online attention seekers do not charge consumers for using the platform.

⁴⁹ Steven Levy, "Yahoo and Alibaba: Joined at the Balance Sheet," March 3, 2015, <https://medium.com/backchannel/yahoo-and-alibaba-joined-at-the-balance-sheet-94b459233894#.cklylx3x3>; Lawrence Meyers, "Yahoo Stock: Is YHOO Worth Nothing Without BABA?," September 21, 2015, <http://investorplace.com/2015/09/yahoo-stock-yhoo-baba-alibaba/#.VnNaiPkrKM8>.

⁵⁰ comScore, "comScore Reports July 2015 U.S. Smartphone Subscriber Market Share," September 3, 2015

⁵¹ Louis Kaplow, "Market Definition, Market Power," May 2015, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2605179##; Jonathan B. Baker and Timothy F. Bresnahan, "Economic Evidence in Antitrust: Defining Markets and Measuring Market Power," *Economic Evidence in Antitrust*, http://web.stanford.edu/~tbres/research/buccrossi_01_ch01_001-042.pdf; Howard H. Change, David S. Evans and Richard Schmalensee, "Assessment of the Relevant Market in Competition Matters," March 30, 2011.





Table 3: Top 20 US Advertising Supported Attention Seeker Websites in September 2002, 2007, and 2012, Ranked by User Time Spent on the Website

Domain	Description	Rank Sept-2002	Rank Sept-2007	Rank Sept-2012
Facebook.com	Social Networking	-	-	1
Youtube.com	Video	-	-	2
Yahoo.com	Portal	1	1	3
Google.com	Search	3	3	4
Msn.com	Portal	2	2	5
Aol.com	Portal	4	4	6
Bing.com	Search	-	-	7
Pinterest.com	Online Pinboard	-	-	8
Huffingtonpost.com	News	-	-	9
Tumblr.com	Social Networking	-	-	10
Pandora.com	Music	-	-	11
Nfl.com	Sports	9	7	12
Cnn.com	News	14	5	13
Tagged.com	Social Networking	-	-	14
Foxnews.com	News	-	18	15
Nbcnews.com	News	-	-	16
Ask.com	Search	16	10	17
Fanfiction.net	Hobby/Interest	-	9	18
Cbssports.com	Sports	-	-	19
Mapquest.com	Maps	17	6	20
Weather.com	Weather	18	17	-
Cartoonnetwork.com	Entertainment	19	-	-
Foxsports.com	Sports	-	12	-
Nytimes.com	News	11	-	-
Mlb.com	Sports	-	13	-
About.com	Reference	-	19	-
Usatoday.com	News	-	20	-
Imdb.com	Movie Reference	-	16	-
Univision.com	Entertainment	-	15	-
Blackplanet.com	Social Networking	6	14	-
Livejournal.com	Blogging	13	-	-
Blogger.com	Blogging	-	11	-
Excite.com	Search	8	-	-
Iwon.com	Portal	10	-	-
Lyos.com	Search	5	-	-
Netscape.com	Software	7	-	-
Altavista.com	Search	20	-	-
Hotmail.com	Web Mail	-	8	-
Ezboard.com	Discussion	12	-	-
Asianavenue.com	Social Networking	15	-	-

Source: Compete.com, September 2002, September 2007, and September 2012

Price is therefore not available as a measure of quality differences and for that matter is not an important element of competition relative to the content and service subsidies.

Market shares are poor indicia of market power for online attention seekers in part because precise market boundaries are more difficult to establish. Narrow market definitions, confined to





functional substitutes for the content or services provided by the platform, seldom make sense because consumers shift their attention fluidly among different platforms. That is not to say that a broad definition is appropriate either, since many platforms have some source of differentiation that makes consumers more likely to give them their attention. To the extent market shares are used, they should be calculated using different plausible definitions of the relevant set of substitutes.

V. Conclusion

Multi-sided platforms comprise an increasingly large portion of the economy, in part as a result of the technological changes described above. Online multi-sided platforms are now behind waves of creative destruction. Protecting competition in this part of the economy is important and competition authorities should be commended for being vigilant in making sure that dominant platforms do not violate the competition rules and that rent-seeking incumbents do not stand in the way of innovative new platforms.

Antitrust analysis, however, needs to adjust the standard tools for assessing market power so that they are accurate, as a matter of economics and mathematics, for multi-sided platforms. That includes recognizing the important implications of interdependent demand, and interlinked sides, for platforms. Particular care should be given to online platforms, and especially online attention seekers, because of the importance of non-price competition, the pervasive use for zero prices and the role, at least for now, of intense dynamic competition.

