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Excessive Litigation by Business Users of Free Internet-Platform Services

David S. Evans*

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Abstract

In the last decade a number of Internet-based multi-sided platforms have emerged that provide free services to, in some cases, millions of businesses. More such platforms are being spawned as the Internet-based economy grows. This Article argues that under current norms in adversarial proceedings, such as those involving competition policy, these platforms are likely to face large numbers of complaints in multiple jurisdictions, a substantial likelihood that at least one of these complaints will result in a false-positive decision against the platform, and material risk of a false-positive decision that results in catastrophic consequences. These effects result from a combination of business users of free services receiving a free litigation option they can pursue if they have any complaints; an adverse-selection problem that results from free services being particularly attractive to start-ups that do not have or want to invest capital in their businesses; and the sheer number of free-business users resulting in a high cumulative probability of at least one false-positive decision. After documenting these phenomena, this Article argues that government policymakers, including competition authorities and courts, should adopt a heightened level of scrutiny concerning complaints from free business users. This heightened level of scrutiny is necessary to counteract the impact of excessive litigation on innovation by multi-sided platforms.

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I. INTRODUCTION

Over the last several decades many multi-sided platforms have emerged that provide free services to large numbers of businesses worldwide. These include the Apple and Android mobile operating systems; the Google, Baidu, Yahoo, and Bing search engines; the Facebook, Twitter, and Google+ social networks; and the PayPal X payments software development platform. The number of businesses that receive free services from these platforms range from the thousands in the case of PayPal to the tens of millions in the case of Google.

More than 37 million businesses, public figures, brands, and charities had, for example, Facebook fan pages with 10 or more fans at the end of 2011.[1] Companies use these pages to communicate with their fans and attract new ones. McDonald's, for example, had more than 12 million fans as of the beginning of 2012.[2] Facebook does not charge these entities for having fan pages.

Businesses that receive free services sometimes object when the platform takes actions that these businesses perceive reduce the value of the free services to them. In some cases their ire has resulted in private litigation, complaints to competition authorities, lobbying for government investigations, and advocating regulation of the platform. A common complaint by business users is that the platform has violated various competition laws. Baidu, Facebook, Google, Microsoft, and Twitter have, for example, all faced complaints by business users of their free-platform services that allege these platforms violated the competition laws[3] of the various jurisdictions.[4]

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[1] Facebook Inc., Registration Statement (Form S-1), at 75 (Feb. 1, 2012).

[2] Fans could, among other things, go to McDonald's fan page and play "The Quest for the Golden McRib." That was one of the ways the hamburger chain used its fan page to engage people and promote its products. McDonald's Facebook page, http://www.facebook.com/McDonalds (last visited Feb. 21, 2012).

[3] In addition to laws against monopolization (Section 2 of the U.S. Sherman Act) and abuse of dominance (Article 102 TFEU), competition laws for the purpose of this article include unfair competition, and deceptive practices, such as under Section 5 of the Federal Trade Commission Act (FTC Act), Ch. 311, §5, 38 Stat. 719, *codified at* 15 U.S.C. §45(a), various US state laws such as the California Unfair Competition Law, laws of various EU Member States concerning unfair competitive practices, and similar laws in other jurisdictions.

[4] The following cases involve allegations by business users of free multi-sided platform services that the platform violated the competition laws, often as well as other laws, of one or more jurisdictions. *See*, *e.g.,* Opinion by Beijing No. 1 Intermediate

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The volume of complaints over free platform services is likely to increase. The number of businesses that use existing free platform services is growing. For example, the number of smart phone applications for the iPhone and Android software platforms increased by about 75 percent between 2010 and 2011.[5] Around 28 percent of iPhone Apps and 57 percent[6] of Android applications do not generate any revenue for the platform.[7] More multi-sided platforms are likely to start as a result of the

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People's Court, Civil Case No. Yizhongminchuzi 845/2009 [Renren v. Baidu]; Case T-201/04 R, Microsoft v. Comm'n, [2004] E.C.R. II-4463 (alleging Baidu reduced Renren's website search rankings in violation of the Chinese Anti Monopoly Laws); *KinderStart.com*, *LLC v. Google, Inc*., No. C 06-2057 JF (N.D. Ca. Mar. 16, 2007) (alleging Google reduced Kinderstart's website search rankings in violation of Section 2 of Sherman Act); Complaint, Sambreel Holdings LLC vs. Facebook, Inc., No. 12 CV 0668 W KSC (S.D. California, March 19, 2012) (alleging Facebook sought to reduce user and advertiser use of the Sambreel's Yontoo Platform in violation of U.S. and California competition laws). *See also* Jhon Ribeiro, *Facebook Faces Antitrust Suit From Advertisement-Sponsored Skins Developer*, PCWORLD (Mar. 20, 2012), *available at* http://www.pcworld.com/businesscenter/article/252189/facebook_faces_antitrust_suit_from_advertisementsponsored_skins_developer.html; Aldridge v. Microsoft Corp., 995 F. Supp. 728 (S.D. Texas, 1998); Aldridge v. Microsoft Corp., 995 F. Supp. 728 (S.D. Texas, 1998). Jeff Bliss & Brian Womack, *FTC Begins Twitter Antitrust Inquiry*, BLOOMBERG (July 1, 2011), http://www.bloomberg.com/news/2011-07-01/ftc-said-to-have-begun-antitrust-inquiry-into-twitter-s-developer-policies.html (concerning FTC investigation over Twitter's policies toward developers).

[5] From about 330,000 in 2010 to about 575,000 in 2011. Dean Takahashi, *Apple's App Store crosses 300,000 apps,* VENTUREBEAT (Oct. 16, 2010), http://venturebeat.com/2010/10/16/apples-app-store-crosses-300000-apps.html (last visited Mar. 13, 2012); Robin Wauters, *Google: Android Market now serving 30,000 apps,* TECHCRUNCH (Mar. 16, 2010), http://techcrunch.com/2010/03/16/google-android-market-now-serving-30000-apps.html (last visited Mar. 14, 2012); Stan Schroeder, *Apple's 500,000 Approved iOS Apps by the Numbers*, MASHABLE (May 24, 2011), http://mashable.com/2011/05/24/app-store-500000-apps (last visited Mar. 13, 2012); David Goldman, *Taking down the Apple and Google smartphone duopoly*, CNNMONEY (Mar. 10, 2011), http://money.cnn.com/2011/03/09/technology/wac_wholesale_applications/index.htm (last visited Mar. 16, 2012). The numbers are estimates as Apple and Android do not make the number of apps publically available. *See* Robin Wauters, *Google: Android Market now serving 30,000 apps,* TECHCRUNCH (Mar. 16, 2010), http://techcrunch.com/2010/03/16/google-android-market-now-serving-30000-apps.html (last visited Mar. 16, 2012); Brennon Slattery, *App Overload: Apple Passes 300k Apps ,* PCWORLD (Oct. 18, 2010), http://www.pcworld.com/article/208070/app_overload_apple_passes_300k_apps.html (last visited Mar. 13, 2012).

[6] Robin Wauters, Distimo: 57% of Andriod Apps Are Free Vs. 28% of iPhone Apps, TECHCRUNCH (Mar. 21, 2012), http://techcrunch.com/2010/07/05/distimo-june-2010/ (last visited April 2, 2012).

[7] Apple and Google charge developers a commission for sales of paid applications through their respective stores. *See* iOS Developer Program: Program Enrollment,

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spread of broadband, the rise of cloud computing, and advances in other technologies. Some of these will provide free platform services to businesses. The global reach of the leading platforms means that the complaints by business users will occur in many jurisdictions around the world; that in turn will result in uncoordinated and differing approaches by these regulators and ensuring uncertainty which could depress investment in these platforms.

It is ironic that giving services away could lead to so much contention. But it is not surprising. Several of these platforms have large shares in the categories of service they provide in many countries. Those metrics provide a starting point for complainants to argue that these platforms are dominant firms with significant market power.[8] These platforms also provide business users with access to customers thereby making it possible for complainants to argue that these platforms are essential facilities or should be treated under a common carrier standard and subjected to regulation.[9] Multi-sided platforms, and the businesses that use them, sometimes offer services that have ostensible similarities so that complainants can argue that the effect, and the motive, for the changes in business practices is to exclude competitors and thereby monopolize a market.[10]

Some or all of these claims could be true in particular circumstances. This Article argues, however, that successful multi-sided platforms that provide free business services are subject to "excessive litigation"[11] that can

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https://developer.apple.com/support/ios/enrollment.html (last visited Feb. 23, 2012); Android Market for Developer: Transaction Fees, https://support.google.com/androidmarket/developer/bin/answer.py?hl=en&answer=112622 (last visited Feb. 23, 2012).

[8] *See, e.g.*, Consumer Watchdog Complaint, Request for Investigation, Injunction, and Other Relief, In the matter of Facebook, Inc. and Facebook Credits (Jun. 28, 2011), *available at* http://www.consumerwatchdog.org/resources/cwd_ftc_facebook_credits_complaint-3.pdf, at 2 ("Facebook is the largest and by far the dominant social network on the planet. Approximately half of the U.S. population actively uses Facebook. While Facebook has not disclosed revenue data, it is estimated that Facebook controls well over 50% of the market for virtual goods offered in social gaming. Thus, Facebook exercises *monopoly power* in that market.").

[9] *See* Class Action Complaint at 19, *KinderStart.com, LLC v. Google, Inc*., No. C 06-2057 JF (N.D. Cal. Mar. 16, 2007).

[10] For example, KinderStart, a site that curated content related to parenting, claimed that it competed with Google in search. *See* Second Amended Class Action Complaint at 7, *KinderStart.com, LLC v. Google, Inc*., No. C 06-2057 JF (N.D. Cal. Mar. 16, 2007).

[11] Excessive litigation means more litigation than is socially optimal. A socially optimal legal system will result in "bad" complaints—ones that an all-knowing power would recognize are not valid—simply because the legal system has imperfect information and transactions costs. The problems identified here result in more bad complaints being brought. If the legal authorities fail to account for these effects, there will be more false

result in false-positive decisions as a result of three mutually reinforcing phenomena.

The first phenomenon involves the litigation option. Businesses that use platform services obtain an option to sue that platform or to advocate policies that could impose significant costs on the platform.[12] As the platform becomes more successful there is an increasing chance that courts or competition authorities would find that the platform is a dominant firm or that legislators would find appealing arguments that the platform should be regulated or otherwise restrained. Moreover, as the platform becomes more successful the business user has a higher chance of obtaining damages, the benefits of behavioral remedies imposed on the platform, or concessions and money from the platform as part of a settlement. The value of the litigation option therefore increases with the success of the platform.

The second phenomenon concerns large numbers. Several of the web-based multi-sided platforms attract millions of businesses. That is a consequence of their global reach, the types of services they are offering, and the attractiveness of free services. As the size of the affected population increases, a larger number of businesses are likely to believe they have been negatively affected by changes in platform policies concerning free services and pursue litigation or other adversarial proceedings. Moreover, it only takes one successful claimant to impose substantial costs on a multi-sided platform. If a claimant can persuade a competition authority, for example, to pursue a claim the platform could be subject to years of investigation and distraction of management time. Each claimant can impose a low probability of a catastrophic event such as a decision by a competition authority or court to break up the firm or subject it to long-term oversight or regulation. Multi-sided platforms can therefore face relatively high probabilities of catastrophic events as these low probabilities are aggregated across more potential claimants.

The third phenomenon is adverse selection. Free-platform services are, all else equal, relatively more attractive to entrepreneurs that cannot secure

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positives (that is, wrong findings of guilt), which would discourage investment in free platform services and induce platforms to avoid improvements desired by users simply because it might harm some firms' business models. Previous papers have compared the social and private incentives to sue, e.g., Steven Shavell, *The Social Versus the Private Incentive To Bring Suit in a Costly Legal System*, 11 J. Leg. Stud. 333 (1982), and have noted that private incentives may lead to too much or too little litigation. However, Shavell's model assumes that courts never make errors in assigning liability and that loss prevention activities by the defendant are always socially desirable. In contrast, this article examines factors specific to free platform services that lead to more bad complaints, and stresses the danger that false positives can cause in such a context.

[12] Buyers always have an option to sue for product liability, breach of contract, or other legal theories. The difference here is that buyers are obtaining that option for free.

funding. Investors are more likely to fund entrepreneurs that have better prospects of success. As a result, platforms that provide free services will tend to attract entrepreneurs that are relatively more vulnerable and relatively more likely to fail. Free platform services are also relatively more attractive to entrepreneurs who are less confident in their own prospects for the same reasons. They have to put up less of their own money when they rely on free platform services. They will tend to sort themselves into businesses that involve less financial commitment. These entrepreneurs are also more likely to fail assuming that their expectations on their prospects are correct. As a result of adverse selection, the businesses that rely on free platform services are more likely to encounter business problems. Some of these businesses may seek to obtain compensation or beneficial changes in the platform's terms by pursuing a government intervention by, for example, filing an antitrust complaint or threatening to do so.[13]

These three phenomena compound each other. Applied to a very large population of businesses the use of the litigation option combined with the adverse-selection problem can result, on average, in many opportunistic complaints that consume management time, that result in a significant likelihood of one or more false-positive decision against that platform, and pose a material risk of a catastrophic decision.

Multi-sided platforms may engage in anticompetitive practices or unfair business practices behavior just like any firm. Competition authorities, for example, should therefore maintain vigilance over these firms given their economic significance. The litigation option, adverse selection and large number phenomena suggest, however, that public authorities should be more skeptical of businesses whose complaints stem from using free services provided by multi-sided platforms. In particular, it implies that courts and competition authorities, for example, should impose a heightened standard of review for these complaints in order to better balance false positives and false negatives.

This heightened review is desirable because it reduces the negative feedback effect between adversarial proceedings and business behavior. The adverse selection and large number phenomena increase the likelihood that offering free business services will result in a false positive decision by governmental bodies with catastrophic consequences. At the margin, those combined phenomena deter platforms from providing free business services or making efficient changes in their free business services. Heightened review helps reduce those negative incentives. It reduces the value of the

[13] There are many reasons why well-funded highly able businesses may find it profitable to use free platform services. The point here is that the offer of free platform services will tend to attract entrepreneurs that lack funding and that these entrepreneurs would be expected *a priori,* to have less successful businesses.

option value of litigation and therefore reduces the incentives for entrepreneurs to rely excessively on free platform services.

This Article explains these three phenomena and how they lead to excessive litigation (or other government interventions) against multi-sided platforms that provide free business services. It also proposes an approach that competition authorities and courts could use for reducing the social welfare losses from these phenomena. The principles behind this heightened review could be applied in other settings including legislative considerations of whether to impose common carrier regulation or adversarial proceedings involving unfair business practices.

Section II summarizes the economic motivations for providing platform services for free, or at a price that is less than the cost of providing them. In most cases, the services are provided for free because they help attract other platform participants that pay. Section II also documents that multi-sided platforms provide free services to large numbers of businesses.

Section III describes two businesses that follow similar business models but made diametrically opposed decisions on relying on free platform services—in this cases search engines. It then examines how businesses balance the benefits of using a free platform against the risks of the platform changing the terms of the deal. It shows how this can result in an adverse selection problem by which platforms attract entrepreneurs that have high likelihoods of failure.

Section IV describes the litigation option, large number and adverse selection phenomena in more detail. It shows how these phenomena work together to make multi-sided platforms vulnerable to many complaints by users of free business services.

Section V presents empirical support for the litigation option, large number, and adverse-selection phenomena. It is based on an analysis of companies that have complained that Google has violated the competition laws by altering search rankings or the presentation of search results for these companies.

Section VI considers the interaction between the adverse selection, litigation option and large number phenomena on social welfare. It shows that the combination of these three phenomena could impose significant costs on the economy as a result of reduced innovation.

Section VII proposes imposing a heightened burden on businesses that bring antitrust complaints stemming from their use of free business services. The approach involves adjusting judgments on the merits of complaints given the adverse selection, litigation option and large number problems and using multiple objective criteria for fine-tuning decisions on procedure and merit. While this Article focuses on antitrust complaints the heightened review presented in that context could be applied in other adversarial

settings as well.

Section VIII makes some concluding remarks.

II. MULTI-SIDED PLATFORMS AND FREE SERVICES

A multi-sided platform provides a place for people and businesses to find each other, engage in interactions, and exchange value.[14] A shopping mall operator, for example, provides a place for stores and shoppers to get together and transact. After developing the mall, it rents out space to stores and encourages shoppers to visit.[15] Many other industries provide services based on multi-sided platforms. Payment card networks such as American Express provide platforms that enable merchants and cardholders to transact. Media businesses such as *The New York Times* help connect buyers (viewers) and sellers (advertisers). Software platforms such as the Android OS help connect users, hardware markers, and applications developers.[16] Social networks typically provide a place for senders and receivers of messages to interact; enable advertisers to present messages to these senders and receivers; and make the social graph available to application developers such as social game providers.[17]

Multi-sided platforms generate value by reducing transactions costs between members of two or more groups that could benefit from getting together. They do that by reducing the costs of finding trading partners, increasing the quality of the matching between these partners, and lowering the costs of exchange. A shopping mall does that by reducing the travel costs for shoppers who can visit several stores in trip and reducing the cost of obtaining customers for the retail stores that benefit from the aggregation of customers. Sometimes the reduction in transactions costs results directly

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[14] *See* David S. Evans & Richard Schmalensee, *The Industrial Organization of Markets with Two-Sided Platforms*, *in* 1 ISSUES IN COMPETITION LAW AND POLICY 151 (W. Dale Collins ed., 2008); Glen E. Weyl, *A Price Theory of Multi-Sided Platforms*, 100(4) AM. ECON. REV. 1642 (2010).

[15] Shopping malls can be physical places such as Simon Properties' Copley Place mall in Boston or virtual places such as the Payvment mall on Facebook. Payvment provides software that enables merchants to operate stores on their fan pages on Facebook. It then makes these virtual stores available on the Payvment fan page on Facebook which then operates as a virtual mall. *See* Shopping Mall by Payvment, http://www.facebook.com/payvment?v=info (last visited Feb. 22, 2012).

[16] INDUSTRIAL ORGANIZATION AND THE DIGITAL ECONOMY, 32 (Gerhard Illing & Martin Peitz eds. 2006).

[17] *See*, *e.g.*, Facebook Developers, http://developers.facebook.com (last visited Feb. 22, 2012).

or indirectly in the provision of new products and services. Software platforms such as Windows have lead to the creation of innovative applications while media properties such as CBS have spawned innovations in entertainment for the purposes of attracting viewers.

The cost of creating a multi-sided platform has declined substantially as a result of the information-technology revolution. The expansion of the Internet, the increased deployment of broadband and wireless, reductions in hardware costs, and advances in software technology have lowered the cost of creating virtual platforms for connecting people and businesses. It has also made it possible for web-based platforms to expand globally very quickly.

Each distinct group served by a multi-sided platform is often called a platform "side". For instance, retailers and shoppers are the two "sides" of the shopping mall platform. It is common for platforms to offer services to members on one side for free or at prices that do not recover the direct variable costs of providing these services as shown next.

A. Free Platform Services

Facebook provides many services for free. As of early 2012 there were more than 800 million active users each month.[18] These users had access to web pages created by Facebook and a variety of tools that helped them communicate with their friends on Facebook. The typical user has about 130 friends[19] and spends on average 7 hours and 46 minutes a month[20] on Facebook. They do not pay anything for these services. Most major companies have set up fan pages[21] for which they pay nothing.[22] Facebook also operates a software development platform that enables companies to develop applications that use the social graph.[23] As of January 2012 more than 7 million applications and websites were integrated into Facebook.[24] Facebook does not, as a general matter, charge developers

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[18] Facebook Newsroom, Company Info, Fact Sheet, Statistics, http://www.facebook.com/press/info.php?statistics (last visited Feb. 22, 2012).

[19] *See Friends & Frenemies: Why We Add and Remove Facebook Friends,* NM Incite (Dec. 19, 2011), http://www.nmincite.com/?p=6051(last visited Mar. 10, 2012).

[20] *August 2011 – Top US Web Brands,* Nielsen Wire (Sept. 30, 2011), http://blog.nielsen.com/nielsenwire/online_mobile/august-2011-top-us-web-brands (last visited Mar. 15, 2012).

[21] Facebook Pages, http://www.facebook.com/pages/learn.php (last visited Feb. 22, 2012).

[22] Facebook Media Kit, Building Your Business with Facebook Pages, *available at* http://ads.ak.facebook.com/ads/FacebookAds/FB_PagesGuide_MediaKit_051611.pdf.

[23] *See* Facebook Developers, *supra* note 17.

[24] Facebook, Inc., Registration Statement (Form S-1), at 75 (Feb. 1, 2012).

for access to its platform. As of 2012 Facebook had two primary sources of revenue. It sells advertising spots on its page.[25] It also requires social games that use Facebook to accept payments using Facebook's virtual currency (Facebook Credits) and takes 30 percent of the credits when they were redeemed.[26]

Free is a common price for multi-sided platforms.[27] The following are examples:

- Access to physical and online shopping malls are free to shoppers.
- Access to APIs for many software development platforms, and the ability to sell the resulting applications for use with that platform, are often free to developers.
- Online search engines are free to the user.
- Listing services such as the "yellow pages" are free to the user.
- Transaction services for credit and debit cards are usually free for consumers or even subsidized with reward points.
- Many media are free to the user including free-television, free-radio, various free magazines and newspapers, and most web-based media.
- Receivers of money from money transmittal platforms do not pay.
- Press-release distribution services are free to media services.

Other platforms offer a price to one side that, while positive, does not typically exceed the marginal cost of serving those customers and therefore does not generate incremental profit. Examples include:

- Video game consoles sold to consumers.
- Many newspapers and magazines.
- Liquidity providers on financial exchanges.

Not all multi-sided platforms have unbalanced pricing structures. Some magazines such as *People Magazine* earn significant revenues from

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[25] It sells targeted ads and charges advertisers a fee for every click the ad receives.

[26] *See* Platform Policies: Facebook Credits Terms, http://developers.facebook.com/policy/credits ("When you redeem Credits with us we will redeem them at the rate of $0.10 per Credit, less a service fee of $0.03 per credit redeemed.") (last visited Feb. 22, 2012).

[27] *See* David S. Evans, *Some Empirical Aspects of Multi-sided Platform Industries*, 2(3) REV. NETWORK ECON. 191, 195 (2003).

both subscribers and advertisers[28] and dating platforms such as eHarmony charge men and women the same prices.[29]

B. Economic Reasons for Free Prices

In the one-sided markets traditionally studied by economists, the profit-maximizing price is always greater than or equal to the marginal cost of production.[30] Economists have identified various exceptions to this rule.[31] Businesses sometimes price below cost to attract customers that will either buy profitable products when they visit the store or will become repeat customers who will buy profitable products in the future. Businesses may produce several complementary products. It is possible that a firm could maximize profit by selling one product at below marginal cost to stimulate the purchase of the complementary product at above marginal cost; this is the famous razor-blade strategy.[32] Businesses could also price below cost for predatory reasons.[33] However, it is uncommon to observe products that are being provided for free for sustained periods of time in one-sided markets.

In multi-sided markets, economists have shown that the profit-maximizing price for one side can be below marginal cost including at or below zero as a matter of theory.[34] As a matter of fact, for many multi-sided platforms the price on at least one side is at or below marginal costs.[35]

Profit-maximizing prices can be at or below zero for one side because the low price attracts users on that side who increase the demand by the

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[28] *See* DAVID S. EVANS & RICHARD SCHMALENSEE, CATALYST CODE: THE STRATEGIES BEHIND THE WORLD'S MOST DYNAMIC COMPANIES 105 (2007).

[29] eHarmony Membership Options, http://www.eharmony.com/singles/servlet/about/membership (last visited Feb. 22, 2012).

[30] See Dennis W. Carlton & Jeffrey M. Perloff, MODERN INDUSTRIAL ORGANIZATION 58-59 (4th ed., 2005) (stating that price equals marginal cost under perfect competition); *id.* at 89-93 (proposing that price is greater than marginal cost under monopoly).

[31] *See* David S. Evans, *Antitrust Economics of Free*, 7(1) COMP. POL'Y INT'L 71 (Apr. 2011).

[32] *See* Randal C. Picker, *The Razors-and-Blades Myth(s)* (Univ. of Chicago Law & Econ., Olin Working Paper No. 532, 2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1676444.

[33] Patrick Bolton, Joseph P. Brodley & Michael H. Riordan (2000), *Predatory Pricing: Strategic Theory and Legal Policy*, 8 GEO. L.J., 88, 2239-2330 (2000).

[34] *See, e.g.,* Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1(4) J. EUR. ECON. ASS'N 990 (2003); Mark Armstrong, *Competition in two-sided markets*, 37(3) RAND J. ECON. 668 (2006). Schmalensee has shown for two of the leading models of two-sided markets that these below-cost prices arise when the demand functions of the two sides are sufficiently different from each other *See* Richard Schmalensee, *Why is Platform Pricing Generally Highly Skewed?*, 10(4) REV. NETWORK ECON. 1274 (2011).

[35] *See* Evans, *supra* note 27, at 191, 193.

other side. A newspaper, for example, gets more revenue from advertisers when it lowers its subscription price because it has more readers that advertisers want to reach. So long at the extra profit that it picks up from advertisers exceeds the profit that it loses from subscribers it will make more money. Following this logic, newspapers and magazines often charge readers less than the marginal cost.[36] Some physical newspapers—especially local ones in the United States—are given away for free.

Several factors influence whether the customers on one side get the platform product or service for free. If customers on side A are particularly valuable to customers on side B the platform has an incentive to invest in acquiring the customers on side A so it can sell them to side B. It may acquire these customers by providing valuable services for free.

The relative elasticity of demand also plays a role. Customers on side A might have more elastic demand (perhaps because they have many low-cost substitutes for the service being provided available) than customers on side B. Increasing prices above zero would result in the loss of many side A customers which would then make the platform much less valuable to side B. In this case the increase of revenue from imposing fees on side A is likely to be lower than the decrease in revenue from side B which has access to many fewer side A customers.

Customers on side A might be able to make the decision on which platform customers on side B must use. Some authors have argued that this is the case for payment cards.[37] The consumer decides which card to pay with at the store and the merchant may have to take this card if it wants to make a sale. It is profitable to subsidize the consumer to get them to use the platform's card and make up the losses from the merchant.

Multi-sided platforms face challenges in starting up that may also require them to begin by making one side free.[38] Often, platforms must have both sides on board to have a viable product. An exchange must have both buyers and sellers, a heterosexual dating venue must have both men and women, and a payment network must have senders and receivers of money. Moreover, they must have enough members on both sides to create value. Some customers may be willing to come on board at the beginning because

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[36] *See* Ulrich Kaiser & Julian Wright, *Price Structure in Two-Sided Markets: Evidence from the Magazine Industry*, 24 INT'L J. INDUS. ORG. 1, 13-14 (2006); Patrick Van Cayseele & Stijn Vanormelingen, *Prices and Network Effects in Two-Sided Markets: The Belgian Newspaper Industry* 21 (Working Paper May 27, 2009).

[37] *See, e.g.*, Özlem Bedre-Defolie & Emilio Calvano, *Pricing Payment Cards* (ESMT, Working Paper No. 10, 2010).

[38] *See* David S. Evans, *How Catalysts Ignite: The Economics of Platform-Based Start-Ups*, *in* PLATFORMS, MARKETS AND INNOVATION 163 (Annabelle Gawer ed., 2009); David S. Evans & Richard Schmalensee, *Failure to Launch: Critical Mass in Platform Businesses*, 9(4) REV. NETWORK ECON. 1 (2010).

they are unusually optimistic that the number of customers on the other side will grow, because they are early adopters, or just curious. But to keep these customers the platform has to grow. If it does not grow then customers on each side will leave, making it more difficult to attract new customers, and leading the platform to contract. A platform must adopt pricing that achieves a critical mass of customers quickly enough to lead to ignition rather than implosion.[39] That may require adopting a zero price. Once competing platforms have adopted a zero price it may be difficult for any of them to deviate significantly from it.

The optimal price to one side may be negative. In some cases it may be possible to offer rewards for joining or using a platform. Many credit cards in the United States offer rewards. Consumers do not pay anything to make a transaction and also receive rewards. As a result consumers are paying a negative price for making a transaction. Some search engines have provided financial incentives to engage in commercial search.[40] More commonly, platforms compete for users by providing valuable services. Free television stations do not charge for people viewing their shows and, moreover, compete in acquiring and developing shows that will attract an audience.

C. Open versus Closed Platforms

The decision to make a platform free to customers on one side is closely related to the choice the platform makes concerning how open it is. A platform is fully closed if no one can use it without authorization while a platform is fully open if there are no barriers to using it. Most platforms fall between these two extremes. Everyone can get into a shopping mall but not every store can rent space even if they are willing to pay for it.

A platform that wants to charge for using its platform must have gating mechanisms for preventing those who have not paid from getting access to its platform. Video game consoles platform providers such as the Sony PlayStation require game developers to enter into contracts to write games for their consoles. The game developers agree to pay royalties for games they sell for the console and in return are given access to the platforms software code as well as other information that helps facilitate writing games for the console. Dating venues such as nightclubs may charge for admittance and may even exclude people who are willing to pay.

A platform that wants to make access to its platform free does not necessarily need gating mechanisms. It may want to invest in making the

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[39] *See* Evans & Schmalensee, *supra* note 28, at ch 4.

[40] *See, e.g.*, iRazoo, http://www.irazoo.com (last visited Feb. 22, 2012). *See generally* David S. Evans, *The Online Advertising Industry: Economics, Evolution, and Privacy*, 23(3) J. ECON. PERSPECTIVES 37 (2009).

barriers to using its platform as low as possible and even provide subsidies in kind to getting on board the platform. Facebook provides developers with free access to its software platform as well as information and tools to help developers create applications. Shopping malls are usually completely open to the public and ones in suburbs often provide free parking to help lower the cost of coming to the mall.

Platforms usually retain the ability to exclude customers even when they have decided to make the platform open and free to these customers.[41] For example, Facebook does not charge people for Facebook pages but it can exclude people who engage in prohibited behavior such as using fake identities or engaging in hate speech.[42]

D. Free Services for Businesses

Businesses often comprise at least one side of multi-sided platforms. In some cases multi-sided platforms adopt business models, including pricing structures, in which businesses on one side of their platforms do not pay for obtaining access to the platform, using services provided by the platform, or interacting with users on the other sides of the platform. Businesses get everything for free or below cost.

Multi-sided software platforms commonly offer free services to business users.[43] A software platform acts as an intermediary between developers of applications and users of those applications. The platform makes code available to application developers through "application programming interfaces" (APIs) and provides them with "software development kits" (SDKs). These APIs and SDKs help developers write applications that work on the platforms and therefore provides them to people that want to use applications on the platform. The availability of these applications makes the platform more valuable to users.

Computer operating system providers such as Apple and Microsoft provided free or low cost access to APIs and SDKs to stimulate the production of applications for their platforms. The creations of "killer applications" such as VisiCalc for Apple's operating system and Lotus 123 for Microsoft's operating system helped drive the success of those platforms. The Apple iOS and Android OS software platforms for mobile

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[41] *See generally* David S. Evans, *Governing Bad Behavior by Users of Multi-Sided Platforms*, 27(1) BERKELEY TECH. L. J. (forthcoming Spring 2012).

[42] *See* Facebook Statement of Rights and Responsibilities, http://www.facebook.com/legal/terms (last visited Feb. 22, 2012).

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

phones have followed a similar approach. Developers of free applications pay little for access to those platforms.[44]

Many Internet-based platforms have also created APIs and SDKs to help developers create applications for their users. Typically, the software platform that helps developers reach users is just one part of their business; that is, they have appended a software platform to add a developer side to another multi-sided platform. Social networks such as Facebook and LinkedIn, for example, have developed software platforms that enable developers to access their social graphs. Payments systems such as PayPal have also created APIs that allow developers to access their payments features and their users.[45]

Search engines also typically provide free services to websites including those operated by businesses. They identify these websites, include them in the search engine database, index them using sophisticated algorithms, and enable users to find content from these websites (and links to them) in response to search requests. They typically provide websites with code and directions for helping the search engine index the content on their sites.[46] The search engines typically do not charge websites anything for these services.

Businesses obtain value from these free platform services. Application developers obtain code that reduces their cost of development. More importantly, they obtain access to customers. Websites obtain the ability to make themselves known to a global audience of searchers. In fact, businesses can earn significant profits as a result of receiving free platform services. Two extreme cases in which startups that obtained free platform services had achieved multi-billion market capitalizations illustrate the point.

Lotus 123 was the leading spreadsheet software for personal computers from the early 1980s until the early 1990s. It relied on Microsoft's MS-DOS and Windows software platforms. Microsoft did not charge Lotus 123 for the ability to use its platforms. Lotus also developed other software applications for personal computers that relied on free access to the software platform. Lotus was sold to IBM for $3.54 billion in 1995.

Zynga, which started in April 2007, developed several social games for Facebook including Farmville, Cityville, and MafiaWars. These games had more than 200 million active monthly users by November 2011. Zynga

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[44] *See* iOS Developer Program: Program Enrollment, *supra* note 7.

[45] *See* David S. Evans & Richard Schmalensee, *Innovation in Payments*, *in* MOVING MONEY: THE FUTURE OF CONSUMER PAYMENTS 36 (Robert E. Litan & Martin Neil Baily eds., 2009).

[46] *See, e.g.*, Bing Webmaster Tools, http://www.bing.com/toolbox/webmaster (last visited Feb. 23, 2012).

used the Facebook software platform to develop these games. Facebook users could install these games and play. Zynga made money by selling virtual goods. Facebook did not charge Zynga anything for access to its platform until April 2010 at which point it effectively imposed a tax of 30 percent on Zynga's revenues from selling virtual goods on its games on Facebook. After going public in late 2011 Zynga had a market capitalization of more than $7 billion.

Modern multi-sided platforms have attracted very large numbers of businesses to their free services. Table 1 provides a summary for selected platforms. It reports approximate numbers when they are available and rough orders of magnitude when they are not. In many cases there is data on the number of applications; some businesses may write multiple applications. While the figures in the table do not provide a precise count of businesses that use free services of multi-sided platforms, they show the likely range goes from the hundreds to thousands to the many millions.

Table 1: Free Business Users of Multi-Sided Platforms

Platform	Number of Businesses Applications	Example
Microsoft Windows	4 million[47]	TurboTax
Facebook Software Platform	More than 550 thousand active applications[48]	Zynga's Farmville
Facebook Fan Pages	37 million with 10 or more likes[49]	Lady Gaga
Search Engines (Baidu, Bing, Google, and Yahoo)	Tens of millions[50]	PYMNTS.com
Google Android	450,000[51]	Out of Milk
Apple iOS	500,000[52]	Angry Birds
PayPalX	1000s[53]	Rentalics
Twitter Broadcasts	1000s	Discover Card
Twitter Software Platform	1 million[54]	Twitscoop

III. THE PLATFORM DEPENDENCY DECISION

Building a business based on free services from a multi-sided platform sounds like a good deal as the examples above illustrate. But it carries risk.

[47] Ina Fried, *Live-blogging Steve Ballmer*, CNET (Jan. 6, 2010), http://www.cnet.com/8301-31045_1-10426723-269.html.

[48] http://en.wikipedia.org/wiki/Facebook_Platform. This figure was from 2010. Facebook does not currently report a separate number on active applications.

[49] *Id.*

[50] *February 2012 Web Server Survey,* NETCRAFT, http://news.netcraft.com/archives/2012/02/07/february-2012-web-server-survey.html (last visited Mar. 10, 2012).

[51] Andy Rubin, *Android@Mobile World Congress: It's all about the ecosystem*, GOOGLE (Feb. 27, 2012), http://googlemobile.blogspot.com/2012/02/androidmobile-world-congress-its-all.html.

[52] The iPhone App Store, http://www.apple.com/iphone/built-in-apps/app-store.html (last visited Mar. 8, 2012).

[53] Damon Hougland, *PayPal X Developers Driving Innovation*, PAYPAL BLOG (May 25, 2010), https://www.thepaypalblog.com/2010/05/paypal-x-developers-driving-innovation.

[54] Jennifer Van Grove, *Twitter's Ecosystem Now Includes 1 Million Apps*, MASHABLE (July 11, 2011), http://mashable.com/2011/07/11/twitter-1-million-applications.

Understanding this will become important for analyzing the adverse selection problem in the next section.

Consider a hypothetical entrepreneur, Jill, who has developed the recipe for an incredible tasting burger. She opens Jill's Awesome Burger (JAB) restaurants. JAB does not invest any money in marketing or advertising. Instead it uses social media—primarily Facebook—to get the word out that JAB is the place to go for the finest burger on the planet. JAB acquires 50 million Facebook fans in the United States in its first three years in business. JAB can send messages to these fans on a regular basis. Advertising and marketing usually comprise a significant portion of costs for consumer brands.[55] JAB can profitably offer lower prices and better service because it avoids those costs.

JAB's business has, however, become dependent on its ability to use Facebook. It bears risk.[56] Facebook could make changes that could sharply reduce JAB's ability to reach its fans. The social network could decide that people are getting too many unwanted messages and therefore reduce the ability of an entity to reach its fans; limit the availability of data for privacy reasons; or charge companies with fan pages significant fees to help increase Facebook's earnings.

JAB is in a very different position than McDonald's. Operating a fan page is just one of many things that McDonald's does to promote its restaurants. Over the decades it has invested in a brand. In addition to advertising it invested in the quality of its food and restaurants thereby attracting new customers and retaining old ones. Of course, McDonald's has made these investments over half a century and during its first four decades it did not have access to search engines, social networks, or other large free platforms for making itself known. Many new consumer businesses, however, continue to use methods other than free online services to establish their brand images and attract customers.[57]

Entrepreneurs starting business in the Internet age face decisions on how much they want to depend on multi-sided platforms and the free

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[55] *See* George Bittlingmayer, *Advertising*, LIBRARY OF ECONOMICS AND LIBERTY, http://www.econlib.org/library/Enc/Advertising.html.

[56] This is not a problem unique to multi-sided platforms or to free business services. Firms buy goods and services from other firms as a matter of course. They face the threat that the terms of trade could change against them. Prices of supplies could rise or become unavailable. A trading partner could turn into a competitor. Businesses manage these hazards through multiple sourcing of supplies and producing critical components themselves. Multi-sided platforms magnify these reliance issues, for the reasons discussed in the introduction, and therefore warrant the focused analysis in this article.

[57] *See* JOHN BURNETT, CORE CONCEPTS OF MARKETING 201, 203, 207-211 (1st ed. 2008), *available at* http://globaltext.terry.uga.edu/userfiles/pdf/Core%20Concepts%20of%20Marketing.pdf.

services they provide.

A. Yelp versus Angie's List

A comparison between Angie's List and Yelp—two businesses that rely on consumer reviews of local businesses—highlights the different choices entrepreneurs make concerning relying on free services from open platforms.

Yelp has a platform that consists of "the contributors who write reviews, the consumers who read them and the local businesses they describe."[58] At the end of 2011 it had 22 million reviews, 529,000 business locations, and 61 million unique visitors.[59] Consumers do not pay for visiting the site and businesses do not pay for listings on the site. Although Yelp pays people to do reviews when it enters a market[60] it mainly relies on consumers to write reviews on their own.[61] Yelp makes money from selling advertising on its web pages to local businesses. For example, the Yelp.com page for plumbers in Boston has a Yelp ad for Roto-Rooter at the top of the page.[62]

Consumers use Yelp.com to find out about local businesses. Yelp lists the businesses in a category, provides a rating (on a scale of 1-5 stars) based on the reviews they have for each business, and provides contact and location information. Consumers could get to the relevant page for local businesses by typing in Yelp.com in their browser.[63] Once the website comes up they could then search for the particular type of business they are interested in a search bar at the top of the Yelp.com page. They could also use a search engine to find out about a particular kind of business. The search results might provide a link to a Yelp.com web page with information. Clicking on the link would then take the consumer to that page.

The consumer experience differs depending on whether the consumer conducts a search or goes to the site directly. Consider looking for a Greek restaurant in Boston. Under the direct method, the consumer types in Yelp.com in their browser. They then type in "Greek restaurant" in the search bar in Yelp; they also select Boston if they are a first-time user.

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[58] Yelp! Inc., Registration Statement (Form S-1), at 47 (Nov. 17, 2011).

[59] *Id.*, at 61.

[60] Jeremy Stoppelman, Comment to *Why Yelp Works,* NEW YORK TIMES BLOG (May 13, 2011, 1:30 PM), http://bits.blogs.nytimes.com/2008/05/12/why-Yelp-works/#comment-198253.

[61] Yelp! Inc., Registration Statement (Form S-1), *supra* note 59, at 1.

[62] YELP, http://www.Yelp.com/c/boston/plumbing (last visited Mar. 10, 2012).

[63] The user might also conduct a navigational query with search by typing in yelp.com in the search toolbar. This would take them to a link for the yelp.com home page.

Yelp provides a list of Greek restaurants in the Boston area. Before this list it also provides a series of choices for narrowing down the choice by area, price, and other considerations.

Under the search method, the consumer types in Greek restaurant Boston in their search engine. With Google the consumer is presented with a link to a Yelp.com page on the first page of search results. Clicking that link takes the consumer to a web page that lists the top Greek restaurants including a featured restaurant, provides links to search by various features, and provides a longer list of Greek restaurants.

As it turns out, the majority of visits to Yelp.com result from people conducting searches. In February 2012, a leading source of web data, compete.com, reports that about 62 percent of the traffic to Yelp.com came from search.[64] That is not surprising. Yelp has not invested significantly in branding or other activities to persuade consumers to go directly to Yelp.com.[65] Yelp's large quantity of searchable reviews tends to increase its search rankings. Like other businesses that rely on search engines it has invested in "search engine optimization" to increase its rankings.[66]

The consumer may also save time and get better results by conducting a search query than going directly to yelp.com. It takes fewer keystrokes to obtain information from search (type "Greek restaurant Boston" in search, type "enter", press "click") than directly (type "Yelp.com" in browser, type "enter", type "Greek restaurant Boston," type "enter").[67] Although the user has to locate the link in the search results Yelp has succeeded in getting its link placed high in the search results and is therefore highly visible. Consumers may prefer the web page Yelp presents following a search since it highlights several restaurants at the top rather than presenting the long list provided in response to a search on the Yelp.com page.

Yelp's design, investment, and other business choices therefore reflect a decision to rely very heavily on non-navigational[68] referral traffic from general search engines.

Angie's List has taken a different approach.[69] The company helps

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[64] Compete.com PRO Database, February 2012. Some of these search queries could have involved navigational queries.

[65] The majority of its sales and marketing expenses are for acquiring local businesses as customers. Yelp! Inc., Registration Statement (Form S-1), *supra* note 58 at 49 (Nov. 17, 2011). Its S-1 filing does not mention incurring significant costs for the acquisition of consumers.

[66] *See* SEOmoz, http://www.seomoz.org/ (last visited Mar. 10, 2012).

[67] It also takes fewer key strokes to conduct an informational query than a navigational query using the search toolbar.

[68] Navigational search traffic results when a user types in the URL or name into the search engine instead of entering the URL into the browser.

[69] *See* Angie's List, Inc., Registration Statement (Form S-1), at 2, 3 (Nov. 2, 2011).

consumers purchase services such as "home remodeling, plumbing, roof repair, health care and automotive care … [that] are typically expensive and carry a high cost to the consumer if performed poorly." It has done this by recruiting members who pay for access to the reviews written by other members and have the opportunity to write reviews themselves. As of September 2011, Angie's List had roughly 1 million members and earned 38 percent of its revenue in the first nine months of 2011 from those members. Unlike Yelp, Angie's List has adopted an approach where consumers pay for access, and in which the consumers provide a significant source of revenue.

Angie's List does not rely significantly on search engines. Its content is behind a pay firewall and is therefore not directly accessible from search engines. Links to the company's website do appear in organic search results—for example in response to "plumber review"—but clicking on the result link takes the user to a page that offers the user the opportunity to join as a member. During February 2012, 34 percent of the visits to Angie's List came from search.[70]

Unlike Yelp, Angie's List relies heavily on advertising to recruit consumers. Its television and radio commercials emphasize how consulting its directory can steer the consumer towards excellent contractors (e.g., as one of its ads highlights, the plumber who takes the dog out for a walk while the housewife is delayed coming home) and away from unscrupulous ones (e.g., as one of its ads highlights, the house painter who watches adult movies while on the job as the housewife discovers from her cable bill). According to a financial filing in preparation for its IPO,[71]

> Our membership growth has been driven largely by our national advertising strategy, which resulted in our marketing expense of $30.2 million and $48.0 million in 2010 and the nine months ended September 30, 2011, respectively. We continue to scale our investment in advertising to grow our membership base. In 2010 and the nine months ended September 30, 2011, our revenue was $59.0 million and $62.6 million, respectively.

Angie's List also earns revenue from advertising but has taken a different approach than Yelp. Members grade businesses on a scale of A-F. Angie's List solicits advertising from businesses that received grades of A or B. Of the 815,000 businesses with reviews as of September 2011, 26 percent had grades of A or B and, of those, 10 percent purchased advertising. This advertising accounted for the other 62 percent of Angie's

[70] Compete PRO Database, January 2012.
[71] Angie's List, Inc., Registration Statement (Form S-1*), supra* note 69, at 1.

List revenues for the first nine months of 2011.

Angie's List and Yelp took very different approaches towards developing enterprises based on consumer reviews of local businesses. Yelp chose to rely on search engines to attract consumers while Angie's List chose to focus on investing in its brand and reputation.

What's behind businesses making such diametrically opposed decisions?

B. The Tradeoffs on Platform Reliance

There are benefits and costs in relying on a platform even if it is providing those services for free. A rational entrepreneur would consider these tradeoffs in deciding on the extent to which they should rely on free platform services. It would choose the optimal degree of reliance based on these considerations. Businesses make different decisions concerning the degree of reliance based on how they evaluate these tradeoffs.

There are two major benefits of working with a platform. The entrepreneur obtains access to customers that constitute another side of the platform. PayPal X developers have access to the over 100 million active account holders and to the 9 million businesses[72] that accept PayPal online for payment. That access dramatically reduces the cost of acquiring customers.

The other benefit is that the entrepreneur often obtains the ability to use some set of assets that facilitate providing services to those customers. Software platforms, for example, include access to APIs, software tools, and information that enable developers to write applications. These assets could result in relatively low capital costs for starting a new business.

These benefits are readily seen in the development of applications for mobile devices. Developers obtained access to the 29 million iPhone users and 46 million Android users in the US at the end of 2011.[73] They also obtained development tools such as software development kits and instructional materials. Developing an application for iOS and Android operating systems requires virtually no capital and relatively little labor.

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[72] X.Commerce, *X.Commerce Press Kit*, https://www.x.com/corporate/newsroom/media-resources (last visited Mar. 15, 2012).

[73] comScore, *comScore Reports December 2011 U.S. Mobile Subscriber Market Share* (Feb. 2, 2012), *available at* http://www.comscore.com/Press_Events/Press_Releases/2012/2/comScore_Reports_December_2011_U.S._Mobile_Subscriber_Market_Share (last visited Mar. 16, 2012). Developers pay a nominal fee for inclusion in the iPhone Store (30% of sales, no hosting or marketing fees) and Android Marketplace (30% of application price). *See* iOS Developer Program: Distribute, https://developer.apple.com/programs/ios/distribute.html (last visited Feb. 23, 2012).

Responding to these incentives developers had created more than 500 thousand applications for the iPhone operating system (iOS) and 400 thousand for the Android operating system as of the end of 2011, as shown in Table 1.

The entrepreneur faces at least five major risks in building her business on top of a platform that is providing free access to customers and free services. These problems exist for all businesses that rely on another business but they are larger in the case of businesses that rely on free platform services.

(1) The platform could raise its prices. When Zynga started developing games Facebook did not charge it anything and did not require it to share any revenues. Then Facebook decided to take roughly 30 percent of the revenues earned from the sale of virtual goods by social games, which is how Zynga and other games on Facebook earn most of their revenues.

(2) The platform could make changes that reduce the value of the service it is providing to businesses that rely on it. That is a common complaint against search engines such as Baidu and Google.[74] Search engines change their algorithms for selecting search results periodically to present better results and to reduce efforts to game the algorithm. That can result in some websites falling in the rankings and therefore being presented to fewer users.

(3) The platform could change the rules for participating and close off access. Apple screens applications that are submitted to the Apple Store.[75] Its screening criteria have changed over time and could change in the future for many reasons including a decision to promote its own applications.[76]

(4) The platform could also decide to integrate into a side of the platform and therefore produce complementary products entirely themselves. Microsoft, for example, became the leading provider of productivity applications for the Windows operating system.[77]

(5) The platform could decline or fail thereby reducing the value of the investment. Once-dominant platforms such as Symbian in mobile operating

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[74] *See infra* Section IV.C.

[75] *See* App Store Review Guidelines, https://developer.apple.com/appstore/guidelines.html (last visited Mar. 13, 2012).

[76] *See* Carolyn Kellogg, *Apple app store policy change is good news for publishers*, L.A. TIMES (Jun. 9, 2011), http://latimesblogs.latimes.com/jacketcopy/2011/06/apple-app-store-change-good-news-for-publishers.html; *Kobo aims to bypass Apple's App Store*, CBC NEWS (July 27, 2011), http://www.cbc.ca/fp/story/2011/07/27/5164104.html.

[77] Jason Mick, *Office 2010 to Launch Today, Microsoft Owns 94 Percent of the Market,* DAILY TECH (May 12, 2010), http://www.dailytech.com/Office+2010+to+Launch+Today+Microsoft+Owns+94+Percent+of+the+Market/article18360.htm.

systems and MySpace in social network declined precipitously.[78]

The entrepreneur might be able to mitigate these risks in particular circumstances. In some platform industries it is possible for customers on one side of the platform to use several platforms—that is consumers could engage in what is known as "multi-homing".[79] Many banks, for example, issue both MasterCard and Visa credit cards and can shift volume between them depending on business terms. Even if an entrepreneur only uses one platform at a time it may be possible to switch between them. Banks usually issue either MasterCard of Visa debit cards but some banks switch programs for various business reasons.

The ability to multi-home depends in part on the extent of platform-specific investments, which can in turn affect the extent to which platforms compete with each other for customers on a side. Developers, for example, can write applications for different smart phones and their operating systems. However, because of differences in software (such as between iOS, Android, and Windows) and hardware (such as between Apple iPhones and the various phones that use Android and Windows) there are costs associated with developing for multiple platforms and those costs may limit, or in some cases prevent, multi-homing. By contrast, the practices that a website publisher users to optimize for one search engine tends to optimize it for others as well.

In other cases competition among platforms is so intense that there is no real issue of platform dependency. That is the case with most advertising. In the United States businesses are not dependent on television networks—platforms that connect advertisers and viewers—for national advertising because there are several competing networks and many alternatives for reaching viewers through a variety of television, radio, print, and online media.

The entrepreneur could also take actions, including investments, to reduce the reliance on the platform. That is most clearly seen in the case of websites. They can invest in branding and marketing activities to drive traffic to their websites. That is what Angie's List has done.

The entrepreneur could also decide to bypass the platform and provide the platform services itself. When Sears decided to introduce a general-purpose credit card (Discover) in the early 1980s it could have become an

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[78] *See* Tim Ocock, *Symbian OS – one of the most successful failures in tech history*, TechCrunch.com, http://eu.techcrunch.com/2010/11/08/guest-post-symbian-os-one-of-the-most-successful-failures-in-tech-history (last visited Feb. 23, 2012); Emma Barnett, *MySpace loses 10 million users in a month*, TELEGRAPH, *available at* http://www.telegraph.co.uk/technology/myspace/8404510/MySpace-loses-10-million-users-in-a-month.html (last visited Feb. 23, 2012).

[79] *See* Rochet & Tirole, *supra* note 34, at 991-993 (2003).

issuer of MasterCard or Visa cards. Instead it chose to create its own credit card system—the Discover Card. AT&T faced with the same decision a few years later chose to become a MasterCard issuer.[80]

C. The Entrepreneur's Decision on the Degree of Platform Dependency

The reliance decision is determined simultaneously with the decision on what opportunity to pursue, how to pursue it, and whether to pursue it. Entrepreneurs sort themselves into pursuits based on their own situations, the business opportunities they have identified, and the alternative avenues available to them.[81] One of the factors that they have to consider in this process is whether and to what extent to rely on a platform.

The economic literature on entrepreneurship has identified three key factors behind the decision to start a business.

Quality. Entrepreneurs and the new firms they found differ in their abilities.[82] They generally do not know with certainty either their own abilities or how those abilities will evolve with experience. They obtain more information about how good they are by operating a business and seeing how they do. A related concept concerns how good a business idea they have.[83] They usually do not know that either. They learn more as a result of getting into the market and observing demand and costs.

Access to capital. New entrepreneurs are often liquidity constrained.[84]

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[80] *See* DAVID S. EVANS & RICHARD SCHMALENSEE, PAYING WITH PLASTIC: THE DIGITAL REVOLUTION IN BUYING AND BORROWING 77-79 (2002).

[81] Richard E. Khilstrom & Jean-Jacques Laffont, *A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion*, 87 J. POL. ECON. 719 (1979); Christophe Chamley, *Entrepreneurial Abilities and Liabilities in a Model of Self-Selection,* 14 BELL J. ECON. 70 (1983); Volker Nocke, *Gap for Me: Entrepreneurs and Entry*, 4 J. EUR. ECON. ASS'N. 929 (2006); Christian Keuschnigg & Soren Bo Nielsen, (CESifo, Working Paper No. 1909, 2007); Daniela Grieco, *The Entrepreneurial Decision: Theories, Determinants, and Constraints* (LIUC Papers in Economics No. 207, 2007).

[82] Robert E. Lucas, *On the Size Distribution of Business Firms*, 9 BELL J. ECON. 508 (1978); *supra* note 81.

[83] Steven N. Kaplan, et al., *Should Investors Bet on the Jockey or the Horse? Evidence from the Evolution of Firms from Early Business Plans to Public Companies*, 64 J. FIN. 75 (2009); Claudio Campanale, *Private Equity Returns in a Model of Entrepreneurial Choice with Learning*, 10 B.E. JOURNAL OF MACROECONOMICS 1 (2010).

[84] *See generally* David S. Evans & Boyan Jovanovic, *An Estimated Model of Entrepreneurial Choice under Liquidity Constraints*, 97(4) J. POL. ECON. 808 (1989); Douglas Holtz-Eakin, et al. *Sticking It Out: Entrepreneurial Survival and Liquidity Constraints,* 102 J. POL. ECON. 53 (1994).; David G. Blanchflower & Andrew J. Oswald, *What Makes an Entrepreneur?*, 16 J. LABOR ECON. 26 (1998). *See also* David S. Evans & Joshua D. Wright, *The Effect of the Consumer Financial Protection Agency Act of 2009 on Consumer Credit*, 22(3) LOY. CONSUMER L. REV. 277, 286 (2010).

That is, they cannot obtain as much capital as they would like to obtain at risk-adjusted interest rates to start their businesses. They may not be able to obtain any external financing at all. In this case they have to rely on their own savings or ability to take out personal loans such as those from credit cards. Other entrepreneurs may have access to significant capital either because they are large corporations or serial entrepreneurs who invest their own funds or have an excellent track record that increases the willingness of investors to back them.

Taste for risk. Entrepreneurs vary in their taste for risk.[85] Some may be willing to take very long odds while others are more averse to risk. Relative to the general population entrepreneurs on average have a higher tolerance for risk. Of course, it is the risk tolerance of investors that determines whether and how much capital these investors will extend to the startup.

These three factors operate interdependently in determining whether an entrepreneur will start a business and how much capital they will be able to invest in that business. Investors will be less willing to extend capital to startups that they perceive as lower quality given what they know about the entrepreneur and the business idea. The entrepreneur herself may also be less willing to invest given what she knows about herself and the business plan. Entrepreneurs that are less risk averse, or more confident in the overall quality of their business, will be willing to invest more of their own capital and time.

Free platform services are more attractive, all else equal, to entrepreneurs that face liquidity constraints. They can start a business with minimal capital requirements. Many of the platforms discussed above enable entrepreneurs to develop businesses and access customers with minimal capital expenditures. Free platform services are also more attractive to entrepreneurs that are less confident in their own ability or the quality of their ideas. They can also learn about their own abilities as an entrepreneur and the quality of their business idea without risking their own capital.

An important implication of these observations is that entrepreneurs that are perceived by themselves or investors as having uncertain abilities or ideas are more likely to sort themselves into relying free platform services. That is because these startups face tighter liquidity constraints and face

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[85] *See* FRANK H. KNIGHT, RISK, UNCERTAINTY, AND PROFIT (Hart, Schaffner & Marx, 1st ed. 1921); Richard E. Kihlstrom & Jean-Jacques Laffont, *A General Equilibrium Entrepreneurial Theory of Firm Foundation Based on Risk Aversion*, 87 J. POL. ECON., 719, 719-748 (1979); C.M. Van Praag & J.S. Cramer, The Roots of Entrepreneurship and Labour Demand: Individual Ability and Low Risk Aversion, 68 ECONOMICA, 45, 45-62(2001); J.S. Cramer, et al., *Low Risk Aversion Encourages the Choice for Entrepreneurship: An Empirical Test of a Truism*, 48 J. ECON. BEHAVIOR ORG, 29, 29-36 (2002).

greater risks of failure. Of course well-funded high quality startups may choose to use free platform services for a multitude or reasons. The point here is that by offering free services the platform tends to pull in poorly funded startups with relatively low *a priori* prospects for success as well.

IV. EXCESSIVE LITIGATION OVER FREE PLATFORM SERVICES

Multi-sided platforms can maximize private profits and social welfare by providing free platform services as shown earlier. However, by providing free services these platforms can sow the seeds of their own destruction through litigation or other governmental process.

Whenever two businesses enter into a transaction they incur the risk that their counterparty will sue. However, this risk is greatly magnified in the case of multisided platforms. By providing free services the platform may attract a very large number of entrepreneurs. If the platform is successful, for example, it faces the risk that a court or competition authority would view it as a dominant firm and that entrepreneurs could claim that the platform has violated the competition laws. While the entrepreneurs are associated with a more valuable platform they have also acquired a more valuable litigation option.

The platform is also susceptible to much more litigation and or other adversarial actions as it becomes more successful. It faces a rising probability of being sued as it attracts many entrepreneurs. Although the probability that any single entrepreneur suing is small the likelihood that at least one will sue rises rapidly[86] as the platform grows. The number of complaints rises as well. As a result highly successful platforms can be swept up in adversarial proceedings.

Free platform services also tend to attract entrepreneurs that are liquidity constrained and which have low *a priori* expectations of success on the part of investors and perhaps even themselves. These entrepreneurs are more likely to encounter business problems or fail thereby laying the basis, for example, for a claim of antitrust injury.

The availability of the litigation option, the large number of business users, and adverse selection work can together to generate enough

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[86] If the annual probability of a single entrepreneur suing is p, lawsuits are independent events, and the platform attracts N entrepreneurs, then the probability of at least one lawsuit a year equals $1 - (1-p)^N$. This probability rapidly approaches 1 as N increases. For example, if p=0.0001 (one in ten thousand), then the probability of at least one lawsuit is 63% at N=10,000, 86% at N=20,000, and 95% at N=30,000, and almost 100% (99.995%) at N=100,000.

complaints to result in a material likelihood that there will be at least one false-positive decision against the platform. That false-positive decision could involve significant behavioral or structural remedies or financial penalties under the antitrust or unfair competition laws or the implementation of restrictive platform-specific laws or regulations. In addition, irrespective of the final results of these complaints, dealing with frequent and numerous complaints involving responses to government authorities could take up significant amounts of management time.

A. The Litigation Option

The "litigation option" refers to the ability to file a complaint, or more generally pursue an adversarial proceeding, against the platform in the event that certain events happen that could make a lawsuit or other use of government processes to seek redress viable. This option has positive expected value. The business does not have to file a lawsuit, for example, just as a person does not have to exercise a stock option. The business will file a lawsuit in the future if it has positive expected value at that time just as the purchase of a stock option reflects the expectation that it has positive value. Although litigation is costly the business will choose to incur these costs only if it expects the benefits of doing so outweigh the costs. Moreover, the costs of lodging a complaint with a competition authority, for example, are relatively small.

Businesses, of course, always acquire an option to sue their suppliers, customers, or other business partners when they enter into an arrangement. Typically, these disputes result in breach of contract lawsuits for failure to pay or failure to perform. Generally, the business that sues successfully would be able to collect its actual losses (perhaps including attorneys fees). These business disputes would usually occur in the civil courts unless there was criminal conduct—fraud for example—at issue. Government authorities would not ordinarily get involved in these contract disputes between businesses.

Businesses can pursue their complaints in a variety of venues and a number of ways and thereby impose costs and risks on their platform provider.[87] They can pursue complaints under a variety of legal theories.

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[87] The cost and benefit of pursuing complaints varies across jurisdictions. In the U.S. private litigation is costly and the odds of success antitrust plaintiffs are long; however, treble damages can make the awards high especially for class-action law firms. In other jurisdictions, modest expenditures can result in a regulatory authority initiating an investigation. The complainant would not get damages directly but could get beneficial remedies.

For example, in *Aldridge v. Microsoft* the application provider sued the platform for business disparagement, defamation, tortuous interference with contract, tortuous interference with business relations, monopolization, and attempted monopolization.[88] They can pursue complaints in multiple jurisdictions or the laws of multiple jurisdictions. A California-based company that has a merchant page on Facebook and that sells globally could, for example, file claims in the U.S. under California, US, and EU laws as well as possibly the laws of many other jurisdictions. In addition to lawsuits, businesses can lobby for the passage of laws or regulations that restrict the platform on the grounds, for example, that is an essential facility that should be subject to common carrier regulations. The prospect that platforms will be subject to what Judge Posner has described as "cluster bomb" attacks is increased by the fact that, given the global reach of the Internet and the ability to replicate the digital delivery of products and services across many countries, both the platform and its business users are likely to operate in many jurisdictions.[89]

One of most common complaints by business users of free platforms is that the platform has engaged in anticompetitive practices. To help explore the scope of the litigation option it is useful to focus on this particular claim. To pursue this claim in many jurisdictions the business user has to argue that the platform has significant market power—a "dominant firm" under EU law or a "monopoly" under US law—and that it has pursued practices that exclude competition from the market.

Under EU law a firm is presumed "dominant" if its market share exceeds 50 percent[90] although some cases have considered firms to be dominant with shares as low as 40 percent.[91] In the United States, under Section 2 of the Sherman Act,[92] a firm is considered to have monopoly power if it has a predominant market share; some courts have held that 90 percent is enough to meet that standard, probably 70 percent or more, but

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[88]Aldridge v. Microsoft Corp., 995 F. Supp. 728 (S.D. Texas, 1998).

[89]Richard A. Posner, *Antitrust and the New Economy*, 68 ANTITRUST L.J. 925 (2001) 925.

[90] Case C62/86, AKZO Chemie BV v. Comm'n, 1991, 5 C.M.L.R. 215, at ¶ 60, *available at* http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:61986CJ0062:EN:PDF. The Court ruled that market shares in excess of 50 percent are "…in themselves, and save in exceptional circumstances, evidence of the existence of a dominant position."

[91] In *British Airways plc v. Commission*, British Airways was found dominant in the context of Article 82 with a share which had declined from 46.3 percent to just under 40 percent during the period of abuse. *See* Case T-219/99, British Airways plc v. Comm'n, 2003 E.C.R. II-5917, ¶¶ 211, 225 (Ct. First Instance), *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:61999A0219:EN:HTML. The finding relied heavily, though, on the fact that the rest of the market was very fragmented.

[92] Sherman Antitrust Act, 15 U.S.C. §2 (1890).

probably not as low as 60 percent.[93] Generally, competition authorities and courts have a great deal of latitude for defining markets narrowly for the purpose of determining these shares. Therefore, complainants have the prospect of persuading the competition and courts that the platform is a dominant firm.

To pursue an antitrust complaint—under Sherman Section 2 or Article 102 TFEU for example—business users would generally need to be able to persuade competition authorities or courts that the platform is foreclosing competition. That would usually involve showing the user and the platform are competing with each other in the same market or that the platform is trying to extend its alleged dominant position in one market to a downstream market in which the user is competing. That imposes some limitation on the ability of free users of platform services to pursue an antitrust claim. However, the antitrust laws provide complainants with considerable flexibility in fashioning theories and interpretations of facts that can result in facially plausible claims. In particular, in the EU and other jurisdictions, dominant firms have a "special responsibility not to … impair competition" and that language can be interpreted to condemn many business practices.[94]

Generally, complainants can argue that they compete with the platform in a primary market. For example:

- a software platform provider and an application provider that exposes APIs and therefore could provide platform features;
- a search engine provider and a website that curates content;
- a social network and an application that in part provides connections between people).

Complainants can also argue that the platform is trying to leverage its platform dominance into a downstream market and thereby excluding

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[93] For a summary of the case law, see Chapter 2: Monopoly Power, *in* U.S. DEP'T OF JUSTICE, COMPETITION AND MONOPOLY: SINGLE-FIRM CONDUCT UNDER SECTION 2 OF THE SHERMAN ACT, *available at* http://www.justice.gov/atr/public/reports/236681_chapter2.htm .

Under Article 102 TFEU a dominant firm has "a special responsibility not to allow its conduct to impair competition on the common market. *See, e.g.,* Case 322/81, NV Nederlandsche Banden Industrie Michelin v. Comm'n, 1983 E.C.R. 3461, ¶ 57, *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:61981CJ0322:EN:HTML. *See also* Case T-201/04, Microsoft v. Comm'n, 2007 E.C.R. II-3601, ¶ 229 ("that undertaking has a special responsibility, irrespective of the causes of that position, not to allow its conduct to impair genuine undistorted competition on the common market . . . ."), *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:62004A0201:EN:NOT.

[94] *Answer given by Mr Almunia on behalf of the Commission*, EUR. PARL. (Mar 1. 2011), *available at* http://www.europarl.europa.eu/sides/getAllAnswers.do?reference=E-2011-000252&language=DE.

competition from that market:

- a software platform provider that includes a feature that could also be provided by an application:
- a search engine provider that provides various services as part of its search results;
- a social network that provides services including applications.

In some jurisdictions, business users of free platform services can argue that the platform is an essential facility to which they should have access on a fair reasonable and non-discriminatory basis. The Supreme Court decision in *Trinko* sharply narrowed circumstances under which a court could conclude that a refusal to supply access was anticompetitive.[95] However, other jurisdictions, including the EU and China, have an essential facilities doctrine under which it is possible for business users to claim that a denial of, or reduction in service or access, by a platform is anticompetitive and to require access on a fair, reasonable and non-discriminatory basis.[96]

The value of the litigation option to business users of free platform services arises in several different ways. As a result of a complaint a court or competition authority may require the platform to make changes in its business terms that would benefit the complainant. The complainant may also be able to obtain concessions from the platform including monetary compensation to withdraw a complaint or not to file it in the first place. In addition, the US allows complainants to obtain treble damages.

The expected value of the litigation option varies depending on the circumstances of the entrepreneur and the platform and can evolve over time. The value of the option becomes higher over time as the platform becomes more successful. As the platform becomes more successful there is a higher likelihood that the courts and competition authorities will find that it is a dominant firm. The value of the option is also higher for firms that anticipate potential difficulties which would have a large effect on their profits and that they can blame on the platform. In fact, the option provides a valuable hedge against the risk of failure.

B. Adverse-Selection

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[95] *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398 (2004).

[96] *See* Christian Ahlborn & David S. Evans, *The Microsoft Judgment and its Implications for Competition Policy Toward Dominant Firms in Europe*, 75(3) ANTITRUST L.J. 887, 926 (2009). Freshfields Bruckhaus Deringer, *China Issues Guidance on Anti-Competitive Practices* 2, (Jan. 2011) http://www.freshfields.com/publications/pdfs/2011/jan11/29540.pdf,

As observed earlier businesses realize there are benefits and costs of relying on free services provided by a platform. Platforms tend to attract businesses that want free services either because investors have not been willing to fund the entrepreneurs adequately or because the entrepreneur themselves are not confident enough in their own prospects to invest themselves. Assuming these expectations are correct, and there is no apparent reason they would not be, these "liquidity-constrained" business are more likely to encounter business problems. As a result there is adverse selection into relying on free platform services. More vulnerable businesses are more likely on average to sort themselves into working with a platform that provides fee services and into relying more on those free services.[97]

The point is not that entrepreneurs that rely on free platform services are mainly poor or vulnerable entrepreneurs. Rather, the thesis is that platforms tend to pull more of these liquidity-constrained firms, that tend to have lower *a priori* odds of success, into their free programs.

For illustrative purposes suppose, as shown in Figure 1, there is a metric of "quality" for entrepreneurs that stands-in for the likelihood that the business will be successful.[98] There are many high quality entrepreneurs that rely on free platform services and many low quality entrepreneurs that do not. The adverse selection problem results in the "average" entrepreneur that relies on free platform services having, however, a lower quality than the average entrepreneur in the population. It also results in the fraction of low quality entrepreneurs being higher for businesses that rely on free platform services than for the population overall.[99]

As a result of adverse selection, platforms that provide free services will tend to have a disproportionate number of businesses that do not do well. These businesses are more likely to complain for two reasons. They are more likely than successful businesses to be able to claim that they have been injured as a result of something the platform has done. The value of

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[97] This is the well-known "self selection" problem which has been studied by economists extensively on the context of labor markets. *See* A.D. Roy, *Some Thoughts on the Distribution of Earnings*, 3 OXFORD ECON. PAPERS, 135 (1951) (presenting what is now considered the classic model of self-selection in labor markets).

[98] Of course, in reality, many factors influence the likelihood that a business will succeed. However, to illustrate the impact of adverse selection it is helpful to use a single hypothetical "quality" measure.

[99] The figure was generated using the following assumptions. Let Q be firm quality and E be everything else that affects the firm's choice of business model. Q and E are both distributed as independent standard normal variables. Let the firm choose a search reliant business model if $Q + E \leq 0$. The lines in the figure represent the density function (pdf) for the distribution of quality in the unselected population of firms and in the population of firms that self-select into search-reliant business models. Simpson's rule for numerical integration was used in the calculation of the selected density. As can be seen in the graph, the selected density assigns more probability mass to the lower quality regions.

the litigation option is also higher for them.

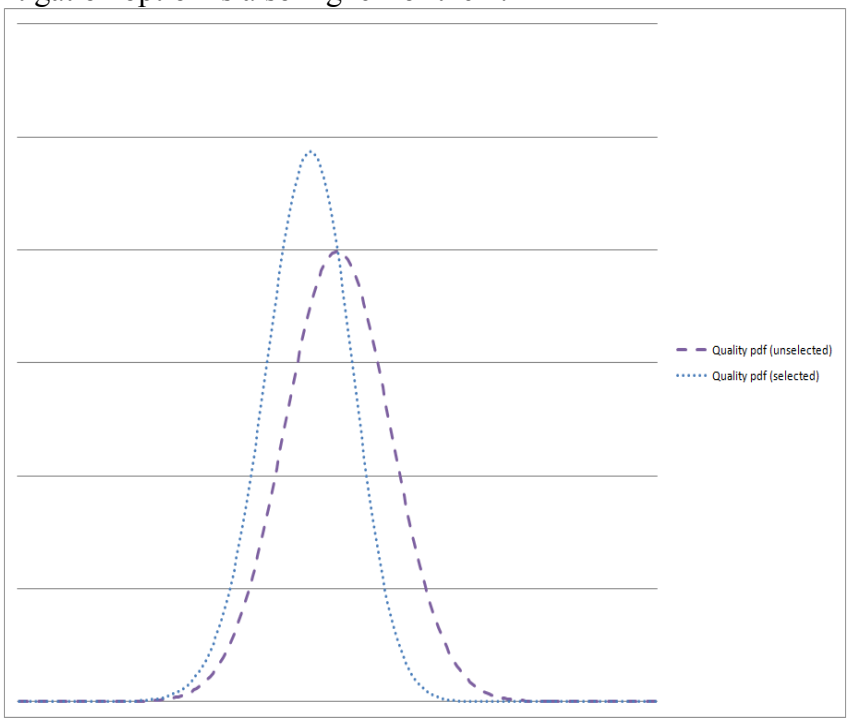

Figure 1: Density function for selected versus unselected firm quality

C. Large Numbers

Almost every significant business in the United States has a website. Most major brands in the United States also have a Facebook merchant page.[100] A recent survey found that more than 75 percent of independent restaurants and more than 95 percent of all chain restaurants have Facebook merchant pages.[101] The number of business users of Facebook and Google just in the United States likely exceeds 5 million.[102] As Table 1 describes, other platform businesses that provide free services also have thousands if not millions of business users.

The large number of business users of multi-sided platform services, combined with the fact that these platforms could be defined as dominant firms, imposes a high risk of antitrust scrutiny, and the possibility of a catastrophic result, on these platforms. Suppose, for example, that the probability of a business filing an antitrust complaint is .01% (i.e., 1 out of

[100] BrightEdge, *BrightEdge Says 61 Percent of World's Top Brands Create Googe+Pages in Just One Week* (Nov. 16, 2011), *available at* http://www.brightedge.com/2011-11-16-BrightEdge-November-SocialShare (last visited Mar. 15, 2011).

[101] Restaurant Sciences LLC Online Presence Survey, March 2012.

[102] U.S. Census Bureau, *Statistics about Business Size (including Small Businesses)*, http://www.census.gov/econ/smallbus.html (last visited Mar. 23, 2012).

10,000 businesses files a complaint). The expected number of complaints would be 1 with 10,000 business users, 10 with 100,000 business users, and 100 with 1 million business users.

A slight increase in the propensity to sue as a result of adverse selection can yield a significant increase in the number of complainants in the case of multi-sided platforms that offer free services. Suppose, for example, that the probability of a business exercising the litigation option increases by .001% (i.e., from 1/10,000 to 1/100,000). The expected increase in the number of complainants would be only 1 with 100,000 business customers but would be 10 with 1,000,000 business customers and 100 with 10,000,000 business customers.

Table 2 reports estimates of the expected number of complaints per year for various assumptions concerning the number of businesses and the likelihood of any business filing a complaint. The number of complaints is significant with even very small probabilities of complaints.

Table 2: The Number of Complaints by Free Platform Users

		Annual Probability of Complaint		
	0.0001%	**0.001%**	**0.01%**	**0.1%**
Number of Business Users		**Annual Number of Complaints**		
10,000	0	0	1	10
100,000	0	1	10	100
1,000,000	1	10	100	1,000
2,000,000	2	20	200	2,000
5,000,000	5	50	500	5,000
10,000,000	10	100	1,000	10,000

IV. SEARCH-ENGINE BASED PLATFORMS

To document the phenomena discussed above, it is useful to focus on search engines and the businesses that use free services for several reasons. First, there are a number of businesses that use free search engine services and they are economically significant. Many businesses have websites that rely to varying degrees on search engines to direct users to them. Businesses opened websites quickly after the start of the commercial Internet in the mid 1990s. Most businesses have websites now. They rely on them to varying degrees from providing a simple listing to being the basis for the entire business. Two industries related to search engines have

emerged. In 2010 US eCommerce accounted for $165.4 billion of sales (4.2 percent of all sales)[103] and online advertising accounted for $26.04 billion of advertising spending (20 percent of all advertising spending).[104] Search engines became widely used in the late 1990s and have become an integral part of ecommerce and online advertising businesses.

Second, it is relatively straightforward to measure, and obtain data on, the reliance of these web-based businesses on free platform services. Web traffic can come from viewers finding the site through a search engine, going directly to the website, which means they must have some prior knowledge of the site, or being referred there by another site. As noted earlier, Yelp is heavily reliant on search engines while Angie's List is not.

Third, not surprisingly, given the large number of web-based businesses and the number of years they have been in existence, there have been many complaints to the courts and competition authorities. Therefore, it is possible to examine these complaints and the associated businesses to assess the possible importance of adverse selection.

Part A describes the business model for search engines. Search engines index websites and their content for free, enable people to find relevant information from these websites for free, and charge for presenting advertisements to viewers attracted by this content. Part B summarizes data on where web-based businesses obtain their traffic. It compares the typical web-based business to ones that have a less search-engine-reliant model. Part C provides an overview of the companies that have brought litigation or filed complaints against Google. It shows that most of the complainants have chosen a search-engine-reliant model.

A. Search Engine Business Model

Search engines have three major customer groups.

- Websites that want people to be able to find them and their content.
- People that are looking for information and hope to find it on the web.

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[103] U.S. Department of Commerce, *U.S.Census Bureau News* Feb. 17, 2011 *available at* http://www2.census.gov/retail/releases/historical/ecomm/10q4.pdf, (last visited March 15, 2012).

[104] Interactive Advertising Bureau, *IAB Internet Advertising Revenue Report 2010 Full Results*, *available at* http://www.iab.net/media/file/IAB_Full_year_2010_0413_Final.pdf (last visited March 23, 2012); Kantar Media, *Kantar Media Reports U.S. Advertising Expenditures Increased 6.5 Percent in 2010* (Mar. 17, 2011), *available at* http://kantarmediana.com/intelligence/press/us-advertising-expenditures-increased-65-percent-2010 (last visited Mar. 16, 2012).

- Advertisers that want to present advertisements to people.

The business model is straightforward despite the complexity of the technology. The search engine aggregates content across the web. It uses that content much like any advertising-supported media company would to attract viewers. It then sells access to those viewers to advertisers.

Search engines have algorithms that predict the relevance of web pages to the search query that an individual has submitted. Google initially focused on the quality of the web page based on the number and quality of the web pages that linked to the web page using its PageRank measure. As of the end of 2011, Google used 200 factors, including PageRank, to select web pages and rank them in response to a query.[105] The results are then presented in order of relevance with results extending to multiple web pages. The probability that a person will click on a result declines sharply with the order in the rankings with a very sharp decline after the results on the first page. Websites that value traffic want to appear on the first page and as high on the first page as possible.

As the search engine business has developed search engines have provided ways for websites to make it easier for the search engines to find the necessary information for ranking the website and therefore to achieve greater visibility in searches. Websites can submit information to the search engine such as a sitemap that the search engine can use to make it easier to find information on the site. Search engines provide websites with tools they can use to make sure that the search engine can find relevant content. They also provide advice on how to design and manage websites to increase the likelihood that users will be able to find relevant content. Search engines do not charge for indexing websites, for the tools or advice they provide to websites to improve their rankings, or for presenting web pages to users.

Because a high ranking generates more clicks websites often invest in "search engine optimization" (SEO) to improve their rankings. (These investments are typically not specific to the search engine.) That results in a major source of tension between the search engines and websites. The websites are interested as a business matter in making sales, attracting customers, or obtaining users for selling advertising. Websites all want to obtain high rankings but of course a higher rank for one is a lower rank for another. They therefore have incentives to trick the search engines into thinking that they are more relevant than they really are. The search engines are interested as a business matter in attracting users. They do that in large part by presenting relevant results to those users. Successful efforts by

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[105] Google Webmaster Tools, *Google Basics: Serving results*, http://support.google.com/webmasters/bin/answer.py?hl=en&answer=70897(last visited Feb. 28, 2012).

websites to trick the search engine into thinking a site is more relevant than it is imposes costs on users and ultimately lowers the reputation of the search engine as a reliable source of information.

B. Search Engine Reliance

Websites obtain traffic in several ways. Direct traffic occurs when a user types in the url for the website into her browser or uses a bookmark that directs the browser to go to that website. Search traffic occurs when an individual uses a search engine to conduct a search and as a result clicks on a link that takes them to that website. Referral traffic results when a user clicks on a link from a website that is not a search engine.

When a website starts, people who are not affiliated with the website would have no way to know that it exists except by coming across it inadvertently. A website can do various things to become known. Like any business it can engage in marketing activities including advertising to let people know that it exists. These activities drive direct traffic. It can also persuade other sites to link to it. Sites refer users to another because they are providing a service to their users who would benefit from knowing about the other site. Sites also engage in swaps: you refer my site and I will refer yours. Websites can undertake search engine optimization to increase the likelihood that their sites will appear in search results.

The share of traffic that comes from search results provides a proxy for search-engine reliance.[106] Sites that are getting the preponderance of their traffic from direct and referral sources have made investments to establish their brands. Sites that are getting the preponderance of their traffic from search have primarily invested in tactics to increase their search rankings.

Data from compete.com show the distribution of the search share. The analysis reported here is based on the 15,000 largest websites ranked by traffic and a stratified random sample of 15,000 of the next 1 million most heavily visited websites. The figures have been weighted to reflect the sampling and therefore reflect the distribution of the largest 1 million websites.[107]

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[106] It is not a perfect proxy because some people use search toolbars to type in the name of a URL. These navigational searches are similar to typing in the name of the site in the browser. Navigational searches, however, are likely to be positively correlated with direct referrals since they both result from people remembering the name of the site to enter. For example, in the case of Yelp, direct referrals are 5.83% of all visits, and navigational searches are 10% of all search referrals; in the case of Angie's List direct referrals are 14.74% of all visits, and navigational searches are 72% of all search referrals. Thus, Angie's List has both a higher share of direct referrals, and a higher share of navigational searches. Compete.com PRO Database, February 2012.

[107] Formally, the sample consists of two strata – 15,000 observations from the top

Table 3 reports summary statistics on these websites. We report total search, which includes some paid search resulting from advertising, because it is most comparable to other data we will report below on the Google complainants. The mean share of non-paid search traffic was 22.7 percent. Two-thirds of the websites (17th percentile through the 83rd percentile) have search shares between 10.4 and 40.9 percent. It is interesting to observe where Angie's List and Yelp, the two web-based businesses discussed earlier, fall in the distribution. Angie's list is on the 52nd percentile of search reliance (just above the median) while Yelp is on the 91st percentile of search reliance.

Table 3 Distribution of Search Shares

Percentile	Non-Paid Search	Total Search
10th	5.41%	6.91%
20th	9.99%	11.52%
30th	13.64%	16.27%
40th	18.80%	21.13%
50th	22.65%	25.20%
60th	26.82%	28.67%
70th	31.17%	33.29%
80th	37.44%	38.90%
90th	44.80%	47.89%
Median	22.65%	25.20%
Average	25.06%	27.41%

C. Search-Engine Litigation

A number of websites have filed complaints against Google in the courts or before competition authorities alleging that the search engine reduced their search rankings or ad placements and engaged in

15,000 websites and 15,000 observations from next one million websites. From this sample of 30,000 websites, websites with missing data on the share of search traffic were excluded, leaving 11,892 websites. Even those websites with missing search traffic data included non-missing data on the total number of visits. This enables the estimation of the probability of missing search data using a logit model with data on all 30,000 websites. To appropriately weight the observations with non-missing search data, each observation should be weighted by the inverse of its probability of inclusion in the sample. This can be done, assuming that once the number of visits is controlled for, the probability of missing data on search traffic is independent of the search traffic share. Under this assumption, if the fitted probability of non-missing data (from the estimated logit model) for observation i is p_i, then the weight for observation i will be $1/p_i$ if i was from the top 15,000 websites, and $(1/p_i)*(1,0000,000/15,000)$ otherwise.

anticompetitive conduct in doing so. This article focuses on the extent to which these complaints come from businesses that have relied heavily on search engines and the implications of this reliance. It does not address and takes no position on the merits of these complaints.

One of the first businesses to sue Google was KinderStart. The complaint, filed in federal court in the US by this "source of parenting and fun learning information",[108] is typical of many of the others. Started in May 2000, KinderStart's business model involved attracting viewers to its site and selling advertising to entities that want to reach those viewers. To get viewers, it relied on search engines such as Google to list it in response to inquiries by consumers for parental advice. KinderStart claims it had "[s]teady, organic growth in visits and page views."[109] By early 2005, it had more than 10 million page views, a common measure that is used in selling web-based advertising.[110]

According to KinderStart, Google effectively blocked its site starting in March 2005. As a result, KinderStart claimed that its traffic dropped by 70 percent, and its advertising revenue declined by 80 percent. It had used Google's AdSense program which paid affiliated websites a share of revenue generated from ads that Google placed on the websites.

A year later, KinderStart sued Google on a number of grounds including violating KinderStart's right to free speech and for engaging in anticompetitive and unfair business practices. KinderStart sought certification of a nationwide class of similarly affected businesses whose websites had been blocked or penalized by Google. This article focuses on the claims that Google had violated Section 2 of the Sherman Act.[111]

KinderStart made several notable observations in its complaint that foreshadow future allegations against Google.

First, KinderStart claimed that search engines constitute a relevant antitrust market and that Google had monopoly power in this market as evidenced by having a share of more than 50 percent of that market.[112]

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[108] KinderStart – About Us, http://www.KinderStart.com/footerlinks.jsp?articleID=96 (last visited Feb. 13, 2012).

[109] *See* Second Amended Class Action Complaint at 7, *KinderStart.com, LLC v. Google, Inc.*, No. C 06-2057 JF (N.D. Cal. Mar. 16, 2007).

[110] *See* Second Amended Class Action Complaint at 7, *KinderStart.com, LLC v. Google, Inc.*, No. C 06-2057 JF (N.D. Cal. Mar. 16, 2007). The complaint does not provide a date for the peak but it is presumably before the decline in traffic starting in March 2005 which is the subject of the complaint.

[111] The discussion below is based on KinderStart's original and amended complaints and the ruling by the court of Google's successful motion to dismiss. The discussion focuses mainly on the Sherman Section 2 claims regarding the search market. *See id.* at 50-53.

[112] *Id.* at 7, 50.

Second, KinderStart claimed that its website "is a directory and ***search engine*** that offers vital links to information and sites on key subjects affecting young children, including child rearing, child care, child development, food and nutrition, and education . . . ."[113] It claimed that it competed with Google in the search market. [114]

Third, KinderStart characterized Google as "a common carrier that makes a public offer to provide communications facilities for subscribers to freely use its facilities to link to and connect with one or more Websites that are hosted on the Internet."[115] It also asserted that any "[w]ebsite seeking to gain visibility, site traffic and page views must rely upon Defendant Google's Google Engine as an ***essential facility*** for receiving search query hits."[116]

Fourth, KinderStart claimed that Google attained and maintained monopoly power in the search engine market by reducing the search rank or denying access to its search engine for listings of KinderStart and other websites that competed in the search engine market.[117]

As it turns out, the court dismissed KinderStart's complaints holding that KinderStart failed to plead a relevant antitrust market and failed to allege causal antitrust injury.[118] The case is relevant because it is prototypical of subsequent actions brought against Google and Baidu. When a website experiences a reduction in its rank on Google search results it has become common for websites to file a complaint which claims that (1) online "search" is a relevant antitrust market, (2) Google has monopoly power in that market, (3) Google's search engine is an essential facility, (4) the website also does search and therefore competes with Google in the search market, and (5) Google reduced the search rank of the website to maintain a monopoly or dominant position.

Table 4 summarizes the major complaints that have been filed against Google in the US and EU. The majority relate to organic search, which Google provides at no charge. In each case the Table identifies the type of website, the main allegation, the venue of the case, and the website's traffic if it was still active. It also reports the percentage of traffic from search and the percentile in the search-reliance distribution for each complainant. A

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[113] Class Action Complaint at 4, KinderStart.com, LLC v. Google, Inc., No. C 06-2057 JF (N.D. Cal. Mar. 16, 2007) (emphasis added).

[114] *Id.* at 10.

[115] First Amended Class Action Complaint at 10, *KinderStart.com, LLC v. Google, Inc.*, No. C 06-2057 JF (N.D. Cal. Mar. 16, 2007).

[116] *Id.* at 12 (emphasis added).

[117] Second Amended Class Action Complaint at 51, *KinderStart.com, LLC v. Google, Inc.*, No. C 06-2057 JF (N.D. Cal. Mar. 16, 2007).

[118] Order Granting Motion to Dismiss at 16, *KinderStart.com, LLC v. Google, Inc.*, No. C 06-2057 JF (N.D. Cal. Mar. 16, 2007).

total of 21 complaints were identified. The number of complainants is minute relative to the number of businesses that obtain free website indexing and search from Google. There were about 662 million active websites worldwide as of May 2012.Of the 21 complainants it was not possible to obtain search data for three. Of the 18 complaints for which search data were available, six were in the top 10 percentile of the distribution of search reliance and 13 were in the top 40 percentile of the distribution. The complaints against Google therefore come disproportionately from firms that have very extreme search reliance: 33 percent of the complaints for which there was data (6 out of 18) were in the top 10 percent of the distribution and 72 percent (13 out of 18) were in the top 40 percent. These results, however, are based on data after the complaints were filed in most of these cases. Since many of the complaints claim reductions in search rankings it is likely that the search shares were even higher before the complaint was filed.[119]

[119] Judging by their complaints, KinderStart and TradeComet were even more dependent on search than indicated here. KinderStart claimed that after Google reduced its search ranking, its page views plummeted to 30% of previous levels (Second Amended Complaint at ¶ 31), implying search dependence of greater than 70%. Similarly, TradeComet claimed that after Google raised the minimum AdWords bids required from TradeComet, traffic to its webpage dropped to 1% of its previous level (Complaint at ¶ 8), implying search dependence of 99%.

Table 4 Examples of Antitrust Complaints Against Google Search Engine [120]

Complainant	Service	Year	Allegation	Venue	Monthly Unique Visitors	Percent of Visits from Search	Search Percentile
Search King	Search	2002	Demotion of search ranking	US	1,447	33%	69th
KinderStart	Parenting resources	2006	Demotion of search ranking	US	807	52%	92nd*
Christopher Langdon	Blog	2006	Refusal to place ads	US	Defunct	-	-
Carl Person	Vertical search	2006	Manipulation of AdWords auctions; favoring other sites	US	2,165	65%	97th
Trade Comet	Business directory	2009	Manipulation of AdWords auctions; favoring other sites	US	2,701	72%	97th
myTriggers	Comparison shopping	2010	Manipulation of AdWords auctions	US	6,155	72%	97th

[120] Traffic is visits from US-based browsers in January 2012 as reported by Compete.com. For US websites, the search percentage is the percentage of visits from US-based browsers referred by search engines, taken from Compete.com if available, and from Hitwise US otherwise. For EU websites, the search percentage is the percentage of visits from browsers worldwide referred by search engines, taken from Alexa.com. Regardless of the source of the search percentage data, the search percentile is found by comparing the search percentage to the distribution of search percentages computed from Compete.com data as described in the text. In cases where the complainant discussed multiple websites for which data were available, the table shows a range of search percentages. Note that due to differences in data sources, the search percentages reported here for KinderStart and Trade Comet differ somewhat from the search percentages reported in the Complaints, *infra* note 118. Also note that the search data reported here includes both paid search and navigational organic search. For most of these websites, the split between the different types of search is unavailable. As a consequence, the search percentages reported here are overstated relative to non-navigational organic search. But since the percentile rankings make the apples-to-apples comparison of total search percentage for these websites to the overall distribution of total search, this problem is alleviated when looking at the rankings. There may be some remaining difference if the ratio of non-navigational organic search to total search is substantially different for the complainants than for the general sample of websites. In our sample of websites, paid searches constitute only 9% of total searches on average, and other studies have found that navigational searches are infrequent relative to total searches (Brian J. Jansen, Danielle L. Booth & Amanda Spark, *Determining the Informational, Navigational, and Transactional Intent of Web Queries*, 44(3) INFO. PROCESSING & MANAGE. 1251 (2008), so this effect is likely to be small on average, and there is no particular reason to expect it to work in either direction.

D'Agostino	eCommerce	2010	Mistaken identification as duplicate site, resulting in a reduction in search ranking	US	Defunct	-	-
Yelp	Local reviews	2010	Favoring Universal Search; excessive utilization of complainant's content	US	16,316,263	50%	91st
TripAdvisor	Travel	2010	Favoring Universal Search	US/EU	13,802,658	31%	65th
Expedia	Travel	2010	Favoring Universal Search	US/EU	33,706,382	13%	23rd
Kayak	Travel	2010	Favoring Universal Search	US	6,569,610	17%	31st
Nextag	Comparison shopping	2010	Favoring Universal Search	US	18,176,620	34%	71st
Ciao	Shopping portal	2010	AdSense exclusivity and other restrictions	EU	-	33-40%	69th – 82nd
Foundem	Comparison shopping	2010	Demotion of search ranking; Favoring Universal Search	EU	-	46%	88th
1PlusV	Vertical search	2010	Removal of webpages from Google's index; Demotion of search ranking	EU	-	56-73%	94th – 98th
Deal Du Jour	Deals	2011	Demotion of search ranking	EU	-	27%	53rd
HotMaps	Online maps	2011	Demotion of search ranking; favoring Universal Search	EU	-	41%	83rd
nntp.it	Newsgroups	2011	Demotion of search ranking	EU	-	13%	23rd
Elf Voetbal	Football resources	2011	Favoring Google OneBox	EU	-	10%	16th
Interactive Lab	Referral services	2011	Manipulation of AdWords auctions	EU	-	-	-

Twenga	Shopping portal	2012	Favoring Google's Universal Search	EU	-	27-40%	56th – 82nd

V. THE IMPACT ON SOCIAL WELFARE OF THE ADVERSE SELECTION AND LARGE NUMBERS PROBLEM

As noted earlier, multi-sided platforms are often economically significant firms. They have the same temptations as any powerful firm does to engage in harmful behavior. Competition authorities, for example, should monitor these firms for all the same reasons they consider other significant companies. The adverse selection and large number problems, however, can generate numerous complaints from firms that have experienced problems largely because of their own failings but have chosen to exercise their litigation option opportunistically against the platform.

If courts and competition authorities had perfect information they could simply identify which complaints have merit and which do not. In practice, these decision makers do not have perfect information and therefore need to determine how much effort they should expend looking into these complaints. Even after investigation and adjudication they would not have perfect information and could, on occasion, condemn pro-competitive practices: what is known in error-cost analysis as a "false positive."[121]

This section argues that if competition authorities and courts ignore the adverse selection and large number problems, multi-sided platforms would be subject to excessive litigation, and false positive decisions, which would reduce social welfare. The next section then describes how competition authorities and courts should adjust their decisions on allocating scarce resources—and ultimately their screens for assessing anticompetitive behavior—given these problems. In both cases, the analysis applies beyond competition authorities to any consideration of government policy towards multi-sided platforms based on complaints by users of free business services.

A. Adverse Selection, Large Numbers, and False Positives

[121] This is also known as a Type II error. *See* Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1 (1984); David S. Evans & A. Jorge Padilla, *Designing Antitrust Rules for Assessing Unilateral Practices: A Neo-Chicago Approach,* 72 U. CHI. L. REV. 72, 73 (2005); RICHARD POSNER, ECONOMIC ANALYSIS OF LAW (8th ed. 2010).

Most antitrust cases arise from complaints by firms. In the US, most antitrust litigation results from private lawsuits; firms bring most of these lawsuits with the exception of class action price-fixing cases involving consumer goods.[122] In most jurisdictions, competition authorities pursue cases as a result of complaints brought by firms. In the European Union the European Commission receives complaints and must make specific decisions on whether or not to pursue those complaints.[123] In the United States, although the Justice Department and the Federal Trade Commission do not have any obligation to pursue complaints, many of the monopolization cases they do pursue arise from complaints by businesses.

The previous sections have shown that several factors can result in competition authorities receiving large numbers of complaints concerning multi-sided platforms. Firms can fashion complaints that articulate a superficially plausible antitrust claim. Changes in platform rules can harm some of the business users of free platform services. A portion of those users may exercise their litigation option and file a complaint in court or before a competition authority. Although the likelihood that any particular user of free platform services files a complaint may be very low, because of the large numbers involved for some platforms, the cumulative likelihood that at least one complaint arises can be very high. In fact, as shown earlier, when a platform serves millions of businesses, a very small probability that a business will sue can result in hundreds of complaints and the virtual certainty of someone complaining.

These complaints are likely to come disproportionately from businesses that had relatively low *a priori* odds of success and relied on free platform services relatively more because of liquidity constraints. When a platform makes a change that harms some users the ones who use it the most are likely to be harmed the most. The businesses that are overly reliant on the platform are also likely to be more vulnerable businesses and therefore more likely to be pushed over the edge, into failure, as a result of the changes. The litigation option may be their only asset.

In the US and other jurisdictions that allow private plaintiffs to recover treble damages businesses tend to have higher valued litigation options all else equal if they have been adversely affected by the platform change and rely heavily on the platform. In other jurisdictions these businesses may be

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[122]In the 12-month period ending March 31, 2011, private antitrust actions accounted for 537 out of the 555 antitrust cases filed in the federal courts (97%). Administrative Office of the U.S. Courts, Federal Judicial Caseload Statistics 2011, Table C-2, *available at* http://www.uscourts.gov/Viewer.aspx?doc=/uscourts/Statistics/FederalJudicialCaseloadStatistics/2011/tables/C02Mar11.pdf

[123] Council Commission Notice on the handling of complaints by the Commission under articles 81 and 82 of the EC treaty O.J. (C 101) 65-77.

able to secure concessions from the platform as a condition of not filing a complaint or withdrawing a complaint that has been filed.

The argument is not that cases brought against platforms necessarily lack merit. However, large multi-sided platforms that provide free services are likely to be subject to many complaints from firms that have failed as a result of their own low quality combined with decisions to rely mainly on the provision of free platform services. These firms are opportunistically using their litigation option to obtain compensation for problems they have, in effect, caused themselves. As noted, if courts and competition authorities had perfect information they could simply screen these cases out.

Information is imperfect, however, and it only takes one complaint to lead to a negative and possibly catastrophic outcome for the platform. Here is where the large number problem raises the stakes for multi-sided platforms. To see why, suppose there is a 99 percent probability that the court or competition authority will reject a complaint that lacks merit and a 1 percent probability that it will rule in a complainants' favor, even though its complaint lacks merit. Consider a platform that has 1 million business users. The platform could expect to face 100 complaints if there were a .01% (i.e., 1/10,000) probability of a business user filing a complaint. Assuming the decisions on complaints are independent, one would expect that these 100 complaints would lead to one false positive.

While one could debate the specifics of this calculation, in both directions, the point is that as the number of business users increases, the probability of false positives increases. For platforms with millions of users each year, the probability of a false positive, over the duration of putative dominance, could approach certainty under plausible assumptions.

If antitrust lawsuits were simply about paying damages this result would not be of much concern. It would just be a cost of doing business for the platform. The problem is that a decision by a competition authority or court can apply to other business users of the platform in similar circumstances. That can result from either behavioral remedies[124] or a decision by the platform to change certain behavior to avoid costly litigation and damages in the future.[125]

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[124] For example, Microsoft was required to make certain information available to firms to facilitate their interoperating with Microsoft's Windows server operating system and to distribute a version of Windows that did not include certain media playing functionality. *See* Case T-201/04 R, Microsoft v. Comm'n, [2004] E.C.R. II-4463.

[125] *See* Claudine Beaumont, *Microsoft and EU reach browser settlement*, TELEGRAPH (Dec. 16, 2009), *available at* http://www.telegraph.co.uk/technology/microsoft/6825561/Microsoft-and-EU-reach-browser-settlement.html.

B. False Positives and Negative Externalities

When a false positive arises, by assumption, the multi-sided platform has not engaged in anticompetitive behavior. In this case one can infer that the platform has adopted business practices, including decisions involving managing positive and negative externalities and balancing the sometimes competing interests of platform members, to maximize profits.[126] Economic theory finds that, although the balance struck by multi-sided platforms may not exactly equal the socially optimal balance, the direction and magnitude of the bias (if any) will depend in a complicated way on a host of hard-to-measure factors (such as marginal costs on all sides, demand elasticities on all sides, and the intensity of competition for end-users on all sides) and that there is no reason to believe that multi-sided platforms in general exhibit a substantial bias towards a particular side.[127] Some authors have identified specific exceptions, such as with payment cards, where under some assumptions the profit-maximizing platform operator may tilt prices more towards one side more than a social welfare-maximizing platform operator would.[128] But even in this case there is no reason to believe that decisions, for example, on which side should bear relatively more of the costs of platform are socially suboptimal—only the degree of the tilt towards one side or the other.

Platforms are likely to alter the balances they strike between different parts of the community when courts or competition authorities reach a false positive decision. In this case the court or competition authority would have reached a conclusion that a business practice involving one side of a multi-sided platform is unlawful. The platform would suspend the practice either as part of a behavioral remedy or to avoid future penalties.

Suppose, for example, Google were compelled to change its practices for ranking websites, or for punishing websites that violate its practices. Some websites would necessarily do better in the rankings but others would

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[126] *See generally* Rochet & Tirole, *supra* note 34; Weyl, *supra* note 14. For a platform with market power there are two possible sources of welfare loss. One is the usual welfare loss resulting from the exercise of market power, which results in the elevation of overall prices. The other is a possible welfare loss which results in tilting the price structure in such as way that one side is bearing more, and another side, less of the cost of operating the platform that a social welfare maximizing regulator would.

[127] Rochet & Tirole, *supra* note 34.

[128] *See* Bedre-Defolie & Calvano, *supra* note 37, at 5-6. Calvano observes, however, that even under these assumptions the privately and socially optimal prices are unlikely to differ dramatically. *See* Emilio Calvano, *Note on the Economic Theory of Interchange, Comment on the Federal Reserve's Proposed Regulation II* (2011), *available at* http://www.federalreserve.gov/SECRS/2011/March/20110328/R-1404/R-1404_030811_69122_621890579792_1.pdf.

do worse and would therefore lose. In addition, to the extent that Google's ranking decisions were correct to begin with, consumers would get lower quality search results. If consumers reduced their use of search because of this reduction in quality then advertisers would have less ability to reach these consumers.[129]

False positive decisions cause negative externalities and thereby reduce social welfare. Platforms seek to maximize the value of the platform to the members after taking into account positive and negative externalities between these members. When one of these decisions is reversed it is likely that the platform will either create fewer positive externalities or more negative externalities. That could result directly from reversing rules that generate positive externalities among members by, for example, making it easier for them to get together and interact or that suppress negative externalities by, for example, discouraging members from disseminating bad information. That could also result indirectly from changing pricing decisions or rules that reduce platform participation by some members. For example, suppose the platform is required to increase prices to a group of platform participants. The platform would have chosen prices given the positive externalities between members to maximize the value of the platform. By raising prices to one group, the platform would reduce their participation, and by reversing positive feedback effects, would reduce the value of the platform to other groups.

C. The Impact of False Positives on Platform Decisions, Design and Innovation

A false positive decision can have spillovers from the narrow matter that was under consideration for that decision. It can set a precedent that the platform must abide by in other related decisions. A decision concerning platform practices or rules concerning the use of free services by businesses can directly affect those practices or rules. A decision may enjoin a particular type of practice. A decision can also lead the platform to modify other practices or rules that seem like they would be subject to similar complaints and thus similar adverse decisions. A false positive decision can also set a precedent that raises the likelihood that similar practices and rules adopted by other platform companies will be subject to adverse decisions.

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[129] Gord Hotchkiss, *Why Results Quality is So Important to Search Engines*, SEARCH ENGINE LAND (May 20, 2011), http://searchengineland.com/why-results-quality-is-so-important-to-search-engines-77957; *In Search of the Perfect Search: Can Google Beat Attempts to Game the System?*, KNOWLEDGE@WHARTON (Mar. 16, 2011), http://knowledge.wharton.upenn.edu/article.cfm?articleid=2731.

Other platforms will therefore alter those practices and rules in anticipation of costly litigation and negative rulings.

The primary cost of false positive decisions arising from the adverse selection and large number problems, however, involves distortions in decisions that platforms, and their entrepreneurs, make prospectively concerning the adoption of business models, the direction of innovation, and governance rules. The thesis of this Article is that these problems result in a high probability, if not a certainty, that large, global multi-sided platforms will face false positive decisions concerning the business users of the platform. That expectation could lead platforms to increase the price to business users to compensate for the risks and incremental costs they will bear; to avoid innovations that could harm some business users; and to vertically integrate into applications rather than relying on an open platform. At the margin the likelihood of false positive decisions—i.e., adverse decisions over pro-competitive business practices—reduces the incentives to start platforms or to consider platform models that involve providing services for free to businesses.

Any reduction in the supply of free business services by multi-sided platforms could have knock-on effects on innovation. An open platform model in which the entrepreneurs are encouraged to develop applications and other complementary products decentralizes innovation. It moves the control of the direction and pace of innovation from the platform owner to a large population of entrepreneurs.[130] This fact is seen from the success that several of the global multi-sided platforms have had as shown in Table 1. It is hard to imagine a centralized firm accomplishing so much innovation in such as short space of time.

D. Impact on Competition Authority Resource Allocation

The large number and adverse selection problems could result in a further inefficiency. Uncorrected, these problems could lead antitrust authorities into misallocating their resources and investigating multi-sided platforms more than other industries that have the same or higher likelihoods of having engaged in wrongdoing. Given that competition authorities have scarce resources the failure to adjust decisions to pursue cases given these phenomena would result in underinvestment in pursuing other complaints.

To see the essence of the problem consider a competition authority that

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[130] Joel West & Scott Gallagher, *Challenges of open innovation: the paradox of firm investment in open-source software*, 33 R&D MANAGE. 319, 320 (2006); Georg von Krogh et al., *Community, joining, and specialization in open source software innovation: a case study*, 32 RESEARCH POL'Y 236, 237 (2003).

has to evaluate whether to invest resources on the investigation of various companies. Company A is a global multi-sided platform that provides free business services and Companies B and C are not multi-sided platforms. All three firms have the same revenue and market value. The authority has 20 complaints against company A, only one against company B, and none against company C. All else equal the authority might conclude that the agency should focus on company A because of the volume of complaints. But company A could be subject to many complaints as a result of the large number and adverse selection problems. There is no a reason, a priori, to believe that company A is more likely to have engaged in anticompetitive behavior than companies B or C.

VI. Heightened Antitrust Scrutiny of Complaints by Business Users of Free Multi-Sided Platform Services

This Article proposes that courts and competition authorities should impose a higher level of scrutiny on complaints brought by business users of free multi-sided platform services. Before describing what this means in practice it is helpful to emphasize that the proposal itself is modest. There is no suggestion that antitrust decision makers should ignore possible antitrust violations by multi-sided platforms much less give them a free pass. Some of these platforms are economically significant and anticompetitive actions by them could impose serious harm. Nor does this article suggest that competition authorities or courts should presume that platform business practices concerning business users of free platform services are pro-competitive.

However, this Article has shown that the litigation option, adverse selection and large number phenomena are likely to lead to false positive decisions against multi-sided platform providers of free business services and that those false positives, and the anticipation of them, reduce social welfare. The reduction in social welfare could be significant since it could lead to an increase of negative externalities on large multi-sided platforms that are subject to an adverse decision and because it could have follow-on effects on innovation and decisions at other, including formative, multi-sided platforms.

A. How Decision Makers Should Adjust Their Assessments

The first part of the proposal is that courts and competition authorities should consider the litigation option, adverse selection, and large number phenomena in forming judgments concerning the weight that a particular complaint by a business user of free plaintiff services should be given.[131] Courts and competition authorities ultimately need to make judgments on whether or not to pursue a complaint. In the US courts have to decide motions to dismiss a complaint and motions for summary judgment.[132] Competition authorities in all jurisdictions need to decide how to allocate resources across different industries. They must also chose which complaints to pursue and how aggressively. Whether they acknowledge it or not these decisions are based in part on judgments concerning the weight to be accorded to various kinds of evidence and, ultimately, the likelihood that further consideration will uncover anticompetitive behavior.

Any particular complaint against a multi-sided platform that provides free services may result from a low-quality business that has failed largely through its own shortcomings, opportunistically exercising their litigation option. That probability increases with the number of businesses that use free platform services. Moreover, competition authorities and courts should discount multiple complaints, at a point in time or over time, against a multi-sided platform provider of free business services according to the number of business users served by a platform. It would be wrong to infer that multiple complaints necessarily suggest a pattern of anticompetitive behavior or signal a serious problem, given the very larger number of entities that interact with the platform.

B. Heightened Scrutiny of Complaints

The analysis set forth indicates that courts and competition authorities could reduce the likelihood of reaching a false positive decision by taking the following factors into account in assessing a complaint:

- The extent to which the harm alleged by the complainant is the result of business practices engaged in by the platform versus the failings of the complainant itself. For this purpose it is useful for the decision maker to examine the quality of the business including the entrepreneur, the management team, the business model, business execution, and financial backing.

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[131] D.H. Kaye, *Burdens of Persuasion: What Bayesian Decision Rules Do and Do Not Do* 3 INT. J. EVID. PROOF 1 (1999).

[132] Such motions are decided according to the tests set out *in Bell Atlantic Corp. v. Twombly*, 550 U.S. 544 (2007) and Ashcroft v. *Iqbal*, 556 U.S. 662 (2009).

- The number of business users of free platform services. With a large number there is a higher probability that the particular complaint is an aberration, due the peculiarities of the business in question, and not evidence of anticompetitive behavior.

- The impact of enjoining the behavior on other platform users. That should consist of other business users as well as other sides of the business. A change in business practices that benefits particular types of business users but harms other business users and other platform users would likely decrease social welfare.

- Whether the decisions regarding the complainant follow a governance system for reducing negative externalities. In this case there is a strong presumption that the decision is pro-competitive and the burden should be placed on the complainant to show that it is not.[133]

These factors could be taken into consideration at any stage of the analysis. For competition authorities these factors would be taken into account at the point of deciding whether to devote resources to a complaint, whether to move a complaint into a fully fledged investigation, whether to pursue a complaint, what issues to focus on, and which behavioral remedies to advocate. For US courts these factors would be considered during procedural phases (motion to dismiss and summary judgment) as well as during consideration of the merits of the case and remedies.

C. Application to Search Litigation

In the case of the Google search litigation this analysis indicates that the courts or competition authorities should take several factors into account in considering complaints.

The relative number of complainants. Google has provided free listing and search services to millions of business websites for more than a decade. The number of complainants relative to the population of businesses that have obtained similar free services from it is extremely low. It also appears that some of these businesses have pursued complaints against Google in part because they have received help from one of Google's competitors.[134]

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[133] *See* Evans, *supra* note 41.

[134] *Microsoft Encourages Google Antitrust Complaints*, Utility Exchange (Mar. 1 2010),http://www.utility-exchange.co.uk/microsoft-encourages-google-antitrust-complaints-5445/.

In effect, a platform competitor has in effect purchased the "litigation options" of these businesses to impose costs.

Search dependency. It appears that most of the companies that have filed complaints against Google (in contrast to other sites) are highly search dependent. About a third of the complainants had developed businesses that relied almost entirely on search for traffic to their websites. That is consistent with these businesses having decided that, given their abilities and their ideas, it was not worth investing in branding that would attract direct traffic.

Adverse selection. Many of the complaints concern reductions in search rankings. These have mainly come from web sites pursuing business models offered by many similar sites. These firms would not have had a high likelihood of success—since such "me-too" sites do not generally—regardless of changes in their search rankings. In addition to relying excessively on search these businesses perhaps ran into difficulties for the same reason that other business do that fail to distinguish themselves.

Alleged harm results from governance system. Most of the complainants claim that they were harmed as a result of Google either reducing their search ranking as a punishment or as a result of Google changing its algorithms. Having a governance system that counters the incentives of websites to engage in self-serving manipulation of their rankings is economically efficient. As noted earlier complainants should bear a heavy burden in challenging practices that result from the application of a platform governance system. In particular, a complaining party should be required to certify that the information provided to the agency is, to their knowledge, accurate. The agencies should also establish a mechanism for sanctioning third parties that mislead the agencies into imposing costs on other parties.[135]

Negative externalities. As a general matter it is economically efficient for search engine platforms to penalize websites that artificially inflate their rankings and to modify their algorithms to reduce the ability of websites to game the system. Moreover, it is impossible in the real world to design governance systems that have zero false positives—just as it is impossible

[135] Although the agencies have tools to punish particularly egregious conduct, these additional measures would provide additional protections that both conserve agency resources and protect targets and third parties from opportunistic abuses. If a party is dissuaded from submitting a complaint because of the requirement to swear as to its veracity, the agencies likely are better off not having received it.

to design a legal system to have zero false positives. Action by a court or competition authority that would discourage the use of these economically efficient methods would impose negative externalities on the other platform participants including websites (some of whom would have lower rankings in the absence of methods to deter opportunistic efforts to increase rankings) and search users (who will obtain less relevant search results).

This Article does not argue that these factors by themselves should lead to the dismissal of complaints against Google or other search engines in similar situations. Rather, the point is that courts and competition authorities should consider these factors in their decision making.

VII. CONCLUSIONS

In the last two decades one of the most remarkable developments in the history of business has occurred. Multi-sided platforms, operating globally, have developed Internet-based software that enables businesses to access hundreds of millions of consumers who also use these platforms for services. These platforms not only provide this access for free, in many cases, but also provide other assistance to help these businesses. Millions of businesses use free services provided by firms such as Facebook and Google. In some cases these multi-sided platforms provide extensive software assistance that enables entrepreneurs to develop businesses based on applications that work with these platforms. Hundreds of thousands of applications have been created by software platforms that run on personal computers, mobile devices, or in the cloud.

By providing free services multi-sided platforms stimulate a great deal of effort by entrepreneurs. But they also tend to attract firms that cannot secure funding or that do not want to invest because of the risk. Many of these entrepreneurs who rely on free platform services may be highly capable. But there are reasons to believe that platform that provide free business services attract entrepreneurs that want to rely on free services because the entrepreneurs and potential investors do not have enough confidence to risk losing their capital investments. As a result when the platform makes changes that adversely affect some business users these low quality firms are the ones most likely to complain. In some cases changes made by the platform push them into bankruptcy or would if they could not get a reprieve. The only asset they have left is a litigation option.

The fact that multi-sided platforms serve very large numbers of business users raises a further problem. These large numbers increase the likelihood

that changes made by a platform will cause some business to file a lawsuit. It takes only a miniscule propensity to sue to generate a complaint—indeed many complaints—given the large numbers of businesses served. Furthermore, when applied to a very large number of businesses the adverse selection of entrepreneurs into reliance on free business services results in a significant number of complaints coming from relatively poor businesses that are exercising their litigation option.

Competition authorities and courts should take the litigation option, adverse selection and large number phenomena into account in evaluating complaints. Otherwise global multi-sided platforms will be swamped with litigation in multiple jurisdictions around the world. Unless courts and competition authorities make adjustments in their decision making, these platforms would be virtually guaranteed that they would be subject to a false positive decision at some point. These false positive decisions would result directly in the reduction in social welfare created by the targeted multi-sided platforms, which would have to rebalance business practices in ways that would necessarily harm some non-complaining users. They would also tend to discourage multi-sided platforms from operating open platforms that provide free services to business users and discourage multi-sided platforms from engaging in legitimate balancing decisions.