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Bundling & Tying

CPI COMPETITION POLICY INTERNATIONAL

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LETTER FROM THE EDITOR

Dear Readers,

Bundling and tying are classic antitrust abuses. Leveraging market power to force customers of "Product A" to purchase "Product B" is an archetypal competition law infringement.

Like most antitrust abuses, tying can take many forms. Aside from the standard paradigm of forcing a customer to purchase a product additional to the one in which the incumbent possesses market power, there can be more nuanced scenarios.

For example, questions have recently arisen as to whether "tying" analysis applies where a monopolist forces customers to purchase multiple units of the same product.

Further, there is the even more nuanced scenario of software bundling. The Microsoft cases of the 1990s (concerning the bundling of browsers and media players with a dominant operating system) have of late given way to cases involving tightly integrated software bundles sold by mobile "platform" providers, and the integration of specialized types of search results within online search platforms.

The above issues, concerning digital markets, also relate to the debate concerning the so-called "free" nature of various online products and services, and the question of how tying analysis can even apply in such a context.

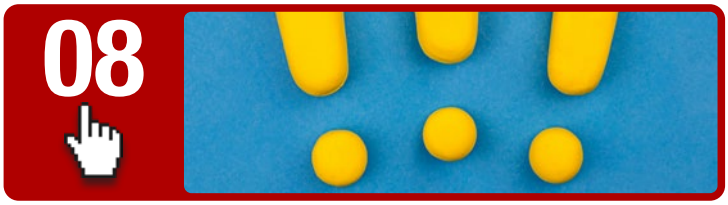
In short, while "tying" and "bundling" are not new concepts, their application to new market contexts gives rise to no shortage of profound legal and economic questions that continue to shed light on their underlying basis. The contributions to this Chronicle form a vital part of this evolving discussion.

As always, thank you to our great panel of authors.

Sincerely,

CPI Team

SUMMARIES



Sell/Buy Bundling

By Adam Brandenburger & Barry Nalebuff

This note examines bundling where a firm sells content or a service and, in the process, buys the customer's attention or data. For example, Google bundles search with ads. This kind of sell/buy bundle is prevalent in the digital economy. We develop a framework to address the question: When will the firm require customers to take a sell/buy bundle rather than allow them to buy the content without selling their attention? Under our assumptions, if the average customer's value of content is large relative to the value of the ad and customer attention costs are relatively low, the profit-maximizing strategy for the firm is to price so that all customers take the bundle. We end by considering other reasons for sell/buy bundling that fall outside our economic model.

A Tying Perspective on Apple, the iPhone, and the App Store

By Michael Waldman

Significant attention has recently been paid to Apple's behavior concerning the iPhone and App Store. In this paper, I employ economic theory concerning tying behavior to better understand the economic forces behind Apple's behavior, and the extent to which intervention is justified. I identify three plausible motivations for Apple's behavior – efficiency, price discrimination, and leveraging its market power – and discuss what each suggests concerning whether intervention is justified. The conclusion is that only the leverage argument provides a plausible rationale for intervention. In addition, this argument suggests that the case for intervention is stronger if Apple' tying behavior concerning the iPhone and App Store significantly negatively affects the supply of apps.

Tying of "Free Goods" in Digital Platform Markets

By Jay Pil Choi

As dominant platforms offer related services and expand into adjacent markets, there are serious concerns for anticompetitive tying that may serve to extend their market power to other markets. In this article, I review recent theoretical developments in the leverage theory of tying in relation to digital platform markets where goods are often provided for "free." With zero pricing, the monopolist of the primary good may be unable to appropriate a rival firm's efficiencies through the pricing of the primary product and therefore have an incentive to resort to tying to foreclose the rival firm and expropriate any rents associated in the tied product market. I also briefly discuss practical issues that may pose challenges in putting theory into practice. In particular, given potential precompetitive and efficiency-enhancing effects of tying, a rule of reason approach that carefully balances pro- vs. anticompetitive effects would be advisable.

Can Identical Products, Bundled Together, Constitute Illegal Tying?

By Melanie Stallings Williams

Can bundling identical items constitute anticompetitive behavior? Unlawful tying occurs when a seller has market control and essentially forces the buyer to purchase another product. Bundling differs from tying because, while products are being sold together, the buyer can purchase the items separately. Bundling does not normally constitute anticompetitive behavior; in fact many products are sold in multiples or with complements. Bundling can reduce consumer welfare, however, if the seller pairs an item over which it has market power (product A) with another item (product B), manipulating prices so as to engage in predatory conduct. But what of two identical products being sold in a bundle? Normally, selling in multiples increases consumer welfare by reducing costs. But what if the markets for the two identical bundled products differ? Can the market for a primary medical emergency device differ from the market for a backup? Or the market for viewing first-run entertainment programs differ from subsequent broadcasts? Or for reading newspapers during the week compared with Saturdays? If so, should we conclude that the otherwise identical products are not substitutes and analyze the two separate markets using tying analysis. Federal district courts in three circuits have reached contradictory conclusions, so that the issue is ripe for analysis.

SUMMARIES

Bundling Identical Products: An Economic Analysis

By David S. Sibley

This article considers whether or not the bundling of two identical products is usefully treated as a tying arrangement. Following Prof. Williams' article in this issue, I discuss three tying cases in which the defendants bundled two products that were arguably identical. Of the three, I focus on the *EpiPen* case. Bundling two identical products might appear to be a tying arrangement because the purchase of one product in the bundle is conditioned on the purchase of a second product, identical to the first. Notwithstanding this, I conclude that the bundling of two identical products is not usefully analyzed by tying analysis. Doing so adds no useful incremental economic insight as to the anti-competitive effects, if any, of this type of bundling arrangement.

WHAT'S NEXT?

For October 2021, we will feature Chronicles focused on issues related to (1) **Imperfect Competition**; and (2) **Breaking Up Is Hard To Do?**

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CPI ANTITRUST CHRONICLES NOVEMBER 2021

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Contributions to the Antitrust Chronicle are about 2,500 – 4,000 words long. They should be lightly cited and not be written as long law-review articles with many in-depth footnotes. As with all CPI publications, articles for the CPI Antitrust Chronicle should be written clearly and with the reader always in mind.

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The CPI Editorial Team will evaluate all submissions and will publish the best papers. Authors can submit papers on any topic related to competition and regulation, however, priority will be given to articles addressing the abovementioned topics. Co-authors are always welcome.

SELL/BUY BUNDLING

BY ADAM BRANDENBURGER & BARRY NALEBUFF[1]

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I. INTRODUCTION

Newspapers and online platforms provide content to readers, and, in return, readers give their attention to advertisements. Sometimes, as in the case of newspapers, there is a net positive price charged to readers for the two transactions. Other times, as with Facebook or Google, the net price is zero.

The case of customers giving up data is similar. The firm provides content or a service and, in return, the customer provides personal data. In this note, we focus on bundles where the customer is selling their attention, but the results do not depend on the label we attach to what the customer is providing.

The sale of content supported by ads is a form of bundling, but not one that has been studied in that context. In a typical case of bundling, a firm sells two goods A and B as an AB bundle. A classic example is the combination of Word, Excel, and PowerPoint into a Microsoft Office Suite bundle. Here, we look at a different type of bundle, where the bundle is a combination of selling A to the customer while buying B from the customer. We call these sell/buy bundles. As Gillian Tett has pointed out, the common case where the net bundle price is zero can also be thought of as a barter transaction since no money changes hands.[2]

The question we address is when does the firm require the customer to take a sell/buy bundle rather than allow the customer to buy the content without selling their attention. In some situations, it would be hard for the firm to provide a buy-only option. For network television to offer an ad-free version of the news would require additional content to be created for the twelve minutes per hour devoted to ads. But for digital content, removing the ads is a simple process. Examples of such unbundled services include Hulu+, Slate+, and YouTube Premium. In 2016, *The New York Times* considered launching a premium online version without ads.[3] This would have allowed readers to buy the content without selling their attention. Similarly, one could imagine a premium-priced or subscription version of Facebook or Google where the content is provided without ads.

The bundling of content with ads has received attention as part of the larger debate around the power of Big Tech. Paul Romer has proposed a tax on targeted digital ads in order to "restore and protect this digital commons."[4] As Romer recognizes (and even encourages), firms could avoid this tax by offering an ad-free subscription service at a premium price. His motivation for the tax is to move content providers away from an ad-supported model that keeps users on the platform via "filter bubbles" and addictive provocations, and towards a subscription-based revenue model. In the search-engine space, a new entry, neeva.com, offers a subscription model that aims to "surface high-authority websites, and not the ones that are chasing after clicks."[5] But for companies such as Facebook, Google, *The New York Times*, and *The Wall Street Journal*, no such premium subscription options presently exist.

In this note, we extend the traditional analysis of bundling to allow the firm to bundle a sale with a purchase. Our goal is to provide a framework for studying sell/buy bundles and to connect the framework to the traditional bundling literature. This type of bundling is prevalent in the digital economy and not well studied.

The sell/buy bundling employed by newspapers and online content providers is different from traditional bundling in one important way: it is a case of one-way bundling. For example, the customer can buy Hulu content on their own (no ads via Hulu+) or the customer can buy Hulu at a lower price and sell their attention (the bundle). But it is not possible for the customer to sell their attention without also buying content. The choice for the firm is between selling A alone or selling A and buying B as a package. There is no option for the firm to buy just B.

2 See https://hbr.org/2021/07/the-data-economy-is-a-barter-economy.

3 http://www.mandmglobal.com/new-york-times-considers-ad-free-premium-digital-subscription-model/.

4 https://www.nytimes.com/2019/05/06/opinion/tax-facebook-google.html.

5 https://www.cnbc.com/2021/05/16/sridhar-ramaswamy-ex-google-building-ads-free-search-engine-neeva-.html.

II. THE BASIC MODEL

In our model, the firm is a monopolist in terms of selling good A and a monopsonist in terms of buying good B from customers who have bought A. We do not assume that the firm is, in general, a monopsonist in terms of buying attention from the customer, only that it is a monopsonist in buying attention while the customer is consuming its A product. For example, for people online at Facebook this is the only firm to which they can sell their attention while exploring Facebook content.

We assume that price discrimination is not possible. The firm has to offer a common price to all customers when selling content and a common price to all customers when paying for their attention. In the case of a sell/buy bundle, the firm offers a single net price (possibly negative) for simultaneously selling its content and buying the customer's attention.

We first consider the case where the customers' value of content and cost of attention are independent. Let the customer's value of content be uniformly distributed over $[0,M]$ and the cost of attention be uniformly distributed over $[0,1]$. Setting the maximum cost of attention to be 1 is a normalization; M is then the ratio of the maximum value of content to the maximum cost of attention. Intuition suggests that $M > 1$, but we consider all possible values of M. Varying M will illustrate how the optimal bundle strategy changes when the average value of content is larger or smaller than the average cost of attention. Initially, we assume the value to the advertiser of any customer's attention is 1, so that it is efficient for all customers to see ads. In Section 4, we relax this assumption.

We begin with the case of a pure bundle. The firm only sells A in conjunction with buying B. The mathematics will be simpler if we adjust the bundle price to include a payment of 1 to the customer for their attention. A bundle price of p implies a net customer price of $p - 1$. (The firm collects $p - 1$ from the customer and 1 from the advertiser for p in total.) A customer with content value v and cost of attention c will buy the bundle provided:

$$v - c \geq p - 1 \text{ or } v + (1 - c) \geq p.$$

We can interpret $1 - c$ as the customer's net gain from selling attention where the 1 comes from the adjusted bundle price. In Figure 1 below, we put the value v on the vertical axis and $1 - c$ on the horizontal axis.

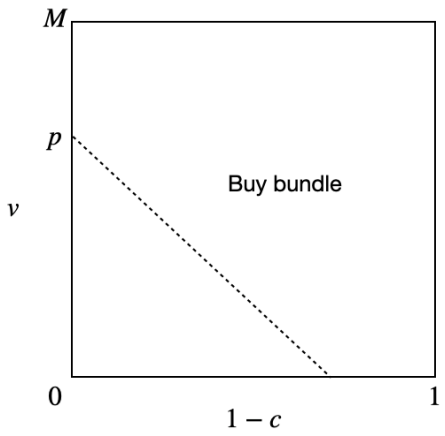


Figure 1

The customers willing to purchase content and sell their attention for a bundle offered at a price of $p - 1$ are all those lying in the upper-right region of the rectangle. This picture looks like the traditional pure-bundle pricing problem. As drawn, $M = 1$, and the profit-maximizing bundle price is $p = \sqrt{(2/3)} \approx 0.82$. Customers are offered a bundle of the content with ads for a net payment of $0.82 - 1 = -0.18$. By comparison, a bundle price of 1 corresponds to a zero-payment trade: the customer gets the content in return for accepting the ads, and no money changes hands.

At a bundle price of 1 (net price of 0), firm profit is $1/2$: the firm sells its content for free to half the market and makes 1 in ad revenue, for a profit of $1/2$. (We assume that content is free to produce.) At a price of 0.82, the firm sells to two-thirds of the market for a profit of 0.54.

These results are standard in the bundling literature. (Adams & Yellen, 1976,[6] and McAfee, McMillan & Whinston, 1989[7] are the classic analyses of buy/buy bundling.) Here, however, instead of putting the value of good B on the horizontal axis, we plot the net gain to the customer from selling attention and getting paid 1 to do so. Thus, a customer with attention cost c will gain $1 - c$. Even a customer with a very low or near-zero value of content will buy (and consume) the content provided $1 - c > p$.

If we move away from the assumption that content value and attention cost are independent, we see that the ideal case for the firm is when the value of content and the net value of selling ads are perfectly negatively correlated across customers. For example, if $v + (1 - c) = 1$ for all customers, the firm could charge a price of 1 and transact with all customers for a net profit of 1, up from 0.54. This case implies $v = c$, that is, the value of the content is perfectly *positively* correlated with the customer's cost of attention. Because one component of the bundle is flipped from selling to buying, the most desirable correlation for bundling is reversed. The cost of attention can be thought of as the customer's value of time. Under this interpretation, the desirable case is when the customer's value of content is positively correlated with the value of time. This might arise if both are positively correlated with income.

III. ONE-WAY BUNDLING

As a general matter, we know that mixed bundling is always at least as profitable for the firm as a pure bundle. And yet we see many instances of pure sell/buy bundles in the digital economy. This leads us to ask: When will the firm find it optimal to sell only a bundle and not sell content on its own? Of course, the firm can achieve the same result as with a pure bundle by offering content with no ads at a very high price. What we mean by a pure-bundle strategy is that the firm will find it optimal to price the mixed bundle so that all customers end up with the content/ad bundle or nothing—no one buys just the content.

Let p_1 be the price of just the content and $1 - p_2$ be the price offered for the customer's attention. The firm's incremental profit from buying attention is thus p_2 (since it also collects 1 from the advertiser).

Only one-way bundles are possible. That is, customers can sell their attention only if they buy the content. Customers have a choice between three options:

- buy content only at price p_1,
- buy content and sell attention at net price $p_1 - 1 + p_2$,
- do neither.

As can be seen in Figure 2, customers for whom $v > p_1$ and $1 - c \leq p_2$ will choose to purchase just the content. Customers for whom $v + 1 - c > p_1 + p_2$ and $1 - c > p_2$ will choose to purchase the content and sell their attention. All other customers will not transact.

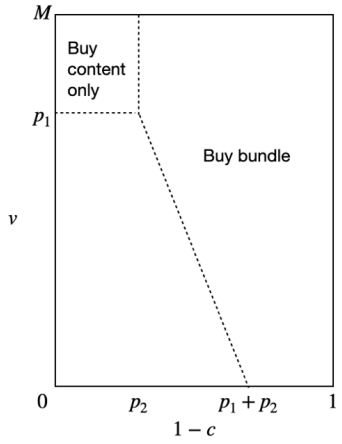


Figure 2

6 Adams, William & Janet Yellen (1976), "Commodity Bundling and the Burden of Monopoly," *The Quarterly Journal of Economics*, 90, 475–98.

7 McAfee, R. Preston, McMillan, John & Michael D. Whinston (1989), "Multiproduct Monopoly, Commodity Bundling, and Correlation of Values," *The Quarterly Journal of Economics*, 104, 371–383.

Following the analysis in Chen and Nalebuff (2006)[8] adapted to the case of a sell/buy bundle, the profit-maximizing solution under the uniform distribution is:

for $M > 3/2$,

$$p_1 = 1/4 + M/2,$$
$$p_2 = 0.$$

for $M \leq 3/2$,

$$p_1 = 2M/3,$$
$$p_2 = 1/2 - M/3.$$

In particular, if $M > 3/2$, so that the average value of content is at least 50 percent higher than average cost of attention, it makes sense for the firm to price so that *all* customers who buy the content also sell their attention. This follows from $p_2 = 0$. Only sell/buy bundles are transacted.

If $M = 3/2$, the price of content is 1 and the rebate for selling attention is also 1, leading to a net price of 0. The firm gives away its content and, in return, the customer looks at ads. We can think of this as the current "barter" or pure-bundle strategy of Facebook and Google.

If $M < 3/2$, the firm prices its content so that exactly two-thirds of customers who most dislike ads ($c = 1$) will buy the content only. In the limit, as M becomes very small, as much as one sixth of customers will pay the higher price and buy content only.

In presenting this solution, we have ignored potential issues around a negative net price. When $M < 3/2$, the net price the customer pays for content and accepting ads is

$$p_1 + p_2 - 1 = M/3 - 1/2 < 0.$$

A negative price has the potential to create moral hazard. Google might not want to pay people to do a search because that would lead people to do searches solely for the purpose of collecting the fee.[9] Similarly, if customers are paid to receive content along with ads, they might take the money and not read the content. That way they do not have to pay the attention cost c. Of course, if the customer is not paying attention, the advertiser is not willing to pay 1. This moral hazard problem can arise even when the product is given away. Advertisers are only willing to pay a high price if they know the magazine and hence the ads are actually being read. For this reason, magazines with a high-end readership often require paid subscriptions even when the ad revenue would more than justify giving away the content. A zero price is less of a concern when the customer is seeking the content than when the content is being pushed to the customer.

IV. EXTENSION

We have assumed that the value of the ad to the content provider exceeds the attention cost to the customer. This seems like a reasonable assumption in the case of print media where it is easy to flip the page. But it is more debatable for content provided on mobile devices, or for ads in video or audio content. In the case of mobile devices, the ad can take up a large fraction of the screen and make it harder to read the content. It can lead to mistaken taps. In the case of ads in video or audio content, it is hard to skip over them. In some cases, such as YouTube, it is impossible to skip without first watching ads for some predetermined amount of time. In all these circumstances, we expect there to be some customers for whom the attention cost exceeds the value of the ad. In our model, that would mean $c > 1$ for at least some customers.

There is a general result for this case: It is always optimal for the firm to provide a content-only option (no ads) which some strictly positive fraction of customers purchase. The only assumption required is that there is strictly positive density for all customer types (v, c) over $[0,M] \times [0,C]$, where $C > 1$ is the maximum attention cost.

8 Chen, M. Keith & Barry Nalebuff (2006), "One-Way Essential Complements," Cowles Foundation Discussion Paper 1588.

9 That said, negative prices can and do arise. Facebook Study pays $10 to $20 monthly to individuals who allow Facebook access to expanded user data; see https://www.facebook.com/facebookstudy.

The intuition is that if the amount some customers are willing to pay the firm not to see the ad is greater than what the advertiser is willing to pay the firm, then the firm should sell the no-ad option to those customers. Making only a bundle available is equivalent to setting the price p_2 for customers' attention equal to $1 - C$. This implies that customers are being paid C for their attention, which is more than the revenue the ad yields. The firm would do better to reduce what it pays for attention down from C to 1, which increases the net price to 0, and then lower p_1 to the earlier bundled price of $p + 1 - C$. The profit from bundled sales remains constant at $p + 1 - C$:

original pricing: $(p_1, p_2) = (p, 1 - C)$,

new pricing: $(p_1, p_2) = (p + 1 - C, 0)$.

Under the new pricing, the firm makes the same profits from those customers who continue to buy the bundle. It also makes the same amount from those who switch from the bundle to content only. It makes more money by increasing content-only sales. This can be seen in Figure 3 below, where the firm gains a new set of content-only customers who provide the same profit as with the original bundle sales. These customers were not previously willing to buy the content when they had to sell their very costly attention in the process.

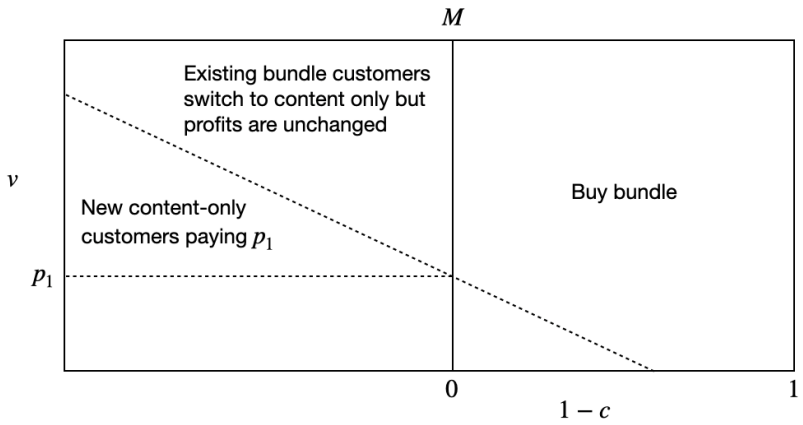


Figure 3

Another way to see this result is that the firm should sell the ad to the highest bidder. Normally, the highest bidder is the advertiser, who is willing to pay 1. If there are customers willing to pay more than 1 not to see the ad, it is more profitable to allow those customers to buy back their attention at a price of 1. Under our pricing convention, $p_2 = 0$ at an attention price of 1, so the firm is giving all the ad revenue back to the customer and doesn't make any profit from the ad. The firm does better to set $p_2 = 0$ and allow customers with $c > 1$ to avoid ads than to set $p_2 < 0$.

V. CONCLUSION

Why do we see firms offering a pure sell/buy bundle without giving customers the option to pay more and get content without seeing ads or providing data? We do see examples of ad-free content sold at a premium price: Hulu+, Slate+, and YouTube Premium, as mentioned earlier. And neeva.com is offering no-ad search and data privacy at a premium price. But why isn't this strategy more common? Our analysis provides some possible answers.

One explanation is that the customer's value of content is large relative to the value of the ad ($M > 3/2$) and customer attention costs are relatively low ($C < 1$). In this case, the profit-maximizing strategy is to price so that all customers buy the bundle.

There are several other explanations for the use of bundle-only strategies that fall outside our model. As we discussed earlier in the example of network news, it may be costly to provide a no-ad version. The no-ad version requires creating more content and not just removing the ads.

Creating a no-ad premium version of a product or service can also lead to conflicts inside the organization. If the customer is allowed to pay a premium in order to avoid ads (or keep data private), this will change the allocation of profits inside the firm. Presumably, the manager in charge of advertising will not want to give up the revenue that would then be credited to a premium subscription. To solve this problem, the incremental charge for the premium subscription over the ad-based model should be credited to the advertising department. It is as if the customers are the ones paying for the ad space (to be blank) and thus are buying out their own ads.

Following a bundle-only pricing strategy may help protect a monopolist from being perceived as charging a monopoly price, a point made Gillian Tett.[10] The bundled price is lower than the content-only price. Indeed, it is often zero in practice. The public and regulators may have a hard time recognizing the implied content-only price since it never appears. If the firm offers an unbundled option, this makes its market power clear to all.

On the flipside, there are arguments for offering a no-ad premium product in addition to the bundle. One expects that there will some be customers for whom the cost of their attention exceeds the value of the ad. (This is $C > 1$ in our model.) If so, profits are higher when the firm also offers an unbundled option. However, if the number of such customers is small, the complications may not be worthwhile.

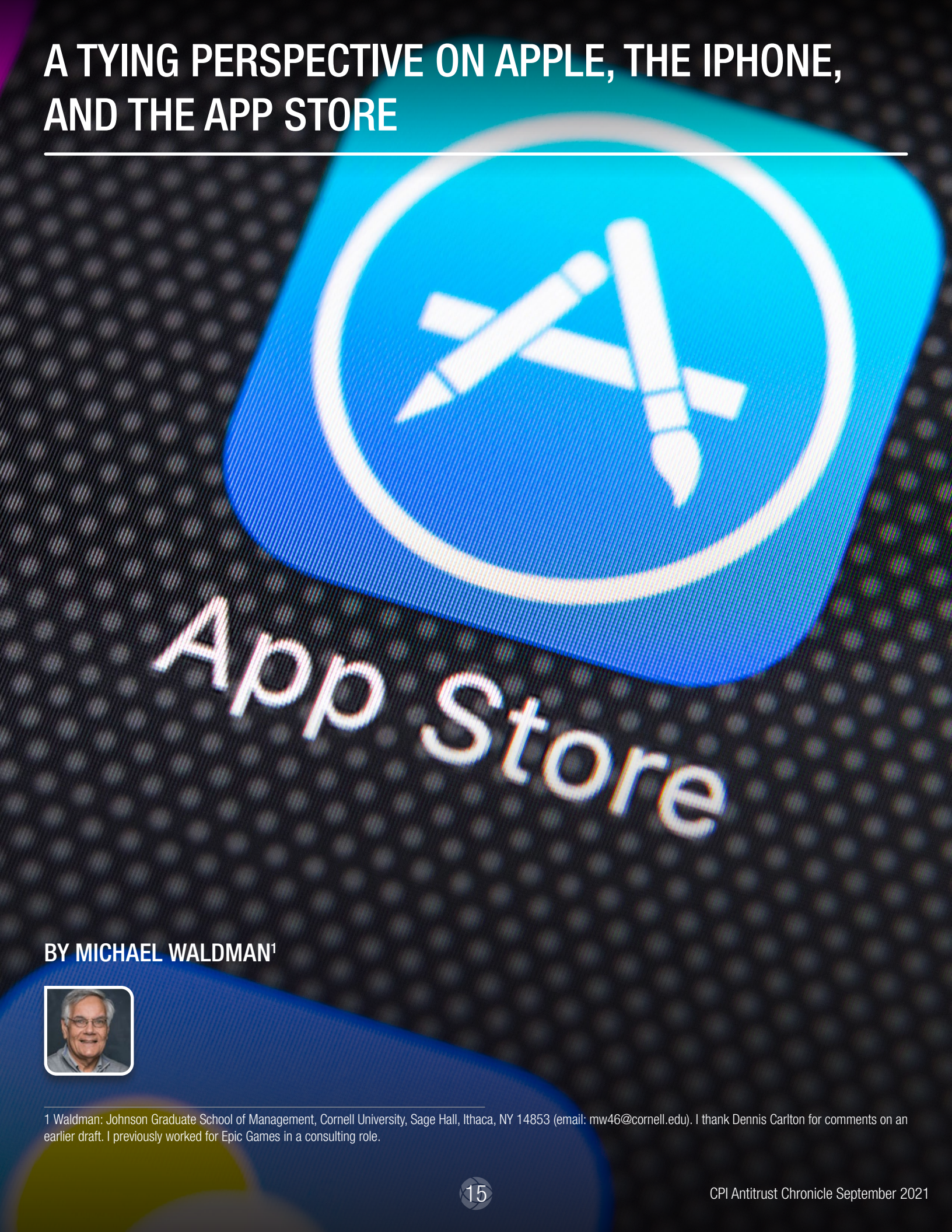
Another reason why the monopolist might offer a no-ad version is that doing so would reduce the supply of ads to be sold, which would allow the monopolist to charge a higher price to advertisers. This, too, is outside our model since we have fixed the price the firm receives from the advertiser at 1. If the demand for ads is determined on a customer-by-customer basis, then this supply reduction doesn't improve profits. The problem is that the firm is reducing the supply all the way to zero for a group of customers. (Zero times a high price is still zero.) This suggests an intermediate sell/buy bundle solution in which customers pay an intermediate subscription price, somewhere between the ad-supported and no-ad prices, and, in return, the firm is limited to showing a reduced number of ads (perhaps even just one) per day. A company called The Trade Desk is providing a platform that limits the number of ads on free services.[11] We thmink it would be interesting to consider a similar tiered strategy for a premium platform. A low premium price would come with a low number of ads and a higher premium price would come with no ads.

The one-way bundling framework is a good starting point for understanding profit-maximizing strategies for sell/buy bundles. The next step is to add features to the model that recognize some of the "hidden" or indirect costs associated with offering a mixed-bundle option. Another important step is to conduct a full welfare analysis of sell/buy bundling. We can make one immediate observation: When $C > 1$, offering a no-ad version at the bundled price would be a Pareto improvement, though this may not be the monopolist's profit-maximizing choice. We leave further welfare analysis as an open issue.

10 See https://hbr.org/2021/07/the-data-economy-is-a-barter-economy.

11 https://www.cnbc.com/2021/07/07/trade-desk-seeks-to-limit-number-of-streaming-ads-with-new-launch.html

A TYING PERSPECTIVE ON APPLE, THE IPHONE, AND THE APP STORE



BY MICHAEL WALDMAN[1]

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I. INTRODUCTION

Apple's behavior concerning the iPhone and the App Store has attracted significant antitrust scrutiny. This includes the recent *Apple-Epic* case, attention from both U.S. and European antitrust authorities, and scrutiny from the U.S. Congress which is considering updating U.S. antitrust laws. This raises a number of related questions. Is this attention justified? Is Apple violating the antitrust rules in either market? Should Apple be forced to change its behavior concerning the iPhone and the App Store?

In this paper, I shed light on these questions by discussing what the economic theory of tying tells us about Apple's behavior. As I discuss in the next section, there are aspects of this case that are not captured by the traditional literature on tying. Nevertheless, my belief is that most of the economic forces underlying Apple's behavior can be understood by viewing the behavior using a "tying lens." Also, the behavior raises legal issues, but those issues can only be properly understood when the economics is clear. Understanding the economics is what this paper is about.[2]

II. BACKGROUND

The smartphone market in the U.S. is dominated by two firms – Apple and Samsung – and there are significant switching costs associated with moving from one firm's smartphone to a competing firm's smartphone. Given the high profits the two major sellers earn in operating in this market, it seems reasonable to treat Apple's behavior concerning iPhones and the App Store from the standpoint of monopoly behavior. In other words, much of what I say below is based on the literature concerning tying in monopoly markets. But simple extensions of the models in the papers cited would show that the arguments apply in duopoly settings, where because of switching costs and an installed based each firm has significant market power. Also, for most of the discussion I do not focus on the two-sided nature of the markets. In terms of the basic economics important for understanding the economic forces driving Apple's behavior, I think it is arguments in the traditional tying literature which are most important. I come back to this issue later.

Apple employs an "almost" irreversible tie of the App Store to iPhones, i.e. the App Store is pre-installed on iPhones and no competing app store (such as the Google Play Store or the Epic Game Store) is allowed to be installed on an iPhone. This is not a fully irreversible tie, since in many cases one can purchase an app elsewhere (or in some cases download the app for free) and have it installed on the user's iPhone. However, downloading an app onto an iPhone after purchasing the app from a different app store is not as convenient as downloading it from the App store. As a result, many iPhone owners download apps for use on their iPhones predominantly from the App Store, and do not treat alternative ways of downloading apps for use on their iPhones as important substitutes.[3]

As indicated, the App Store is pre-installed on iPhones and there is no separate charge for the App Store app. However, this does not mean that Apple earns zero profits from the App Store. Far from it. Apple receives 15 or 30 percent of the price when an app is purchased from the App Store, and also receives 15 or 30 percent of later charges associated with use of the app, i.e. in-app payments, where these subsequent payments are substantial for many apps.[4] Given that the costs of maintaining and upgrading the App Store over time are relatively low, it is estimated that the App Store is a very profitable product for Apple. Note, however, (as emphasized by Apple) that similar fee structures are standard in the industry.

A related point is that from a theory standpoint, having the App Store pre-installed on iPhones with a fee for apps purchased is just one avenue through which Apple can monetize apps used on an iPhone. In particular, even in the absence of such fees, more apps and higher quality apps makes an iPhone a more attractive product for many consumers. So a second way that app availability can be monetized is through a higher iPhone price.

2 It would be more precise to describe Apple's tie as being between iOS, which is a mobile operating system exclusive to Apple's hardware, and the App Store. However, from an expositional standpoint, in terms of applying the tying literature to this case, it is more straightforward to describe the tie as being between the iPhone and the App Store, rather than iOS and the App Store.

3 One method for installing apps on an iPhone without using the App Store is to jailbreak the device, i.e. using software available on the web to break the lock that Apple places on iPhones. However, this voids the warranty and stops normal updating of the device. There are also sideloading techniques that do not involve jailbreaking the device, but these techniques are more complicated than purchasing an app from the App Store, especially for users who are not particularly tech savvy.

4 Currently, a 15 percent fee is charged for the first million dollars in sales of an app developer, and 30 percent for additional sales. Earlier the fee was a flat 30 percent. Apple enforces these charges by requiring iPhone users who purchase an app or make in-app payments using the iPhone to employ Apple's payment system. To be precise, therefore, this paper is about Apple's tie of the App Store to the iPhone in combination with the required use of Apple's payment system.

III. THE CHICAGO SCHOOL AND RELATED ARGUMENTS

Viewing Apple's behavior concerning the iPhone and the App Store from the perspective of tying theory, the first argument that comes to mind is the classic Chicago School argument concerning tying (see, for example, Director & Levi (1956),[5] Bowman (1957),[6] Posner (1976),[7] and Bork (1978)).[8] Think of the iPhone as the monopolized primary or tying product, and the App Store as the tied product. The Chicago School argument is that Apple's motivation for the tie cannot be extending its market power in the tying product to the tied product, because it can achieve all potential monopoly profits by optimally pricing the tying product, i.e. the iPhone.

To see the logic, consider a monopolist of left shoes in a setting in which right shoes are sold competitively. Suppose there are no efficiency reasons for tying and assume a one-period setting. The Chicago School argument is that the monopolist can do just as well selling left shoes only and letting consumers purchase right shoes from the competitive industry, as it could by selling pairs of shoes. Let P^* be the monopoly price for pairs of shoes, and P^R the competitive price for right shoes. The monopolist can set the price for left shoes at P^*-P^R, and the outcome in terms of monopoly profits, the consumer price for pairs of shoes, and total sales would be the same as if the monopolist sold pairs of shoes. The conclusion drawn is that, if we observe tying in this type of setting, the presumption should be that there is an efficiency rationale.

Whinston (1990)[9] employs a formal game theoretic approach to investigate the robustness of this argument (see also Ordover, Sykes & Willig (1985)).[10] He considers a one-period setting in which there is a monopolist of a primary good, a complementary good that can be produced both by the monopolist and a rival producer, constant marginal costs of production for the two goods, and a fixed cost for the production of the complementary good. He also assumes that ties are irreversible meaning that, if the monopolist ties or bundles the complementary good with sales of the monopolized primary good, then consumers cannot add the rival's complementary good. Whinston shows that in this setting the Chicago School argument is correct if the primary good is essential for all uses of the complementary good. That is, if the only demand for the complementary good is for combining it with the monopolized primary good, then the Chicago School argument applies. The monopolist does just as well pricing the primary good optimally and not tying, as by tying the complementary good to sales of the primary good.

As just discussed, Whinston (1990) shows conditions for which the Chicago School argument applies, but that paper and later papers show that the Chicago School argument will sometimes not apply when those conditions are not satisfied. Further, some of the analyses which investigate when the Chicago School argument does not apply are potentially relevant for understanding Apple's behavior concerning the iPhone and App Store.

One condition that Whinston finds is key for the Chicago School argument to apply, which clearly does not hold in the iPhone-App Store setting, is that the monopolized primary good is essential for all uses of the complementary good. Clearly, there are app stores such as the Google Play Store for which there is demand outside of the store being uploaded as an app onto an iPhone. A number of papers show that when the primary good is not essential for all uses of the complementary good, then there can be a return to tying to leverage market power into the complementary good market.

One such analysis appears in Whinston's 1990 paper, where he extends his basic analysis described above by adding a use for the complementary good that does not require the primary good. Here he shows that, if economies of scale in the production of the complementary good are important, then the monopolist may tie because tying reduces the size of the rival's potential sales and the rival then exits the complementary good market due to the economies of scale. In other words, tying extends the monopoly position in the primary market to the complementary good market. Whinston (1990) and Nalebuff (2004)[11] also show related results in models where the two products are independent rather than complementary.

5 Director, A. & E.H. Levi, "Law and the Future: Trade Regulation," Northwestern University Law Review, 1956, 51, pp. 281-296.

6 Bowman, W.S., "Tying Arrangements and the Leverage Problem," Yale Law Review, 1957, 67, pp. 19-36.

7 Posner, R.A., Antitrust Law, An Economic Perspective, Chicago, IL: University of Chicago Press, 1976.

8 Bork, R.H., The Antitrust Paradox: A Policy at War with Itself, New York: Basic Books, 1978.

9 Whinston, M.D., "Tying, Foreclosure, and Exclusion," American Economic Review, 1990, 80, pp. 837-859.

10 Ordover, J.A., A.O. Sykes & R.D. Willig, "Nonprice Anticompetitive Behavior by Dominant Firms Towards the Producers of Complementary Products," In F.M. Fisher, ed., Antitrust and Regulation: Essays in Memory of John J. McGowan, Cambridge, MA: MIT Press, 1985.

11 Nalebuff, B., "Bundling as an Entry Barrier," Quarterly Journal of Economics, 2004, 119, pp. 159-188.

Another related analysis appears in Carlton & Waldman (2002).[12] That paper considers two-period models in which the monopolist's primary good is not essential in the sense that the rival has the potential to enter the primary good market in the second period. In other words, in the first period the monopolist's primary good is essential, but there is potential entry into the primary market in the second period, and the possibility of such entry means the monopolist's primary good is not essential in the second period. Carlton & Waldman show that, given either economies of scale or network externalities, tying can arise in such a setting because it can serve to stop entry into the primary market, and thus preserve the firm's primary market monopoly. Note that Whinston (1990) contains a related analysis in which tying does not stop entry into the primary market, but rather eliminates as a substitute a competitively supplied inferior primary product.[13]

Another condition which is important for the Chicago School argument to apply is the assumption in Whinston's (1990) basic analysis that the goods are consumed in fixed proportions. This condition is arguably also not satisfied in the iPhone-App Store setting. That is, although a single App Store app appears on the typical iPhone, the idea that the revenue generated by the app varies significantly across consumers means the setting more closely resembles a setting consistent with variable proportions between the primary and complementary goods, rather than fixed proportions.

When products are consumed in variable proportions, rather than fixed proportions, tying can sometimes be used to price discriminate via what is commonly referred to as metered sales. The basic argument was first put forth to explain IBM's behavior in a famous 1936 case concerning punch cards and tabulating machines (see also Chen & Ross (1993)[14] and Klein (1993)).[15] Suppose that some consumers of the primary or potentially tying product are heavy users of the complementary good, while other consumers are lighter users. If the consumers who are more intensive users of the complementary good are also the high valuation consumers, then the monopolist can frequently increase profits by tying and setting a high price on units of the complementary good. The basic idea is that tying in this case allows the monopolist to more effectively price discriminate, i.e. the high valuation consumers make higher total payments than other consumers, because they purchase a higher number of the high priced complementary good.

Note that Stigler (1963),[16] as well as later papers such as Schmalensee (1984),[17] McAfee, McMillan, & Whinston (1989),[18] and Bakos & Brynjolfsson (1999),[19] explore another price discrimination related argument for tying. In this argument, tying is used to reduce heterogeneity concerning consumer valuations. These models do not satisfy Whinston's condition that there is an essential primary good. In terms of understanding Apple's behavior, this argument seems less relevant than the metered sales argument. That is, valuations in the iPhone-App Store case are likely positively correlated, which is more consistent with the metered sales argument, rather than this alternative concerning reducing consumer heterogeneity.

A third condition assumed by Whinston (1990) in his basic analysis that is important for the Chicago School argument to hold is that all sales occur simultaneously (this is an implicit condition of Whinston's analysis given his focus on one-period models). Carlton & Waldman (2012) consider tying in a two-period durable goods setting in which the complementary good can be produced both by the primary good monopolist and a rival, where the complementary good can be upgraded in the second period.[20] Upgrading in their analysis means that each firm has the ability to invest in research and development concerning complementary good quality, and then offer a higher quality complementary good in the second period. Note that upgrades over time of the App Store and other app stores is a common feature of that market, and new apps and upgraded apps over time can also be potentially thought of as complementary good upgrades i.e. upgrades of the App Store, when applying this analysis to Apple's behavior.[21]

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12 Carlton, D.W. & M. Waldman, "The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries," Rand Journal of Economics, 2002, 33, pp. 194-220.

13 Another argument in which tying arises where the monopolist's primary good is not essential is found in Carbajo, de Meza & Seidman (1990). In that argument goods are independent, rather than complementary, and tying is used to increase product differentiation in the tied good market.

14 Chen, Z. & T. Ross, "Refusals to Deal, Price Discrimination, and Independent Service Organizations," Journal of Economics and Management Strategy, 1993, 2, pp. 593-614.

15 Klein, B., "Market Power in Antitrust: Economic Analysis After Kodak," Supreme Court Economic Review, 1993, 3, pp. 43-92.

16 Stigler, G.J., "*United States v. Loew's Inc.*: A Note on Block Booking," Supreme Court Economic Review, 1963, 1963, p. 152-157.

17 Schmalensee, R., "Gaussian Demand and Commodity Bundling," Journal of Business, 1984, 57, S211-S230.

18 McAfee, P., J. McMillan, & M.D. Whinston, "Multiproduct Monopoly, Commodity Bundling, and Correlation of Values," Quarterly Journal of Economics, 1989, 93, pp. 371-383.

19 Bakos, Y. & E. Brynjolfsson, "Bundling Information Goods: Pricing, Profits and Efficiency," Management Science, 1999, 45, 1613-1630.

20 Carlton, D.W. & M. Waldman, "Upgrades, Switching Costs and the Leverage Theory of Tying," Economic Journal, 2012, 122, pp. 675-706.

21 In this analysis, the monopolist's primary good is essential for all uses of the complementary good, so the earlier result concerning the Chicago School argument breaking down when the monopolist's primary good is not essential does not apply here.

The main result of this analysis is that, if the complementary good is sold rather than leased, then tying will increase monopoly profitability when the value consumers place on the second period upgrade is sufficiently high. The logic is that, because the upgraded complementary good is sold at a later date than the monopolized primary good, the primary good price cannot capture all the surplus associated with the complementary good upgrade. So to capture this surplus, the primary good monopolist must be the firm that sells the upgrade, which the monopolist can guarantee by employing an irreversible tie that stops consumers from adding the rival's complementary product. In other words, in this case tying is profitably used by the primary good monopolist to leverage its market power into the complementary good market, where the driving force is capturing surplus associated with complementary good upgrades.[22]

IV. THE IPHONE-APP STORE TIE

In the previous section, I reviewed the classic Chicago School argument concerning tying, and then discussed various reasons for tying that can arise when the conditions needed for the Chicago School argument to apply do not hold. As briefly mentioned in that discussion, a number of these arguments potentially apply in the iPhone-App Store setting. In this section, I discuss in more detail which of these theories may be the most relevant for understanding Apple's behavior concerning the iPhone and App Store, and what that potentially means for social welfare. At the end of the section, I also briefly discuss potential issues concerning directly applying the lessons of the mainstream literature on tying to the iPhone-App Store setting. This discussion, as emphasized earlier, focuses on economics not the application of the antitrust law.

Before discussing which tying theories are most relevant for understanding Apple's behavior concerning the iPhone and App Store, let me briefly point out that Apple's own explanation for the irreversible tie is an efficiency rationale. In particular, if apps are uploaded to an iPhone which have any of various security problems such as malware, there would be a potential cost to Apple because the demand for their iPhones might be hurt. The App Store is designed to filter out unreliable apps of this sort, and Apple argues that it does not trust rival app store developers to be sufficiently concerned about this issue. Note that this argument is similar to an argument that IBM made to justify its tying in the 1936 punch card and tabulating machine case. That is, in that case IBM argued that if consumers were to purchase punch cards from alternative producers of punch cards, the cards would not be guaranteed to be sufficiently high quality. The result, in turn, would be damage to IBM's reputation in the tabulating machine market, and reduced profitability in that market. I come back to Apple's own explanation for its behavior in the next section.

I now consider the strategic rationales for tying discussed in Section III. In one set of models tying is used to either preserve or enhance the firm's monopoly position in the primary market. In terms of the iPhone and the App Store, that argument translates into Apple irreversibly tying the App Store to the iPhone in order to reduce the quality and availability of alternative app stores, which in turn hurts rival smartphone producers and increases the demand for the iPhone. The evidence suggests this is not the correct explanation for Apple's irreversible tie concerning the App Store. There are numerous alternative app stores, and it seems unlikely that Apple's tie has a substantial effect on the quality and availability of these alternatives. Also, Samsung has its own app store (but does not employ an irreversible tie), so any perceived negative effect on the quality of Android phones would seem to be quite limited.

On the other hand, the idea that the tie is driven or at least partially driven by the desire to more effectively price discriminate through metered sales seems quite plausible. iPhone owners surely vary in terms of their valuation for an iPhone, and it also seems likely that those with a higher valuation, on average, use more apps and pay more for apps. Since Apple has limited ability to price discriminate directly through its pricing of the iPhone, this seems exactly the type of setting where the firm can increase its profits by employing an irreversible tie and practicing metered sales.

The idea that tying can be profitable given complementary good upgrades may also be relevant for understanding Apple's behavior concerning the iPhone and App Store.[23] Clearly, there is upgrading of the App Store and competing app stores over time, and there are R&D investments associated with the upgrading. This is exactly the type of setting, as Carlton & Waldman (2012) show, in which a producer with substantial market power in a primary good market may tie in order to leverage that market power into a complementary good market. One could also argue that development of new and upgraded apps over time is in a sense an upgrading of the App Store and alternative app stores over time. This serves as a further reason to think that tying to leverage market power in the presence of complementary good upgrades could be important for understanding Apple's behavior concerning the iPhone and App Store.

22 Choi & Jeon (2021) in a recent paper use a related argument to show how tying can arise to leverage market power in two-sided markets when there are non-negative price constraints. Choi, J.P. & D-H. Jeon, "A Leverage Theory of Tying in Two-Sided Markets with Nonnegative Price Constraints," American Economic Journal: Microeconomics, 2021, 13, pp. 283-337.

23 The evidence suggests that the leverage argument in which the tie reduces the availability of rival complementary products is not applicable to this case. As argued above, there are numerous alternative app stores, and the quality and availability of these alternatives is likely little affected by Apple's tie.

In terms of social welfare, it is well known that an improved ability to price discriminate has an ambiguous effect on social welfare. So to the extent that the iPhone-App Store tie improves Apple's ability to price discriminate, it is unclear whether the result is an increase or decrease of social welfare. As for the upgrading rationale for tying, Carlton & Waldman (2012) find in their formal analysis that tying in this type of setting can lower social welfare if the rival's complementary good is superior. However, as I discuss below, although the Carlton & Waldman analysis is helpful for understanding that tying to leverage market power into a complementary good market may be important in driving the iPhone-App Store tie, fully understanding the social welfare implications of the leverage argument in this case requires going beyond their formal analysis.

There are a few aspects of the iPhone-App Store tie that make the traditional tying literature, which is my focus above, not directly applicable to the situation. One difference was mentioned earlier. Most of the papers in the traditional tying literature discussed above concern tying by a firm with a monopoly position in one or more markets. Clearly, Apple is not a monopolist in the smartphone market since Samsung has a strong market position. However, the high profits of these two firms in the industry suggest they are charging far above marginal cost for their products, and high switching costs and large consumer installed bases suggest that behavior can be understood by using a lens associated with the presence of market power. So I do not consider the non-monopoly nature of Apple's market position in this market a real concern in terms of employing the tying literature to understand behavior in this case.

A second difference between the iPhone-App Store case and the traditional tying literature concerns the nature of the complementary product. The product is itself a store whose value to consumers depends to a great extent on the quantity, quality, and prices of the apps available at the store. This aspect of the setting is not captured in standard models of tying. In a standard model in which a complementary good is tied to a monopolized primary good, the quality of the complementary good depends solely on the R&D expenditures on product quality of the good's producer. But in the iPhone-App Store case, the quality of the App Store in a sense depends on the quantity, quality, and prices of the apps produced by other firms.[24]

Why is this important? When Apple irreversibly ties the App Store to the iPhone, it likely moves some revenue from app producers to Apple. For example, an important substitute to the App Store for purchasing an Epic Game such as Fortnight is the Epic Game Store. So when Apple irreversibly ties the App Store to the iPhone and more Epic games are purchased at the App Store, which charges a 15 percent or 30 percent fee, some revenue is moving from the game developer to Apple. One might suspect that this hurts social welfare because Epic will have a smaller incentive to invest in game development. However, there is a countervailing effect to the extent that Apple's incentive to invest in iPhone and App Store quality should be enhanced, and this includes investments by Apple that improve app performance. It is unclear from a purely theoretical standpoint which of these social welfare effects is larger. But given the substantial revenue flows to app developers, even if the net effect on social welfare is negative, I suspect the effect is small.[25]

V. ANTITRUST POLICY

The Supreme Court in 1984 in the *Jefferson Parish* case ruled that tying is *per se* illegal if certain conditions are met. For example, one condition is that the seller must have significant market power in the tying market, while another is that the tie forces consumers to buy the tied product. Since in practice the exact meaning of the conditions needed for the *per se* ruling to apply is unclear, the courts have frequently taken a rule of reason approach that balances possible efficiencies with anticompetitive effects.

As mentioned earlier, Apple argues that the iPhone-App Store tie is needed to stop unsafe apps from being downloaded onto iPhones, while critics argue that alternative app stores can be just as effective in avoiding unsafe apps. I do not have any special expertise concerning whether Apple or instead its critics are correct concerning this issue. However, if the courts were to determine that Apple's arguments concerning security issues are a valid concern, then a high hurdle should be imposed concerning potential anticompetitive effects needed for a ruling against Apple concerning its tying behavior.

24 A third difference between models in the standard tying literature and the iPhone-App Store setting is that consuming an app on an iPhone, such as a game like Fortnight, is not necessarily a perfect substitute for consuming it on a different device such as a personal computer. One reason is that there may be times when a consumer has access to her iPhone but not to her personal computer. I suspect this introduces a rationale for Apple to tie the App Store to the iPhone for leverage reasons which is in addition to the Carlton & Waldman (2012) argument. However, I am not familiar with any paper that specifically models this aspect of the iPhone-App Store setting, e.g. Choi's (2010) paper on tying and multi-homing does not capture it, and providing a formal game theoretic analysis which captures how tying would work in such a setting is beyond the scope of the current paper. Choi, J.P., "Tying in Two-Sided Markets with Multi-Homing," Journal of Industrial Economics, 2010, 58, pp. 607-626.

25 One could also argue that social welfare is hurt because the 15 or 30 percent fee that Apple charges for apps and in-app payments causes prices to rise. But if the marginal costs for apps and in-app payments are close to zero which is likely the case, standard pricing theory suggests the fees charged should have little or no effect on pricing. However, some argue, including the European Commission, that the fee has resulted in higher prices.

In Section IV I identified two non-efficiency-based reasons that are plausibly motivating Apple's tying behavior. The first is price discrimination via a metered sales type argument. If the courts were to decide this is the main motivation, my view is that the behavior should be allowed. Price discrimination in general has ambiguous social welfare consequences. But since perfect price discrimination maximizes social welfare, practices that increase a firm's ability to price discriminate should tend, on average, to improve social welfare. Further, identifying whether Apple's tie violates this average tendency and, in fact, hurts social welfare seems beyond what the courts can determine with any confidence. So the best policy would seem to be not to intervene if it is ruled that price discrimination is the main driving factor.

The second non-efficiency-based rationale for the iPhone-App Store tie identified in Section IV is that the tie may be used to leverage market power into the app store market, due to the presence of complementary good upgrades. As I discussed, in this case the tie arguably hurts social welfare, especially if the redirection of revenues from app developers to Apple serves to significantly reduce the quantity and quality of available apps. As pointed out earlier, however, I am somewhat skeptical that any potential negative effect is large given the substantial revenues that flow to app developers. However, if the courts found that the effect on the supply of apps was significant, there might be a reasonable case for the courts to intervene and rule that the tie is illegal.

VI. CONCLUSION

Why does Apple irreversibly tie the App Store to the iPhone, and what is appropriate antitrust policy concerning Apple's behavior? In this paper, I shed light on these issues by discussing what the traditional literature on tying tells us about the economic forces driving Apple's behavior. After reviewing the relevant tying literature, I argue that there are a number of possibilities concerning what is driving Apple's behavior – efficiency motivations, price discrimination, and leveraging its market power. I then argue that for only one of these possibilities – the leverage theory – is there a plausible argument to be made that the courts should intervene to stop the behavior. The logic is that the leverage theory suggests that the tie may decrease social welfare, especially if the tie hurts the quantity and quality of apps available. So as the courts, antitrust authorities, and the U.S. Congress focus on Apple's tying behavior and whether intervention is justified, attention should be paid to whether the evidence supports the leverage argument and, if it does, how much does the tie affect the supply of apps.

TYING OF "FREE GOODS" IN DIGITAL PLATFORM MARKETS

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I. INTRODUCTION

As a few big digital platforms, collectively known as "Big Tech," FAANG,[2] or GAFAM,[3] play an increasingly important role in our daily lives, competition authorities and regulators around the world are expressing concerns about their market domination and potentially imposing unfair terms on businesses and consumers as gatekeepers. In particular, more scrutiny is called for any actions taken by these firms that may enhance their existing market power or limit the entry by more or equally efficient competitors.

One such practice is tying, which can leverage existing market power in one market to acquire market power in adjacent markets.[4] The European Commission ("EC"), for instance, fined Google €4.34 billion in July 2018 for engaging in "illegal tying" by requiring "manufacturers to pre-install the Google search app and browser app (Chrome), as a condition for licensing Google's app store (the Play Store)." The EC concluded that the Play Store is a "must-have" app, so such tying thereby "den[ied] rivals the chance to innovate and compete on the merits."[5] In the recent *Epic v. Apple* litigation, Epic alleged that Apple tied IAP, its in-app payment solution for in-app purchases of digital goods, to the distribution of iOS apps through the App Store. Epic defined two separate markets — one for iOS app distribution and another for iOS in-app payment solutions — and claimed that Apple "uses its monopoly power in iOS app distribution to coerce developers of iOS apps to use Apple's payment solution [IAP]" by "contractually [tying] together app distribution and payment solutions for in-app purchases of digital goods."[6]

One challenge for competition policy in the area of digital platforms is that many two-sided platforms provide free services to consumers and generate revenue by charging the other side, such as advertisers or application developers (Rochet & Tirole, 2005; Amelio & Jullien, 2012; Choi & Jeon, 2021).

This article introduces some of the recent theoretical developments on tying in platform markets and discusses practical issues in implementing competition policies against potentially anticompetitive tying arrangements. In particular, I focus on the tying of "free goods," a practice that is uniquely prevalent in platform markets, unlike traditional markets where an elevated price in the affected market is the main mechanism through which antitrust effects arise.

II. THE LEVERAGE THEORY OF TYING AND THE CHICAGO SCHOOL CRITIQUE

Tying occurs when a firm provides a consumer with a product A (the tying product) under the condition that the consumer also obtains a different product B (the tied product) from the firm. In the case of tying, the tying product cannot be obtained separately even though the tied product can be; (pure) bundling occurs when the two products can only be obtained jointly as a package. The practices of tying and bundling are widespread simply because they are often efficient. Some common examples are smartphones with essential apps pre-installed or cars with tires included.

Competitive concerns, however, arise when the producer has significant market power in market A (the tying product market) such that it may be able to foreclose competition in market B (the tied product market). According to the "leverage" theory, tying practices are inherently anti-competitive and allow a monopolist in market A to also obtain a monopoly in market B.

To understand new issues that arise for tying in platform markets, I first illustrate the influential Chicago School criticism of the leverage theory. The Chicago School argument illuminates a flaw in the leverage theory. For complementary products, for instance, the monopolistic supplier of A could price aggressively its B product to drive down the competitor's price so that consumers have high surplus when they buy the rival product. This enables the monopolist to charge a correspondingly high price for A to extract the surplus. This tactic of "price squeeze," which allows the (more efficient) rival firm to sell B, would yield a higher profit to the monopolist than the one under tying which extends its monopoly to market B.

2 Facebook, Amazon, Apple, Netflix, Alphabet (Google).

3 Alphabet (Google), Amazon, Facebook, Apple, Microsoft.

4 Other practices include self-preferencing and data collection of third-party vendors they host.

5 Press Release, European Commission, Antitrust: Commission fines Google €4.34 billion for illegal practices regarding Android mobile devices to strengthen dominance of Google's search engine (July 18, 2018). For a detailed discussion of the key aspects of Google's practices and their potentially exclusionary effects in the mobile phone industry from a legal perspective, see Benjamin G. Edelman & Damien Geradin, *Efficiencies and Regulatory Shortcuts: How Should We Regulate Companies Like Airbnb and Uber?*, 19 STAN.TECH. L.REV. 293 (2016) and Federico Etro & Cristina Caffarra, *On the Economics of the Android Case*, 13 EUR. COMPETITION J. 282 (2017).

6 *Epic Proposed Findings of Fact and Conclusions of Law*, May 28, 2021, https://cdn2.unrealengine.com/epic-proposed-findings-of-fact-and-conclusions-of-law-redacted-bafb520e1d4b.pdf.

To illustrate this idea more formally, consider the following numerical example. For the sake of argument, suppose that there are two independent products, A and B, in that the consumers' valuation for each product is independent of the consumption of the other. Market A is served by Firm 1, a monopolist, and entry to market A is not possible. In contrast, Firm 1 competes with Firm 2 in market B; Firm 1 sells product B1 and Firm 2 sells product B2. Firms' production costs are zero in all markets.

In market A, each consumer's willingness to pay for product A is $v_A = \$10$. In market B, each consumer's willingness to pay for each firm's product is given by $v_{B1} = \$10$ and $v_{B2} = \$11$, respectively, which means firm 2's product is superior to firm 1's.

If these products are sold independently without tying, firm 1 will charge $p_A = v_A = \$10$ in its monopolized market A. In market B, both firms compete on price and the equilibrium prices are given by $p_{B1} = \$0$ and $p_{B2} = \$1$.[7] Firm 1 is willing to drive down its price to its marginal cost of zero, while Firm 2 will choose the highest price it can while still ensuring that consumers are equally better off buying from Firm 2 (paying $1 for product B2, which they value at $11) as buying from Firm 1 (paying $0 for product B1, which they value at $10). All consumers buy from firm 2 in market B, and this is an efficient market outcome. Each firm's profits are given by

$$\pi_1 = p_A = \$10$$
$$\pi_2 = p_{B2} = \$1$$

Now suppose that firm 1 ties its monopolized product A with product B1. Consumers now have two choices: buy the bundle of A and B1, which they value at $v_A + v_{B1} = \$10 + \$10 + \$20$, or buy B2 only, which they value at $v_{B2} = \$11$. As firm 2 is willing to drive down its price to its marginal cost of zero, the tying firm needs to charge a price of $9 for consumers to choose the bundle over buying only B2. Thus, even if tying provides a mechanism to capture the tied good market, it is self-defeating as it reduces firm 1's profits from $10 in the first scenario to $9 in the tying scenario.[8]

$$\tilde{\pi}_1 = p_{Bundle} = \$9 \ (<\$10 = \pi_1)$$

Note that the $1 loss of profits for the tying firm is due to the need to compensate consumers for purchasing its inferior product B1, instead of a better product B2 (whose value is higher by $1). Thus, the monopoly firm has no incentives to tie to extend its market power to the other market. This is the essence of the Chicago school's criticism of the leverage theory of tying.

In fact, if we consider *complementary* products, the Chicago School logic is strengthened. For the complementary products case, a monopolistic supplier of one complementary product can automatically exclude competitors by tying. However, there are no incentives to foreclose the complementary market, because it is more profitable to maintain competition; the Chicago School critique correctly points out that the ability to exclude does not mean incentives to exclude. By choosing to compete in the complementary market rather than tie, the monopolist can drive down the price of the complementary good of the more efficient rival firm while extracting more surplus by charging a higher price for the monopolistic product. This strategy of "price squeeze" is more profitable than monopolizing the otherwise competitive complementary market by tying.

Whinston (1990), however, resurrects the leverage theory by showing that a sensible modification of the model with the introduction of scale economies and oligopolistic competition can provide a coherent theory of leverage with anticompetitive effects.[9] Even though the theory was developed for one-sided markets, many of the insights can still apply to digital platform markets. In particular, models developed by Carlton & Waldman (2002)[10] and Choi & Stefanadis (2001)[11] show that dynamic considerations can make tying a profitable entry-deterring strategy, which may be more relevant for evolving and innovative industries. For instance, Carlton & Waldman consider a two-step entry process in which entry into the secondary (tied) market can facilitate entry to the primary (tying) market. In such a context, the monopolist in the primary tying market may have incentives to engage in tying, which sacrifices short-term profits by deterring the more efficient firm's entry into the secondary market, as posited by the Chicago School critique, but in the long-run it can be profitable because it *preserves* market power in the primary market.

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7 I assume that consumers buy from the firm that can potentially provide more surplus when they are indifferent. Alternatively, without this tie-breaking assumption, firm 2 can charge a price of $p_{B2} = \$0.99$ to ensure that consumers are better off buying from it.

8 I denote firm 1's profit under tying with a tilde.

9 Michael Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990).

10 Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33 RAND J. ECON. 194 (2002).

11 Jay Pil Choi & Christodoulos Stefanadis, *Tying, Investment and the Dynamic Leverage Theory*, 32 RAND J. ECON 52 (2001).

III. TYING IN PLATFORM MARKETS WITH "FREE" PRODUCTS

Zero prices are often seen in two-sided platform market. Two-sided platforms are organizations that create value by enabling interactions between two distinct groups of customers. Uber, OpenTable, credit card networks, and mobile operating systems are a few examples of two-sided platforms. Uber connects drivers and riders, OpenTable connects diners and restaurants, credit card networks connect merchants and buyers, and mobile OSes connect app developers and mobile device users. Two-sided platforms are characterized by their indirect network effects, which are present when greater participation by one group increases the value of the platform to the other group. The need for all sides of the market to engage, combined with these indirect network effects, creates a "chicken and egg" problem (Caillaud & Jullien, 2003) in that members of each group are willing to participate in the market only if they expect many members from the other side to participate. For example, OpenTable diners prefer to have a greater selection of restaurants on the platform, and restaurants also benefit from having access to a greater number of potential diners, and neither side would participate if the other side were not present on the platform.

The literature on two-sided markets has analyzed the optimal pricing structure to coordinate the demands of distinct groups of customers and shows that oftentimes below-cost pricing naturally arises on one side in order to enhance participation, because the loss from the below-cost pricing can be recouped on the other side of the market (see Armstrong (2006) and Rochet & Tirole (2006)). In particular, if there are competing platforms in the two-sided market, and one side of the market single-homes (i.e. uses only one platform) while the other side of the market multi-homes (i.e. uses multiple competing platforms), the single-homing side of the market constitutes the competitive bottleneck. The platforms will compete for the single-homing side of the market, and the resulting price structure will subsidize the single-homing side while charging the multihoming side.[12]

When the marginal cost is low as in digital markets, the optimal pricing strategy may entail negative prices. However, we can imagine situations in which negative prices may be impractical due to adverse selection and opportunistic behaviors by consumers.[13] It is therefore not uncommon for the business model of a two-sided platform to charge one group of customers a zero price in order to induce participation by that side, which then encourages participation by the other side, and so on.

Note that the Chicago School theory hinges upon both the tying and tied product being sold at a positive price. The logic breaks down if either product is offered at a zero price. Without the price mechanism, there is no response in prices that would harm consumers and no price from which to "squeeze out" additional profits from more efficient rival firms.

A recent paper by Choi & Jeon (2021) analyzes a model of tying in platform markets that has two key features: (i) the two-sided nature of platform markets and (ii) the presence of price constraints (in particular, the non-negative price constraint with zero pricing).[14] It shows that tying provides a mechanism to circumvent the non-negative price constraint in the tied product market without inviting an aggressive response by the rival firm, if the rival firm's price response to tying faces the non-negative constraint.

To illustrate the idea, let us change the previous example by explicitly considering two-sidedness in platform markets. More specifically, let us consider an ad-financed business model of platform markets where both products are provided for "free" to consumers and revenues are generated from the other side of the platform. Assume that in each market, an additional consumer brings in $a_A = a_B = \$2$ of revenue (imagine, for example, advertising revenues a search engine can generate by selling sponsored search results, revenues from the sale of consumer data to third parties or future in-app purchases).[15] Otherwise, we retain the same assumptions about consumers' valuations and marginal costs as in the previous section.

As the price constraint plays a crucial role in the theory of Choi & Jeon (2021), it is worth commenting on various reasons for "free" goods. In Market A, where the monopolist does not face any competition, the monopolist may have made a prior commitment to a "free" price in Product A's nascent stage. For instance, Google has made a strategic decision to make its Android system available for "free" without any charges as an "open source" mobile operating system when it was first introduced in 2007. The decision may have been necessary for market penetration and building an installed base of consumers to compete against alternatives such as Symbian and Windows Mobile. In Market B with competition, firms may want to charge negative prices (i.e., provide subsidies to attract customers), but such pricing may be infeasible due to various adverse selection and moral hazard reasons. In such a scenario, the price constraint takes the form of the non-negative price constraint with zero pricing.

12 Mark Armstrong, *Competition in Two-Sided Markets*, 37 RAND J. ECON. 668 (2006).

13 Andrea Amelio & Bruno Jullien, *Tying and Freebies in Two-Sided Markets*, 30 INT'L J. INDUS. ORG. 436 (2012).

14 Jay Pil Choi & Doh-Shin Jeon, *A Leverage Theory of Tying in Two-Sided Markets with Non-Negative Price Constraints*, 13 AM ECON J-MICROECON. 283 (2021).

15 This setup is called a situation of "competitive bottleneck" in the literature where consumers who single-home constitutes the bottleneck side and receive a better deal.

In this modified setup that reflects some of the key elements of platform markets, if firm 1 does not tie its products, then all consumers use product A and product B2 for free because B2 provides a higher quality than B1. Consumers receive a surplus of $10 in market A and $11 in market B because the products are provided for free, and each firm's profits are simply their advertising revenues.

$$\pi_1 = p_A + a_A = \$0 + \$2 = \$2$$
$$\pi_2 = p_B + a_B = \$0 + \$2 = \$2$$

Suppose firm 1 decides to tie product A and product B1. Consumers value the bundle at $20 and product B2 at $11, so consumers will purchase the bundle when all products including the bundle are offered for free.[16] The monopolist's (firm 1's) profit after tying now becomes

$$\tilde{\pi}_1 = p_{Bundle} + a_A + a_B = \$0 + \$2 + \$2 = \$4\ (>\$2 = \pi_1)$$

Thus, tying is profitable as it is used to steal the advertising revenues from the rival firm in market B. However, it is inefficient because consumers use product B1, rather than better product B2.[17]

In this example, it is noteworthy to understand the role of price constraints. Imagine that there is no price constraint and any prices (including a negative price) can be charged. In such a scenario, firm 1 will charge a price of $10 in market A and each firm is now willing to drive its price down to -$2 because its loss can be recouped with advertising revenues from the other side. Without tying, firm 2 will charge a negative price of -$1 for B2 (that is, provide a subsidy of $1 to consumers given firm 1's price of -$2 for B1) and receives a profit of 1 whereas firm 1 receives a profit of $12.

$$\pi_1 = p_A + a_A = \$10 + \$2 = \$12$$
$$\pi_2 = p_{B2} + a_B = \text{-}\$1 + \$2 = \$1$$

After tying, the tying firm needs to charge a price of $7 to sell the bundled product because firm 2 will be willing to offer its product of value $11 at the price of -$2 and provides a total surplus of $13 to consumers. This implies that firm 1's total profit will be $11 (< $12).

$$\tilde{\pi}_1 = p_{Bundle} + a_A + a_B = \$7 + \$2 + \$2 = \$11\ (<\$12 = \pi_1)$$

This is the same qualitative result as in the previous example where tying reduces firm 1's profit by 1, highlighting the importance of price constraints (or "free" products) for the new theory.

In the model of Choi & Jeon (2021), the non-negative price constraint plays two roles: 1) it limits competition in the tied good market, which creates additional potential surplus to extract through tying, and 2) it limits the rival firm's response to tying. In addition, tying in their model is credible without any commitment mechanism and forecloses the rival in the tied product market regardless of whether the two products tied together are independent or complementary. The credibility of tying can explain the use of contractual tying for the leverage purpose.[18]

IV. PRACTICAL ISSUES WITH ANTITRUST ENFORCEMENT

I have discussed the potential anticompetitive effects of tying in platform markets. We expect more tying-related cases in platform markets as dominant players in their respective markets continue expanding their product offerings to adjacent markets to build their platform ecosystems. Merger assessments in digital markets may also pay increased attention to the possibility that related products will be tied after the merger. However, there are many practical challenges in implementing sensible competition policy against anticompetitive tying in digital platform markets, because actual antitrust cases are fact-intensive and market-specific. I discuss some of the issues below.

16 For the sake of argument, we implicitly assume that tying cannot be used as a mechanism to circumvent the prior price commitment or price constraint for product A.

17 Etro & Caffarra (2017) use this theory of harm to assess the Android case. See Federico Etro & Cristina Caffarra, *On the Economics of the Android Case*, 13 EUR. COMPETITION J. 282 (2017).

18 The tying literature distinguishes contractual tying from technical tying: the former can be undone ex post with a relatively low cost while the latter can be undone only with a significant cost. Therefore, technical tying can be used as a device to pre-commit to tying when tying is not ex post credible. See Michael Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990).

A. Potential Procompetitive Effects

There can be substantial precompetitive and efficiency-enhancing effects of tying which should be carefully balanced against any potential harm. Tying or seamless integration of different services may confer consumer benefits with the convenience of "one-stop shopping." In addition, tying can serve as a mechanism to introduce implicit subsidies on one side of the market in order to solve the coordination failure in two-sided markets. As a result, tying can raise participation on both sides and can benefit consumers.[19] Tying in digital platform markets thus should be submitted to a rule of reason standard because "applying per se analysis … creates undue risks of error and of deterring welfare-enhancing innovation,"[20] as set by the *Microsoft* case.[21]

B. Multi-Homing

Choi (2010) shows that tying in two-sided markets can have very different competitive effects depending on whether or not multi-homing is allowed.[22] Multi-homing can counteract the tendency towards tipping and the lock-in effects in industries with network effects. His model was developed partly to analyze one of the first tying cases in the digital media market, which concerned Microsoft's practice of requiring Windows operating system users to accept its Windows Media Player software. The model shows that tying induces more consumers to multi-home and makes platform-specific exclusive content available to more consumers, which is beneficial to content providers. As a result, tying can be welfare-enhancing if multi-homing is allowed, even in cases where its welfare impacts are negative in the absence of multi-homing. This implies that the assessment of multi-homing possibility should be a key consideration in antitrust cases with digital platforms.

C. Market Definition

Tying claims require the burden of proof on the plaintiff side to establish that the two products are in different markets and that there is separate demand for each product. A market definition analysis is therefore considered a prerequisite in actual cases. However, traditional methods for defining single-sided markets cannot be applied in the same manner to two-sided markets, and the rapidly evolving, fluid nature of platform markets can lead market shares to dissipate quickly and unexpectedly. As the market boundaries of various services become blurry, the SSNIP test in two-sided market can be much more complex. In addition, a product complementary at one point can easily turn into a substitute product, and vice versa, and the nature of competition can change. As a result, the main battleground in actual cases is expected to be in market definition rather than the evaluation of economic harm. Too much reliance on market definition in the court case, however, can be counterproductive and divert attention from more important economic effects of tying. [23] It would be advisable to move away from too much emphasis on market definition and towards more direct inferences concerning competitive effects of tying, if such evidence is available, with economic substance over legal form.

D. Technological Incompatibility as Tying

When products are complementary and require interoperability between them for proper functioning, technological incompatibility with different vendors' products is tantamount to tying of products. For instance, a monopolistic producer of an essential component can engage in *de facto* tying by making its product incompatible with any other complementary products of rival firms and making its interface proprietary with intellectual property ("IP") rights. When IP is involved, antitrust authorities face the difficult task of balancing ex post competition against ex ante incentives to develop innovative products. Intervening in the form of compulsory licensing to ensure interoperability and open access to "essential facilities" raises a host of thorny issues in its implementation.[24] In the digital market, interoperability can be achieved through the exposure of the Application Programming Interface ("API") information. However, there may be cases where it may be technically difficult to expose the API without revealing proprietary information about the inner working of the so-called implementation of the information of the "essential facility." In addition, there can be difficulty restricting the use of disclosed information in the digital market, in contrast to physical facilities, due to special properties of information.

19 See Andrea Amelio & Bruno Jullien, *Tying and Freebies in Two-Sided Markets*, 30 INT'L J. INDUS. ORG. 436 (2012).

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

21 There have been gradual movements away from the *per se* rule since *Jefferson Parish Hospital District No. 2 v. Hyde*, 466 U.S. 2 (1984) established the "modified *per se*" rule. In *United States v. Microsoft Corp.*, the rule of reason was established. See Christian Ahlborn, David S Evans & A Jorge Padilla, *The antitrust economics of tying: a farewell to per se illegality*, 49 ANTITRUST BULL. 287 (2004).

22 Jay Pil Choi, *Tying in Two-Sided Markets with Multi-Homing*, 58 J. INDUS. ECON. 607 (2010). See also Susan Athey & F. Scott Morton, *Platform Annexation* (Working Paper, 2021) for the importance of "tools" that enable multi-homing of platforms in maintain competition in the market.

23 For a radical proposal to abandon the practice of delineating the relevant market, see Louis Kaplow, *Why (Ever) Define Markets?*, 124 HARVARD L. REV. 437 (2010).

24 See Jay Pil Choi, *Compulsory Licensing as an Antitrust Remedy*, 2 WIPO J. 74 (2010).

E. Assessment of Non-Price Effects with "Free" Services

When tying involves services that are free to consumers, consumer harm from anticompetitive tying is likely to manifest in terms of lower quality of service, more intrusive advertisements, and less privacy protection and cybersecurity, rather than a higher price. Thus, the assessment of the "but-for world" in the evaluation of pro- vs. anticompetitive effects of tying becomes more difficult because they are more difficult to measure. Several recent cases around tying in platform markets have grappled with the issue of zero prices. For instance, in the recent suits against Facebook brought by the FTC and attorneys general from 46 states, Facebook argued that the regulators had failed to prove how the Facebook services, which are free, harmed consumers.[25]

F. Cumulative Effects with Ancillary Restraints

We have focused on tying as one of the possible exclusionary practices that can be deployed by a dominant digital platform. In isolation, anticompetitive effects may not be considered materially important. However, there may be many other exclusionary practices employed by the dominant firm, along with tying, which once again may not raise substantial anticompetitive concerns in isolation. Nonetheless, they may have substantial anticompetitive effects in combination by amplifying individual effects. Thus, a comprehensive approach may be necessary to assess their cumulative effects.[26]

V. CONCLUSION

As dominant platforms offer related services and expand into adjacent markets, there are serious concerns for anticompetitive tying that may serve to extend their market power to other markets. I have reviewed recent theoretical developments in the leverage theory of tying in relation to platform markets. In particular, when products are provided for "free," the monopolist of the primary good may be unable to appropriate a rival firm's efficiencies through the pricing of the primary product and therefore have an incentive to resort to tying to foreclose the rival firm and expropriate any rents associated in the tied product market. In addition, I have briefly discussed practical issues that may pose challenges in putting theory into practice. In particular, given potential precompetitive and efficiency-enhancing effects of tying, a rule of reason approach that carefully balances pro- vs. anticompetitive effects would be advisable.

25 See Cecilia Kang, *Judge Throws Out 2 Antitrust Cases Against Facebook*, THE NEW YORK TIMES, June 28, 2021.

26 In the *Android* case, for instance, the European Commission proposed a theory of harm that shows how Google's tying of its search engine to its app store Google Play through the Mobile Application Distribution Agreements can foreclose rival search engines in combination with the Anti-Fragmentation Agreements.

CAN IDENTICAL PRODUCTS, BUNDLED TOGETHER, CONSTITUTE ILLEGAL TYING?

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I. INTRODUCTION

After years of relative quiet in antitrust enforcement, the topic of tying and bundling promises to heat up. A recent Congressional report, with a focus largely on digital industries, identified a cascade of examples of largely unregulated tying and bundling of products and services, all to the detriment of consumers.[2] Some of the report's recommendations were aimed at reducing constraints on private antitrust prosecutions, including what the subcommittee characterized as "judicially imposed standards constraining what constitutes an antitrust injury."[3] Congress responded, proposing "sweeping antitrust legislation."[4]

But while Congress's focus has been on digital markets, its recommendations are more broadly stated, seeking both to strengthen antitrust laws and revive vigorous enforcement.[5] What of "old school" industries where spotty federal enforcement and restricted private efforts have resulted in virtual monopolies? The health care industry, with its heavy reliance on distributing patented products, has long been subject to claims that anticompetitive behavior has stifled competition, raised prices, and reduced consumer choice. Because product selection and payment are often made by intermediaries like medical care providers, insurers, and government agencies, consumer power is even further reduced. *In re EpiPen*,[6] a class action, raises an issue unresolved among the federal circuits: can identical bundled products constitute illegal tying when the products' uses differ? Should we look not at the products themselves, but instead at the consumers' uses when determining whether products or services have been illegally tied? We seem poised for a more sophisticated analysis of what constitutes unlawful tying and bundling.

II. DISCUSSION

A. Factual Background

EpiPens are a type of epinephrine auto-injector ("EAI"). These disposable devices contain pre-measured epinephrine (also known as adrenalin) to be administered when a victim is suffering from anaphylaxis, or a severe allergic reaction to certain foods, insect bites, medications, and other substances. Such allergies are not uncommon, with an estimated one in thirteen children suffering from food allergies alone.[7] Anaphylaxis is a life-threatening emergency and can result in death within thirty minutes. Because of the deadly risk and swift consequences, such patients are advised to keep an EAI handy. While epinephrine is an old drug (with early forms of adrenalin in use for more than a century without FDA approval),[8] the retractable single-dose EpiPen is covered by patents.[9]

Over the years, EpiPens gained dominance in the market. While rival manufacturers of EAIs emerged, some were hampered by inferior products.[10] But a great part of the failure of competing manufacturers was allegedly anticompetitive behavior on the part of Mylan, the sole distributor of EpiPens. The current class action against the distributor and manufacturers of EpiPens alleges, among other things, that the defendants paid illegal kickbacks to pharmacy benefit managers, filed frivolous patent infringement cases, offered exclusionary rebates, obtained additional patents designed not to improve the product but instead to handicap competitors, and engaged in "pay for delay" settlements where competing generic product manufacturers agreed to delay their entry into the market.[11] Mylan lobbied for the successful passage of a federal law that required schools to keep EAIs on site (essentially requiring counties to stockpile the product) and then offered "free" EAIs with agree-

2 Subcomm. on Antitrust, Com. and Admin. Law of the Comm. on the Judiciary, Majority Staff Rep. and Recommendations, 116th Cong., Investigation of Competition in Digital Markets (2020), https://judiciary.house.gov/uploadedfiles/competition_in_digital_markets.pdf?utm_campaign=4493-519.

3 *Id.* at 21.

4 Cecilia Kang, *Lawmakers, Taking Aim at Big Tech, Push Sweeping Overhaul of Antitrust*, N.Y. Times, June 11, 2021, https://www.nytimes.com/2021/06/11/technology/big-tech-antitrust-bills.html.

5 Subcomm. on Antitrust, Com. and Admin. Law of the Comm. on the Judiciary, *supra* note 2, at 20-21.

6 *In re EpiPen Mktg., Sales Practices & Antitrust Litig.*, 336 F. Supp. 3rd 1256 (D. Kan. 2018).

7 *Id.* at 1277.

8 *Par Pharm., Inc. v. Hospira*, Inc. 420 F. Supp. 3d 256, 261 (D. Del. 2019).

9 *In re EpiPen, supra* note 6, at 1277.

10 Caroline Y. Johnson & Catherine Ho, *How Mylan, the EpiPen Company, Maneuvered to Create a Virtual Monopoly*, Wash. Post (Aug. 25, 2016), https://www.washingtonpost.com/business/economy/2016/08/25/7f83728a-6aee-11e6-ba32-5a4bf5aad4fa_story.html.

11 *In re EpiPen*, *supra* note 6, at 1278-81.

ments that limited the schools' right to purchase competing products.[12] EpiPen was so ubiquitous that the resulting School Access to Emergency Epinephrine Act of 2013 was dubbed the "EpiPen Law."[13] These reported efforts were successful: since 2009, Mylan's market share of EAI's exceeded 90 percent, rising to almost 100 percent by 2012 despite significant price increases over that period.[14]

While some consumers bought single EAIs, others bought two devices so as to have a backup. Because consumers were told that the medication expired after twelve to eighteen months, this meant a continuous cycle of purchases. When Mylan acquired the exclusive right to distribute EpiPens in 2007, the product's cost was less than $50 per device. By 2016, the cost had risen to $304[15] although the cost of epinephrine had remained constant during that period at approximately $1 per dose.[16] Beginning in 2011, Mylan began a "hard switch," raising the price of the product and selling them only in packages of two devices. The class plaintiffs complained that this conduct violated antitrust laws because it forced consumers to buy two products when they may have preferred to buy a single device or to buy the branded EpiPen as their primary EAI and a cheaper, generic EAI as a backup. However, this raises a difficult problem for antitrust analysis. Can two identical products, packaged together, constitute unlawful "tying" within the meaning of the Sherman and Clayton Acts?

B. Bundling and Tying

Bundling and tying are often analyzed interchangeably for antitrust purposes, but involve different conduct. Bundling occurs when products are packaged together. Bundling rarely involves anticompetitive conduct and often increases consumer welfare. Consumers may prefer to buy jumbo packages of toilet paper rather than single rolls, for example, when it costs less per item, is more convenient, and results in less packaging waste. There is nothing necessarily anticompetitive about bundling and, in fact, most products are bundled in the sense that they could be broken down to their component parts.[17]

Similarly, bundling may involve two complementary products packaged together. When white board markers are packaged with erasers, the two products have been bundled. Bundling differs from tying because, with bundling, there is no barrier to the buyer purchasing the items separately. That is, there is nothing to stop the consumer from separately buying markers and erasers. Tied products, however, differ from bundled products because they leave the buyer with no choice. If the only way to have bought an iPhone when the product was introduced in 2007 was to use Apple's designated carrier (Cingular), the product and the service had been tied. Tying constitutes an antitrust violation if the seller has control of the market and essentially forces the buyer to purchase a product that the buyer did not want or would have preferred to purchase elsewhere.[18]

While bundling is often advantageous to buyers, it can present some of the same anticompetitive problems as tying. There is a risk that bundling can become predatory if a seller prices products so as to reduce competition.[19] If a seller, for example, controls the market for the A product (for example, by holding a patent) it can bundle product A with another product over which is does not have market control. If the price of product A is inflated, the seller can afford to price product B below its average variable cost, giving the false appearance that product B is a bargain. The seller's control of the market for product A, in other words, allows them to manipulate its price so as to engage in predatory pricing in the market for product B. If the seller prices product B below the cost of production, it can reduce competition by giving the appearance that it is undercutting competitors' prices. Once they have eliminated their competition, the seller has the ability to raise the price of product B to supra-competitive levels, to the harm of consumers. Note, however, that simply holding a patent on a product does not, by itself, show that the

12 *In re EpiPen*, *supra* note 6, at 1285.

13 Johnson & Ho, *supra* note 10. Mylan was additionally the source of controversy during this period when Heather Bresch, its CEO and the daughter of then-Governor Joe Manchin, allegedly falsely claimed to hold an MBA from West Virginia University, a scandal that resulted in the resignation of the university's president, himself a past lobbyist for Mylan. Martha Neil, *Urged By Law Profs to Resign, W. Va. U Prez, Michael Garrison, Will Step Down*, ABA J., June 6, 2008, https://www.abajournal.com/news/article/urged_by_law_profs_to_resign_west_va_u_prez_michael_garrison_step_down.

14 *In re EpiPen, supra* note 6, at 1277.

15 Johnson & Ho, *supra* note 10.

16 *In re EpiPen, supra* note 6, at 1277.

17 Herbert Hovenkamp, Economics and Federal Antitrust Law 216 (1985).

18 *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 12 (1984), abrogated by *Ill. Tool Works Inc. v. Indep. Inc.* 547 U.S. 28, 41-42 (2006).

19 *Cascade Health Sols. v. PeaceHealth*, 515 F.3d 883, 911 (9th Cir. 2007).

seller controlled the market. Instead, the complainant must demonstrate that the seller held market control.[20]

C. Can Selling Identical, Bundled Products Constitute Anticompetitive Behavior?

In *EpiPen*, unlike traditional anticompetitive bundling cases, the products were identical: two EAI devices were sold in a single package. After 2011, consumers could not purchase EpiPens packaged singly. On the face of it, this is no different than other like items being packaged as a group, whether that involves cookies or crew socks. In *EpiPen*, however, the class complainants alleged that while the products were identical, their intended uses were not. Some allergy sufferers wished to buy backup EAI devices; others did not. Those allergy sufferers who wanted a backup device might otherwise have chosen to purchase a lower-priced generic product, especially in light of the fact that the product would probably go unused; they would not need a backup unless they had a second medical emergency without time to fill a new prescription and before the medication expired. Product A, in other words, was the market for emergency EAI devices and product B (itself identical) was the market for backup devices with a low probability of being used.[21]

The question confronting the *EpiPen* court on deciding the defendants' motion to dismiss the class complaint was whether identical products bundled together could constitute a tying claim when the products' uses allegedly differed. Simply packaging two products together does not, of itself, constitute anticompetitive behavior if the product could be purchased, unbundled from competing suppliers.[22] Was that possible in *EpiPen*? An EpiPen itself could not be purchased as a single EAI device after 2011, but there were competitors. However, because of the allegedly anticompetitive conduct of the class defendants (including, as noted *supra*, alleged kickbacks and other exclusionary behavior), EpiPen controlled almost the entire market by 2012.[23] There is an argument, therefore, that by 2011 EAI devices could not realistically be purchased unbundled.

For unlawful tying to exist, a plaintiff must show (1) that the defendant controlled the market, and (2) that the buyer was essentially forced to purchase the tied (or bundled) product.[24] With almost 100 percent of the EAI market controlled by EpiPen, this presumably demonstrates control. But that begs the question of how to define the market: was the market for primary use EAI devices different from the market for backup devices? The devices themselves were identical. The relevant product market in any given case is one "composed of products that have reasonable interchangeability for the purposes for which they are produced - price, use and qualities considered."[25] Surely the two EAI devices would be considered interchangeable by users; it would not matter which of the two bundled devices was used. But if their uses differed, was that sufficient for a finding that there were two markets? A tying claim cannot exist unless the sale links "two distinct markets for products ... distinguishable in the eyes of buyers" but "whether one or two products are involved turns not on the functional relation between them, but rather on the character of the demand for the two items."[26] In *EpiPen*, the class plaintiffs alleged that the primary market for EAI devices differed from the backup market. Those who wanted no backup device were compelled to buy one. But were consumers who did want a backup but preferred to buy a cheaper, generic EAI foreclosed from doing so? Because few would want three devices (i.e. by buying the bundled EpiPen along with a generic backup device), has the market for backup devices been impermissibly tied?

In *EpiPen*, the district court observed that the complaint alleged "sufficient consumer demand" for one to buy a primary EAI separately from a backup device (or to decline to buy a backup) so that it would be efficient for a firm to sell the devices individually.[27] Noting two other cases that held otherwise, the *EpiPen* court concluded that the class complaint plausibly pled a viable tying cause of action sufficient to overcome

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20 *Ill. Tool Works Inc. v. Indep. Inc.*, 547 U.S. 28 (2006). This judicial approach is now under attack legislatively. In its report, the Congressional subcommittee urged a return to the standards created in *Jefferson Parish*:

> Although antitrust law has long treated tying by a monopolist as anticompetitive, in recent decades, courts have moved away from this position. Subcommittee staff recommends that Congress consider clarifying that conditioning access to a product or service in which a firm has market power to the purchase or use of a separate product or service is anticompetitive under Section 2, as held by the Supreme Court in *Jefferson Par. Hosp. Dist. V. Hyde*.

Subcomm. on Antitrust, Com. and Admin. Law of the Comm. on the Judiciary, *supra* note 2, at 398.

21 Mylan estimated that 1-20 percent of backup EAIs would be used. In re EpiPen, *supra* note 6, at 1284.

22 Jefferson Par. Hosp, *supra* note 18, at 11.

23 *In re EpiPen, supra* note 6, at 1277.

24 *Ill. Tool Works Inc. v. Indep. Ink*, Inc., 547 U.S. 28, 34-35 (2006).

25 *U.S. v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377, 404 (1956).

26 *Jefferson Par. Hosp*, *supra* note 18, at 19.

27 *In re EpiPen, supra* note 6, at 1287.

a motion to dismiss, although the class plaintiffs would need to provide evidence "to support a reasonable finding that two separate product markets exist."[28]

Whether identical products packaged together but with arguably different uses (or values to purchasers) has been raised twice before *EpiPen*, and with different conclusions. In *Metromedia Broad. Corp. v. MGM/UA Entm't Co.*,[29] an entertainment studio combined the sale of broadcast rights for first run television episodes with syndicated reruns of the show. The buyer could not purchase a license to broadcast solely the first-run episodes; any such license was tied with the right to broadcast reruns. The show's episodes (first run or rerun) were, of course identical. But the viewership for the broadcasts would, the plaintiff asserted, differ as would, consequently, the value of advertising rights. In declining to issue an injunction, the district court ruled that because the show's copyright included the bundle of rights of both first and subsequent broadcasts, it was a single market. Requiring the purchase of both sets of rights, the court held, did not constitute unlawful tying.

Similarly, in *Paul v. Pulitzer Pub. Co.*,[30] a district court held that requiring newspaper carriers to sell and deliver papers on Saturdays as well as Mondays through Fridays did not constitute separate markets for purposes of a tying analysis. Different issues of the same newspaper, the court held, were not separate and distinct products. The court did not analyze whether consumer demand differed, i.e. whether the market for Monday – Friday issues differed from that of readers who also wanted Saturday papers.

The *EpiPen* court declined to follow both *Metromedia* and *Paul*, noting that those cases had occurred at more fully developed stages in the litigation and that the *EpiPen* class would still need to demonstrate the elements of market identification and control.[31] Regardless, however, it leaves us with an apparent circuit split: can identical bundled products constitute unlawful tying if their product uses differ? If a patient's use of an EAI differs depending on whether it is a primary device or backup, should antitrust law be interpreted to encompass the planned consumer use when defining the market? Similarly, if consumer demand for first-run program viewing differs from the demand for watching re-runs (or for reading newspapers on Saturdays compared with reading them during the traditional work-week), should we incorporate those differences when analyzing markets? If the prices for such otherwise-identical products differ, is that enough to show that the consumers do not view the products as substitutes? If so, the products are not truly interchangeable and we should view them as separate markets for purposes of antitrust analysis.

III. CONCLUSION

EpiPen, *Metromedia*, and *Paul* were decided by district courts in the Tenth, Ninth, and Eighth Circuits, respectively. While *Paul* was an unpublished decision, it still leaves us with a circuit split. How to reconcile the question of whether identical products bundled together can constitute unlawful tying when the circuits differ on how to evaluate the issue? In light of the congressional subcommittee's recommendation to pursue bundling and tying cases more assertively, the issue seems primed for the enactment of reasoned legislation and further adjudication.

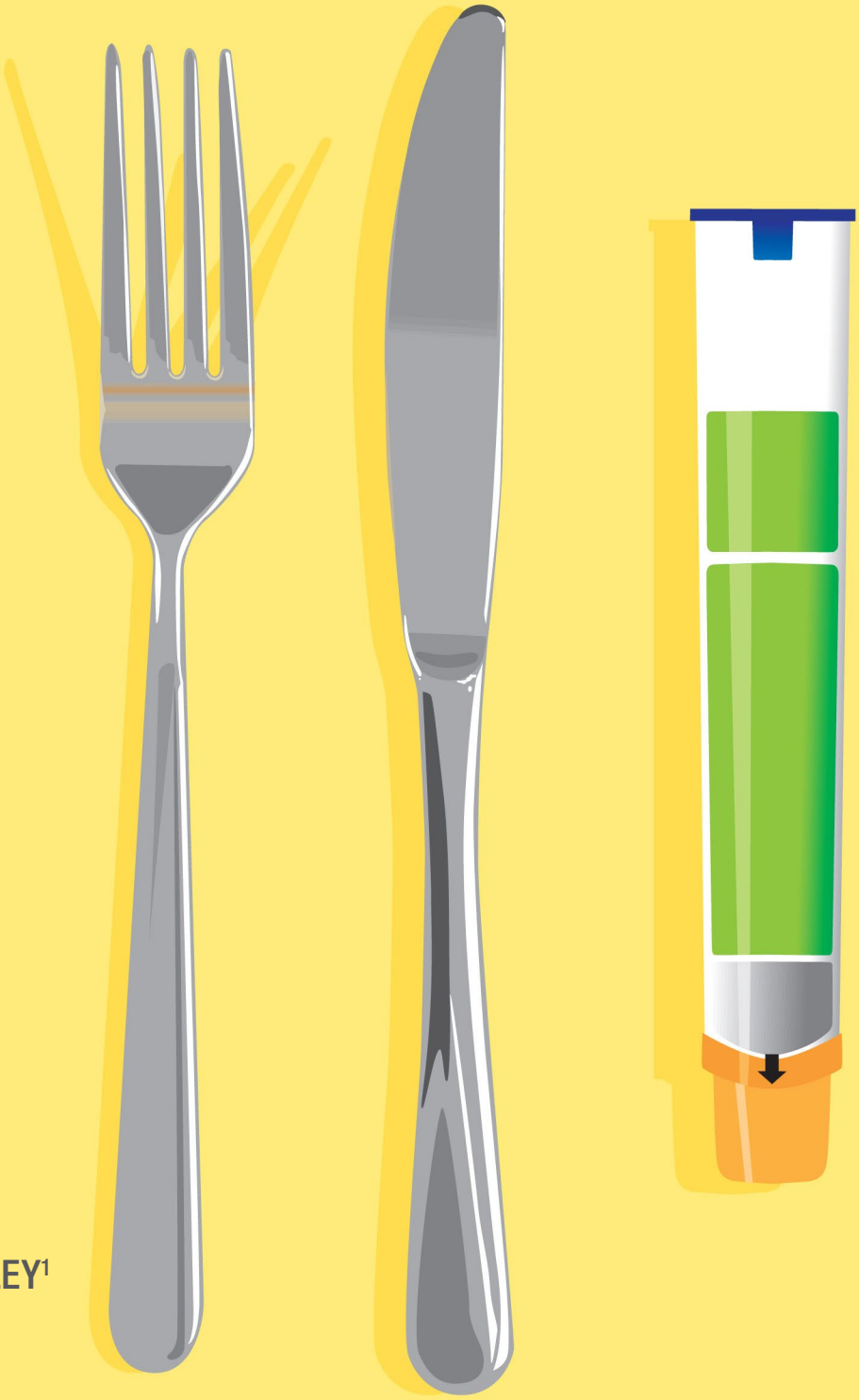
28 *In re EpiPen, supra* note 6, at 1288.

29 611 F. Supp. 415 (C.D. Cal. 1985).

30 No. 7432C(A), 1974 WL 887 (E.D. Mo. May 24, 1974).

31 *In re EpiPen, supra* note 6, at 1288.

BUNDLING IDENTICAL PRODUCTS: AN ECONOMIC ANALYSIS



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I. INTRODUCTION

Elsewhere in this issue, Professor Melanie Williams discusses the fact that there have been tying claims that have centered on the bundling of two products that are, arguably, identical. Judicial reactions to such claims have been inconsistent. In *Paul v. Pulitzer* and *Metromedia v. MGM/UA*, courts ruled that the products in question were identical and bundling them was not an illegal tie.

In *EpiPen*, however, the court was open to a different view[2] in a motion to dismiss. *EpiPen* is a class action case filed against Mylan, the exclusive distributor of the EpiPen, the most widely used Epinephrine auto-injector device ("EAI"). Although EpiPens had been sold one at a time since they were introduced in 1987, in 2011 Mylan announced that would only sell EpiPen in packets of two (the "2-Pak").

The plaintiffs argued that the 2-Pak constituted an illegal tie. Mylan filed a motion to dismiss, based, *inter alia*, on the claim that the 2-Pak could not be a tying arrangement because each EpiPen unit in the bundle was identical, and not a separate product.

However, the court found that the plaintiffs had pled a tying cause of action sufficiently well to overcome a motion to dismiss. The basis of the plaintiffs' argument was that users sometimes wanted one EpiPen to serve as a backup to another EpiPen. This fact allegedly differentiated the two EpiPens.

Professor Williams has addressed the legal issues involved. In this article, I describe the economic issues. I will focus on the *EpiPen* case, because it comes the closest to one in which a firm sells two literally identical products as a bundle. The other two are similar, but the bundled products in those cases are less obviously identical than in the *EpiPen* case. The *EpiPen* case is ongoing, so my discussion, like that of Professor Williams, is based on the court's memorandum rejecting Mylan's motion to dismiss. I will proceed, as did the court, by accepting the facts asserted by the plaintiffs as true.

I conclude that if a firm with market power bundles two identical products, the competitive effects of doing so are not usefully addressed by tying analysis. This is true even if one of the identical items in the bundle were used on different occasions or otherwise differently than the other. Rather, the bundling of two identical products is better viewed as one way to exploit market power by increasing prices in a single market. Based on the facts cited by the court in *EpiPen*, characterizing identical product bundling as tying does not add economic insight to the analysis of its economic effects.

II. TRADITIONAL TYING ANALYSIS

It is well known that tying and bundling are innocuous in many situations, and may even be pro-competitive in some circumstances. For example, tying can be a method of price discrimination that a firm without market power might use as part of its ordinary competitive strategy. In other cases, tying may enable a seller to assure quality control in aftermarkets. Tying may also solve certain types of free rider problems.[3]

However, in cases in which the firm doing the bundling (call it Firm 1) possesses market power in one product in the bundle, tying may have anti-competitive effects. Suppose that Firm 1 has market power in the sale of a product A and competes in the market for another product, B, where it is not the only seller.

The products A and B must be shown to be separate products, based on accepted market definition analysis. In many cases, this is done by focusing on the functional characteristics of the two products. For example, A and B may be complements. As noted, the *EpiPen* plaintiffs argue that even if A and B are perfect substitutes in a functional sense, they could be considered different products if they are used on different occasions for different purposes.

Given separate products A and B, an anti-competitive tie must involve coercion[4]. That is, a consumer buys B from Firm 1 only because that is required in order to buy A from Firm 1.

Coercion leads to competitive harm because Firm 1 will typically set a price for B higher than those set by its rivals in the market for B. Consumers are willing to pay this higher price only because of the coercion. Typically, output in the B market declines, due to Firm 1's tying arrangement.

2 *In re EpiPen Mktg., Sales Practices & Antitrust Litig.*, 336 F. Supp. 3rd 1256 (D. Kan. 2018).

3 Carlton, D.W. and J.M. Perloff. 2000. *Modern Industrial Organization*, Addison Wesley, Longman at 303.

4 *Jefferson Parish Hospital District No. 2 v. Hyde* 466 U.S. 2(1984).

In practice, A and B are often complements. Examples are: (1) Microsoft bundling the Internet Explorer browser with its Windows operating system[5]; and (2) Jefferson Parish Hospital tying surgical facilities to the use of its own anesthesia[6] services. This fact makes the three cases discussed herein atypical.

III. THE *EPIPEN* CASE

In 2007, Mylan acquired exclusive distribution rights to EpiPen. Since 1987, most users only had bought a single EpiPen at a time. However, a relatively small percentage of EpiPen users[7] also needed a second EpiPen, to serve as a backup.

In 2011, Mylan changed its pricing policy. From that point on, EpiPens could only be bought in "2-Pak" containers. Even those who did not want a second EpiPen were forced to buy one. At the same time, the price of an EpiPen went up drastically, from about $100 to about $600.

From an economic standpoint, the question arises: why did competitors not undercut these prices and offer the equivalent to the EpiPen 2-Pak, but sold one unit at a time? One answer is that the EpiPen patents were still in force at that time, although different methods of injecting epinephrine were available and had been approved by the FDA. Mylan sued four generic entrants for infringement, each of which had its own type of injection device. They were: Sandoz, Intelliject, Sanofi, and Teva. Sanofi, Intelliject, and Teva all made agreements with Mylan to delay market entry. Sandoz was also sued, and stopped its entry process.

During this time, Mylan's market share was in excess of 80 percent. Much of this was due to exclusivity agreements that it had with pharmacy benefit managers ("PBMs") and school systems. During the period of 2013-2015, Mylan's market share was in the high 90-percent range.[8] It was during this period that the conduct at issue is alleged to have taken place.

IV. ANALYTICAL ISSUES

As noted by Prof. Williams, the first issue concerns whether or not it makes sense to think of the two identical EpiPens in the Mylan bundle as separate products. From a purely functional standpoint, of course, they are the same product.

A tying claim also requires that one product be defined as the tying product, and the other as the tied product. This is important because the locus of anticompetitive harm in a tying case is the tied product market. A claim regarding the bundling of two identical products requires the analyst to identify which of the two identical EpiPens is the tying product and which is the tied product.

Finally, are the alleged competitive effects of the Mylan bundling strategy similar to those in a traditional tying case? A key concern in tying analysis is whether or not the market power that Firm 1 possesses in the tying product is extended, via tying, into the tied market.

Regarding the first issue, the defendants in *EpiEpen* argued that the Mylan bundle did not consist of two products, because the two EpiPens in each 2-Pak are identical. The plaintiffs argued that the two EpiPens in the bundle could be distinguished by differences in their intended use.

However, even accepting this "occasion of use" argument, the relevance to formal tying analysis is not clear. Which of the two identical EpiPens is the tying product? Which is the tied product? If a patient has the type of serious allergic reaction calling for the use of epinephrine, it is likely that the patient would simply reach for the first EpiPen that he or she could extract from the package[9]. There is no meaningful distinction between the two EpiPens in the bundle.

This makes it hard to see how the EpiPen bundling constitutes a tying arrangement that makes a tied market less competitive than it would be absent the tie. It may well be that Mylan's conduct caused the market for EAIs to be less competitive than it might otherwise have been.

5 *U.S. v. Microsoft Corporation*, 253 F. 3d 34 (D.C. Cir. 2000).

6 *In Re Jefferson Parish Hospital District No. 2 v. Hy*de 466 U.S. 2 (1984).

7 Said to be "up to 20%." *In Re EpiPen* at 1284.

8 *In Re EpiPen* at 1277.

9 Imagine trying to implement a SSNIP test to define a market for only a backup EAI. Because the "primary" EAI and the "backup" EAI are only distinguished by labels of convenience how could the analyst even set up the SSNIP analysis?

Even so, it is not clear that this harm to competition occurs in a separate market. If all EAIs constitute an antitrust product market, for example, then harm to competition may have occurred in that market, but not in another "tied" market.

However, it is hard to see how the Mylan bundling policy, by itself, could have caused harm to competition. EAI technology was well known by 2013, and the firms mentioned above had obtained regulatory approval to provide generic products that served the same purpose as the EpiPen did. If the other exclusionary conduct engaged in by Mylan had not taken place, any attempt by Mylan to use bundling to increase prices would likely have been undercut by generic entry in 2013.

This entry did not occur on large scale, however. Accepting the plaintiffs' allegations as true, Mylan's exclusivity arrangements with PBMs and school systems likely led to its high market share, reducing opportunities for generic competition.

Its aggressive litigation policy towards entrants almost certainly allowed it to deter entry for an appreciable period of time. The basis for this claim is that the Sanofi, Teva, and Intelliject lawsuits all led to pay-to-delay agreements.

Had entry occurred on a large scale in 2013-2015, the Mylan bundling arrangement could easily have been duplicated by generic entrants. Mylan would likely have faced downward pressure on prices and would likely have lost market share to generic entrants. Today, even Mylan offers a generic version of the EpiPen at prices equivalent to those of its competitors[10].

I conclude from this that the Mylan bundling strategy, by itself, is not likely to have led to reduced competition in the market for EAIs, or in any other market. Rather, it may simply have been a way to increase prices in a single EAI market, something made possible by other types of entry-deterring conduct engaged in by Mylan.

So what were the competitive effects of Mylan's conduct, assuming that the plaintiffs' allegations were true? They would be much the same as those alleged by the plaintiffs. A substantial number of consumers were forced to buy two EpiPens, the great majority of whom only wanted one EpiPen. Others may have wanted a backup EAI, but would have preferred to buy a cheaper generic EAI. Accepting the plaintiffs' factual allegations as true, prices were higher than they would have been absent the bundling.

The bundling policy of Mylan may, indeed, have been part of a pattern of conduct that violated antitrust law. However, based on the facts set out in by the court, it does not seem useful to analyze that conduct using the framework of tying. Rather, the economically significant conduct is likely to have been Mylan's successful efforts to obtain exclusivity with large customers and to deter entry by means of pay-to-delay agreements with potential entrants. These exclusivity arrangements were needed for the bundling to be effective.

V. SIMILAR CASES

In the court's analysis of *EpiPen*, it noted two other cases that seemed germane. In each, a plaintiff alleged an anticompetitive tying arrangement. In each case, the defendant countered that the products alleged to have been tied were not separate products.

In *Paul v. Pulitzer Publishing Co.*, two distributors of the St. Louis Post-Dispatch desired either not to distribute the Saturday edition of the paper, or wanted to price the Saturday edition somewhat higher than the weekday editions. The newspaper had required them to deliver the Saturday edition as a condition of being able to distribute the other daily editions and not to price them any differently. The plaintiffs argued that this constituted an illegal tying arrangement.

This case looks somewhat different from EpiPen in the sense that the demand for the Saturday edition seems to have been different – and lower – than for the weekday editions.[11] Arguably, the Saturday news is of a different type than weekday news, and was less in demand. This appears to have been why the plaintiffs did not want to distribute the Saturday paper. This contrasts with *EpiPen*, in which the two products in the bundle were literally identical.

In the court's decision, there is no reference to any effort by either party to investigate the substitutability of the Saturday paper and weekday papers. By the standards of modern antitrust economics, this is a significant omission. Therefore, whether or not the alleged tie and tying products were in separate markets cannot be inferred from the decision.

10 "FDA Approves fist generic version of EpiPen," FDA press release, August 16, 2018.

11 No. 74-327(CA) Dated May 24, 1974.

Therefore, in purely economic terms, it is not clear whether the above discussion of *EpiPen* is relevant to *Paul v. Pulitzer*.

The other case is *Metromedia Broad. Corp. v. MGM/UA Entm't Co.*[12] In that matter, the issue concerned MGM/UA's syndication of episodes of the television series FAME. MGM/UA required that Metromedia agree to show reruns of this series as a condition of being allowed to license first-run episodes.

Metromedia claimed that to require the licensing of reruns as a condition of licensing new episodes constituted an illegal tie. MGM/UA argued that all FAME episodes were the same product, covered by the same licensing rights.

The court sided with MGM/UA, ruling that both new episodes and re-runs were a single product. The court summarized MGM/UA's reasoning as follows: "MGM/UA contends…that there is no unlawful tie-in because the bundle of rights subsumed under the FAME copyright are of a single product which distinguishes the packaging of FAME first runs and FAME reruns..."[13]

This approach seems to ignore the product substitutability approach normally taken in market definition. This is because the court's reasoning did not focus on the consumer demand characteristics of each product. Rather, the court focused on the fact that they were both licensed under a single set of rights.

It is possible, hypothetically, that first runs and reruns appealed to very different viewer populations and did not compete with each other to a significant degree. A hypothetical monopolist test, therefore, would find them to be separate products. Under the court's approach, though, they would still be found to be a single product.

VI. CONCLUSIONS

The three cases discussed above show that two courts have accepted the view that a bundle of two allegedly identical products cannot be a tying arrangement. The *EpiPen* case suggests that an "occasion of use" argument may be accepted at some future date. This might open the door to applying tying analysis of bundles containing identical products.

However, this seems incorrect. If there are no functional differences between two products bundled together, deciding which of two identical products is to be the tying product, and which the tied product, is problematic. Whatever the details of the conduct at issue, tying analysis may not add much insight.

12 611 F.Supp. 415 (C.D. Cal 1985).

13 *Ibid.* at 422.

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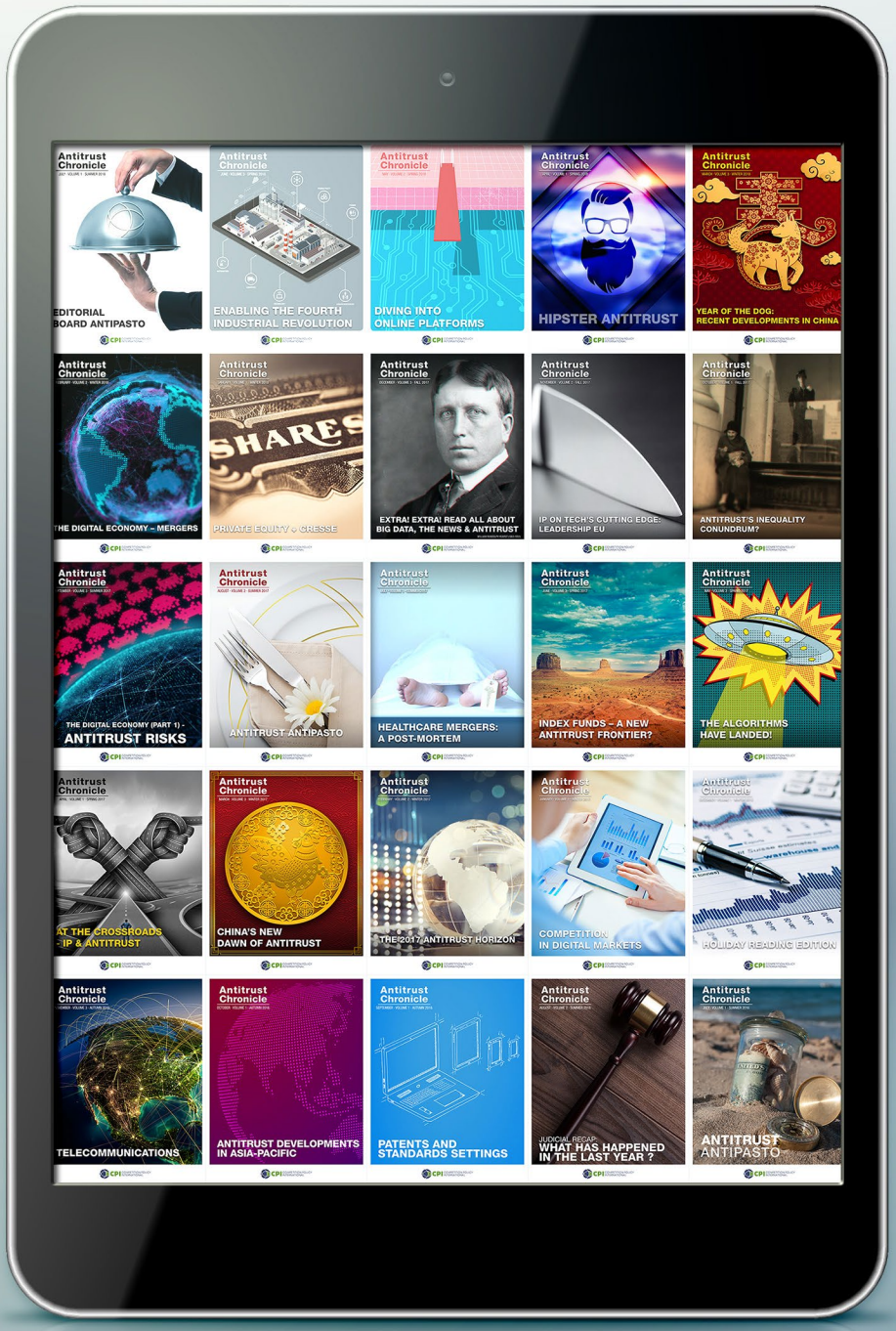


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