



Free Can Make Cents: How to Think About “Free” in Competitive Markets

Lesley Chiou and Avigail Kifer

Introduction

Firms offering products at a price of zero or for “free” is not a new phenomenon. The Yellow Pages have been distributed to consumers free of charge for decades, as have free-to-air television and radio services, and retail establishments often offer free samples or products to draw people into their storefronts. As digital content has exploded, “free” products have become ubiquitous. Today, consumers commonly encounter free digital products or services in the form of search engines (Google, Yahoo, Bing), creative content (YouTube, Pinterest), social media (Facebook, Twitter, TikTok), communications products (Skype, Zoom), travel booking sites (Priceline, Kayak), and navigation services (Waze, Apple Maps, Google Maps). The firms that offer these “free” products profit through a variety of different strategies, including collecting valuable consumer data, collecting advertising revenue, and/or charging consumers for premium services.¹

While “free” is certainly not a new concept, the types of situations in which free products are encountered and the effects of free products on the dynamics of competition have evolved as digital service providers have developed new ways

to deliver value and earn payment. In both traditional and digital markets, a “free” product is usually accompanied by a related, paid product that provides the rationalization for a firm offering such a pricing arrangement. That is, a firm may find giving away Product A for free leads to profitable increases in demand for Product B and ultimately higher profitability overall. This could be true whether Product B is an entirely different product from Product A, a higher quality version of Product A, or simply sales of Product A made later in time or sold to different customers than those that purchased Product A.

In this article, we offer an overview of the nature of products that are often priced for “free,” firms’ incentives for employing this pricing structure, and the importance of quality in assessing competition in the supply of “free” products.

Economic Incentives to Offer “Free” Products

A seller that offers only a single product or service would not find it profitable to offer this sole product or service for “free” to *all* customers at all times.² Thus, it is not surprising that when a “free” product or service exists for some customers, it is usually connected to a related paid product or service, or is

¹ Alessandro Bonatti, Anindya Ghose, Avi Goldfarb, Daniel G. Goldstein, Anja Lambrecht, Randall Lewis, Anita Rao, Navdeep Sahni, and Song Yao, “How Do Firms Make Money Selling Digital Goods Online?” *Marketing Letters* 25, no. 3, June 2014, pp. 331–341; John M. Yun, “Overview of Network Effects &

Platforms in Digital Markets,” *The Global Antitrust Institute Report on the Digital Economy 2*, November 11, 2020.

² As described below, a platform may have an incentive to offer free access to its services to one side of the platform. However, in order to make profits, it will likely charge at least one other side of the platform a positive price.

sold at a positive price to a separate and distinct group of customers (or to the same group of customers but at different times). The relationship between the “free” and paid products or services (or the customer groups paying zero and non-price prices) is typically what incentivizes firms to offer products or services to certain customers for free in the first place. There are several different types of economic arrangements in which the price of one product is free. These arrangements differ in terms of the relationship between the free and paid products, whether the consumers of the free and paid products overlap, and whether the zero prices are sustainable in the long run.

Zero Priced Platform Products

The first type of product that is frequently offered for free is “access” to one side of a multi-sided platform. Economists use the term “multi-sided platform” to refer to a business or firm that adds value by acting as an intermediary between two or more distinct types of agents or customers whose demands for access to the platform (which facilitates interactions or transactions) are interdependent.³ For example, social media platforms connect users and advertisers; streaming services connect content creators, content consumers, and advertisers; credit cards connect consumers and merchants; health insurers connect patients and healthcare providers.

A multi-sided platform may offer “free” access to one side while charging the other side because the demand from one group is directly or indirectly related to the demand from the other group; the value that customers on at least one side of the platform place on the platform will depend upon the demand for the network by customers on the other side. Economists refer to this form of demand interdependency as “indirect network effects” between the customer groups. For example, in the case of credit cards, the demand by merchants on

one side and cardholders on the other is interdependent: the card is worth more to the cardholder when it is accepted by a greater number of merchants and the value to the merchant of accepting payment cards from a particular brand is higher when more cardholders prefer to pay with cards from that brand. Similarly, the larger the audience on a streaming service, the more valuable the platform is to content creators and advertisers. The greater the variety in content, the more valuable the platform is to listeners or viewers.

Indirect network effects have important implications for how platforms price access to their services to each side of the platform. Demand interdependency means that a platform can increase the total usage of its platform and its profits by charging relatively more to the less price-sensitive group of customers and relatively less to the more price-sensitive group of customers.⁴ Thus, in equilibrium, a platform will have an incentive to charge the less price-sensitive group of customers a higher price than the more price-sensitive group of customers, which may optimally result in the more price-sensitive group paying a zero price.⁵ For example, a social networking site that allows consumers to join for free would attract more consumers than if it charges an access fee. In turn, the additional consumers that use the social network when it is free would increase its value to advertisers, possibly even to the point where the increase in advertising profits more than covers any profits that would have been raised from charging consumers an access fee. A platform may have a further incentive to offer the more price-sensitive customers access for “free,” as opposed to a cost slightly above zero, if transaction costs exist. In addition, evidence from behavioral economics suggests that there can be a discontinuous change in demand when a product is priced at zero. When

³ David S. Evans and Richard Schmalensee, “Markets with Two-Sided Platforms,” *Issues in Competition Law and Policy*, Volume 1, eds. Wayne D. Collins, et al. (Chicago, IL: ABA Section of Antitrust Law, 2008), pp. 667–693 (“Evans and Schmalensee (2008)”).

⁴ Jean-Charles Rochet and Jean Tirole, “Two-Sided Markets: A Progress Report,” *The RAND Journal of Economics* 37, no. 3, 2006, pp. 645–667 (“Rochet and Tirole (2006)”).

⁵ It may even be profit-maximizing for a platform to charge a price below marginal cost to one group of customers in order to increase their participation, while recouping the platform’s loss through a higher price on the less price-sensitive side.

this discontinuity is present, firms have an additional incentive to offer free products.⁶

Note that for zero priced platforms, at least one customer group typically does pay a non-zero price to the platform, which may come in the form of a subscription fee, a fixed fee per listing or sale, or a percentage of the transaction price, among other arrangements. For example, service providers pay a monthly fee to Booksy, a beauty and wellness appointment booking service, while consumers may book the appointments for free.⁷ In addition to charging restaurants a subscription fee, OpenTable charges them a booking fee for every reservation made, while the diners that make the reservations do not pay the platform.⁸

While a platform may elect to not charge certain customers a positive monetary access fee, these customers may offer something of value that allows the platform to increase its own value to both sides of the platform. These non-monetary payments may take a number of forms, depending on the platform's monetization strategy. Some of the more common non-monetary payment types, particularly when the paid side of the platform involves advertisers, are characterized as the consumer's "attention" and "data." In return for accessing the platform's product for a zero price, the consumer implicitly agrees to exchange his attention (a valuable commodity for advertisers) or data (also valuable, as they may reveal his preferences and facilitate targeted advertisements). A consumer's data may include his contact information, social network, location, device ID, web browser history, past purchases, interactions with a business' website, and other metrics. A platform can then use this information to sell high quality advertisement opportunities to advertisers, in which advertisers can personalize ads and ad content to users and

increase their return-on-investment.⁹ The more value advertisers place on interactions with consumers, the greater the value they place on consumer attention and data, which help them improve the success rates of those interactions. In other words, the value of such non-monetary payments increases with the strength of the indirect network effects.

Importantly, these data can, and are also used to, improve the user experience offered by the platform itself. Platforms that incorporate insights from consumer data can improve recommendation algorithms for video and music streaming services, for search engines, for news feeds, and more.¹⁰ They can also use that data to learn about the limitations or potential of a product, and devise strategies to address those limitations or expand the product's potential more efficiently.

Freemium Offerings

The freemium strategy is characterized by the offer of a free, but basic, product or service, alongside a higher quality product with enhanced functionality or features. Freemium offerings exist in many contexts and do not rely on platform economics to be successful. For example, in many instances, providers of online storage or music streaming services will offer a limited version of their service to consumers at no cost, but then charge a premium price for access to more space, a greater music library, the ability to curate playlists, etc. Firms' incentives to employ this pricing arrangement lie in the fact that consumers are more likely to engage with the free product at first, which can then stimulate demand for the paid product. In this arrangement, the free and companion products are intertemporal complements (i.e., goods that are

⁶ Mehdi T. Hossain and Ritesh Saini, "Free Indulgences: Enhanced Zero-Price Effect for Hedonic Options," *International Journal of Research in Marketing* 32, no. 4, 2015, pp. 457–460; Kristina Shampianier, Nina Mazar, and Dan Ariely, "Zero as a Special Price: The True Value of Free Products," *Marketing Science* 26, no. 6, 2007, pp. 742–757 ("Shampianier et al. (2007)").

⁷ "About Us – Booksy," Booksy, <https://booksy.com/en-us/p/about>; "Pricing," Booksy, <https://booksy.com/biz/en-us/pricing.html>.

⁸ "How OpenTable Works for Restaurants," OpenTable, <https://blog.opentable.com/2010/how-opentable-works-for-restaurants>.

⁹ The platform may also sell the data to third parties.

¹⁰ Mallika Rangaiah, "How Spotify is Using Big Data to Enhance Customer Experience," *analytic Steps*, January 6, 2021, <https://www.analyticssteps.com/blogs/how-spotify-using-big-data>; Barrack Diego, "How Is Big Data Impacting Search Engine Optimization," *Reflective Data*, June 28, 2019, <https://reflectivedata.com/how-is-big-data-impacting-search-engine-optimization/>.

consumed together but at different times)¹¹ of different qualities purchased by the same consumers.

Such a business model is common among providers of digital goods, as the low marginal costs of production may mean that even low volumes of sales of the paid product can compensate for losses on the free product.¹² In addition, freemium business models are often well-suited for “experience goods,” where consumers may be unable to assess the quality of (or their demand for) a product without “experiencing” it first.

Bundled Products

Another economic arrangement in which “free” goods are found is in products that are explicitly or implicitly bundled. For example, some travel packages offer a paid product alongside a “free” component, such as hotel room bookings that come with free meals. Experimental evidence indicates that consumers may even shift their demand towards a cheaper, less preferred hotel precisely due to the free breakfast option.¹³ In this arrangement, the free and companion products are in related markets and are purchased by the same customers. As another example, smartphones are often offered for “free” with the purchase of a cellular plan. This scenario differs from the other example offered in that the marginal cost of a phone or device is significant. The buyer of the smartphone “internalizes the impact of his purchase on the demand and surplus attached to” the cellular plan.¹⁴ In other words, the buyer accepts a higher price for the plan (sometimes in the form of a long-term contract) in exchange for the free phone.¹⁵

As above, the rationale behind this pricing structure is that increasing demand for one product (by setting its price to zero) can increase demand for

the bundled product, allowing the firm to at least break even on both.¹⁶ In other words, when the demand for two products is related (such as a smartphone and a cellular plan, or lodging and food), adjusting the relative prices for those products may increase total sales and profits, even if one of the products is nominally sold below cost or even for “free.”

Other Arrangements

For completeness, we note that there are other arrangements where one good has zero price. These include arrangements where the production of the zero price good is motivated by altruism (e.g., Wikipedia, Linux software), or where the offer of a zero price is temporary and part of a promotional period or free trial (e.g., some subscription services or memberships).¹⁷

Note that zero price products may be offered simultaneously through multiple arrangements. It is not uncommon, for example, to pair a freemium strategy with a multi-sided platform, such that the free product is supported both by a paid version and by advertisers on the other side of the platform.

Quality Competition in Zero Price Products

Given that firms that price a product at zero generally have strong incentives to pick that price, as opposed to some other low but positive price, it is not surprising that firms that offer one of their products for “free”—and compete with other “free” products—often compete on quality, particularly in the multi-sided platform context. Thus, observing that a platform does not charge customers a non-zero price does not mean the firm is not competing. This dynamic is consistent with competition on quality.

¹¹ Two goods are complements when a decrease in the price of the first good increases the quantity demanded of the second good. The goods are intertemporal complements if the second good is demanded at a different point in time (i.e., the goods are not consumed concurrently).

¹² David Evans, “The Antitrust Economics of Free,” *Competition Policy International* 7, 2011 (“Evans (2011)”); John M. Newman, “Antitrust in Zero-Price Markets: Foundations,” *U. Pa. L. Rev.* 164, no. 1, 2015, pp. 149–205 (“Newman (2015)”).

¹³ Juan L. Nicolau and Ricardo Sellers, “The Free Breakfast Effect: An Experimental Approach to the Zero Price Model in

Tourism,” *Journal of Travel Research* 51, no. 3, 2012, pp. 243–249.

¹⁴ Jean-Charles Rochet and Jean Tirole, “Platform Competition in Two-Sided Markets,” *Journal of the European Economic Association* 1, no. 4, 2003, pp. 990–1029 (“Rochet and Tirole (2003)”).

¹⁵ Shampianier et al. (2007).

¹⁶ Evans (2011).

¹⁷ Newman (2015).

There are many different dimensions of quality along which such firms compete. Importantly, competition on the quality of the zero price offering does not preclude competition on the quality of the non-zero price offering. Due to the indirect network effects, any improvements in quality that attract more users to the zero price side of a platform may also increase the attractiveness of that platform (and thus its competitive position) for customers on the other sides.

The quality of a zero-priced product or service can be affected by the features of the service and by the degree to which the service develops innovative new features or improvements. For example, the quality of a search engine (from the consumer – or the zero price side – point of view) may be related to the speed at which it produces search results, the relevance of those search results, and the degree of personalization vs. privacy offered.¹⁸ The quality of a social media site may be related to the content formats offered (text, images, videos), the options available to interact with users and the content they post, and the algorithms that present this content to users. The quality of a news aggregation platform may be related to the customization options it offers and its ability to identify high quality news that is local or relevant to the user: empirical research has found that whether or not users research news materials in depth can be influenced by the degree to which an aggregator presents local or high quality news.¹⁹ These are all examples where consumers are generally *consuming* the platform's product and thus their demand for the platform may depend on the product that the platform is offering them.

In cases where the platform acts as a matchmaker, the quality of the platform may additionally be affected by the sheer numbers of customers on each side of the platform. For example, the quality of a credit card network may be related to the travel perks offered, access to a dedicated concierge or customer service, and fraud protection features. It is also closely related to, in consumers' eyes, the number of merchants that accept the cards, and, in merchants' eyes, the number of consumers carrying the cards. The quality of a streaming site may be related to its discovery features (e.g., the algorithm through which it recommends and curates new content) and audio quality offered. It is also closely related to, in consumers' eyes, the content available and the content creators on the platform, and, in content creators' eyes, the size of the audience. The content available, in fact, may be a meaningful differentiating factor for multi-sided platforms, which may find that signing exclusive arrangements with suppliers can enhance the competitiveness of the platform. In other words, differentiation can encourage consumers to multi-home across platforms in order to access a variety of content, which in turn stimulates competition among platforms for both consumers and the suppliers.

For digital platforms, the quality is also affected by features such as the user interface: is the service easy to use? If the service includes online ads, do they create clutter?²⁰ Are they relevant for the user? While some posit that ads may be viewed as unwelcome or disruptive in some contexts, others suggest that ads may help users discover new brands and thus enhance the platform's value to consumers.²¹

¹⁸ Some search engines, such as DuckDuckGo, advertise their policy of not collecting or sharing a user's personal information (see, e.g., duckduckgo.com). Others offer personalized search results, based on data such as a user's search history or physical location. See, for example, Google, "Personalized Search for everyone," December 4, 2009, <https://googleblog.blogspot.com/2009/12/personalized-search-for-everyone.html>; Bing, "Making search yours," Microsoft Bing Blogs, February 10, 2011, <https://blogs.bing.com/search/2011/02/10/making-search-yours/>.

¹⁹ Lesley Chiou and Catherine Tucker, "Content Aggregation by Platforms: The Case of the News Media," *Journal of Economics & Management Strategy* 26, no. 4, 2017, pp. 782–805.

²⁰ Empirical research has shown that ads and ad content may affect consumer search patterns. Lesley Chiou and Catherine Tucker, "How does the use of trademarks by third-party sellers affect online search?" *Marketing Science* 31, no. 5, 2012, pp. 819–837.

²¹ Google, "About Discovery campaigns," <https://support.google.com/google-ads/answer/9176876>; Aaron Barr, "Nearly half of consumers will try new brands if the ad is relevant," *Marketing Dive*, September 28, 2020, <https://www.marketingdive.com/news/nearly-half-of-consumers-will-try-new-brands-if-the-ad-is-relevant/585972/>.

Firms that offer zero priced products may also compete by continually improving their products' features. For example, social media sites have developed user verification options, content that disappears after a set time, new ways to organize content, and a variety of engagement opportunities (likes, retweets, reactions, replies, shares).²² They have worked to detect deepfakes²³ and to protect users from harmful or false content.²⁴ Similarly, search engines have been improving the artificial intelligence powering the search algorithms to better understand misspelled words, interpret very specific search phrases, or even conduct an image search. They have also experimented with the ways in which results are displayed, including by recognizing when a chart or graph may better serve a search request and processing the relevant data in order to do so, or by generating infographics.²⁵ In fact, for platforms that compete for user attention (the degree to which users engage with and spend time on the platform) in addition to the number of users, the incentives for such innovation are clear: platforms need to ensure their users are engaged.²⁶ Innovation that improves a platform's ability to create value for consumers may strengthen indirect network effects, and strengthen a platform's competitive position.

Conclusion

While there is no longer debate surrounding whether (or not) conduct in markets containing "free" or zero priced products could ever engender anticompetitive effects, procompetitive economic incentives for such pricing arrangements clearly

exist.²⁷ These incentives likely drive the prevalence of free goods or services, particularly in the digital space, which in turn can stimulate dynamic and intense competition on quality. As we discuss in this article, such competition can take on a number of forms, which themselves may continue to evolve as digital markets grow.

About the Authors



Lesley Chiou is a Professor of Economics and Department Chair at Occidental College



Avigail Kifer is a Senior Manager at Cornerstone Research

²² Karin Olafson, "The Top Twitter Updates You Need to Know: January 2021," *Hootsuite*, January 26, 2021, <https://blog.hootsuite.com/twitter-updates/>, accessed August 9, 2021; Twitter, "Help us shape our new approach to verification," https://blog.twitter.com/en_us/topics/company/2020/help-us-shape-our-new-approach-to-verification, accessed August 9, 2021; Joshua Yao and Sam Haverson, "Fleets: a new way to join the conversation," *Twitter*, November 17, 2020, https://blog.twitter.com/en_us/topics/product/2020/introducing-fleets-new-way-to-join-the-conversation, accessed August 9, 2021; Rose Yao, "Improvements to Timeline," Facebook, March 13, 2013, <https://about.fb.com/news/2013/03/improvements-to-timeline/>, accessed August 9, 2021.

²³ Deepfakes use advanced artificial intelligence techniques to create realistic-looking but fake, misleading, and counterfeit videos and other digital content.

²⁴ Xi Yin, "Detecting the Models Behind Deepfakes," *Facebook*, June 16, 2021, [https://about.fb.com/news/2021/06/detecting-](https://about.fb.com/news/2021/06/detecting-the-models-behind-deepfakes/)

[the-models-behind-deepfakes/](https://about.fb.com/news/2021/06/detecting-the-models-behind-deepfakes/), accessed August 9, 2021; Amit Chowdhry, "Facebook Launches A New Tool That Combats Fake News," *Forbes*, March 5, 2017, <https://www.forbes.com/sites/amitchowdhry/2017/03/05/facebook-fake-news-tool/>.

²⁵ Prabhakar Raghavan, "How AI is powering a more helpful Google," *Google*, October 15, 2020, <https://blog.google/products/search/search-on/>; Microsoft Bing, "Microsoft Bing delivers more visually immersive experiences that save you time," March 4, 2021, https://blogs.bing.com/search/2021_03/Microsoft-Bing-delivers-more-visually-immersive-experiences-that-save-you-time.

²⁶ David S. Evans, "Attention Rivalry Among Online Platforms," *Journal of Competition Law and Economics* 9, no. 2, 2013, pp. 313–358.

²⁷ John M. Newman, "Antitrust in Zero-Price Markets: Applications," *Washington University Law Review* 94, no. 1, 2016, pp. 49–111.

