

ANTITRUST ISSUES RAISED BY THE EMERGING GLOBAL INTERNET ECONOMY

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INTRODUCTION

Web-based businesses are increasingly the subject of antitrust concerns. Plaintiffs in the United States have sued eBay for tying its online payments service to its transaction service.¹ Multiple jurisdictions in the European Community have claimed that Apple has violated the competition laws by limiting the ability of its music player to play music from competing music stores and limiting the ability of competing music players to play music purchased from its music stores.² During 2007, although the U.S. Federal Trade Commission decided not to block Google's acquisition of DoubleClick after a lengthy investigation, it expressed its intent to "closely watch these markets" involved in online advertising.³

Of course, competition policymakers have not just discovered the web. In 1998, shortly after the start of the commercial internet three years earlier, the U.S. Department of Justice and various states filed an antitrust case against Microsoft for engaging in various practices related to web brows-

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¹ See, e.g., *Malone v. eBay, Inc.*, No. 07-01882-JF (N.D. Cal. filed Apr. 4, 2007).

² *Free-DRM Music By iTunes, But EC Starts Official Investigation*, EDRI.org, Apr. 12, 2007, <http://www.edri.org/edrigram/number5.7/ituned-free-drm>; *Increased Competition Pushes iTunes Towards Interoperability*, Forbrukerombudet, Feb. 11, 2008, <http://www.forbrukerombudet.no/index.gan?id=11038653> (link); Helena Spongenberg, *Apple's iTunes Risks EU Backlash After Norway Ruling*, EU Observer, Jan. 25, 2007, <http://euobserver.com/871/23334>; *Apple: European Consumer Organisations Join Forces in Legal Dispute Over iTunes Music Store*, Verbraucherzentrale, Jan. 22, 2007, <http://www.vzbv.de/go/dokumente/571/8/36/index.html> (link); Consumer Council of Norway, *Complaint against iTunes Music Store* (Jan. 25, 2006), <http://forbrukerportalen.no/filearchive/Complaint%20against%20iTunes%20Music%20Store.pdf> (link).

³ Fed. Trade Comm'n, *Statement of FTC Concerning Google/DoubleClick*, Dec. 20, 2007, available at <http://www.ftc.gov/os/caselist/0710170/071220statement.pdf> (link).

ers.⁴ The European Commission started an investigation of Microsoft's practices related to media players that stream music over the internet in 2001.⁵ However, the Microsoft cases mainly involved the use of the company's market power in personal computers to influence competition in web-based markets that threatened it. The matters involving Apple, Google, and eBay concern market power in web-based products and services themselves.

The internet economy is likely to raise antitrust concerns—and possible demands for regulation—for years to come. Global gargantuan firms have emerged, which will likely attract scrutiny by competition authorities and by policymakers concerned with competition issues. The companies mentioned above, for example, have shares in putative antitrust markets that rival those held by Microsoft.⁶ Apple has more than a 70 percent share of paid music downloads in the European Union,⁷ Google has more than an 80 percent share of search queries in Europe,⁸ and eBay has more than a 90 percent share of auction site page views in France, Germany, Italy, Spain, and the UK.⁹

Competition authorities and private parties can challenge the practices of these leading firms under the antitrust laws of most jurisdictions. Such challenges are especially likely under European Community law and decisional practice which impose special obligations and significant scrutiny on firms that have market shares as low as 40 percent.¹⁰ Moreover, many web-

⁴ The D.C. Circuit Court of Appeals upheld in 2001 portions of a lower court ruling in 2000 that found Microsoft guilty of violating Section 2 of the Sherman Act. *See* *United States v. Microsoft Corp.*, 253 F.3d 34, 45 (D.C. Cir. 2001) (citing *United States v. Microsoft Corp.*, 87 F.Supp.2d 30 (D.D.C. 2000)).

⁵ In 2007 the European Court of First Instance upheld the Commission's 2004 decision that Microsoft has violated Article 82 EC by tying its media player software to its dominant operating system. *See* T-201/04, *Microsoft Corp. v. Comm'n*, 2007 WL 2693858 (Sept. 17, 2007).

⁶ These are not necessarily relevant antitrust markets but they are ones that competition authorities could plausibly adopt.

⁷ *See* Anna Jenkinson & Don Jeffrey, *Apple, Record Companies Restrict Music Sales, EU Says (Update6)*, Bloomberg.com, Apr. 3, 2007, <http://www.bloomberg.com/apps/news?pid=20601085&sid=aiMds7KddG14&refer=europe> (link).

⁸ COMSCORE, MYMETRIX QSEARCH 2.0 KEY MEASURES REPORT (Dec. 2007). comScore is a "global Internet information provider" that gathers data on internet usage trends. comScore Who We Are, <http://www.comscore.com/about/default.asp> (link). comScore's data analyses are based on its panel of over two million users. *Id.* In recruiting its panelists, comScore attempts to ensure that "[a]ll demographic segments of the online population are represented in the comScore Global Network, with large samples of participants in each segment." comScore Methodology, <http://www.comscore.com/method/method.asp> (link).

⁹ COMSCORE, MYMETRIX KEY MEASURES REPORT (Dec. 2007).

¹⁰ *See* *British Airways, PLC v. Comm'n*, 2003 E.C.R. II-5917, ¶¶ 211, 223–25 (finding British Airways dominant in the context of Article 82 with a share of 39.7%, notwithstanding evidence that its share had declined from 46% over a seven year period).

The finding in *British Airways* relied heavily on the fact that the rest of the market was very fragmented. *See id.* ¶¶ 211–25. This was the first time that a firm with a market share below 40% was

based firms have complex business models and arrangements. Separating the merely complicated from the nefarious will take courts and competition authorities time to sort out. This Essay describes the economics and technology behind the web-based economy and how these features will influence internet competition policy in the years to come.

Section I provides a birds-eye view of the web-based economy. Although this sector is evolving quickly, its contours are beginning to take shape and we can be reasonably confident that several globally dominant firms will play significant roles. Section II describes the economics of the web-based economy. The key businesses are what economists call “multi-sided platforms” that serve several distinct but interdependent customer groups. Google for example serves people who are searching the web, advertisers who want to reach these users, and application developers who are using Google’s software to develop complementary products. The leading multi-sided platforms for the web are often built on “software platform” technologies that make portions of their code available to software developers who write applications that benefit users of the software platform. Section III considers the competition that arises in the web-based economy. The appearance of dominant firms in key sectors will ensure ongoing scrutiny, and the nature of the economics and technology of these businesses will result in ongoing disputes over their practices.

The web economy poses two major challenges to competition authorities. The law and economics for analyzing the multi-sided platforms that dominate the internet sector is not well developed. At the same time the web-economy is evolving very rapidly and in ways that are sure to result in antitrust complaints and investigations. Competition authorities and courts will need to exercise great care in balancing the protection of consumers from anticompetitive behavior against causing harm from interfering in complex businesses that are both rapidly moving and not fully understood.

I. AN OVERVIEW OF THE WEB-BASED ECONOMY

The internet refers to computer networks that are linked through wired and wireless connections and that interoperate through standard communication protocols. This global communication system provides access to various software-based services. The most important set of services on the internet is the world-wide web, which consists of digital media linked

found to be dominant. Subsequently, in *Wanadoo Interactive*, the Commission concluded that Wanadoo did hold a dominant position, though it only had a market share of 39%. *Wanadoo Interactive*, Commission Decision of July 16, 2003, ¶ 227 (link). The Commission reached this finding both based on the size and strength of Wanadoo’s main competitors, who all had market shares in between 6.5% and 16%. The Commission reached this finding both based on the size and strength of Wanadoo’s main competitors, who all had market shares in between 6.5% and 16%. *Id.* The issue of thresholds for finding dominance was not examined further by the CFI in Case T-339/04 *France Télécom SA v. Comm’n*, 2007 E.C.R. II-00521 (2007).

through hyperlinks and uniform resource locators (“URLs”).¹¹ For simplicity, this Essay refers to the internet as the physical communication system and to the web as all products and services that rely on this communication system.

The key innovations behind the internet started occurring in the early 1960s, and the key innovations behind the web came in 1989.¹² The commercial web began roughly in 1995 with the introduction of browsers that made web navigation easy for regular computer users; this therefore encouraged the formation of businesses geared to a mass audience. There was much prognostication in the late 1990s on how the web would evolve, and enormous optimism that it would lead to quick fortunes as network effects—more users make a site more valuable which leads to more users—propelled early entrants to monopolies.¹³ Those hopes were seemingly dashed in 2001, when the market caps of most web-based firms plummeted and vast numbers of these firms vanished.¹⁴ It became apparent that many of these firms had not developed business models that allowed them to make money from the visitors who came to their sites. In the aftermath of the burst bubble, though, a robust web-based economy has emerged that is creating completely new services, from social networking to behaviorally targeted advertising, and also disrupting many traditional businesses from media to telephony.¹⁵ As we will see below, advertising revenue for delivering traffic has become the major driver for a significant portion of the web economy.

A large portion of the population in industrialized countries touches the web-based economy daily. In 2007 55 percent of the population in the European Union¹⁶ and 71 percent of the population in the United States had

¹¹ Other internet services include online gaming, Voice-over-IP, email, instant messaging, file sharing, and other communication services. Most of these services are bundled into websites.

¹² See David C. Mowery & Timothy Simcoe, *Is the Internet a U.S. Invention?—An Economic and Technological History of Computer Networking*, 31 RES. POL’Y 1369, 1371–76 (2002).

¹³ See, e.g., CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 13 (1999) (“When the value of a product to one user depends on how many other users there are, economists say that this product exhibits *network externalities*, or *network effects* Technologies subject to strong network effects tend to exhibit long lead times followed by explosive growth. The pattern results from *positive feedback*: as the installed base of users grows, more and more users find adoption worthwhile.”) (emphasis in original).

¹⁴ See, e.g., Suzanne McGee, *New Economy Sours on Venture Capitalists*, WALL ST. J., Jan. 2, 2001, at R.6; *Easy.com easy.gone*, ECONOMIST, June 16, 2001, Special Section, A *Survey of the New Rich*, at 6–9; *Living in Freefall*, ECONOMIST, Nov. 18, 2000, at 117–18.

¹⁵ See Reply All Blog, *Is ‘Web 2.0’ Another Bubble?*, WSJ.com, Dec. 27, 2006, <http://online.wsj.com/article/SB116679843912957776.html> (link).

¹⁶ Internet World Stats, Internet Usage in the European Union, <http://internetworldstats.com/stats9.htm>, (last visited Apr. 19, 2008) (link). Population penetration is defined as the number of Internet users divided by the total population of the region. An Internet user is defined as “anyone currently in the capacity to use the Internet,” namely, that he has access to an Internet connection point and can use the technology. Internet World Stats does not adjust the figures to exclude children, illiterate people, or any other segment of the population.

access to the internet.¹⁷ In December 2007, 78 percent of all internet users in the United States and 69 percent worldwide used webmail;¹⁸ 39 percent of all internet visitors in the US and 47 percent worldwide used instant messaging.¹⁹ According to a year 2007 survey of Americans who frequently used the internet, 84 percent used a search engine.²⁰ The same survey found that the average respondent spent 33 hours per week on web products and services in 2007 compared with 16 hours viewing television.²¹

Web-based products and services are consumed primarily through the personal computer, which is the primary internet-connected device in most countries.²² However, it is widely expected that most mobile phones around the world will soon be connected to the internet.²³ This increased portability will increase the amount of time people can access the web because people usually have their mobile phones with them all the time. It will also increase the use of web-based products and services in lesser developed countries because mobile phones are less expensive than personal computers and more widely held.²⁴

One must be modest in speculating on the future evolution of the web. The internet and the web are very new technologies by historical standards.

¹⁷ Internet World Stats, Internet Penetration in North America: Nov. 2007, <http://www.internetworldstats.com/stats14.htm#north>, (last visited Apr. 19, 2008) (link).

¹⁸ comScore Media Metrix, data for December 2007, available at <http://www.marketingcharts.com/interactive/more-what-if-data-issued-on-yahoo-microsoft-combo-3362/> (link) (follow “In the email category, Yahoo mail leads both in the US (82 million visitors) and worldwide (257 million visitors)” hyperlink).

¹⁹ *Id.* (follow “A Microsoft/Yahoo combined instant messenger audience of 298 million would reach nearly 77% of the instant messenger audience worldwide.” hyperlink) (link).

²⁰ IDC, U.S. ONLINE CONSUMER BEHAVIOR SURVEY RESULTS 2007, PART I: WIRELINE INTERNET USAGE 1 (2007) (on file with author).

²¹ *Id.* at 52.

²² The major exceptions are Korea and Japan, where many consumers use their mobile phones to connect to the internet and where sophisticated web-based mobile phone services have been introduced. See Michael Fitzpatrick, *Why Mobile Japan Leads the World: A Combination of an Urban Lifestyle and Infrastructure Advantages Mean that the Fixed Internet is Being Left Behind by the Mobile*, THE GUARDIAN, Sept. 27, 2007, at Tech. News & Features 3, available at <http://www.guardian.co.uk/technology/2007/sep/27/guardianweeklytechnologysection.mobilephones> (link).

²³ See, e.g., Press Release, Ipsos, Mobile Phones Could Soon Rival the PC As World’s Dominant Internet Platform (Apr. 18, 2006), available at http://www.ipsos-na.com/news/act_hit_cntr.cfm?id=3049&Region=us&PDF_name=mr060418-1b.pdf (link); Press Release, comScore, Mobile Phone Web Users Nearly Equal PC Based Internet Users in Japan (Sept. 20, 2007), available at <http://www.comscore.com/press/release.asp?press=1742> (link); see also Darren Waters, *Why the Future is in Your Hands*, BBC News, Feb. 18, 2008, <http://news.bbc.co.uk/2/hi/technology/7250465.stm> (link).

²⁴ See *id.* Also, cell phone unit shipments were nearly 1.2 billion units in 2007 while the number of PCs shipped globally was just over 270 million. See Ann Steffora Mutschler, *SIA: 2007 global chip sales up modestly by 3% to \$256B*, EDN.com, Feb. 1, 2008, <http://www.edn.com/article/CA6527975.html?industryid=47037> (link); Press Release, Gartner, Gartner Says Worldwide PC Market Grew 13 Percent in 2007 (Jan. 16, 2008), available at <http://www.gartner.com/it/page.jsp?id=584210> (link).

One could not have reliably forecasted the development of electricity at a similar vantage point during its development. The recent dot.com bust teaches how wrong smart and financially motivated people can be about the business prospects of a new technology. Nevertheless, five features of the web-based economy appear to have emerged that are critical for understanding how this industry will evolve, the competitive strategies used in this sector and their implications ultimately for antitrust policy.

Many web businesses follow the traditional advertising-supported media model. Content is used to attract traffic. Access to that traffic is sold to advertisers. The content is usually made available for free so that advertising is the primary source of revenue and profits. Many of the leading web properties follow this approach.

Table 1 lists the top ten sites in the United States based on the number of pages of those sites that are viewed by visitors. All but three of these sites are primarily supported by advertising; Amazon and eBay are funded through transaction mechanisms while Wikipedia is funded by voluntary donations.

Table 1: Top 10 Properties (U.S.) January 2008.

Rank	Property	Unique Visitors (in thousands)
	Total Internet Audience²⁵	184,239
1	Yahoo! Sites	138,059
2	Google Sites	134,886
3	Microsoft Sites	119,297
4	AOL LLC	109,442
5	Fox Interactive Media	83,752
6	eBay	78,789
7	Amazon Sites	59,003
8	Wikipedia Sites	55,589
9	Time Warner - Excluding AOL	52,645
10	Ask Network	52,102

Source: Press Release, comScore, comScore Media Metrix Releases Top 50 Web Rankings for January (Feb. 18, 2008) at Table 3, available at <http://www.comscore.com/press/release.asp?press=2067> (link).

Google and Ask primarily sell advertising on their search results pages. AOL, Fox, Microsoft, Time Warner, and Yahoo primarily sell advertising on their various web properties. The emergence of the advertising-

²⁵ Properties include all of the sites owned by an entity, including search engines, international sites and sites acquired. For example, 'Google Sites' include google.com and other international homepages, search pages for specific categories such as news and images, applications such as Gmail, Google Maps and Google Earth, and sites owned by Google such as Picasa and YouTube.

supported media model for websites is one of the most significant changes since the dot.com bust and is the revenue source behind what is sometimes called Web 2.0.

Transaction platforms play a key role. The web has resulted in the development of a number of transaction platforms which reduce the costs of connecting buyers and sellers and consummating trades between them. These platforms earn most of their revenues and profits from transaction fees.²⁶ For example, although eBay began by helping consumers sell second-hand goods to other consumers who wanted to buy those goods, it has evolved into a broad platform for connecting consumers and businesses. Other e-commerce sites, such as Amazon have started moving from directly selling merchandise on their own behalf to providing a platform for connecting businesses and consumers.

Social networking is a critical innovation. Social networking has emerged as a new form of communication and interaction among individuals. MySpace, for example, has attracted 69 million users worldwide who post information about themselves on the site and use it to stay in contact with friends and to make new acquaintances. A related phenomenon is that a great deal of the “content” on the web is generated by users. Although sites such as YouTube, as well as MySpace and Facebook, rely on advertising to make money as traditional media firms do, they expend few resources on actually creating or purchasing any content themselves—they focus mainly on inducing others to provide this content.

*Demand and supply-side scale economies tend to lead to certain segments of the web being dominated, on a national and often global basis, by a few large firms.*²⁷ On the demand side, some web-based platforms create more value for each customer as they obtain more customers. A transaction platform such as eBay, for example, is more valuable to buyers because it has more sellers and more valuable to sellers because it has more buyers.

²⁶ These transaction platforms usually have integrated payment platforms. eBay has PayPal, Alibaba has AliPay, and Google’s commerce site has Google CheckOut. In 2007, 25 percent of eBay’s net transaction revenue came from the use of its payment platform, PayPal, rather than its auction platforms and communications segment (for example, Skype).

²⁷ A demand-side scale economy results when a product or service becomes more valuable as more people use it. Demand-side scale economies result from direct and indirect network effects. In the case of direct network effects, “the benefit to a network user depends directly on how many other users are hooked up to the network.” In indirect network effects, “the benefit to a user arises indirectly because the number of users of the network affects the price and availability of complementary products.” See DENNIS W. CARLTON AND JEFFREY M. PERLOFF, *MODERN INDUSTRIAL ORGANIZATION* 392–393 (4th ed., 2005). Supply-side scale economies result when the long-run average total cost of providing a good or service fall as the quantity of output increases. *Id.* at 36–40.

The mere fact that a firm has a large share of a segment does not necessarily imply that it has scale economies or network effects and in fact some of the shares discussed below are likely the result of the fact that these firms were just better than their rivals. However, for the reasons discussed below it is apparent that indirect network effects, and to a lesser extent cost-based scale economies, are important for these businesses.

Moreover, buyers and sellers appreciate being able to reach others across borders.

On the supply side, some web-based platforms—Google, for example—also incur significant fixed costs in developing and maintaining their software platforms and in acquiring computer server and storage capacity for their activities. The average cost of providing products and services is lower for larger platforms, which can amortize these fixed costs over a larger customer base. Demand and supply-side scale economies result in larger firms being able to offer greater value to consumers at lower costs, as discussed in more detail below. These scale economies do not necessarily result in a monopoly but they do tend to limit the number of viable firms in a segment.²⁸ In some segments, it is in fact unclear how many viable firms will remain and whether they will evolve towards monopoly.

Web-platforms support many web firms. These giant global web-based firms provide platforms for other web-based businesses. They make software services available so other businesses can provide complementary services. For example, the music service iLike.com and the online Scrabble platform Scrabulous are two of the most popular Facebook applications, raising the value of the Facebook platform as a whole. Google makes its popular mapping software available to developers who are writing applications based on Google's maps. Web-platforms also provide services that these businesses rely on. Many web-based small businesses depend on auction sites such as eBay or e-tailers such as Amazon to make sales. Most blogs rely on Google to sell ad space on their sites to advertisers who want to reach blog viewers.²⁹ These web-platforms are examples of the multi-sided platforms that we describe in more detail below. The web-based businesses that rely on these platforms provide complementary products and services that make the web platform more valuable and help drive revenue to it.

II. THE ECONOMICS AND TECHNOLOGY OF WEB-BASED BUSINESSES

A. *The Economics of Multi-sided Platforms*

Many of the key businesses that have arisen on the web are what economists call “multi-sided platforms.”³⁰ A multi-sided platform provides

²⁸ As firms become larger indirect network effects and scale economies from further expansion may diminish and congestion and managerial economies may counter the other benefits from size. Furthermore, multiple firms may coexist in a segment despite indirect network effects and scale economies if they can differentiate their products and services from each other.

²⁹ See, e.g., Posting of David S. Evans to Catalyst Code, <http://www.thecatalystcode.com/theconversation/blog/2007/08/06/economics-of-the-blogsphere/> (Aug. 6, 2007) (link).

³⁰ Multi-sided platforms are also called “two-sided markets” by economists even though they are not markets—at least as markets are defined in antitrust. See, e.g., Jean-Charles Rochet & Jean Tirole,

goods or services to two or more distinct groups of customers who need each other in some way and who rely on the platform to intermediate transactions between them.³¹ Multi-sided platforms usually lower transactions costs and thereby facilitate value-creating exchanges. They tend to arise when there is some value available from getting multiple sides together but transactions costs or other obstacles stand in the way. eBay, for example, drastically lowered the cost of exchange between buyers and sellers of second-hand goods.

Multi-sided platforms usually perform each of three interrelated core functions to some degree.³² First, they serve as matchmakers to facilitate exchange by making it easier for members of each group to find each other. That can be for love (matchmaker.com) or money (eBay). Second, they build communities (or audiences) because this makes it more likely that members of a group will find a suitable match. Facebook provides value in part because people are more likely to find people they want to meet and because advertisers can reach a large audience. The value of the platform grows as the audience grows. Third, they provide shared resources and reduce the cost of providing services to multiple groups of customers. This is an especially important characteristic of software platforms discussed below.

One key feature of multi-sided platforms is the presence of the “indirect network effects” mentioned earlier.³³ That means that the value that a customer on one side realizes from the platform increases with the number of customers on the other side. Consumers looking to buy something value a search engine more if it provides advertisements that are more relevant to their search, while companies value advertising on a search engine higher if they are more likely to reach potential consumers.

Another key feature is that multi-sided platforms must cater to multiple, distinct customer groups simultaneously. To establish a two-sided platform, for example, the founders must solve a chicken-and-egg problem: customers on Side A will not participate without customers on Side B, but customers on Side B will not participate without customers on Side A. YouTube had to pursue people who want to post videos, people who want

Two-Sided Markets: A Progress Report, 37 RAND J. ECON. 645 (2006) [hereinafter Rochet & Tirole, *Two-Sided Markets*]. Most web-based businesses are at least two-sided because they are transaction platforms (such as eBay, Amazon, Alibaba) which connect buyers and sellers, social networking sites (such as MySpace and Facebook) which connect friends, of advertising-supported sites (such as cnn.com as well as the social networking sites) which connect viewers and advertisers.

³¹ See David S. Evans, *The Antitrust Economics of Two-Sided Markets*, 20 YALE J. REG. 325, 328 (2003); David S. Evans, *Some Empirical Aspects of Multi-Sided Platform Industries*, 2 REV. NETWORK ECON. 191 (2003); Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1 J. EUR. ECON. ASS'N 990 (2003).

³² See David S. Evans & Richard Schmalensee, *The Industrial Organization of Markets with Two-Sided Platforms*, 3 COMPETITION POL'Y INT'L 158–59 (2007).

³³ See, e.g., Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 J. ECON. PERSP. 93 (1994).

to watch videos, and advertisers who want to reach these viewers. These features make the profit-maximizing calculus for a multi-sided platform more intricate than for a traditional business. A firm operating one of these platforms must consider the demands of all sides, the interrelationships between these demands, the costs directly attributable to each side, and the costs of running the platform.

Further complicating this calculus is the fact that the profit-maximizing prices for multi-sided platforms can result in users on one side getting a price that is less than the incremental cost incurred by a customer on that side, and even less than zero.³⁴ The side that is “needed more” or that is “harder to get” may receive a price break; conversely, the side that gets the most value out of access to members of the other side likely bears more of the cost.³⁵ As an empirical matter, many multi-sided platforms make their money from one side and make access to the platform available to another side for a price that does not cover the cost of provision.³⁶ Facebook, for example, is free to users and makes money by selling advertising.³⁷

There are several major classes of industries in which most if not all of the businesses are based on multi-sided platforms. These include advertising-supported media including newspapers, magazines, radio, television; payments including credit and debit cards; exchanges including auction houses, commodity exchanges and financial exchanges; and dating and matchmaking such as singles bars and matchmaking services. Another major class consists of industries that have software platforms as their underlying technology.³⁸ These include computer operating systems, mobile telephones, personal digital assistants, and video game consoles.³⁹ They also include many web-based businesses.

B. Software Platforms

A software program is a “platform” if it provides services that other web software can rely on. Typically a software platform includes modules of code that other software programs can access through application programming interfaces (“APIs”). By relying on these APIs software developers can obtain services that enable them to write software programs that are complementary to the software platform and useful to those who rely on the

³⁴ See Rochet & Tirole *Two Sided Markets*, *supra* note 30, at 659; Mark Armstrong, *Competition in Two-Sided Markets*, 37 RAND J. ECON. 668–70 (2006); Geoffrey G. Parker & Marshall W. Van Alstyne, *Two-Sided Network Effects: A Theory of Information Product Design*, 51 MGMT. SCI. 1494, 1498 (2005).

³⁵ See DAVID S. EVANS & RICHARD SCHMALENSEE, CATALYST CODE: THE STRATEGIES BEHIND THE WORLD’S MOST DYNAMIC COMPANIES 71–92 (2007).

³⁶ When there are more than two sides, at least one side must make money. *Id.*

³⁷ See About Facebook, <http://www.facebook.com/about.php> (last visited Apr. 23, 2008) (link).

³⁸ See generally DAVID S. EVANS, ANDREI HAGIU & RICHARD SCHMALENSEE, INVISIBLE ENGINES: HOW SOFTWARE PLATFORMS DRIVE INNOVATION AND TRANSFORM INDUSTRIES (2006).

³⁹ See *id.* at 1–2.

software platform. By relying on Facebook's APIs, Scrabulous provides a game for Facebook users and thereby makes Facebook a more valuable social networking site for those users.⁴⁰

Historically, a major type of software platform consisted of operating systems that run on personal computers or on servers that are nodes in an organization's network of computers. Software applications such as Microsoft Word that ran on operating systems were also installed on these desktop or server computers.⁴¹ The software platforms that are central to web-based businesses reside on servers that are attached to the internet. Moreover, applications that work with these platforms may reside on other servers that are attached to the internet. This has resulted in what is sometimes called "cloud" computing, in which the software platform, and possibly the application, primarily resides on several interchangeable computers that the individual user accesses through the internet. Google's search-based advertising platform is an example. The search engine that individuals use to conduct search queries, much of the software that advertisers rely on for advertising campaigns, and much of the software that publishers rely on for inserting advertisements into their web pages, reside on vast interconnected but indistinguishable "server farms" that Google operates around the world.

C. *The Interconnected Web Ecosystems: The Example of Google*

The economics and technology of web-based businesses has resulted in an ecosystem that consists of interconnecting multi-sided platform businesses—based on software platform technology—that provide services to each other, to many other web-businesses that depend on them, and to consumers. This pattern can be seen by starting with Google's advertising platform and considering the businesses that are connected to that node. The relationships are shown in Figure 1.

⁴⁰ The owners of Scrabble have objected to this take off on their game. See Heather Timmons, *Scrabble Tries to Fight a Popular Imposter at its Own Game*, N.Y. TIMES, April 7, 2008, at C7, available at <http://www.nytimes.com/2008/04/07/technology/07scrabulous.html?scp=1&sq=scrabulous&st=nyt> (link).

⁴¹ Operating systems are a type of software platform that manipulates the computer hardware in addition to providing code that supports other software and hardware applications.

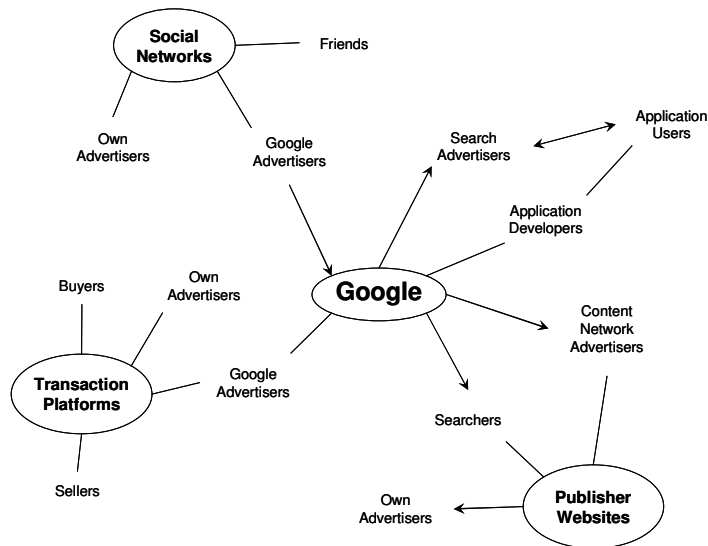


Figure 1: Google's advertising platform connections.

Google's advertising platform enables companies to insert ads based on keywords used in a search query, in which case the ad appears on the search-results page, or based on the keywords found in a website that belongs to Google's network of web publishers.⁴² Google's search engine makes money by drawing traffic to its search-results pages, where it sells and places advertising. That search engine also helps people find web-based businesses—including publishers and e-tailers—that are not paid advertisers. Those businesses benefit from Google's search engine, but Google does not charge them for being listed in the organic search results that appear on the left-hand side of the search-results page. Google also provides advertising services to web publishers. Those publishers make space available for Google to insert ads; Google sells that space to advertisers and pays the publishers a portion of its ad revenues.

Many of the entities that Google interconnects with are also multi-sided platforms. Web publishers operate two-sided platforms in which they use content to attract viewers and sell access to those viewers to advertisers. Many small publishers, including blogs, rely entirely on Google to sell their advertising space. Many large publishers use Google to sell some portion of their advertising space; some of them also have Google search boxes and receive payments from Google for advertising revenue that results from

⁴² See David S. Evans, *The Economics of the Online Advertising Industry* (Jan. 2008) (unpublished manuscript at 37), available at <http://ssrn.com/abstract=1086473> (link).

their visitors clicking on ads on Google's search results pages. Social networking sites are similar to web publishers in using advertising to make money. The site attracts traffic by providing social networking and makes money by selling that traffic—and data related to individual users—to advertisers through platforms such as Google. Google's advertising platform also intersects with eBay's transaction platform. eBay buys advertising on Google's search results pages to obtain leads to various products and services on eBay. In addition, eBay makes advertising space available to Google and receives payments in return.

Google makes its APIs available to software developers that are writing programs to provide other services. In return, Google reserves the right to insert advertising on those services. Since January 2007, developers have written around 20,000 “gadgets”—mini-applications that use the Google Gadgets API and can run on Google platforms (e.g. Google Calendar, iGoogle—a personalized Google homepage, Google Desktop, Blogger, Google Maps, Orkut), which can be embedded in any webpage, and can run on other third party applications (e.g. MyAOL)—which are used across 100,000 Web sites. Developers can also create map applications on their websites using the Google Maps API. For example, using the Google Maps API, Orbitz added “Orbitz Updates” to its site, a map which shows real-time user-reported weather, traffic, parking, and wait-line conditions at U.S. airports.

D. Scale and Dominance in the Web-Based Economy

The economics and technology of web-based businesses has resulted in the emergence of companies that have substantial shares in their categories in many countries globally.⁴³ These shares are partly the result of scale economies in production and indirect network effects for these multi-sided platforms.

⁴³ I am using the term “category” to refer to commonly known types of products or services such as social networking, portals, instant messaging, and auction-sites. These categories do not necessarily correspond to markets because products and services in one category can substitute to some degree for products and services in another category. Moreover, the extent of cross-category substitution can vary over time; for example, in my experience people are increasingly using social networking sites such as Facebook as their entry point when they sign on to the web rather than a traditional portal such as Yahoo.

Table 2 reports data on the two largest platforms in three representative categories:⁴⁴ online auctions, search-based advertising, and social networking for a number of countries.⁴⁵ These categories are highly concentrated in every country. Moreover, the search-based advertising and online auction categories are dominated by the same firm in most countries for which data are available. eBay is the largest auction site, with over 90 percent share of this category in all of countries for which individual data are available. Google is the leading search-engine provider with a share in excess of 80 percent in 7 out of 16 countries for which data are available and a share in excess of 50 percent in 12 out of 16 countries. Social networking does not have a single leader although the leading social networking site has more than a 50 percent share in most countries for which there are data.⁴⁶

⁴⁴ I have chosen these three because, as discussed below, they reflect the most important types of platforms for the foreseeable future. However, the same basic points apply to instant messaging, online payment systems, and web mail.

⁴⁵ These categories do not necessarily correspond to relevant antitrust markets and any analysis of market definition should properly consider the two-sided issues mentioned above. As noted below, these shares are based on categories as reported by comScore and may over or understate the true significance of the leading companies. First, the shares of the main search engine providers (Google, Yahoo, Microsoft, and Baidu) are understated because comScore includes searches that are done within websites such as eBay in its calculation of search shares, even though eBay is not generally used for internet searches. Second, the calculation of search query shares further understates the search revenue share for Google because Google earns a higher revenue per search than Microsoft or Yahoo. See Search Marketing Communications, <http://cohn.wordpress.com/category/revenue-per-visit/> (Feb 7, 2008) (link); Miguel Helft, *A Long-Delayed Ad System Has Yahoo Crossing Its Fingers*, N.Y. TIMES, Feb. 5, 2007, at C1.

⁴⁶ Facebook's implied market value after investments by Microsoft and Chinese billionaire Li Ka-shing is \$15 billion; that suggests that at least some investors are betting that Facebook will become the leading social network. See Suzy Jagger, *Li Ka-shing makes big impression on Facebook*, THE TIMES ONLINE, Mar. 29, 2008, http://business.timesonline.co.uk/tol/business/industry_sectors/technology/article3642805.ece (link); Thomas R. Eisenmann and Brian Feinstein, *Facebook Platform*, Harvard Business School Case Study N2-808-128 (Mar. 18, 2008), at 1.

Table 2. Shares of Market Leaders in Major Internet Platforms

Measure	Auctions Page Views		Search Searches		Social Networking Page Views	
	Leading Platform	Second Platform	Leading Platform	Second Platform	Leading Platform	Second Platform
Countries						
Argentina			Google 91%	Yahoo! 4%		
Australia			Google 79%	eBay 6%	MySpace 43%	Bebo 25%
Brazil			Google 90%	Yahoo! 2%	Google 98%	Fotolog 1%
Canada			Google 78%	Microsoft 6%		
China			Baidu 54%	Google 19%		
France	eBay 99%	Delcampe 0%	Google 82%	Microsoft 3%	Skyrock 78%	Facebook 7%
Germany	eBay 99%	Yatego GmbH 0%	Google 80%	eBay 6%	StudiVZ 43%	Schueler 12%
Hong Kong					Facebook 50%	Xanga 30%
India			Google 81%	Yahoo! 11%	Google 87%	Facebook 6%
Italy	eBay 99%	Bidplaza 0%	Google 85%	Telecom Italia 3%	Netlog 27%	Badoo 23%
Japan			Yahoo 49%	Google 41%	Mixi 62%	Google 14%
Malaysia					Friendster 58%	MySpace 25%
Mexico			Google 89%	Microsoft 4%		
New Zealand					Bebo 81%	Facebook 7%
Russia			Yandex 52%	Google 32%		
Singapore					Friendster 54%	Facebook 15%

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Spain	eBay 94%	MercadoL ibre 3%	Google 93%	Microsoft 2%	Fotolog 50%	Metro- flog 9%
South Korea			NHN 65%	Lycos 16%	CyWorld 97%	Paran.co m Club 0%
Taiwan					Microsoft 23%	Yahoo! 16%
UK	eBay 98%	Price-drop tv 0%	Google 74%	eBay 6%	Bebo 40%	Facebook 28%
USA	eBay 96%	Bidz 1%	Google 53%	Yahoo! 17%	MySpace 62%	Facebook 21%
Worldwide	eBay 57%	Taobao 14%	Google 62%	Yahoo! 13%	MySpace 17%	Facebook 15%

Sources: comScore, *MyMetrix Key Measures Report (Dec. 2007)*; comScore, *MyMetrix qSearch 2.0 Key Measures Report (Dec. 2007)*.

Notes: The search figures are shares as reported by comScore. They include searches on web sites where searches are primarily or exclusively used to search within the site rather than generally on the internet. They also include searches on sites where advertising is not featured. Shares of search engines used for general searches on the internet and shares of search engines relevant to search advertising will likely be higher than the shares reported here. Social networking shares are also as reported by comScore. They include blogging sites such as Blogger. If these sites are excluded, the shares of the market leaders would be higher.

The web-economy is still young compared to other industries. Some of the leading firms are not even a decade old. It remains to be seen whether they maintain their leadership and the extent to which other platforms, through differentiation, can survive. Yahoo has long been a leading portal and advertising platform, but its market value fell 33 percent between January 31, 2007 and January 31, 2008. Following this decline, Microsoft announced its desire to acquire Yahoo on February 1, 2008. Despite its past success and enormous user base, some analysts concluded that Yahoo could not succeed on its own.⁴⁷ Other web giants have also encountered problems. The growth of eBay has slowed, and the company was undergoing a

⁴⁷ See, e.g., Michael Liedtke, *Microsoft Woo Yahoo?*, ST. PAUL PIONEER PRESS, Feb. 12, 2008, at C1; Grouchy Geek, <http://grouchygeek.blogs.fortune.cnn.com/2008/02/01/yahoo-needs-microsofts-help/> (Feb. 1, 2008, 11:56 EST) (link); Claudine Beaumont, *Fading Yahoo! Needs Microsoft rescue*, THE TELEGRAPH, Feb 2, 2008, <http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2008/02/01/bcnmicro601.xml> (link).

shakeup in management in early 2008. It faces increased competition from Amazon, Google, and other web properties that provide transaction platforms for businesses. The capital markets have also expressed profound uncertainty over Google's growth. Its share price fell by 34 percent between January 2, 2008 and April 17, 2008, the day it announced its first quarter earnings.⁴⁸ Google reported a 30 percent increase in quarterly profits that day and its stock increased by 23 percent by April 22, 2008.⁴⁹

III. COMPETITION AND REGULATORY POLICY

Antitrust scrutiny of the leading web-based platforms from around the world was, and is, inevitable. This scrutiny has come, so far, either through self-initiated investigations by competition authorities, through complaints by their diverse stakeholders, or through complaints by their rivals.⁵⁰ These web-platforms have large shares of the segments in which they operate. While one can debate whether these segments correspond to well-defined antitrust markets, the competition authorities and complainants may take these categories as a starting point. Under European Community law, a firm can be considered dominant with a share as low as 40 percent.⁵¹ Many of these platforms have segment shares that exceed 80 percent in many countries. The European Commission suggested, in its case against Microsoft, that such "super-dominant firms" should receive even greater scrutiny; some observers believe that the Court of First Instance has agreed with the Commission in its Microsoft judgment.⁵² Under U.S. law, firms that have market shares in excess of 60 percent are often considered to have monopoly power.⁵³ Although it has become more difficult for plaintiffs to prevail

⁴⁸ See Google Finance, Google Inc., <http://finance.google.com/finance?q=NASDAQ:GOOG> (follow "compare" hyperlink, then follow "Zoom: 6m" hyperlink, then track the dates and corresponding share prices on the graph). In fact, Google's stock price had been stumbling since November, 2007. See Posting of *Jim Kerstetter* to CNET Tech News Blog, http://www.news.com/8301-10784_3-9920376-7.html (Apr. 16, 2008, 11:06 PDT) (link).

⁴⁹ See Google Finance, *supra* note 48; Press Release, Google, Google Announces First Quarter 2008 Results (April 17, 2008), available at http://www.google.com/intl/en/press/pressrel/revenues_q108.html (link).

⁵⁰ In keeping with the global focus of this article "complainants" is used to refer to parties that complain to a competition authority as well as plaintiffs in private actions, which is the dominant form of antitrust enforcement in the United States.

⁵¹ See *British Airways, PLC v. Comm'n*, 2003 E.C.R. II-5917, ¶¶ 211, 223-25; *Wanadoo Interactive*, Commission Decision of July 16, 2003, ¶ 227 (link).

⁵² See Renata B. Hesse, *Microsoft and the Court of First Instance: What Does it All Mean?*, GLOBAL COMPETITION POLICY, Oct. 3, 2007, <http://www.globalcompetitionpolicy.org/index.php?id=562&action=907> (link); Harry First, *Strong Spine, Weak Underbelly: The CFI Microsoft Decision*, GLOBAL COMPETITION POLICY, Sept. 28, 2007, <http://www.globalcompetitionpolicy.org/index.php?id=555&action=907> (link).

⁵³ See Gerald F. Masoudi, Deputy Assistant Attorney Gen., Antitrust Div., U.S. Dep't of Justice, Some Comments on the Abuse-of-Dominance Provisions of China's Draft Antimonopoly Law, Address Before the University of International Business and Economics Competition Law Center Conference on

on various monopolization theories in the United States, the case law on tying products together and offering discounts for bundles of products continues to provide significant opportunities for plaintiffs to pursue cases.

The existence of indirect network effects and scale economies means these platforms are competing in “winner-take-all” and “a few winners take all” markets. That leads to aggressive struggles to win market share at the expense of rivals. Competition authorities worry and rivals complain, however, when “tough” business tactics succeed in reducing the rivals’ sales, thereby “foreclosing” them from the market. Complicating matters, competition authorities and courts have difficulty distinguishing pro-competitive from anti-competitive business practices for multi-sided platforms. For example, as mentioned previously, multi-sided platforms often charge prices that are below cost to customers on one or more sides of the platform. In some circumstances these low prices drive out competition as a result of what business strategists refer to as “envelopment.”⁵⁴ Rivals who lack the money-making side of the platform that subsidizes the money-losing product cannot survive.

Several competition and regulatory issues are likely to arise in the coming years as a result of this antitrust scrutiny and given the probable evolution of the web-based economy.

The emergence of impregnable monopolies. There are likely to be concerns over the seeming monopolization of certain segments. It is possible that the web-economy will see a constant churning of its leading players. The fact that eBay and Yahoo have lost their once seeming impregnability is consistent with the view that dominance is fleeting. However, the evolution of the web-economy thus far is also consistent with the evolution of other industries in which it takes time for the winners to emerge.⁵⁵ If so, it is possible that a handful of firms will have near-monopoly positions in certain segments and that those positions will be protected in part by indirect network effects and the scale economies resulting from the ability to average fixed software and hardware costs across larger communities. American antitrust policy recognizes that such monopoly is the reward for successful investment and innovation.⁵⁶ European Community (EC)-based competition policy views competition as the more desirable

Abuse of Dominance: Theory and Practice, (July 21, 2007), available at <http://www.usdoj.gov/atr/public/speeches/225357.htm>.

⁵⁴ See Thomas R. Eisenmann, Geoffrey Parker & Marshal W. Van Alstyne, Platform Envelopment (Harv. Bus. Sch. Tech. & Operations Mgt. Unit, Working Paper No. 07-104, 2007) (manuscript at 3), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=996852 (link).

⁵⁵ See David S. Evans, Daniel D. Garcia Swartz & Bryan G. Martin-Keating, *The Failure of E-Commerce Business: A Surprise or Not?* 3 EUR. BUS. ORG. L. REV. 1, 7 (2002); Michael Gort & Steven Klepper, *Time Paths in the Diffusion of Product Innovations*, 92 Econ. J. 630, 331 and Table 3 (1982) (on the decline in number of firms).

⁵⁶ See *Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 407 (2004).

outcome, and when that is not possible, it imposes significant obligations on the dominant firm.⁵⁷

Leveraging into adjacent markets. The structure of the web ecosystem makes it likely that dominant firms will seek to move into related markets for complementary products or services. Because these firms are based on software platforms it is relatively easy to add new features and services. For example, Google introduced its Google Checkout payment service in competition with PayPal by extending its software platform, integrating code into Google Product Search and bundling Google Checkout for merchants into AdWords for advertisers. Moreover, the leading web platforms often provide complementary services. It is a well-established economics proposition that a monopoly could make greater profit if it also owned complementary monopolies or if it could replace these complementary monopolies with competitive markets.⁵⁸ Therefore, assuming that competition is not feasible, we would expect the dominant firms to attempt to establish monopolies across more segments than is true today. That could happen through mergers or through one dominant firm challenging another, as Google is doing with eBay.

Access to facilities. Access to the other platforms and to the intellectual property that enables one platform to work together (“interoperate”) with another are likely to be raised when, as is the case in the European Community, the law is conducive to do so.⁵⁹ One set of issues concerns access to a “closed platform.” The Apple iTunes/iPod platform is largely closed. Apple does not encourage—and indeed seeks to prevent—other music stores from making music available for iPods or for other device makers to play music from iTunes. Although it could obtain indirect network effects from an open strategy, it has chosen a tightly integrated business software-hardware model. This issue is central to the recent European Community cases against Apple.⁶⁰ Other platforms close themselves in par-

⁵⁷ Firms that are dominant are subject to the provisos of Article 82 EC Treaty which has been interpreted to prohibit various forms of tying, refusals to deal, bundled price rebates, pricing below cost, and other activities. See RICHARD WHISH, *COMPETITION LAW 202–208* (5th ed., 2004) (discussing examples of abuse of dominance). In many of these cases the practices are essentially prohibited per se if the firm is dominant—has a share of an antitrust market that is higher than forty percent or so. See *British Airways, PLC v. Comm’n*, 2003 E.C.R. II-5917, ¶¶ 211, 223–25; *Wanadoo Interactive*, Commission Decision of July 16, 2003, ¶ 227.

⁵⁸ See Michael A. Salinger, *Introduction to Chapters VII and IX of Augustin Cournot, Mathematical Principles of the Theory of Wealth*, 4 *Competition Policy Int’l* 274, 280–82 (2008) (“Today, the fundamental distinction between horizontal and vertical effects is widely accepted by antitrust practitioners.”).

⁵⁹ The OpenGroup, a consortium that aims to facilitate interoperability, explains that interoperability is the ability to both exchange information and to use it. “Without a way to exchange information ... [sic] high-tech systems literally can’t communicate with each other. And, if they can’t communicate, they can’t work—interoperate—with each other.” The Open Group, *Interoperability Matters*, http://www.opengroup.org/bus_area/interoperability/info1/IBinfo1.htm#what, (last visited Apr. 10, 2008).

⁶⁰ See Keith Regan, *iTunes Draws Ire of EU Commissioner*, *MACNEWSWORLD*, Mar. 13, 2007, <http://www.macnewsworld.com/story/56255.html> (link); Eric Bangeman, *EU Commissioner Criticizes*

ticular dimensions. Facebook, for example, does not allow search engines to crawl its website, and as a result, the content on this social networking site is not available to searchers.

Another set of issues relates to portability of data. Web platforms derive benefits from the data they collect in a variety of ways. eBay's "Feedback Forum" provides quality information on sellers that is valuable to buyers. Users input a great deal of valuable personal information into social networking sites such as MySpace and Facebook. Google retains data on search queries that it can use to refine searches and deliver ads. In these cases one could imagine competitors seeking access to this information under an "essential facilities" theory under European Community law.⁶¹ One could also imagine competition policy cases over restrictions that prevent users from exporting their data to competing sites. This battle has already begun, as Facebook rivals are currently lobbying publicly for the portability of social networking data.

Tying and bundling. As the current spate of cases suggests, it is probable that leading web platforms will face complaints over tying of various forms.⁶² It is also a common business strategy for software platforms to expand by adding features. They face low marginal costs for doing so, they can sometimes provide efficiencies by integrating features together or making it easier for consumers to obtain them more conveniently, and they can aggregate demand over users who may value one feature but not another.⁶³ The D.C. Court of Appeals found that it was appropriate to apply a rule-of-

iPod-iTunes Tie-in, ARS TECHNICA, Mar. 11, 2007, <http://arstechnica.com/news.ars/post/20070311-eu-commissioner-criticizes-ipod-itunes-tie-in.html> (link).

⁶¹ "[T]he essential facilities doctrine imposes liability when one firm, which controls an essential facility, denies a second firm reasonable access to a product or service that the second firm must obtain in order to compete with the first." *Alaska Airlines, Inc. v. United Airlines, Inc.*, 948 F.2d 536, 542 (9th Cir. 1991). For a review of the implementation of the essential facilities doctrine by the European Union, see James Turney, *Defining the Limits of the EU Essential Facilities Doctrine on Intellectual Property Rights: The Primacy of Securing Optimal Innovation*, 3 NW. J. TECH. & INTEL. PROP. 179 (2005) (link).

⁶² For example, in September 2007, The European Court of First Instance (CFI) upheld the European Commission's accusations against Microsoft of illegal tying of the Windows Client PC Operating System and Windows Media Player. See Case T-201/04, *Microsoft v. Comm'n*, 2007 ECJ CELEX LEXIS 554 (Sept. 14, 2007). Further, in January 2008, the Commission opened an investigation into the alleged tying of Internet Explorer and other software products to the Windows PC operating system. See Memorandum from the European Commission, Antitrust: Commission Initiates Formal Investigations Against Microsoft in Two Cases of Suspected Abuse of Dominant Market Position (Jan. 14, 2008) available at <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/19>. The Commission has also censured Apple for its tying of the iPod music player and the iTunes Music Store. See Regan, *supra* note 60; Bangeman, *supra* note 60.

⁶³ See EVANS, HAGIU & SCHMALENSEE (2006), *supra* note 38, at ch. 11. Demand aggregation is most easily seen with newspapers: many people only read portions of the newspapers; however, by offering various features readers find enough content to persuade them to subscribe to the newspaper.

reason legal standard to tying for software platforms⁶⁴ because of the possibility that there were particularly compelling efficiency explanations for the practice in this situation.⁶⁵ Whether the U.S. courts treat the web-based companies as software platforms, however, remains to be seen; these companies have different business models and practices than Microsoft did with Windows, which was the subject of the D.C. Circuit decision. Moreover, the European Community's Court of First Instance has re-affirmed the Community's formalistic approach to tying in the Microsoft judgment.⁶⁶

Envelopment and predation. Multi-sided platforms are a bit like clumsy giants stepping on other creatures as they move through the ecosystem. Although they may crush competitors intentionally, this may also happen as a natural byproduct of legitimate pricing and design decisions. Multi-sided platforms—and this is particularly true with the leading web platforms—give many features and services away, often for the purpose of attracting traffic. They can readily crush companies that charge for features and services they offer for free. But it is not only the little guy that faces concern from this strategy. Google Checkout can undercut eBay's PayPal because Google, unlike eBay, can obtain more advertising revenue from having an efficient payment method and can secure data that it can use to target ads better. Likewise, Google's ability to subsidize software with advertising poses a threat to Microsoft and other software companies that charge for software; Microsoft is moving rapidly into online advertising just so that it can have a source of revenue similar to a key rival. Nevertheless, one would expect that tying, bundling and pricing strategies that foreclose rivals will lead to competition policy investigations and prosecutions.

CONCLUSIONS

At the inception of most new industries, hundreds of firms enter.⁶⁷ They battle it out over time. A few winners usually emerge—firms that have secured scale economies or that have benefited from superior management or both. This pattern has been repeated numerous times over the course of the second industrial revolution that started after the U.S. Civil War. Consider the automobile industry. It began with the invention of the automobile by Karl Benz in 1885. The first commercial automobile company in the United States was Duryea, which entered the market in 1893. As of 1908, 253 automobile companies were competing in the U.S. This

⁶⁴ “A rule-of-reason analysis requires first checking whether the facts of a given case suggest that anti-competitive tying is a possibility and then weighing those anti-competitive effects with the benefits resulting from a tying policy.” See David S. Evans, A. Jorge Padilla & Michele Polo, *Tying in Platform Software: Reasons for a Rule-of-Reason Standard in European Competition Law*, 25 WORLD COMPETITION 509, 514 (2002).

⁶⁵ See *United States v. Microsoft Corp.*, 253 F.3d 34, 93 (D.C. Cir. 2001).

⁶⁶ See Christian Ahlborn & David S. Evans, *The Microsoft Judgment and its Implications for the Competition Policy Towards Dominant Firms in Europe*, ANTITRUST L. J., (forthcoming 2008).

⁶⁷ See Gort & Klepper, *supra* note 55 at 631.

was whittled down to the big four—General Motors, Ford, Chrysler, and American Motors—by 1960. Many other industries followed a similar course.

Antitrust scrutiny often follows consolidation. The leaders in the industry have large market shares, which, under longstanding antitrust practice, makes them vulnerable to claims of unlawfully maintaining or acquiring a monopoly or running afoul of other antitrust laws that have a market power screen. AT&T was hit with its first major antitrust case in 1911, twenty-six years after it opened the first telephone exchange. IBM faced its first antitrust case forty-seven years after it received patents for the punch card machine.

We can expect the web-based industries will follow the same trajectory, and thus far they have. Massive entry has taken place. As with many new industries, we remember the YouTubes that succeeded but we forget that Google Video and hundreds of other start-ups tried and quickly failed. There are some differences, though, which suggest more antitrust controversy will result, sooner. The first is speed. Although the notion of “Internet Time” may have been exaggerated, it is true that web-based firms can achieve leading positions in many countries around the world very quickly. The second is complexity. Almost all of the leading web-based firms have intricate multi-sided business models. The third is interconnectedness. The web-economy is interconnected, which leads to dependencies and rivalries that can create conflict and antitrust complaints.

As a result, the competition authorities and courts will have a challenging set of issues to deal with concerning the web-based economy in the years to come. The future will bring merger cases as firms seek to consolidate to achieve economies of scale and indirect network effects; refusal-to-deal cases as closed platforms deny others access to their communities; predation cases as rivals complain about “free” offerings that foreclose if not destroy them; tying cases as platforms use software platform technologies to add features and functions which in some cases will foreclose their rivals; and exclusive dealing cases as platforms lock up traffic to achieve indirect network effects. Courts and competition authorities should exercise care in balancing the need to protect long-run social welfare against the need to stop anti-competitive strategies in this highly dynamic and complex part of the economy.