ECOSYSTEMS, ANTITRUST ERRORS & THE NUMERATOR BIAS

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INTRODUCTION

The notion of markets remains a cornerstone in antitrust legal analysis. Despite criticisms of antitrust's market definition exercise,[1] courts and antitrust plaintiffs continue to spend considerable time and resources in defining the relevant market. This exercise is supposed to subsequently

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[*] Author's note.

[1] Most notably, see Louis Kaplow, *Why (Ever) Define Markets?,* 124 HARV. L. REV. 437, 440 (2010) (arguing why courts should abandon defining markets). As Prof. Kaplow argues:

> *The central, conceptual argument is that there does not exist any coherent way to choose a relevant market without first formulating one's best assessment of market power, whereas the entire rationale for the market definition process is to enable an inference about market power. Why ever define markets when the only sensible way to do so presumes an answer to the very question that the method is designed to address? A market definition conclusion can never contain more or better information about market power than that used to define the market in the first place. Even worse, the inferences drawn from market shares in relevant markets generally contain less information and accordingly can generate erroneous legal conclusions--unless one adopts a purely results-oriented market definition stratagem under which one first determines the right legal answer and then announces a market definition that ratifies it. Additional, largely unavoidable difficulties are identified with the economic logic underlying market redefinition. Because virtually all of the argument reveals inherent problems in the very conception of the market definition / market share paradigm, it follows that the conclusions here do not depend on one's assessment of the quality of various means of measuring market power either in general or in particular cases and that they are independent of the legal application at hand.*

illuminate findings of market power, which underscores monopolization cases, and the analysis of competitive effects.

But market definition, which played an important role in the brick-and-mortar economy, is becoming increasingly irrelevant in the digital economy when the defendant's monopoly power arises from its control over an entire ecosystem of interconnected platforms, products and services.[2] Although antitrust analysis has incorporated some of the important features of the digital economy (such as network effects and the competitive importance of personal data), the legal framework remains hampered by its outdated approach to market definition and power.

The failure to properly encapsulate ecosystems into the antitrust legal framework enabled ongoing consolidation and abuses of power by dominant tech firms, such as Google, Apple, Meta, Amazon, and Microsoft. Courts and until recently enforcers turned a blind eye to the Big Tech Barons' increased power, which was not captured through the simplistic market definition tools of yesteryear. Indeed, monopoly power has proven more durable in the digital economy, and more elusive when it stems from the control over ecosystems and its weaponization. Furthermore, large ecosystems now not only compete on multiple markets, but in themselves operate private markets in which others compete. Think of the online environment where you shop, search, engage with others, or watch videos. What may appear as an organic interaction between sellers, service providers, customers, and users, is in fact a controlled ecosystem where a few firms, namely Google, Amazon, Meta, Apple, and Microsoft, determine

[2] On the notion of ecosystems, see: Michael G. Jacobides, Carmelo Cennamo, & Annabelle Gawer, *Towards a Theory of Ecosystems*, 39 STRATEGIC MANAGEMENT JOURNAL 2255 (2018); Michael G. Jacobides & Ioannis Lianos, *Ecosystems and Competition Law in Theory and Practice*, 30 INDUSTRIAL AND CORPORATE CHANGE 1199 (October 2021); Marc Bourreau, *Some Economics of Digital Ecosystems*, OECD 3 December 2020 DAF/COMP/WD(2020)89.

the rules, the fees, the flow of information, and the competitive dynamics between sellers and users.

And yet, astonishingly, these dynamics often remain below the radar screen of the U.S. courts. Preoccupied with defining a relevant antitrust market and relying on it to identify power, courts may reach conclusions as to competitive effects that are divorced from economic realities. And so, these dominant ecosystems can entrench their power and exhaust the competition officials in tactical battles in which they are required to accurately define a relevant market and establish monopoly power within this narrow theoretical boundary.

To put it simply, suppose one had direct evidence of a monopolist acting like a monopolist, namely using anticompetitive tactics that harmed app developers and customers. Also suppose that the monopolist controls the dynamic of competition within its ecosystem. It imposes monopolistic fees on sellers and advertisers, excludes them if they threaten its value chains, harvests users' data, and uses it against their interests. Furthermore, suppose that the monopolist's actions were stifling innovation. One would imagine a straight-forward antitrust case, where the monopolist would be liable for violating the Sherman Act. After all, the court need not struggle with issues of market definition when presented with direct evidence of both monopoly power and anticompetitive effects. Not so.

Our paper addresses the analytical gap that surrounds the antitrust analysis of ecosystems and makes two important contributions.

First, we show how courts (and until recently agencies) are often slow to recognize changes in business landscapes and models, relying on outdated or inapplicable economic tools, like market definition and relative market power. We highlight how the case law is hindering a much-needed change in analysis of the digital economy. As a result, consumers and

sellers subject to the dominant ecosystems' anticompetitive behavior pay the price. Since the Sherman Act does not mandate the courts' market definition exercise, we provide an alternative, namely, using ecosystems in its appraisal of monopoly power.

Second, while noting the need to develop the current antitrust analytical framework to encompass ecosystems' monopoly power, our paper notes the risks associated with treating all "ecosystems" as a proxy for monopoly power. This is of particular concern, when most antitrust enforcement in the U.S. is by private plaintiffs, not state or federal antitrust agencies. Once courts accept ecosystems as a potential source of monopoly power, private plaintiffs have the incentive to allege that many large tech firms, with interlocking platforms, are ecosystems, as this implies that they have monopoly power. We show how courts may fall victim to the numerator bias, where they focus on the headline number (the numerator, which would be the size of the ecosystem), without considering countervailing or qualifying factors (the denominator, such as the contestability of the ecosystem from within or by outside forces). Indeed, the numerator bias is undermining current antitrust analysis, where the courts rely on arbitrary market shares without assessing important qualifying factors. Once these factors are considered, we show how a firm with a presumptively non-monopolistic market share (say 45%) can have more market power than one with a presumptively monopolistic share.

We highlight the need to develop a more robust analytical framework for antitrust enforcement in ecosystem settings, that can, on the one hand, ensure that ecosystems that abuse their power and distort competition are not left unchallenged, and on the other hand, offer limiting principles that will prevent the numerator bias leading to over-enforcement. Our aim in exploring the error costs on both sides is to help courts and

enforcers update antitrust analysis to consider ecosystems and at the same time avoid the numerator bias.

Part I examines the rise of a few powerful ecosystems, and how they differ from popular apps, platforms, and other ecosystems. As we'll see, the Big Tech Barons' ecosystems differ from platform markets and narrowly defined antitrust markets in terms of the (a) source of the Tech Baron's power, (b) area of anticompetitive effects, and (c) nature of anticompetitive harm, in terms of influencing innovation paths.

Although antitrust analysis is supposed to account these economic realities, Part II explores how the "threshold step" for most antitrust cases today is in defining and proving the relevant market. This market definition exercise ostensibly serves several purposes, such as measuring defendant's market power and assessing competitive effects of the challenged restraint. But the current tools typically yield very narrow markets.

Part III discusses the breakdown in antitrust analysis: the courts fail to address (or even see) see the dominant ecosystems' abuses, since ecosystems, under the courts' framework, cannot provide monopoly power. That power for the courts comes only when the defendant controls a very high market share in a narrowly defined market. While competition agencies push to integrate ecosystem analysis to better reflect market reality, they are met with the courts' formalistic approach. As we'll see in one recent monopolization case against Apple, there was ample direct evidence that Apple behaved like a monopoly. But the district court instead spent much of its opinion on the threshold issue of market definition, an inquiry that yielded an inaccurate, subjective, and unpredictable result.

Given the multiple harms from the US courts' fixation on market definition, Part IV plots the efforts to adjust the analytical approach to take account of ecosystems. We review the way in which European enforcement

agencies and courts are starting to acknowledge ecosystems in their analysis of markets, and how ecosystems considerations increasingly inform the assessment of power.

While it is vital for antitrust analysis to evolve and integrate ecosystems in the legal framework, it is also important to identify limiting principles to ensure accurate, predictable, objective results. Therefore, Part V highlights the risk of oversimplification of the ecosystems analysis. We explain how judges, just as the rest of us, are prone to the numerator bias, and could be biased when they accept ecosystems as a source of monopoly power. To put it plainly, just because a defendant controls an ecosystem does not mean it is a monopoly. We consider how courts can mitigate this bias by examining several other factors besides the numerator.

I. The Changing Digital Landscape

It has been said that apps are worth millions, and platforms are worth billions. But on top of the food chain are the a few powerful firms' ecosystems. As Google's CEO told investors in 2019, his company builds ecosystems, not products: "If you look at an ecosystem like Android, this is what we do. And so that's going to be a focus for us."[3]

In the management literature, an ecosystem commonly "refers to a network of interconnected organizations that are linked to or operate around an organization or a technology platform and that produce valuable goods

[3] Alphabet Inc. Q2 2019 Earnings Call, Jul 25, 2019, 4:30 p.m. ET, https://www.fool.com/earnings/call-transcripts/2019/07/25/alphabet-inc-googl-q2-2019-earnings-call-transcrip.aspx.

and services."[4] Of course, not all online ecosystems are alike—some are more open, horizontal, and democratic than others.[5]

We have heard of late how a few tech firms have captured a large share of the S&P 500[6] and the attention of antitrust enforcers: namely, Google, Apple, Meta, Amazon, and Microsoft. Where do these Tech Barons derive their market power? Not from a particular product or service, but their control over an ecosystem of products and services.[7] Apple, for example, attributes the source of its strength not to a particular product, such as iPhone, but its ecosystem.[8] Meta's vision likewise, "does not center on any

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[4] Dias Sant´Ana et al., *The Structure of an Innovation Ecosystem: Foundations for Future Research*, 58 MANAGEMENT DECISION 2725 (2020), https://doi.org/10.1108/md-03-2019-0383 (noting how "[t]he importance of building an ecosystem has gained prominence in both the strategy and practice of organizations").

[5] Edward Curry, *The Big Data Value Chain: Definitions, Concepts, and Theoretical Approaches*, *in* NEW HORIZONS FOR A DATA-DRIVEN ECONOMY: A ROADMAP FOR USAGE AND EXPLOITATION OF BIG DATA IN EUROPE 33 (José Maria Cavanillas, Edward Curry, and Wolfgang Wahlster eds. Cham: Springer, 2016) (noting definitions and how within a healthy business ecosystem, companies can work together in a complex business web where they can easily exchange and share vital resources).

[6] Bank of America analyst Michael Hartnett dubbed the following seven tech-focused firms as the "Magnificent Seven": Microsoft, Apple, Nvidia, Alphabet, Amazon, Meta Platforms, and Tesla. In July 2024, these seven firms collectively accounted for 35.5% of the market capitalization of the leading stock index, the S&P 500. Daniel Foelber, *35% of the S&P 500 Is Concentrated in the "Magnificent Seven." Here's What That Means for Your Portfolio*, Motley Fool, July 9, 2024, https://www.fool.com/investing/2024/07/09/sp-500-magnificent-seven-growth-stock-value/.

[7] See generally ARIEL EZRACHI & MAURICE E. STUCKE, HOW BIG-TECH BARONS SMASH INNOVATION AND HOW TO STRIKE BACK 9-40 (2022).

[8] Apple Form 8-K (filed 11/2/2023), https://www.sec.gov/Archives/edgar/data/320193/000032019323000104/0000320193-23-000104-index.html ("Our active installed base of devices has again reached a new all-time high across all products and all geographic segments, thanks to the strength of our ecosystem and unparalleled customer loyalty," quoting Luca Maestri, Apple's CFO); Apple Form 8-K EX-99.1 of filed (2022-10-27) (Luca Maestri, Apple's CFO stating that "[t]he strength of our ecosystem, unmatched customer loyalty, and record sales spurred our active installed base of devices to a new all-time high. This quarter capped another record-breaking year for Apple, with revenue growing over $28 billion and operating cash flow up $18 billion versus last year.").

single product, but rather an entire ecosystem of experiences, devices, and new technologies."[9] So too, an "important element" of Microsoft's business model "has been to create platform-based ecosystems on which many participants can build diverse solutions. A well-established ecosystem creates beneficial network effects among users, application developers, and the platform provider that can accelerate growth. Establishing significant scale in the marketplace is necessary to achieve and maintain attractive margins."[10] To achieve and maintain monopoly margins, the Tech Barons focus on building "platform-based ecosystems."[11]

This Part examines multiple factors that distinguish powerful ecosystems from popular apps, platforms, and other ecosystems. As we'll see, the Big Tech Barons' ecosystems differ from platform markets and narrowly defined antitrust markets in terms of (a) the source of the Tech Baron's power, (b) the area of anticompetitive effects, and (c) the nature of anticompetitive harm, in terms of influencing innovation paths. This Part next explores how ecosystems can empower the Big Tech Barons, and how the anticompetitive effects from their abuses are not limited to narrowly defined markets.

A. What Distinguishes a Tech Baron's Ecosystem from Popular Apps, Platforms, and Other Ecosystems?

At least seven features distinguish a Tech Baron's ecosystem from popular apps, platforms, and other ecosystems.

First, looking at the profits and current market capitalizations of Google, Apple, Meta, Amazon, and Microsoft, one sees that their power does not arise from one platform or market; it arises from their control of multiple,

[9] Meta (Annual report) filed 2023-02-02.
[10] Microsoft 10-K (Annual report) filed (2022-07-28)
[11] Microsoft 10-K (Annual report) filed (2022-07-28)

popular interlocking platforms, products, and services, which, in turn, attract many developers, sellers, and consumers. For example, 60 percent of iPhone users also use an iPad (tablet), and Apple seeks to decrease switching costs from iPhones and iPads to "lock customers into [its] ecosystem."[12] Thus, the ecosystem is more powerful than the sum of its parts—the platforms, services, the data collected, and the analytics undertaken. Why? Because one might avoid a platform, but not the Big Tech Baron's expanding and tightly controlled ecosystem.[13]

Second, in designing the ecosystem and supporting infrastructure, the Tech Baron ensures itself unparalleled access to data and other critical inputs of the digital economy.[14] The Tech Baron can pull the personal and commercial data and place it in its reservoir. That data can then be used to improve the Tech Baron's products, services, technology, and algorithms and give it a significant advantage over others. The data also alerts them of competitive threats and changes in market dynamics.[15] Uber as a platform has a detailed view of where people are traveling.[16] But a Tech Barons which controls the ecosystem in which Uber resides, has a broader view and more data about the individuals and the wider digital economy. This data advantage is further amplified with enhanced analytics and the use of artificial intelligence.

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[12] Epic Games v. Apple, 4:20-cv-05640-YGR, slip op. at 58 (N.D. Cal. September 10, 2021).

[13] Ezrachi & Stucke, Big Tech Barons, *supra* note, at 11-14.

[14] On the data advantage that the ecosystems enjoy, see Ezrachi & Stucke, Big Tech Barons, *supra* note, at 66, 105-06, 110—11, 156-57, 191-93; MAURICE E. STUCKE, BREAKING AWAY 13-22 (2022).

[15] We refer to this as their nowcasting radar. Ezrachi & Stucke, Big Tech Barons, *supra* note, at 42-44, 53, 56, 163, 168; Stucke, Breaking Away, *supra* note, at 33-38.

[16] Johana Bhuiyan, *Uber Settles With New York Attorney General Over "God View" Tracking Program,* BuzzFeed (January 6, 2016_, https://www.buzzfeednews.com/article/johanabhuiyan/uber-settles-godview .

Third, the Tech Baron controls the interconnections in the ecosystem – the bridges (interoperability) and the information flows (basically what information the companies or individuals receive). Thus, in contrast to open ecosystems, the Tech Barons determine the configuration patterns within the ecosystem and external relationships outside the ecosystem.[17]

Fourth is governance. As a gatekeeper, the Tech Baron creates and enforces the rules of the ecosystem. So, Google sets the rules for not only its search advertising and YouTube display ads; it, along with Facebook, effectively determines and enforces the rules for display advertising on millions of apps and websites. And the Tech Baron makes sure that the rules (and dynamics of competition) within its ecosystem ultimately benefit them. The Tech Baron's terms are not subject to negotiation. Nor is there a right to due process when access is denied.[18]

Fifth, while the Tech Baron is not immune from competitive pressure, its gatekeeper position enables it to block innovations that might jeopardize its ecosystem. It takes the destruction out of innovation's potential creative destruction, and its influence extends beyond its ecosystem.[19]

Sixth, in controlling the ecosystem, the Tech Baron ensures that it obtains a significant share of its value chain. For example, Google obtains monopoly rents not only from one single market (such as search advertising), but across the value chain of digital advertising. So, Google profits from advertisements on third-party websites as well as those on its properties, like YouTube.

Seventh, in controlling their ecosystems, Tech Barons have more weapons to neutralize competitive threats.[20] Moreover, the anticompetitive

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[17] Ezrachi & Stucke, Big Tech Barons, *supra* note, at 50-54.
[18] Stucke, Breaking Away, *supra* note, at 90-109.
[19] Ezrachi & Stucke, Big Tech Barons, *supra* note, at 123-39.
[20] *Id*. at 44-57.

effects of their actions can ripple across many platforms and markets, and beyond their ecosystems.[21]

Thus, the Tech Barons' ecosystems differ from platform markets and narrowly defined antitrust markets in terms of the (a) the source of the Tech Baron's power, (b) the area of anticompetitive effects, and (c) the nature of anticompetitive harm, in terms of influencing innovation paths.

B. How Ecosystems Can Empower the Tech Barons

To illustrate how the Tech Baron derives its power from its control over its ecosystem, not from a particular constituent component, let us consider Google and Apple.

Alphabet (which, for our purposes, we will call Google) has dominated over the past decade general search and general search advertising in the United States, Europe, and elsewhere. Google has leveraged its search monopoly to dominate other markets, including web browsers (Chrome),[22] mobile operating systems (Android),[23] web-mapping (Google Maps and Waze),[24] and YouTube, one of the leading user-generated entertainment and video content platforms.[25]

By 2020, nine of Google's products— Android, Chrome, Gmail, Google Search, Google Drive, Google Maps, Google Photos, Google Play Store, and YouTube—had over a billion users each.[26] Google Pay, by 2018, was the most downloaded financial technology app worldwide, with millions of consumers spending and transferring "tens of billions of dollars."[27] Google

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[21] *Id*. at 81-100.
[22] https://gs.statcounter.com/browser-market-share/
[23] https://gs.statcounter.com/os-market-share/mobile/worldwide
[24] https://www.statista.com/statistics/865413/most-popular-us-mapping-apps-ranked-by-audience/
[25] https://www.statista.com/topics/2019/youtube/#topicOverview.
[26] Stucke, Breaking Away, supra note, at 2.
[27] *Id*.

Home and Assistant products, by 2019, were the market leaders in that category on a global basis.[28]

Apple's power comes from its closed ecosystem of distinct products, such as its iPhones, iPads, AirPods, Apple Watches, and Macs, and services (such as AppleTV, Apple Music, and cloud storage). Apple's power increases as more users stay within its ecosystem, for example, buying a Mac to pair with one's iPhone, and then an Apple Watch to pair with the other two Apple devices. As the United States and state attorneys general allege in their monopolization complaint against Apple, this lock-in effect is intentional: "as early as 2010, then-CEO Steve Jobs discussed how to 'further lock customers into our ecosystem' and 'make Apple['s] ecosystem even more sticky.' Three years later, Apple executives were still strategizing how to 'get people hooked to the ecosystem.'"[29]

So, for example, Apple allegedly leveraged the power of its ecosystem to gain an unfair competitive advantage in the sale of its Apple Watch. Good smart watches can be expensive (costing between $300 and $400[30]), but they are not standalone devices. Their functionality improves when they are paired with one's smartphone. As the United States alleged, Apple not only favored its own watch, but suppressed "key functions of third-party smartwatches—including the ability to respond to notifications and messages and to maintain consistent connections with the iPhone" and in doing so, "denied users access to high performing smartwatches with preferred styling, better user interfaces and services, or better batteries, and

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[28] *Id.*

[29] Compl. at ¶ 3, filed in United States v. Apple, Case 2:24-cv-04055, (D.N.J. filed March 21, 2024), https://www.justice.gov/opa/media/1344546/dl?inline [hereinafter UA Apple Compl.]

[30] Valentina Palladino & Cherlynn Low, *The best smartwatches for 2024: Our guide to picking the best smartwatch for you (and no, the Apple Watch isn't your only option)*, ENGADGET (July 23, 2024), https://www.engadget.com/best-smartwatches-153013118.html

it has harmed smartwatch developers by decreasing their ability to innovate and sell products."[31]

To effectively access Android and Apple users, app developers and product and service providers need to be admitted within Google's and Apple's ecosystems, and have their products and services work seamlessly with the Big Tech Baron's products and services. But to access the ecosystem, developers must accede to Google's and Apple's non-negotiable interlocking rules and regulations. These rules benefit primarily the Big Tech Baron, not users or app developers.

For example, Apple unilaterally decides what apps are admitted in its App Store.[32] Moreover, app developers distributing their apps via Apple's App Store must accept Apple's terms, such as a 30% tax on all in-app purchases.[33] App developers cannot choose alternative in-app payment processors or app stores, as Apple has denied this. [34] As the Ninth Circuit found,

> *there is periodic friction between Apple and app developers. That is because Apple, when it opened the iPhone to third-party developers, did not create an entirely open ecosystem in which developers and users could transact freely without any mediation. Instead, Apple created a "walled garden" in which Apple plays a significant curating role.*[35]

Nor can app developers "inform their customers of alternative cheaper purchasing possibilities, steer them to those offers and allow them to make

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[31] US Apple Compl. at ¶ 10.
[32] Epic Games, Inc. v. Apple, Inc., 67 F.4th 946, 967 (9th Cir. 2023).
[33] *Id*.
[34] *Id*.
[35] *Id*.

purchases."[36] As the European Commission found, consumers are left in the dark about lower prices, because of Apple's anti-steering practices:

> *Apple bans music streaming app developers from fully informing iOS users about alternative and cheaper music subscription services available outside of the app and from providing any instructions about how to subscribe to such offers. In particular, the anti-steering provisions ban app developers from:*
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> - *Informing iOS users within their apps about the prices of subscription offers available on the internet outside of the app.*
> - *Informing iOS users within their apps about the price differences between in-app subscriptions sold through Apple's in-app purchase mechanism and those available elsewhere.*
> - *Including links in their apps leading iOS users to the app developer's website on which alternative subscriptions can be bought.*
> - *App developers were also prevented from contacting their own newly acquired users, for instance by email, to inform them about alternative pricing options after they set up an account.*[37]

Thus, where did Apple's power come from to force millions of app developers, including powerful ones like Epic, to agree to its anti-competitive terms? Not from its control over a narrow antitrust market, like gaming transactions, but from its control over its closed ecosystem. As Apple adds more products and services and denies functionality or interoperability to rival products and services, users will increasingly adopt

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[36] European Commission, Press Release: Commission sends preliminary findings to Apple and opens additional non-compliance investigation against Apple (June 24, 2024), https://digital-markets-act.ec.europa.eu/commission-sends-preliminary-findings-apple-and-opens-additional-non-compliance-investigation-2024-06-24_en

[37] European Commission, Press Release: Commission fines Apple over €1.8 billion over abusive App store rules for music streaming providers (March 4, 2024), https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_24_1161/IP_24 _1161_EN.pdf.

and use Apple's products and services, and Apple's ecosystem and power grows.

C. The Anticompetitive Effects Are Not Constrained to Narrowly Defined Markets

Often, the Tech Baron not only compete against other companies on various markets, but also operate private markets where others compete and interact. Consider, for example, third-party sellers on Amazon and app developers that compete within Google's and Apple's app stores. Competition in these "private" markets is controlled and often distorted to advance the interests of the ecosystem.[38] And so, the Big Tech Baron determines the nature of services that will access these markets, the conditions of sale, the flow of information, and the overall dynamics of competition. While these marketplaces for goods, services and communications may resemble organic markets, they are not governed by the invisible hand of competition, but rather by a digitalized hand - that of the Tech Baron.

The control over the ecosystem not only enables the Tech Barons to affect competition dynamics, but also bestow on them the power to distort the supply and demand of innovation.[39] While Google, Apple, Facebook, Amazon, and Microsoft invest a lot in research and development, they use their vast powers to suppress disruptive innovation that threatens their value chains or power. The innovation that we receive is geared to allow the Tech Barons to grow their empire and influence. Other innovations that could benefit us, may be quashed if they are deemed disruptive to this goal. So,

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[38] For more on such self-preferencing, see Ezrachi & Stucke, Big Tech Barons, *supra* note, at 68-69; Stucke, Breaking Away, *supra* note, at 42-46, 50-53, 102-04.

[39] Ezrachi & Stucke, Big Tech Barons, *supra* note, at 41-80 (discussing how powerful ecosystems can disrupt the supply and demand of disruptive innovations).

while we tend to believe that market forces dictate the path and mix of innovation, the reality is more like the film "The Truman Show" as innovation is not driven by our desires, but by the profit motive of the Tech Barons. With this in mind, it is perhaps of little surprise that the nature of innovation changes. We often assume that innovation is a good thing. Regulators often posit how they don't want to chill innovation. But as we already sense, not every innovation creates value. In the digital economy and elsewhere, innovation can also extract or destroy value. So as the Big Tech Barons become more powerful, the nature of innovation changes and it may become toxic. Products and services that were originally meant to help us, are now being designed to extract value from us – by enabling data extraction, targeting and manipulation.

The harm from the toxic innovations and Big Tech Barons' stifling of value-added innovations ripples beyond the Tech Barons' ecosystems. So even if we seek to avoid the Big Tech Barons' ecosystems, the toxic innovations to manipulate our behavior are redeployed elsewhere, such as in the political arena. Ultimately the toxic innovations from the Big Tech Barons' ecosystems ripple through society – helping spread conspiracy theories, false news, and hate. For example, when Facebook's algorithms reward negative stories, the political parties become more negative in their messaging. And this rancor and tribalism weaken trust and democratic systems. Similarly, new technologies affect our self-esteem and mental health.

Importantly the effects from the distortion of competition and innovation are not constrained to narrowly defined markets. Ecosystems not only confer greater power than brick-and-mortar markets but can also lead to ripple effects that are felt well beyond. Negative effects are not confined to higher prices and reduced output in a particular market (such as paying

more for cellophane) but extend to wider areas of society. The distortion of innovation paths can harm our privacy, autonomy, well-being and democracy. With the stakes higher with ecosystems, we consider next whether the main legal avenue – namely, the anti-monopolization law under Section 2 of the Sherman Act – is up to the task.

II. THE CURRENT ANTITRUST FRAMEWORK IN ASSESSING MARKETS

While the concept of ecosystems has been debated extensively in literature,[40] and introduced into European regulatory instruments applicable to the digital economy,[41] it has proven more difficult to integrate into competition analysis, and more specifically, US antitrust analysis.

This limitation risks driving antitrust into irrelevance, and stands at odds with the US antitrust law supposing to account the economic realities.[42] As the Supreme Court noted over thirty years ago, "[l]egal presumptions that rest on formalistic distinctions rather than actual market realities are generally disfavored in antitrust law," as the Court preferred "to resolve antitrust claims on a case-by-case basis, focusing on the 'particular

[40] See Michael G. Jacobides & Ioannis Lianos, *Ecosystems and Competition Law in Theory and Practice*, 30 INDUSTRIAL AND CORPORATE CHANGE 1199 (October 2021); Frederic Jenny, *Competition law and digital ecosystems: Learning to walk before we run*, 30 INDUSTRIAL AND CORPORATE CHANGE 1143 (October 2021); Amelia Fletcher, *Digital competition policy: Are ecosystems different?*, OECD, DAF/COMP/WD(2020)96; Daniel A. Crane, *Ecosystem Competition and the Antitrust Laws*, 98 NEB. L. REV. 412 (2019); Viktoria H. S. E. Robertson, *Antitrust market definition for digital ecosystems*, Concurrences N° 2-2021, 3-9

[41] See for example the EU DMA: Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) OJ L 265, 12.10.2022, p. 1–66.

[42] Broad. Music, Inc. v. Columbia Broad. Sys., Inc., 441 U.S. 1, 14 (1979) (quoting the Department of Justice that "[t]he Sherman Act has always been discriminatingly applied in the light of economic realities").

facts disclosed by the record.'"[43] In "determining the existence of market power," the Court pointed to examining "the economic reality of the market at issue."[44] Likewise, the Court emphasized that "Congress prescribed a pragmatic, factual approach to the definition of the relevant market and not a formal, legalistic one."[45]

Indeed, the Court struck down anti-competitive restraints based on the market realties at issue. For example, in *Associated Press v. United States*,[46] the Supreme Court upheld, without any elaborate market definition inquiry, the lower court's finding that the association's by-laws restrained trade.[47] The district court found that AP possessed market power, not as a result of any formulistic market definition exercise, but the economic reality: AP was "a vast, intricately reticulated organization, the largest of its kind, gathering news from all over the world, the chief single source of news for the American press, universally agreed to be of great consequence."[48]

So, if antitrust analysis is supposed to account the economic realities, and if the economic reality is that ecosystems can be a source of monopoly power, then courts, in considering whether the Big Tech Barons have monopoly power, should consider the control over their ecosystems.

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[43] Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 466–67 (1992) (quoting Maple Flooring Manufacturers Assn. v. United States, 268 U.S. 563, 579 (1925); United States v. E. I. du Pont de Nemours & Co., 351 U.S. 377, 395 n. 22 (1956); Continental T.V., Inc. v. GTE Sylvania Inc., 433 U.S. 36, 70 (1977) (White, J., concurring in judgment)).

[44] Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 467 (1992).

[45] Brown Shoe Co. v. United States, 370 U.S. 294, 336 (1962).

[46] 326 U.S. 1, 12–13 (1945).

[47] *Id*. (finding the newspaper organization "had tied the hands of all of its numerous publishers, to the extent that they could not and did not sell any part of their news so that it could reach any of their non-member competitors," had "hindered and restrained the sale of interstate news to non-members who competed with members").

[48] *Associated Press*, 326 U.S. at 18.

This should not be controversial, from a jurisprudential perspective. But as this Part explores, the U.S. courts, including the Supreme Court in recent years, had elevated the importance of market definition in antitrust over the economic realities.

A. Importance of Market Definition in Antitrust

Outside of per se illegal cases, antitrust liability under U.S. law (namely, the Sherman and Clayton Acts) is predicated on defendants' significant market power, which is determined typically circumstantially by their market share. While there are some exceptions (e.g., cluster markets), parties and courts devote a lot of energy to define a relevant antitrust market, and the defendants' share of that market. As the federal courts note, "[a] threshold step in any antitrust case is to accurately define the relevant market, which refers to 'the area of effective competition.'"[49] Thus, to state an antitrust claim, and survive a motion to dismiss, antitrust plaintiffs must first plead a plausible relevant market, which encompasses "both a geographic market and a product market."[50] If the plaintiffs fail to allege a plausible antitrust market, then the courts typically dismiss their complaint.[51]

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[49] Coronavirus Rep. v. Apple Inc., No. 21-CV-05567-EMC, 2021 WL 5936910, at *6 (N.D. Cal. Nov. 30, 2021), quoting Fed. Trade Comm'n v. Qualcomm Inc., 969 F.3d 974, 992 (9th Cir. 2020) (citation omitted)).

[50] Reilly v. Apple Inc., 578 F. Supp. 3d 1098, 1106 (N.D. Cal. 2022), quoting Hicks v. PGA Tour, Inc., 897 F.3d 1109, 1120 (9th Cir. 2018); see also hiQ Labs, Inc. v. LinkedIn Corp., 485 F. Supp. 3d 1137, 1148 (N.D. Cal. 2020) ("[T]he relevant market must still be plausibly alleged to make it past a 12(b)(6) challenge.").

[51] *See, e.g.*, NSS Labs, Inc. v. Symantec Corp., No. 18-CV-05711-BLF, 2019 WL 3804679, at *9 (N.D. Cal. Aug. 13, 2019) ("Failure to identify a relevant market is a proper ground for dismissing a Sherman Act claim.") (quoting Tanaka v. Univ. of S. California, 252 F.3d 1059, 1063 (9th Cir. 2001)).

Most antitrust cases are adjudicated under the Supreme Court's rule of reason legal standard.[52] Under that standard, market definition has become the critical threshold legal issue.[53] As the Supreme Court stated, "courts usually cannot properly apply the rule of reason without an accurate definition of the relevant market."[54] This is because "without a definition of the market there is no way to measure the defendant's ability to lessen or destroy competition."[55]

Thus, market definition can determine the case's outcome.[56] Even if plaintiff, as we'll see with the *Epic* case, has strong evidence of monopoly power and anticompetitive effects, the court will focus initially on whether plaintiff accurately defines an antitrust market. Nearly all rule of reason cases are dismissed in the first step, which encompasses showing anticompetitive effects in a properly defined antitrust market.[57] The threshold issue in the first step is whether plaintiff adequately pleads and proves a relevant antitrust market. So, an inquiry that is supposed to be

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[52] "Under this rule the fact finder weighs all of the circumstances of a case in deciding whether a restrictive practice should be prohibited as imposing an unreasonable restraint on competition." Continental T.V., Inc. v. GTE Sylvania, Inc., 433 U.S. 36, 49–50 (1977); for criticisms of the standard, see Maurice E. Stucke, *Does the Rule of Reason Violate the Rule of Law,* 42 UC Davis L. Rev. 1375 (2009).

[53] *See, e.g.*, Vital Pharms., Inc. v. Berlin Packaging LLC, 632 F. Supp. 3d 780, 786 (N.D. Ill. 2022) ("a plaintiff's threshold burden under the [r]ule of [r]eason analysis involves the showing of a precise market definition in order to demonstrate that a defendant wields market power, which, by definition, means that the defendant can produce anticompetitive effects") (quoting Agnew v. Nat'l Collegiate Athletic Ass'n, 683 F.3d 328, 337 (7th Cir. 2012)).

[54] Ohio v. Am. Express Co., 585 U.S. 529, 543 (2018).

[55] *Id*. (internal quotation and brackets omitted).

[56] Health All. Plan of Michigan v. Blue Cross Blue Shield of Michigan Mut. Ins. Co., No. CV 14-13788, 2018 WL 10322116, at *2 (E.D. Mich. Jan. 2, 2018).

[57] *Epic*, 67 F.4th at 993 n. 19 (noting an amicus brief reporting that courts have decided 90% of Rule of Reason cases since 1977 at step one and that the figure rises to 97% when considering only post-1999 cases).

flexible, in accounting the industry's economic realities, has become formulaic.

Market definition thus has become "an essential predicate to the entire case."[58] Interestingly, the language of the Sherman Act does not impose this requirement.[59] Nor does the Sherman Act require plaintiffs to show that the challenged restraint produces "significant anticompetitive effects" within a "relevant market."[60]

Instead, U.S. courts offer two justifications for this rigid threshold. Both justifications, as we shall see later, are flawed. But for now, let us see how the market definition exercise distorts monopolization cases involving the Tech Barons' ecosystems.

B. Antitrust Markets, Because of Current Tools (SSNIP or Brown Shoe Factors), Tend to Be Narrow

Even though "the concept of 'relevant market' is central to all section 2 [monopolization] claims," courts recognize that this concept "is not easily defined."[61] The touchstone of defining the relevant antitrust market (which encompasses both a product and geographic market) is cross-elasticity of demand, namely shifts in consumer demand relative to changes in price.[62]

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[58] Coronavirus Rep. v. Apple Inc., No. 21-CV-05567-EMC, 2021 WL 5936910, at *6 (N.D. Cal. Nov. 30, 2021).

[59] Section 1 of the Sherman Act provides that "[e] very contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal." 15 U.S.C. § 1. Section 2 provides that "[e]very person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony." 15 U.S.C. § 2.

[60] Tanaka v. Univ. of S. California, 252 F.3d 1059, 1063 (9th Cir. 2001).

[61] Telecomm Tech. Servs., Inc. v. Siemens Rolm Commc'ns, Inc., 66 F. Supp. 2d 1306, 1316 (N.D. Ga. 1998).

[62] United States v. E. I. du Pont de Nemours & Co., 351 U.S. 377, 380 (1956); United States v. Cont'l Can Co., 378 U.S. 441, 449 (1964) ("Though the 'outer boundaries of a product market are determined by

But as courts have found, it is "ordinarily quite difficult to measure cross-elasticities of supply and demand accurately."[63] Thus, the antitrust agencies and courts use two tools to define antitrust markets: the hypothetical monopolist's SSNIP test[64] and *Brown Shoe* factors.[65] Both tools typically yield narrowly defined markets.

In undertaking the hypothetical monopolist SSNIP test, economists begin with a very narrow product and geographic market. As the Ninth Circuit noted:

> *To perform a SSNIP analysis, an economist proposes a narrow geographic and product market definition and then iteratively expands that definition until a hypothetical monopolist in the proposed market would be able to profitably make a small but significant non-transitory increase in price ("SSNIP"). At each step, if consumers would respond to a SSNIP by making purchases outside the proposed market definition, thereby rendering the SSNIP unprofitable, then the proposed market definition is too narrow. At the next step, the economist expands the proposed geographic or product market definition to include the substituted products or area. This process is repeated until a SSNIP in the proposed market is predicted to be profitable for the hypothetical monopolist.*[66]

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the reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it,' there may be 'within this broad market, well-defined submarkets * * * which, in themselves, constitute product markets for antitrust purposes.'") (quoting *Brown Shoe*, 370 U.S. at 325); Coronavirus Rep. v. Apple Inc., No. 21-CV-05567-EMC, 2021 WL 5936910, at *6 (N.D. Cal. Nov. 30, 2021) ("The principle most fundamental to product market definition is 'cross-elasticity of demand' for certain products or services.") (quoting Kaplan v. Burroughs Corp., 611 F.2d 286, 291–92 (9th Cir. 1979)).

[63] In re Live Concert Antitrust Litig., 247 F.R.D. 98, 124 (C.D. Cal. 2007).

[64] Optronic Techs., Inc. v. Ningbo Sunny Elec. Co., 20 F.4th 466, 482 (9th Cir. 2021).

[65] Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962); see also United States v. Bertelsmann SE & Co. KGaA, 646 F. Supp. 3d 1, 25 (D.D.C. 2022) (noting how courts evaluate relevant product markets in the monopsony context in two ways: by considering qualitative, "practical indicia" as described by the Supreme Court in the *Brown Shoe* case and by examining "supply substitution" and applying the "hypothetical monopsonist test").

[66] Optronic Techs., Inc. v. Ningbo Sunny Elec. Co., 20 F.4th 466, 482 (9th Cir. 2021).

Thus, under the SSNIP test, an economist focuses on narrow categories of goods and services, and asks whether consumers would meaningfully shift, if at all, in response to a small price increase.[67] Take bread, as one example. The United States in applying the SSNIP test found the relevant product market to be white pan bread (such as that sold under the Wonder brand), as opposed to bread generally.[68]

While it is difficult to measure cross-elasticities of supply and demand accurately, so too, absent good data, it is difficult to accurately assess whether a hypothetical monopolistic could impose a SSNIP. Thus, a second method to define antitrust markets is using the *Brown Shoe* factors, where courts examine "practical indicia [such] as industry or public recognition of the submarket as a separate economic entity, the product's peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialized vendors."[69] These non-exclusive factors are sufficiently supple to reflect economic realities. But courts often employ these factors as a proxy of cross-elasticity of demand, which again can lead to narrowly defined antitrust markets.[70]

Thus, both the SSNIP test and *Brown Shoe* factors typically lead to narrowly defined antitrust markets. Courts, for example, have further delineated the market to "premium" products or services within it. For

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[67] Tevra Brands LLC v. Bayer HealthCare LLC, No. 19-CV-04312-BLF, 2024 WL 1909156, at *5 (N.D. Cal. May 1, 2024) ("an economist proposes a narrow geographic and product market definition and then iteratively expands that definition until a hypothetical monopolist in the proposed market would be able to profitably make [a SSNIP]").

[68] United States v. Interstate Bakeries Corp. & Continental Baking Co., Civil Action No. 95C 4194 (N.D. Ill. 1995).

[69] Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962).

[70] *Epic*, 67 F.4th at 976 (describing an antitrust treatise that these indicia have "evidentiary usefulness" in determining cross-elasticity of demand); NSS Labs, Inc. v. Symantec Corp., No. 18-CV-05711-BLF, 2019 WL 3804679, at *9 (N.D. Cal. Aug. 13, 2019) (citing Newcal Indus., Inc. v. IKON Office Sol., 513 F.3d 1038, 1044 (9th Cir. 2008)).

example, in *United States v. Bertelsmann SE & Co. KGaA*, the relevant antitrust market was "anticipated top-selling books," as opposed to general fiction or non-fiction books.[71] In one supermarket merger, the court found "premium, natural, and organic supermarkets" that "generally target affluent and well educated customers" as the relevant product market.[72] This narrowly defined market included Whole Foods but excluded Kroger's or Safeway.

Although courts typically do not find a single brand to constitute the relevant product market,[73] using either the SSNIP test or *Brown Shoe* factors, courts can find two products to be in different markets, even when the products are functionally fungible.[74] What is key is whether consumers treat them as reasonably interchangeable. As one court noted, "even though the drug Coumadin and its 'chemically identical' generic equivalent, warfarin sodium, perform exactly the same function, economic analysis reveals they are in different product markets."[75] Although fountain pens

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[71] United States v. Bertelsmann SE & Co. KGaA, 646 F. Supp. 3d 1, 28–29 (D.D.C. 2022) (noting how the "government's focus on anticipated top-selling books also is consistent with cases in which courts have recognized the "high end" of other broad markets as distinct submarkets for antitrust purposes"); see also Int'l Boxing Club of N.Y., Inc. v. United States, 358 U.S. 242, 251 (1959) (affirming district court's conclusion "that nonchampionship fights are not 'reasonably interchangeable for the same purpose' as championship contests" and explaining that defining the relevant market "involves distinction in degree as well as distinctions in kind"); O'Bannon v. Nat'l Collegiate Athletic Ass'n, 7 F. Supp. 3d 955, 986–88 (N.D. Cal. 2014) (recognizing relevant submarket of "elite football and basketball recruits"), rev'd in part on other grounds, 802 F.3d 1049 (9th Cir. 2015); United States v. Paramount Pictures, Inc., 334 U.S. 131 (1948) (first-run showings of movies as a relevant product market).

[72] F.T.C. v. Whole Foods Mkt., Inc., 548 F.3d 1028, 1032 (D.C. Cir. 2008).

[73] In re Fresh Del Monte Pineapples Antitrust Litig., No. 04-MD-1628RMBMHD, 2009 WL 3241401, at *11 (S.D.N.Y. Sept. 30, 2009), aff'd sub nom. Am. Banana Co. v. J. Bonafede Co., 407 F. App'x 520 (2d Cir. 2010); Nobel Scientific Indus., Inc. v. Beckman Instruments, Inc., 670 F. Supp. 1313, 1323 (D.Md.1986) ("Many cases have rejected a narrow definition of [a] product market, limited to one commodity."); Domed Stadium Hotel, Inc. v. Holiday Inns, Inc., 732 F.2d 480, 488 (5th Cir.1984) ("absent exceptional market conditions, one brand in a market of competing brands cannot constitute a relevant product market").

[74] Geneva Pharms. Tech. Corp. v. Barr Labs. Inc., 386 F.3d 485, 497 (2nd Cir. 2004).

[75] Universal Surveillance Corp. v. Checkpoint Sys., Inc., No. 5:11-CV-1755, 2015 WL

perform the same function, the United States alleged, and the court found, a separate antitrust market for fountain pens in the $50 to $400 range.[76] At times, agencies and courts can reach different conclusions, such as whether super-premium ice cream constitutes a relevant product market.[77]

Consequently, as this Part shows, the "threshold step" for most antitrust cases is defining the relevant market. This serves several purposes. First the relevant market is where the defendant enjoys market power. This is often inferred by the defendant having a high market share (say over 65%) in that relevant market[78] (which we will see later can be problematic). Second, the relevant market is where the alleged restraint occurs. Third, the relevant market is where the anticompetitive harm manifests itself. Finally, any structural or behavioral remedy will focus on the relevant market. So, the analysis of monopoly power, anticompetitive restraints, harm, and relief are contained in the relevant market, which under the current tools are often narrowly defined. These tools may define markets that reflect the economic realities of some segments of the brick-and-mortar economy, like bread,

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6082122, at *4 (N.D. Ohio Sept. 30, 2015), citing Geneva Pharms. Tech. Corp. v. Barr Labs. Inc., 386 F.3d 485, 497 (2nd Cir. 2004).

[76] United States v. Gillette Co., 828 F. Supp. 78, 81 (D.D.C. 1993).

[77] Thomas J. Horton & Robert H. Lande, *Should the Internet Exempt the Media Sector from the Antitrust Laws?*, 65 FLA. L. REV. 1521, 1558 (2013) (noting divergence between In re Super Premium Ice Cream Distrib. Antitrust Litig., 691 F. Supp. 1262, 1268 (N.D. Cal. 1988) (finding that, despite substantial and material differences in butterfat content, air volume, and the use of natural ingredients, "all grades of ice cream compete with one another for customer preference and for space in the retailers' freezers"), aff'd sub nom. Haagen-Dazs Co. v. Double Rainbow Gourmet Ice Creams, Inc., 895 F.2d 1417 (9th Cir. 1990) and Nestle Holdings, Inc., 136 F.T.C. 791, 794 (2003) (consent order) (noting the FTC complaint defined the relevant market as "the sale of superpremium ice cream products to the retail channel")).

[78] *See, e.g.,* Epic Games, Inc. v. Apple Inc., 559 F. Supp. 3d 898, 1029 (N.D. Cal. 2021), aff'd in part, rev'd in part and remanded, 67 F.4th 946 (9th Cir. 2023) (citing the case law on the threshold market share for finding a prima facie case of monopoly power as "generally no less than 65% market share").

facial tissue,[79] and gypsum board.[80] But as the next Part examines, these tools do not work well for digital ecosystems, where the parties and courts deconstruct the Tech Barons' ecosystems into narrow markets and focus on defendants' market share within these narrow markets.

III. How Antitrust Law Currently Does Not Address Ecosystems

As we saw in Part I, the Tech Barons derive their power from ecosystems, and not any specific product or service. But, as we saw in Part II, for their antitrust claims to proceed, plaintiffs must allege and prove a relevant antitrust market, where cross-elasticity of demand is the touchstone. This Part highlights some of the many problems in applying the current market definition tools to ecosystems. To illustrate how the current tools can yield the wrong result, we'll examine Epic's antitrust lawsuit against Apple.

A. Problems with Applying the SSNIP Test & Brown Shoe *Factors*

The SSNIP test has many problems when applied to digital ecosystems, especially when the product or service is ostensibly free.[81] For our

[79] United States v. Kimberly-Clark Corp. & Scott Paper Co., Civil Action No. 3:95 CV 3055-P (N.D. Tex. 1995) (merger in tissue and baby wipes industry).

[80] United States v. Georgia-Pacific Corp., Civil Action No. 96-164 (D. Del. 1996) (merger in gypsum industry).

[81] Case AT.39740, Google Search (Shopping), 2017 E.C. 1/2003, ¶ 245 http://ec.europa.eu/competition/antitrust/cases/dec_docs/39740/39740_14996_3.pdf ("SSNIP test would not have been appropriate in the present case because Google provides its search services for free to users"). The EU Revised Market Definition Notice stipulates that "[w]hen undertakings compete on parameters other than price, such as quality or the level of innovation, the application of the SSNIP test is difficult, in particular in the context of zero monetary price products and highly innovative industries." The Commission further notes the difficulties

purposes, the SSNIP inquiry when applied to ecosystems yields several results, none of which accurately reflect monopoly power or commercial realities.

The first incongruous result is that ecosystem is the source of the Tech Baron's power, but the ecosystem cannot constitute a relevant market under the SSNIP test since its constituent components are not substitutable with

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associated with gathering reliable empirical information on the amount of losses a hypothetical monopolist would incur when implementing a SSNIP. It subsequently notes that "in most cases the SSNIP test serves only as a conceptual framework for the interpretation of available evidence." (paras 30, 31, Commission Notice on the definition of the relevant market for the purposes of Union competition law, C/2023/6789); see also Michal S. Gal, Daniel L. Rubinfeld, *The Hidden Costs of Free Goods: Implications for Antitrust Enforcement*, 80 ANTITRUST L.J. 521, 549 (2016) (noting that the "SSNIP test generally relates to a single market rather than to a business ecosystem with multiple types of non-competing products" and does not "capture the competitive constraints on the firm offering the free good, which often accrue in a companion market"); John M. Newman, *Antitrust in Zero-Price Markets: Applications*, 94 WASH. U.L. REV. 49, 65 (2016) ("This analytical framework loses its coherence in zero-price markets, where the basic unit of value extracted from customers is not expressed as a price."); Florian Wagner-von Papp, *Should Google's Secret Sauce Be Organic?*, 16 MELB. J. INT'L L. 609, 628–29 (2015) ("The traditional SSNIP test cannot be applied without modifications on the search side of a market in which most or all participants use a two-sided business model where the search user is charged nothing"). An alternative assessment method may rely on the consideration of a small but significant non-transitory decrease in quality ('quality degradation' or 'the SSNDQ test'). While this approach brings about challenges associated with the quantification of quality, it forms relevant evidence in the assessment. The EU Commission considered this approach as part of its market definition in its Android investigation (Case AT.40099 – Google Android, 18 July 2018) On appeal, the European General Court confirmed the relevance of the SSNDQ test:

> *In the case of a product that was very unlikely to lend itself to the classic hypothetical monopolist test aimed at verifying the market's response to a small but significant and non-transitory increase in the price of an asset (Small but Significant and Non-Transitory Increase in Price), the SSNDQ test, which envisages the quality degradation of the product at issue, did constitute relevant evidence for the purpose of defining the relevant market. Competition between undertakings can indeed take place in terms of price, but also in terms of quality and innovation.*

each other. Take Apple's ecosystem as an example. In response to a SSNIP of smart watches, consumers are not likely to switch to laptops. Because there is low cross elasticity of demand between many of the components of Apple's ecosystems, each product and service would fall into separate, narrow markets. As the leading case notes, the "offense of monopoly under § 2 of the Sherman Act has two elements: (1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident."[82] So under this first element, the inquiry would be whether Apple has monopoly power in each of these narrow relevant markets. If not, absent a leveraging or tying claim,[83] any monopolization claim involving that narrow product market would likely be dismissed. Likewise, if the *Brown Shoe* factors are applied in such a way to assess cross-elasticity of consumer demand, courts will not find ecosystems to constitute a relevant market.

One way around this is to allege that an ecosystem is the equivalent of a "cluster" market.[84] After all, the Supreme Court saw "no barrier to combining in a single market a number of different products or services where that combination reflects commercial realities."[85] So, in theory, the

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Para 177, Case T-604/18 Google and Alphabet v Commission, EU:T:2022:541).

[82] United States v. Grinnell Corp., 384 U.S. 563, 570–71 (1966).

[83] For a tying claim under Section 1 of the Sherman Act, the defendant leverages its strength in one market to coerce customers to buy products or services in a second market. In the primary market one does not need monopoly power, but "significant market power—more than the mere ability to raise price only slightly, or only on occasion, or only to a few of a seller's many customers." Chase Mfg., Inc. v. Johns Manville Corp., 84 F.4th 1157, 1179–80 (10th Cir. 2023), quoting Grappone, Inc. v. Subaru of New Eng., 858 F.2d 792, 796 (1st Cir. 1988).

[84] Fed. Trade Comm'n v. Staples, Inc., 190 F. Supp. 3d 100, 117 (D.D.C. 2016); see also
U.S. Department of Justice & Federal Trade Commission, Merger Guidelines, at 46 (December 18, 2023).

[85] United States v. Grinnell Corp., 384 U.S. 563, 572 (1966).

ecosystem can constitute the relevant market when that reflects the economic reality.

But the lower courts again have limited the concept of cluster markets to cross-elasticity of demand, namely whether buyers are shifting from one company's cluster of products and services (e.g., one bank's portfolio of checking, savings and lending services) to a rival's cluster of the same types of products and services.[86] As one court noted, a "cluster market exists only when the 'cluster' is itself an object of consumer demand."[87] So, under the courts' construction, a cluster market may contain products that are *not* substitutable for each other (such as bank customers would not consider a checking account as a substitute for a commercial loan). But customers must expect rivals to offer a similar cluster of products and services and will switch between the competing clusters (such as the services of different retail banks).

Thus, an antitrust plaintiff challenging a Big Tech Baron's ecosystem will run into the same dead-end: Ecosystems are not cluster markets because consumers do not demand the Tech Baron's ecosystem of products and services. Nor can consumers shift from Google's cluster of products and services to Amazon's, Microsoft's, or Meta's, as the clusters themselves are not substitutable for each other.

Indeed, as we saw in Part I, consumers may be harmed by the ecosystem. For example, consumers do not demand that Google provide a cluster of products and services (namely, a search engine, browser, smart phone operating system, navigation map, etc.). Consumers do not

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[86] *See, e.g.,* Emigra Grp., LLC v. Fragomen, Del Rey, Bernsen & Loewy, LLP, 612 F. Supp. 2d 330, 353 (S.D.N.Y. 2009) ("any definition of a cluster market must be responsive to the purpose of the market definition process—identification of an area of competition in which variations in price will affect the demand for alternative products").

[87] Green Country Food Mkt., Inc. v. Bottling Grp., LLC, 371 F.3d 1275, 1284 (10th Cir. 2004).

necessarily demand that Apple also sells smart watches. Rather iPhone users may prefer a Garmin watch over an Apple Watch.[88] Instead of demanding that Apple provide a cluster of products and services, consumers may instead demand interoperability and functionality for their products. Namely, iPhone users who have Garmin watches will want them to work seamlessly together.[89] So, the consumers may want inter-operability, not substitutability. Garmin owners will not want Apple, as the government alleged, to purposefully degrade the functionality of their smart watch to prevent them from responding to text messages on their Garmin watch (just as one could on an Apple Watch); maintaining a reliable connection between their iPhone and Garmin watch, and not otherwise undermine the performance of their Garmin watch.[90]

The net result is that ecosystems cannot be a plausible antitrust market under the current market definition tools because (a) the products and services within the ecosystem are not interchangeable with each other,[91] and (b) the ecosystem itself is not an object of consumer demand.[92]

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[88] Nicole Nguyen, *The Cult of Garmin: Why Athletes Stick With These Smartwatches Over Apple or Samsung: In a category dominated by tech giants, here's how Garmin has held on to its high-spending, sports-focused fan base with models including the $1,000 Epix*, WALL ST. J. (Oct. 30, 2022), https://www.wsj.com/articles/the-cult-of-garmin-why-athletes-stick-with-these-smartwatches-over-apple-or-samsung-11667088984 (noting that as of 2022, Apple Watch accounted for over 36% of wearables sold globally, followed by Samsung with 10% of the market, but that in the premium, over-$500 smart watch category, Garmin remained the leader).

[89] *Id*. (noting that while Garmin's watches work with both iOS and Android platforms, they do not have the same smart functionality as Apple Watches have with Apple products, such as unlocking Macs and auto-pairing with AirPods).

[90] US Apple Compl. ¶ 100.

[91] *See, e.g.*, In re Payment Card Interchange Fee & Merch. Disc. Antitrust Litig., 562 F. Supp. 2d 392, 403 (E.D.N.Y. 2008) (noting that products that cannot be substituted for each other generally should not be lumped together in a relevant market).

[92] Sharif Pharmacy, Inc. v. Prime Therapeutics, LLC, 950 F.3d 911, 918 (7th Cir. 2020).

Because courts will find ecosystem markets implausible, plaintiffs cannot allege them as the source of defendant's market power, even when that reflects the economic reality. Instead, they must allege a narrow antitrust market that is defendable under the current market definition tools. The result, as we'll next see in *Epic*, is a market divorced from economic realities.

B. Epic's Monopolization Case Against Apple

Epic, a multi-billion-dollar video company, refused to pay Google's and Apple's 30 percent in-app tax and wanted the opportunity to start its own app store on both Google Android and Apple phones. But it, like many app developers, could not, even though customers would benefit from the competition. So Epic challenged Apple[93] and Google.[94] Its antitrust case against Apple was a bench trial, while the Google case went before the jury. Different outcomes, as we'll see, which are explainable in part by antitrust's market definition tools.

Epic alleged that that Apple acted unlawfully under the Sherman Act and California law by "restricting app distribution on iOS devices to Apple's App Store, requiring in-app purchases on iOS devices to use Apple's in-app payment processor, and limiting the ability of app developers to communicate the availability of alternative payment options to iOS device users."[95]

Apple acted like a monopoly, as the evidence before the district court made clear. As the Ninth Circuit observed early in its opinion the friction

[93] Epic Games, Inc. v. Apple Inc., 559 F. Supp. 3d 898, 922 (N.D. Cal. 2021), aff'd in part, rev'd in part and remanded, 67 F.4th 946 (9th Cir. 2023).

[94] In re Google Play Store Antitrust Litig., 3:20-cv-05671-JD (N.D. Cal.), https://storage.courtlistener.com/recap/gov.uscourts.cand.364325/gov.uscourts.cand.364325.606.0.pdf

[95] *Epic*, 67 F.4th at 966.

between Apple and app developers was over Apple's control over its controlled ecosystem.[96] Both the district and appellate court referenced Apple's closed ecosystem.[97] Introduced into evidence was internal Apple documents about locking consumers into the Apple ecosystem.[98] But in the bench trial and on appeal, the courts spent most of their energy on the threshold issue of defining the relevant market with the current antitrust tools.[99]

One could blame in part Epic, which alleged two very narrow product markets, namely the "aftermarkets of iOS app distribution and iOS in-app payment solutions."[100] On appeal, Epic argued why it was "entitled, as a factual matter, to a finding in favor of its proposed aftermarkets," which ultimately did not sway the Ninth Circuit.[101] Although the Ninth Circuit found that the district court erred as a matter of law on several antitrust issues, Epic failed to establish—as a factual matter—its proposed market definition.[102]

But as we saw in Part II, the antitrust plaintiff, under the current legal framework, must define a relevant market, and that market must be supported by the current tools that focus on cross-elasticity of demand. If Epic alleged Apple's ecosystem as the relevant market, the complaint would likely have been dismissed.

[96] *Id*. at 967.
[97] *Epic*, 559 F. Supp. 3d at 922.
[98] *Id.* at 956.
[99] *Id.* at 955-91; 1014-1027.
[100] *Epic*, 67 F.4th at 973.
[101] *Id.*, 67 F.4th at 980 (holding that Epic failed to carry its "heavy of burden on appeal of showing that the district court clearly erred in finding that (1) Epic failed to show a lack of general consumer awareness regarding Apple's restrictions on iOS distribution and payment processing, (2) Epic failed to show significant switching costs, and (3) the empirical evidence in the record and the Brown Shoe practical indicia support a market of mobile-game transactions, not Epic's iOS-specific aftermarkets").
[102] *Epic*, 67 F.4th at 973. Epic also failed to prove the existence of any substantially less restrictive alternative means for Apple to accomplish the procompetitive justifications supporting iOS's walled-garden ecosystem.

Ultimately, the district court came up with its own narrow product market, namely digital mobile gaming transactions.[103] The court found that Apple's market share of 52 to 57% in the market that the court itself defined was insufficient for monopoly power.[104] Instead, Apple's market share put it "near the precipice of substantial market power, or monopoly power."[105] As a result, the district court dismissed Epic's monopolization claims.[106]

This outcome suggests the 1956 Supreme Court case, *United States v. E. I. du Pont de Nemours & Co*., where the Court's market definition exercise dictated the outcome.[107] The majority in *du Pont* applied the cross-elasticity test, yet obtained an incorrect result, leading the case be known more for its blunder (namely the *Cellophane Fallacy*) rather than its holding.[108] The case is a testament of how mechanically applying a market definition test can blind the court to the market realities and yield the wrong result. Ironically, the Ninth Circuit in *Epic* both recognized the

[103] *Id*.

[104] *Epic*, 559 F. Supp. 3d at 1030.

[105] *Epic*, 559 F. Supp. 3d at 1032.

[106] The district court also dismissed the monopolization claims on a second ground, namely that Epic Games failed to satisfy the rule of reason analysis under Section 1—"an acknowledged less exacting test as compared to Section 2." *Epic*, 559 F. Supp. 3d at 1044.

[107] 351 U.S. 377 (1956).

[108] *See, e.g.*, Pac. Steel Grp. v. Com. Metals Co., 600 F. Supp. 3d 1056, 1071 (N.D. Cal. 2022) (citing the fallacy and Donald F. Turner, *Antitrust Policy and the Cellophane Case*, 70 HAR. L. REV. 281, 285 (1956); Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 471 (1992) ("The existence of significant substitution in the event of further price increases or even at the current price does not tell us whether the defendant already exercises significant market power.")); Insight Equity v. Transitions Optical, Inc., 252 F. Supp. 3d 382, 390 (D. Del. 2017) (noting how economists "have criticized the Court's analysis for failing to account for the possibility that DuPont had already exercised its monopoly power to charge a supracompetitive price, i.e., a price above the competitive price"); In re Aggrenox Antitrust Litig., 199 F. Supp. 3d 662, 667 (D. Conn. 2016); United States v. Eastman Kodak Co., 63 F.3d 95, 105 (2d Cir. 1995).

cellophane fallacy,[109] and the Supreme Court's instruction that courts "should conduct market-definition inquiries based not on 'formalistic distinctions' but on 'actual market realities.'"[110] Nonetheless, the Ninth Circuit never considered the factors cited by the dissent in *du Pont*, which were more probative of Apple's monopoly power than the market definition tools that it and the lower court employed. Had it done so, there was plenty of evidence of Apple's monopoly power.

In *du Pont*, the key issue was whether over market definition: namely, was the relevant market cellophane (in which case du Pont would be a monopoly) or whether the market included other flexible packaging materials. In upholding flexible packaging materials as the relevant market, the majority relied on cross-elasticity of demand: "If a slight decrease in the price of cellophane causes a considerable number of customers of other flexible wrappings to switch to cellophane, it would be an indication that a high cross-elasticity of demand exists between them -- that the products compete in the same market."[111] The Court's error was that this high cross-elasticity of demand exists when the defendant charges a monopoly price. The monopoly price, by definition, yields the greatest profits. Any SSNIP above the monopoly price will cause the monopolist's profits to drop. Likewise, any price decrease will increase consumer demand.

Although the cellophane fallacy was not at issue in *Epic*, the case is a warning about applying any market definition tool mechanically and disregarding the economic realities.

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[109] 67 F.4th at 975 n. 7 (noting that the court in applying the SSNIP test to a monopoly price runs the risk of a false negative: "over-defining a market and finding no market power where, in fact, it does exist").

[110] 67 F.4th at 978.

[111] 351 U.S. at 400.

In contrast, the dissenting justices in *du Pont* looked at the commercial realities to assess whether du Pont acted like a monopoly. For example, du Pont's "independent pricing policy and the great profits consistently yielded by that policy" left "no room for doubt that it had power to control the price of cellophane."[112] In highly competitive markets, companies are more likely to be price takers, rather than price setters.[113]

Undisputed in the *Epic* case was that "Apple chose the 30% commission without regard to or analysis of the costs to run the App Store."[114] So Apple had a lot of flexibility in choosing its app tax and was not constrained by competition. Moreover, Apple's profit margin, which exceeded 75% for its app store, could suggest significant market power.[115] Indeed, Apple's operating margin was far greater than du Pont's 31% "operative return" (before taxes), which suggested monopoly power.[116]

Moreover, du Pont "recognized that it need not concern itself with competition from other packaging materials."[117] Du Pont's "every action was directed toward maintaining dominance over cellophane."[118] Likewise, in *Epic*, the Ninth Circuit noted that Apple was not deterred by concerns over losing app developers to other platforms. Instead, Apple insisted that developers "distribute their apps to Apple's iOS devices only through Apple's App Store and after Apple has reviewed an app to ensure that it meets certain security, privacy, content, and reliability requirements."[119] Apple also demanded that developers "use Apple's in-app payment

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[112] United States v. E. I. du Pont de Nemours & Co., 351 U.S. 377, 423 (1956).

[113] *Epic*, 67 F.4th at 983 ("a firm with market power is a price-maker, not the price-takers that economic theory expects in a competitive market").

[114] *Epic*, 559 F. Supp. 3d at 947.

[115] *Epic*, 559 F. Supp. 3d at 952.

[116] *du Pont*, 351 U.S. at 420.

[117] *Id.*, 351 U.S. at 418.

[118] *Id.*

[119] *Epic*, 67 F.4th at 967.

processor (IAP) for any purchases that occur within their apps" and pay "a 30% commission on initial app purchases (downloading an app from the App Store) and subsequent in-app purchases (purchasing add-on content within an app)."[120]

In competitive markets, customers can threaten to switch if the seller charges unfair prices. Here, in contrast, "nothing other than legal action seems to motivate Apple to reconsider pricing and reduce rates."[121] As the district court noted, competition did not play a role in how Apple determined the app tax.[122]

In *du Pont*, commercial buyers could not use other products to lower du Pont's price for its cellophane. As the dissent noted, "We cannot believe that buyers, practical businessmen, would have bought cellophane in increasing amounts over a quarter of a century if close substitutes were available at from one-seventh to one-half cellophane's price."[123] Likewise, app developers, including large ones like Epic, could not play off other gaming app platforms or Google's ecosystem for better terms: "To distribute apps to iOS users, a developer must pay a flat $99 fee and execute the Developer Program Licensing Agreement (DPLA). The DPLA is a contract of adhesion; out of the millions of registered iOS developers, only a handful have convinced Apple to modify its terms."[124] So it would make no sense for practical businesses to fork over billions of dollars in commissions to Apple if there were lower priced substitutes.[125]

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[120] *Id.*

[121] *Epic*, 559 F. Supp. 3d at 948.

[122] *Id.*, 559 F. Supp. 3d at 947-948.

[123] *du Pont*, 351 U.S. at 417.

[124] *Epic*, 67 F.4th at 968. As the district court found, Apple's "contractual terms are standardized and nonnegotiable—a contract of adhesion. Only a few developers have succeeded in modifying these terms by threatening to go to other platforms. Specifically, Spotify and Netflix have removed in-app purchasing functionality from iOS apps." *Epic*, 559 F. Supp. 3d at 993.

[125] https://www.cnbc.com/2022/01/10/apple-implies-it-generated-record-revenue-from-app-store-during-2021-.html (estimating that Apple

Finally, Apple's conduct had anticompetitive effects. Apple's ecosystem did not arise organically through superior products and services. Instead, Apple created its "walled-garden ecosystem through both technical and contractual means."[126] As the district court found, "Apple's anti-steering restrictions artificially increase[d] Apple's market power by preventing developers from communicating about lower prices on other platforms."[127]

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grossed between $70 and $85 billion in App Store sales in 2021).

[126] *Epic*, 67 F.4th at 968.

[127] *Epic*, 559 F. Supp. 3d at 898. As the district court found,

> *Because Apple has created an ecosystem with interlocking rules and regulations, it is difficult to evaluate any specific restriction in isolation or in a vacuum. Thus, looking at the combination of the challenged restrictions and Apple's justifications, and lack thereof, the Court finds that common threads run through Apple's practices which unreasonably restrains competition and harm consumers, namely the lack of information and transparency about policies which effect consumers' ability to find cheaper prices, increased customer service, and options regarding their purchases. Apple employs these policies so that it can extract supracompetitive commissions from this highly lucrative gaming industry. While the evidence remains thin as to other developers, the conclusion can likely be extended.*
>
> *More specifically, by employing anti-steering provisions, consumers do not know what developers may be offering on their websites, including lower prices. Apple argues that consumers can provide emails to developers. However, there is no indication that consumers know that the developer does not already have the email or what the benefits are if the email was provided. For instance, Apple does not disclose that it serves as the sole source of communication for topics like refunds and other product-related issues and that direct registration through the web would also mean direct communication. Consumers do not know that if they subscribe to their favorite newspaper on the web, all the proceeds go to the newspaper, rather than the reduced amount by subscribing on the iOS device.*
>
> *While some consumers may want the benefits Apple offers (e.g., one-stop shopping, centralization of and easy access to all purchases, increased security due to centralized billing), Apple actively denies them the choice. These restrictions are also distinctly different from the brick-and-mortar situations. Apple created an innovative platform but it did not disclose its rules to the average consumer. Apple has used this lack of knowledge to exploit its position. Thus, loosening the restrictions will increase competition as it will force Apple to compete on the benefits of its centralized model or it will have to change its monetization model in a*

Apple's actions also stifled innovation. As it came out in trial, Apple was not innovating in its app store: "Apple's slow innovation stems in part from its low investment in the App Store."[128] Indeed, Apple's own former Head of App Review, Philip Shoemaker, described the App Store as "antiquated," with "no radical innovation, only evolution" for the last ten years.[129]

So, while the Ninth Circuit recognized the Cellophane Fallacy, it, like the majority in *du Pont*, downplayed the commercial realities, which pointed to Apple's monopoly power.

Epic's other antitrust claims failed for other reasons (notably its failure to show lesser restrictive alternatives under the third step of the rule of reason). But so much attention at both the district and appellate level was over applying the existing market definition tools, that they missed the Supreme Court's "instruction that courts should conduct market-definition inquiries based not on 'formalistic distinctions' but on 'actual market realities.'"[130] Had they heeded the Court's instruction, both courts would have recognized that Apple possessed monopoly power. That would have led them to inquire where Apple derived that power. The answer was Apple's ecosystem, and not from any narrowly defined product market.

In sum, antitrust's market definition exercise, which yields narrow product markets, did not help the courts in assessing Apple's market power. Instead, the elaborate inquiry that consumed much of the courts' attention was divorced from the economic realities. And the only relief Epic received

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way that is actually tied to the value of its intellectual property.

[128] *Epic*, 559 F. Supp. 3d at 1000.

[129] *Id.*

[130] *Epic*, 67 F.4th at 978 (quoting *Amex*, 138 S. Ct. at 2285 (quoting *Kodak*, 504 U.S. at 466–67)).

was under the California Unfair Competition Law, which does not require market definition as a threshold matter.[131]

In its antitrust case against Google, Epic raised similar allegations of Google monopolizing app distribution and in-app payment processing in Android phones.[132] Ostensibly, the facts were better for Google than Apple, as Android consumers could in theory download third party apps directly on their phones (a process called sideloading, which was impossible for Apple phones).[133]

But in the Google case, the jury was the finder of fact, and that jury took "little more than three hours" to rule in Epic's favor that "Google had maintained a monopoly in the smartphone app store market and engaged in anticompetitive conduct that harmed the videogame maker."[134] Indeed, although Epic's antitrust allegations against Google were similar to its claims against Apple (including the 30% app tax), the jury in Google defined a different relevant market (namely, an "Android app distribution market" and "Android in-app billing services for digital goods and services transactions").[135] Given the swiftness in the jury's verdict, the jury likely focused on the commercial realities of Google's anticompetitive behavior, and did not fixate on whether its markets comported with any SSNIP test.

C. Apple – Take Two.

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[131] *Epic*, 67 F.4th at 1002 (rejecting Apple's argument that the state law requires courts to define a relevant antitrust market).

[132] See Compl. filed in Epic Games v. Google, Case 3:20-cv-05671 (N.D. Cal. filed Aug. 13, 2020) [hereinafter Android Compl.].

[133] See Android Compl. ¶¶ at 62, 94, 98, 101 (alleging how Google made it difficult for consumers to sideload apps).

[134] Nico Grant, *Google Loses Antitrust Court Battle With Makers of Fortnite Video Game*, N.Y. TIMES (Dec. 11, 2023) https://www.nytimes.com/2023/12/11/technology/epic-games-google-antitrust-ruling.html.

[135] https://storage.courtlistener.com/recap/gov.uscourts.cand.364325/gov.uscourts.cand.364325.606.0.pdf

In contrast to Epic's largely unsuccessful antitrust litigation against Apple, the United States and state AGs in their 88-page monopolization complaint against Apple allege a slightly broader antitrust market: performance smartphones and alternatively smartphones generally, sold in the United States.[136] But in reading the complaint, one realizes that Apple's power stems from its growing ecosystem of products and services. While the government alleges that Apple has monopoly power in these markets, the complaint focuses on Apple's dominant ecosystem, which has driven the company's "astronomical valuation."[137]

As expected, Apple has attacked the government's complaint, alleging in significant part, the government's failure to "properly define the relevant market or establish that Apple has monopoly power in it."[138] As Apple argues,

> *the alleged markets are legally disconnected from the challenged conduct. While the complaint seeks to define two hardware markets (smartphones and "performance" smartphones), the alleged anticompetitive conduct purportedly occurred in other markets, such as Apple's policies and practices concerning messaging apps, cloud-streaming apps, digital wallets, and smartwatches. Those products all exist in their own separate markets with their own competitive dynamics, and the Government's failure to define the proper market for those products is fatal.*[139]

The district court, as of mid-2024, has not ruled on Apple's motion to dismiss. But defining these additional markets adds little to the analysis if Apple's monopoly power arises from its control over the Apple ecosystem, rather than from constituent products and services.

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[136] United States v. Apple, Case 2:24-cv-04055, (D.N.J. filed March 21, 2024), https://www.justice.gov/opa/media/1344546/dl?inline

[137] US Apple Compl. at 3.

[138] Apple's Letter, dated May 21, 2024 to Honorable Julien X. Neals, U.S.D.J., filed in United States v. Apple Inc., Case 2:24-cv-04055-JXN-LDW (D. N.J. filed 05/21/24)

[139] US Apple Compl. ¶ 3.

Returning to antitrust's first principles, the analysis must account the economic realities. If there is direct evidence of monopoly power or anticompetitive effects, then it makes little sense to require the government to prove market power circumstantially through evidence of a high market share in an artificially narrow market. As the Court noted, market power is "the power 'to force a purchaser to do something that he would not do in a competitive market.'"[140] So, if the Tech Barons are forcing market participants, like app developers, to do things they wouldn't do in a competitive market (like pay the 30% app tax), then they have significant market power. Nor does it make sense to require the government to use the faulty market definition tools to narrowly define the markets where the anticompetitive effects are occurring.

D. Antitrust Law Does Not Mandate Market Definition

As we saw, courts have made market definition the essential predicate to the entire antitrust case. This is not because the language of the Sherman Act requires it. Indeed, in criminal prosecutions of per se violations of the Sherman Act, where the stakes are often greater, the courts do not define antitrust markets.[141] So, if the law does not mandate market definition, why do the courts?

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[140] Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 464 (1992) (quoting Jefferson Par. Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2, 14 (1984)).

[141] F.T.C. v. Superior Ct. Trial Laws. Ass'n, 493 U.S. 411, 430–31 (1990) (noting how per se rules avoid "the necessity for an incredibly complicated and prolonged economic investigation into the entire history of the industry involved, as well as related industries, in an effort to determine at large whether a particular restraint has been unreasonable" quoting Northern Pacific R. Co. v. United States, 356 U.S. 1, 5 (1958) and that if small parties "were allowed to prove lack of market power, all parties would have that right, thus introducing the enormous complexities of market definition into every price-fixing case," quoting ROBERT BORK, THE ANTITRUST PARADOX 269 (1978)).

The first justification is that "[w]ithout a definition of [the] market there is no way to measure [the defendant's] ability to lessen or destroy competition.'"[142] A second justification is that to undertake the rule of reason analysis, which is now the default antitrust legal standard, the court must first define the relevant market.[143]

Both justifications are mistaken. First, to prove an antitrust violation, like any violation, one can rely on direct or circumstantial evidence. If, as we saw with the *Epic* case, there is direct evidence of either the restraint's anticompetitive effects or defendant's market power, then market definition is less critical. Indeed, courts, in the past, noted that direct evidence of either market power or anticompetitive effects, obviates the need for market definition.[144]

Second, the Sherman Act does not mandate the use of the rule of reason. The Supreme Court created that legal standard, which as the Court acknowledged, has many significant infirmities.[145] But even under this

[142] Ohio v. American Express Co., —— U.S. ——, 138 S. Ct. 2274, 2285, 201 L.Ed.2d 678 (2018).

[143] *Amex*, 138 S. Ct. at 2285 ("courts usually cannot properly apply the rule of reason without an accurate definition of the relevant market").

[144] F.T.C. v. Indiana Fed'n of Dentists, 476 U.S. 447, 460–61 (1986) ("Since the purpose of the inquiries into market definition and market power is to determine whether an arrangement has the potential for genuine adverse effects on competition, "proof of actual detrimental effects, such as a reduction of output," can obviate the need for an inquiry into market power, which is but a 'surrogate for detrimental effects.' 7 P. Areeda, Antitrust Law ¶ 1511, p. 429 (1986). In this case, we conclude that the finding of actual, sustained adverse effects on competition in those areas where IFD dentists predominated, viewed in light of the reality that markets for dental services tend to be relatively localized, is legally sufficient to support a finding that the challenged restraint was unreasonable even in the absence of elaborate market analysis."); see also Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 477 (1992) ("clearly reasonable to infer that Kodak has market power to raise prices and drive out competition in the aftermarkets, since respondents offer direct evidence that Kodak did so").

[145] *See., e.g.*, Kimble v. Marvel Ent., 576 U.S. 446, 459 (2015) ("whatever its merits may be for deciding antitrust claims . . . the "elaborate inquiry" required under that standard "produces notoriously high litigation costs and unpredictable results"); Oneok, Inc. v. Learjet, Inc., 575 U.S. 373, 398 (2015) (Scalia, J. dissenting, with Roberts, C.J. joining) (calling the rule of reason "amorphous"); FTC v. Actavis, Inc, 570 U.S. 136, 173 (2013) (Roberts, C.J., dissenting, with Justices Scalia and

flawed legal standard, plaintiff can satisfy the first step of the rule of reason with direct evidence—namely, "by proving the existence of actual anticompetitive effects, such as reduction of output, increase in price, or deterioration in quality of goods or services."[146]

Third, even if one lacks direct evidence of monopoly power or anticompetitive effects, one need not equate market definition with the narrow-market definition tools employed by the courts. As we saw, market definition must reflect economic realities. The SSNIP test is unhelpful with respect to ecosystems and can lead to the wrong result. If the Tech Baron's power arises from its control over the ecosystem (and not a particular platform, product, or service), and if the Tech Baron leverages this power to quash innovation that disrupts its power or profits, then one can miss a lot of these anticompetitive effects if one focuses only on narrowly defined markets. The government's Apple complaint avoids this mistake, by focusing on Apple's ecosystem, rather than narrowly defined markets. Indeed, notably absent from the complaint is the SSNIP test traditionally used to define narrow markets. But Apple, like other monopolies, will press the district courts that plaintiff must first define and prove a relevant antitrust market using the existing market definition tools.

E. The Enforcement Gap

As a result of the mismatch between the current legal tools and market dynamics, courts will miss the importance of dynamic shift from markets to

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Thomas joining) (calling the standard "unruly" and commenting "[g]ood luck to the district courts that must, when faced with a patent settlement, weigh the 'likely anti-competitive effects, redeeming virtues, market power, and potentially offsetting legal considerations present in the circumstances"').

[146] United States v. Brown Univ. in Providence in State of R.I., 5 F.3d 658, 668–69 (3d Cir. 1993).

ecosystems and market power that can arise from a defendant's control over the ecosystem.

One problem is false negatives: Tech Barons will avoid antitrust liability when their power comes from ecosystems, rather than narrow product markets. Plaintiffs cannot allege ecosystems as the source of the Tech Baron's power. Instead, they must prove that the power comes from a narrowly defined market that is supported by the court's current market definition tools and where defendant enjoys a significant market share (at least over 65%).

A second problem is relief. When it comes to fashioning an antitrust remedy, the Supreme Court said, "caution is key."[147] Even if the plaintiff can prove monopoly power in a narrow market, relief will likely focus on the narrowly defined market, rather than ecosystem overall. Thus, either behavioral or structural relief will likely be inadequate, when it does not address the source of the monopoly's power (the ecosystem), but only the manifestation of that power in a narrow market where the defendant has a very high market share.

A third problem is antitrust's deviation from the rule of law. The Supreme Court often cautions about an antitrust legal standard that would set litigants into a "sea of doubt."[148] That is the case here where the market definition exercise is divorced from economic realities. Indeed, Judge

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[147] Nat'l Collegiate Athletic Ass'n v. Alston, 594 U.S. 69, 106 (2021).

[148] *Id.*, 594 U.S. at 107; Nat'l Soc. of Pro. Engineers v. United States, 435 U.S. 679, 696 (1978); Cline v. Frink Dairy Co., 274 U.S. 445, 462 (1927). The Court is quoting United States v. Addyston Pipe & Steel Co., 85 F. 271, 283–284 (6th Cir. 1898), where Justice Taft said, "It is true that there are some cases in which the courts, mistaking, as we conceive, the proper limits of the relaxation of the rules for determining the unreasonableness of restraints of trade, have set sail on a sea of doubt, and have assumed the power to say, in respect to contracts which have no other purpose and no other consideration on either side than the mutual restraint of the parties, how much restraint of competition is in the public interest, and how much is not."

Thomas in *Epic* recognized this, in dissenting in part with the Ninth Circuit's finding that the district court's market definition errors were harmless. As he noted, "[u]nless the correct relevant market is identified, one cannot properly assess anticompetitive effects, procompetitive justifications, and the satisfaction of procompetitive justifications through less anticompetitive means. The analysis is different; therefore, the errors affected substantial rights and cannot be considered harmless."[149] After all, how can the parties prepare their case, when so much under the current antitrust framework depends on market definition. Nor can the parties prepare their case if the judge can unilaterally define its own market that is divorced from economic realities. It is also difficult to square Epic's antitrust defeat against Apple, with its win against Google.

IV. The Slow Shift to Ecosystem Analysis

As we have seen, attempts in the US to advance ecosystem analysis have been hampered by the shackles of past case law. Despite the principle understanding that the "[c]ourt should be cautious about putting dispositive weight on doctrines from antiquity but of slight relevance,"[150] change has been difficult to implement. Agencies and plaintiffs therefore often opt for narrow market definition which poorly reflects economic reality. Attempts to include ecosystem analysis are unsurprisingly hampered by constant criticism from large corporations that intercept attempts to challenge their power.

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[149] Epic Games, Inc. v. Apple, Inc., 67 F.4th 946, 1005-06 (9th Cir. 2023).

[150] Leegin Creative Leather Prod., Inc. v. PSKS, Inc., 551 U.S. 877, 888 (2007).

This Part focuses on the way in which enforcers and courts in Europe and the US have taken steps to acknowledge ecosystems in their analysis. We start with attempts to integrate ecosystem analysis into market definition and then consider the way ecosystem considerations affect the assessment of power.

A. Market Definition

Being mindful of the limitations of traditional market definition, the European Commission has updated its approach to market definition to include references to ecosystem competition. In its notice on market definition, the Commission extends its traditional analysis of primary and secondary markets to more complex ecosystems. It notes that digital ecosystems "can, in certain circumstances, be thought of as consisting of a primary core product and several secondary (digital) products whose consumption is connected to the core product, for instance, by technological links or interoperability."[151] The Commission acknowledges that "not all (digital) ecosystems fit an after-market or bundle market approach" and indicates that it "takes into account, where relevant, factors such as network effects, switching costs (including factors capable of leading to customer lock-in) and (single- or

[151] Point 104, Commission Notice on the definition of the relevant market for the purposes of Union competition law (C/2023/6789) OJ C/2024/1645, 22.2.2024, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AC_202401645#ntc142-C_202401645EN.000101-E0142

multi-) homing decisions for the purpose of defining the relevant product market(s).”[152]

That approach reflects earlier developments in European case law, where the Commission and EU Courts took ecosystems into account in their market analysis. In its *Google and Alphabet v Commission (Google Android)* judgment,[153] for example, the European General Court evaluated the EU Commission’s decision to fine Google €4.34 billion for illegal restrictions it imposed on Android device manufacturers and mobile network operators to cement the dominant position of Google's search engine.[154] In its judgment, the Court considered the definition of the relevant market in the context of an “ecosystem.” The Court noted the validity of traditional approach to market definition, but emphasized the need in that case to go “beyond mere segmentation into markets” in order better to assess Google’s economic strength.[155] The Court noted that in the digital economy, “traditional parameters such as the price of products or services or the market share of the undertaking concerned may be less important than in traditional markets, compared to other variables such as innovation, access to data, multi-sidedness, user behaviour or network effects.”[156] It then proceeded to state that:

in a digital ‘ecosystem’, which brings together

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[152] *Id*.

[153] Case T-604/18 *Google and Alphabet v Commission*, EU:T:2022:541, 14 September 2022.

[154] CASE AT.40099 *Google Android* (18 July 2018).

[155] Para 114, Case T-604/18 Google and Alphabet v Commission, EU:T:2022:541.

[156] Para 115.

> *several categories of supplier, customer and consumer and causes them to interact within a platform, the products or services which form part of the relevant markets that make up that ecosystem may overlap or be connected to each other on the basis of their horizontal or vertical complementarity. Taken together, the relevant markets may also have a global dimension in the light of the system that brings its components together and of any competitive constraints within that system or from other systems.*[157]

The Court subsequently upheld the Commission's market analysis, as well as its consideration of quality degradation of Android, as part of that analysis.[158]

This broader approach is significant, in particular when endorsed by the European courts, as it opens the door to market analysis which is more in tune with economic reality. Implicit in this trajectory is the acceptance of a more loosely defined boundary in which competition is assessed. Conduct implemented by an ecosystem could subsequently be assessed outside a narrow market definition, in a manner that more credibly reflects reality.[159]

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[157] Para 116.

[158] In para 177 the Court held: "In the case of a product that was very unlikely to lend itself to the classic hypothetical monopolist test aimed at verifying the market's response to a small but significant and non-transitory increase in the price of an asset (Small but Significant and Non-Transitory Increase in Price), the SSNDQ test, which envisages the quality degradation of the product at issue, did constitute relevant evidence for the purpose of defining the relevant market. Competition between undertakings can indeed take place in terms of price, but also in terms of quality and innovation."

[159] Cristina Caffarra, *Furthering Ecosystem Analysis in Antitrust*, PROMARKET (Dec. 14, 2023), https://www.promarket.org/2023/12/14/furthering-ecosystem-analysis-in-antitrust/

In the US, one may identify attempts to similarly align market analysis with economic reality. Nonetheless, the U.S. courts have yet to incorporate ecosystem considerations in their antitrust market analysis. Some private plaintiffs, as in *Epic,* reference the Tech Barons' ecosystems, but then plead narrower product markets, which the courts then find as implausible.[160] No US court, as of mid 2024, accepted ecosystems as a relevant market in which to assess defendant's monopoly power.

B. Market Power and Competitive Effects

Returning to why courts define markets, two important justifications are, first to assess whether the defendant possesses monopoly power and, second to assess the challenged restraints' competitive effects. The analysis of market power and anticompetitive effects may necessitate an assessment at the level of the ecosystem rather than at the level of individual narrowly defined product markets.[161]

[160] *See, e.g.*, Reilly v. Apple Inc., 578 F. Supp. 3d 1098 (2022) (dismissing claims because plaintiff's complaint fails to allege plausible product or geographic markets, which are threshold showings for plaintiff's antitrust claims); Coronavirus Rep. v. Apple Inc., No. 21-CV-05567-EMC, 2021 WL 5936910, at *6-7 (N.D. Cal. Nov. 30, 2021) (same); In re Google Digital Advert. Antitrust Litig., No. 20-CV-03556-BLF, 2021 WL 2021990, at *3 (N.D. Cal. May 13, 2021) (dismissing allegations of Google's online advertising ecosystem, because, inter alia, plaintiffs' "proposed market improperly includes services for both advertisers and publishers"); Bookhouse of Stuyvesant Plaza, Inc. v. Amazon.com, Inc., 985 F. Supp. 2d 612, 621 (S.D.N.Y. 2013) (dismissing claims over Amazon's closed e-book ecosystem because plaintiffs failed to plausibly allege a properly defined market within which defendants have price-setting power).

[161] Paras 39, 40, EU Commission 'The Evolving Concept of Market Power in the Digital Economy – Note by the European Union' OECD, DAF/COMP/WD(2022)30.

In its Google Android decision, the European Commission found that "Android app stores constituted an ecosystem-specific market, rejecting Google's arguments that app stores and mobile operating systems compete together as a system against other 'mobile platforms.'"[162] The Commission noted how the combination of assets within the Google Android ecosystem increases users' switching costs,[163] and creates barrier to entry, as competitors cannot easily replicate the ecosystem.[164]

In its OECD submission on "Market Power in the Digital Economy" the European Commission elaborated on its approach and noted that ecosystems' market power could be manifested throughout the ecosystems, including the ability to prevent or degrade interoperability with third parties' products, to raise barriers to entry, or to leverage market power.[165] Illustrative of this approach is the Commission's Amazon eBook decision, in which the Commission noted the closed ecosystem operated by Amazon which could support customer lock-in.[166]

Beyond conduct cases, ecosystem power has been the subject of appraisal in merger cases where the aggregation of power raised concerns.[167]

[162] *Id*.

[163] Paras 522-532, CASE AT.40099 Google Android, 18/07/2018.

[164] Para 624, CASE AT.40099 Google Android, 18/07/2018.

[165] Para 42, EU Commission 'The Evolving Concept of Market Power in the Digital Economy – Note by the European Union' OECD, DAF/COMP/WD(2022)30.

[166] Para 65, Case AT.40153 – E-book MFNs and related matters, 04/05/2017.

[167] Eliana Garces, Olga Kozlova Guglielmi, & Devin Reilly, *Ecosystem Theories of Harm in Merger Enforcement: Current Direction and Open Questions*, JOURNAL OF EUROPEAN COMPETITION LAW & PRACTICE, 2024, 1–6,

In its prohibition of the *Booking/eTraveli* transaction, the European Commission appraised the proposed acquisition by Booking (an online travel agency ("OTA") mainly active in the provision of hotel accommodation) of a main customer acquisition channel operated by eTraveli (a flight OTA).[168] The Commission was concerned that following the transaction "Booking would leverage its ability to acquire customers in the neighbouring flight OTA market to strengthen its dominant position in the hotel OTA market." It referred to its 2019 report on the digital economy[169] and noted that "in cases where the acquirer operates an ecosystem that benefits from strong positive network effects, which act as a significant barrier to entry, 'the risk to competition resulting from an acquisition is not limited to the foreclosure of rivals' access to inputs, but extends to the strengthening of dominance as it fortifies the dominance of the ecosystem, in part because the new services add value to the consumers for which they are complements and in part because they help retain other users for which they are partial substitutes.'"[170] The Commission opined that the transaction would enable Booking to develop a travel ecosystem while leveraging its brand strength, existing customer inertia and network effects, to strengthen its position on the hotel OTA market, and to attract end

https://doi.org/10.1093/jeclap/lpae024.

[168] Case M.10615 - Booking Holdings / eTraveli Group (25.9.2023).

[169] European Commission, 'Competition Policy for the digital era', Final report, 2019.

[170] *Id*. at ¶¶ 202 & 204.

customers earlier on in their trip planning process.[171]

Likewise, the UK Competition and Markets Authority (CMA) decision in *Microsoft/Activision* notes the strength of Microsoft's gaming ecosystem,[172] and its "potential strengths in cloud gaming arising from its broader multi-product ecosystem," [173] The CMA asserted that Microsoft's "multi-product ecosystem gives it a stronger position in cloud gaming than would be suggested by assessing each of its products and services individually."[174] These assertions served as genal backdrop to a more conventional vertical foreclosure theory. Reportedly, the CMA original approach more heavily relied on ecosystem effects, and raised concerns that the collection of assets held by Microsoft would bestow it with significant first-mover advantage in the nascent market for cloud streaming games. Following significant push back from Microsoft, and to reduce risk of appeal, the CMA reportedly abandoned this line of argument and focused its analysis on input foreclosure.[175]

US antitrust enforcers, like their counterparts in the EU and UK, are developing ecosystems as a source of monopoly

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[171] *Id*. at ¶¶ 740, 741, 905, 909, 919, 926; contrast this with the Commission decision to clear Amazon's acquisition of MGM (which produces and distributes audio-visual content), the Commission considered whether the transaction increased lock-in effects by attracting customers to the Amazon ecosystem. It concluded that MGM's strength and content will unlikely raise barriers to entry. (Paras 310-12, Case M.10349 - AMAZON / MGM, 15/03/2022)

[172] Paras 63-4, CMA Final report - Anticipated acquisition by Microsoft of Activision Blizzard, Inc. (26 April 2023).

[173] *Id*. at ¶ 41.

[174] *Id*. at ¶ 8.198.

[175] Caffarra, *Furthering Ecosystem Analysis*, supra note; Cristina Caffarra, Annabelle Gawer & Michael G. Jacobides, *Mapping Antitrust onto Digital Ecosystems*, CPI ANTITRUST CHRONICLE (April 2024).

power and in the agencies' theories of harm. In 2022, the head of the DOJ Antitrust Division noted how digital ecosystems can confer monopoly power, and how the agencies must examine the monopolies' course of conduct not in narrow markets, but across their entire ecosystems.[176]

In addition to the *Apple* monopolization case, the United States and a bi-partisan coalition of state attorneys general rely on ecosystems as the source of Live Nation's monopoly power. As the government alleges in the 2024 complaint,

> *Live Nation maintains and exercises its power through a coordinated pattern of anticompetitive conduct that serves a variety of ends: expanding its scope and reach into every crevice of an increasingly more complex and interconnected ecosystem, eliminating rivals, continuing to increase barriers to entry, and inhibiting competition on the merits. Each act is exclusionary on its own. But the acts also work together across the ecosystem, enhanced by the flywheel and scale effects, to magnify the anticompetitive force of the scheme.*[177]

The government also alleges how Live Nation's control over its "live entertainment" ecosystem enables it to extract monopoly rents throughout the value chain.[178] The ecosystem's "self-reenforcing flywheel" gives the monopoly "multidimensional power."[179]

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[176] Assistant Attorney General Jonathan Kanter of the Justice Department's Antitrust Division Delivers Keynote at CRA Conference, March 31, 2022, 2022 WL 971165 (D.O.J.).

[177] Compl. at ¶ 68, filed in United States v. Live Nation, 1:24-cv-03973 (S.D.N.Y. filed May 23, 2024).

[178] Live Nation Compl. at ¶¶ 39 & 139.

[179] Live Nation Compl. at ¶ 52.

In addition to the *Apple* and *Live Nation* cases, one can see a recognition of ecosystems in the 2023 Merger Guidelines, issued by the U.S. Department of Justice and the Federal Trade Commission. Although the Guidelines do not specifically mention ecosystems, they set forth analytical frameworks that account for industry-specific market realities, including changes in digital markets. In it, the agencies put forward elements that could serve as a steppingstone to ecosystem analysis and de-emphasis the rigid distinction between horizontal and vertical effects. In their discussion of limited access to products, services, or routes to market (Guideline 5), the agencies note that anticompetitive foreclosure effects do not necessarily involve traditional vertical relationships. Guideline 6 further elaborates on the risks of entrenchment and elaborates on ecosystem competition – where "an incumbent firm that offers a wide array of products and services may be partially constrained by other combinations of products and services from one or more providers, even if the business model of those competing services is different."[180] The agencies note the possible elimination of nascent threat that may "be able to add features or serve additional customer segments, growing into greater overlap of customer segments or features over time, thereby intensifying competition with the dominant firm." They add that "the success and independence of the nascent threat may both provide for a direct threat of competition by the niche or nascent firm and

[180] Merger Guidelines at 20.

may facilitate competition or encourage entry by other, potentially complementary providers that may provide a partial competitive constraint." The agencies further note the risk of entrenchment during technological transitions than may hamper the emergence of more competitive markets. Evidently, the mix of old and new is a characteristic of change, as the US agencies need operate within the existing legal framework that earlier courts constructed for the brick-and-mortar economy, while trying to update the analysis to reflect the new market realities of the digital economy.

Overall, when it comes to ecosystem analysis, Europe is further along in recognizing how analyzing ecosystems can inform the assessment of monopoly power and theories of anticompetitive harm. Key in the development in Europe, is the acknowledgment by the Court that the boundary of competition is not necessarily dictated through narrow market definition. In this respect, US courts lag in limiting their assessment of market power and anticompetitive effects to a market definition exercise, which is foreign to how businesses see the markets and economics outside of antitrust.

V. THE RISK OF THE NUMERATOR BIAS

There is little doubt as to the need to accelerate the development of better analytical frameworks that can assess ecosystems' monopoly power and their effects on competition. As competition agencies and courts move slowly in that direction and remedy the current under enforcement in that

area, another risk emerges, which could stem from the oversimplification of the ecosystem analysis.

Here courts can fall to the numerator bias. Basically, they focus on one headline issue (i.e., whether defendant is an ecosystem), without assessing the qualifying factors (the denominator). That risk is of particular significance when considering the outsized role of private litigation in the US. Once ecosystem analysis becomes more prevalent, the numerator bias may result in oversimplification and onerous finding of monopoly power.

Let us first elaborate on the nature of this bias to which many of us fall prey. One example is personal investing, when we focus primarily on the numerator, namely the investment's expected return, without fully appreciating other factors such as the risk of the investment (the denominator).[181] Some areas of law, like evidence, seek to mitigate the numerator bias by excluding otherwise relevant evidence.[182]

[181] VICTOR HAGHANI & JAMES WHITE, THE MISSING BILLIONAIRES 36-39 (2023) (discussing that despite the usefulness of the Merton share in investment decisions, the authors found few investment bankers and business school students knew of it). Robert Merton's formula $\kappa = \frac{\mu}{\gamma \sigma^2}$ calculates the optimal amount to bet or invest, which is calculated by dividing the numerator (the investment's expected return) by γ (one's personal degree of risk-aversion) and the square of σ (the investment's standard of deviation). *Id*. at 36.

[182] James S. Liebman et. al., *The Evidence of Things Not Seen : Non-Matches As Evidence of Innocence*, 98 IOWA L. REV. 577, 639–40 (2013) (discussing Federal Rules of Evidence 404 through 411 which seek "to neutralize jurors' tendency to jump to the conclusion that someone who did something bad in the past is likely to offend again or that people who act guilty are guilty, without considering innocent explanations for the behavior. Rephrased in Bayesian terms, the law fears that jurors will treat the evidence as a confession of guilt and (via the representativeness, simulation, and other biases) erroneously jump to a conclusion based on the high numerator probability without considering a non-inconsequential denominator probability. The law consequently excludes the evidence to be sure that jurors do not treat it as unique to guilty people (i.e., as having a high numerator value and a denominator worth no attention). Because blameworthy people so often take remedial measures, cover their tracks, run away, or stay silent in the face of accusations, the law expects jurors to assume that anyone who has done one of these things is guilty and ignore the fact that innocent people often do them too. Careful people, that is, may quickly repair unanticipated hazards, and innocent people may worry that polygraphs will mistake nervousness for guilt, but the law expects the high numerator value to keep

Our focus will be antitrust, and particularly the issue of assessing market power. As this Part explores, the antitrust litigants and the court have fallen for the numerator bias before, such as when the fixate on the numerator – such as the size of the defendant (or transaction) or the defendant's market share – without considering qualifying factors (which are the denominator). Indeed, we saw this with the district court in *Epic*, which fixated on Apple's market share in the court's self-constructed market, without considering other factors. To put it bluntly, as economists have long recognized, market share is overhyped: a firm with a 45% share can have more power than one with a 70% share. Nonetheless, the courts fixate on the numerator (whether the market share is at least 65%) without considering other important factors (which we'll call the denominator), such as for monopsonies (1) an upward sloping or somewhat inelastic supply curve in the input market; and (2) an inability or unwillingness for new purchasers to enter the market or current purchasers to expand the amount of their purchases in the market. This bias can lead to some false positives (when the defendant lacks monopoly power despite the high market share) and false negatives (when the courts dismiss monopolization cases where the defendant's share falls below 65%).

In the context of ecosystems, we note how the numerator bias could result in simple attribution of monopoly power to ecosystems and to false positives. As Part I addresses, ecosystems can vary and not all of them convey monopoly power. Accordingly, just because a defendant controls an ecosystem it is not presumptively a monopoly, and courts should mitigate this bias by assessing several other factors besides the numerator.

A. Past Examples of Numerator Bias

jurors from considering these possibilities.").

In assessing whether defendant possessed significant market power, some courts and plaintiffs originally considered the defendant's size and amount of purchases. At its most basic level, the numerator bias is to focus on the bigness of the defendant, without looking at how big the defendant is relative to others.

A good example is the 1961 *Tampa Electric* case where the district and appellate courts considered the amount of coal purchased by defendant, without considering the denominator (amount of coal purchased by other utilities) and the amount of coal sold by the coal company without considering the denominator (amount of coal sold by other coal mines).[183]

Tampa Electric was a public utility that produced and sold electricity in the Tampa Bay area. By 1954, Tampa Electric, like other Florida utilities, used oil to generate electricity. Tampa Electric sought to expand and use coal for two of its six new electricity generating units. Tampa Electric contracted with Nashville Coal to supply Tampa Electric's total requirements of coal with not less than 225,000 tons of coal per unit/per year for 20 years. Moreover, if Tampa Electric expanded, Nashville Coal would supply it with coal. The contract had set a minimum price of $6.40 per ton, subject to an escalation clause. Tampa Electric thereafter expended some $3 million extra to construct its coal-burning units (than it would if it built oil-burning units). Nashville Coal told Tampa Electric that their contract was void, as it violated § 3 of Clayton Act. Tampa Electric had to buy coal on the open market at $8.80 ton. One can surmise that Nashville Coal was motivated – not by antitrust concerns but economics: it wanted out of the contract where it sold coal at $6.40 /ton when the market price had increased to $8.80 /ton. The Florida utility sought a declaratory judgment that its requirements contract with the coal company was valid

[183] Tampa Elec. Co. v. Nashville Coal Co., 365 U.S. 320 (1961).

and for enforcement according to its terms. The District Court for the Middle District of Tennessee and the Sixth Circuit both ruled for the coal company, holding that the exclusivity agreement violated § 3 of Clayton Act.

The lower courts focused on two headline numbers: namely the length of the contract (twenty years) and the large amount of coal covered by the contract. But the lower courts did not consider the denominator, namely the total amount of coal consumed in the southeast. When placed in this context, the exclusivity contract did not foreclose competition. Besides Nashville Coal, as least 699 competitors sold over 290 million tons of coal on the open market in 1954, of which over 78 million tons were sold to electric utilities. Coal consumption in Florida and Georgia was increasing. And the amount of coal that the Tampa Electric-Nashville Coal contract foreclosed was less than 1%. Given the insignificant percentage of the market foreclosed, the contract's 20-year duration was not a concern.

A second example of the numerator bias is where the courts focus primarily on defendant's market share in a narrowly defined market. The district court noted in *Epic* how the case law imposes a threshold market share for finding a prima facie case of monopoly power.[184] Generally the defendant's market share has to be at least 65% market share.[185] Some courts even demand a market share of 70% or higher for monopoly power.[186] And a market share below 50 percent is "presumptively

[184] *Epic*, 559 F. Supp. 3d at 1029.

[185] *Id*.

[186] *Id*. citing Kolon Indus. Inc. v. E.I. DuPont de Nemours & Co., 748 F.3d 160, 174 (4th Cir. 2014) ("Although there is no fixed percentage market share that conclusively resolves whether monopoly power exists, the Supreme Court has never found a party with less than 75% market share to have monopoly power. And we have observed that when monopolization has been found the defendant controlled seventy to one hundred percent of the relevant market." (citations omitted)); Syufy Enters. v. Am. Multicinema, Inc., 793 F.2d 990, 995 (9th Cir. 1986) ("[A]s far as we know, neither the Supreme Court nor any other court has ever

insufficient to establish" the requisite level of market power under a Section 2 claim.[187] But other courts rejected these market share cut-offs.[188]

One reason is that market share by itself can be misleading. First, the market may be defined too narrowly, thus inflating defendant's share and power, or too broadly, thus understating defendant's share and market power. Second, even if the market is properly defined, a high market share may overstate defendant's market power, and a low share may understate defendant's market power. So, in assessing the significance of a high market share (which we'll call the numerator), agencies and courts must consider other factors such as entry barriers, contestability of the market, and changing market dynamics. Rather than rely on market share thresholds alone to find monopoly and monopsony power, courts should consider additional interrelated factors, such as, for monopsony power: (1) "an upward sloping or somewhat inelastic supply curve in the input market;" and (2) "an inability or unwillingness for new purchasers to enter the market or current purchasers to expand the amount of

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decided whether a market share as low as 60-69% is sufficient, standing alone, to sustain such a finding.").

[187] *Epic*, 559 F. Supp. 3d at 1029, quoting Rebel Oil Co., Inc. v. Atl. Richfield Co., 51 F.3d 1421, 1438 (9th Cir. 1995).

[188] US Airways, Inc. v. Sabre Holdings Corp., No. 11 CIV. 2725 (LGS), 2022 WL 874945, at *9 (S.D.N.Y. Mar. 24, 2022) (finding that a share of forty-nine and fifty-two percent of the market "is enough to support a finding of monopoly power when combined with other evidence") (citing Broadway Delivery Corp. v. United Parcel Serv. of Am., Inc., 651 F.2d 122, 129 (2d Cir. 1981) ("Sometimes, but not inevitably, it will be useful to suggest that a market share below 50% is rarely evidence of monopoly power, a share between 50% and 70% can occasionally show monopoly power, and a share above 70% is usually strong evidence of monopoly power."); Hayden Publ'g Co., Inc. v. Cox Broad. Corp., 730 F.2d 64, 69 n.7 (2d Cir. 1984) ("[A] party may have monopoly power in a particular market, even though its market share is less than 50%."); Sitts v. Dairy Farmers of Am., Inc., 417 F. Supp. 3d 433, 477 (D. Vt. 2019) ("[M]arket share in the range of 50% is evidence of monopsony power....").

their purchases in the market."[189]

Let us elaborate more, using an example on buyer power. In explaining why reliance on market share alone can be misleading,[190] Professors Blair and Harrison apply the following formula to measure the degree of buyer power (i.e., the percentage deviation from the competitive result):

$$\frac{s}{\varepsilon+\eta(1-s)}$$

where s is the buyer's market share, η is the elasticity of demand of the fringe buyers, and ε is the overall elasticity of supply.[191] From this formula, one can see that market share is only the numerator, and to assess monopsony power one needs to consider several interrelated factors that determine buyer power. Indeed, in defining the relevant monopsony product and geographic markets, one should account both η and ε.[192]

In assessing whether the defendant possesses monopsony power, the competition authority and court should consider first its market share, s, namely the

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[189] ROGER D. BLAIR & JEFFREY L. HARRISON, MONOPSONY IN LAW AND ECONOMICS 60 (2010).

[190] BLAIR & HARRISON, *supra* note, at 60; Aravind R. Ganesh, *The Right to Food and Buyer Power*, 11 GERMAN L.J. 1190, 1223 (2010); *see also* Cory S. Capps, *Buyer Power in Health Plan Mergers*, 6 J. COMPETITION L. & ECON. 375, 380, 383 (2009) (discussing how assessing buyer power in health insurance cases based on shares of patients may understate the risk of harm, given the difference in reimbursement levels from commercially insured patients and Medicare and Medicaid patients).

[191] BLAIR & HARRISON, *supra* note, at 58.

[192] Federal Trade Comm'n & U.S. Dep't of Justice, Improving Health Care: A Dose of Competition 15 (July 2004), 2004 WL 1685795 (F.T.C.), at 122 ("whether the buyers of the input in the putative market successfully would be able to lower the price they pay for the input or whether, instead, the sellers have sufficient realistic alternatives to allow them to circumvent the price decrease").

percentage share in either dollars or units of defendant's purchases of that input.

Next is the elasticity of fringe demand, η, which is the capacity of alternative buyers to purchase the goods or services "without undue delay, risk, or cost."[193] The greater the widget sellers' difficulty in turning to other buyers to purchase their widgets, the greater the defendant's buyer power.[194] One factor is entry barriers. If the defendant attempts to exercise monopsony power by offering too low a price, would other buyers likely enter the market to timely defeat the exercise of monopsony power?

Third is the elasticity of supply, ε, namely the sellers' ability and incentive to switch to providing other goods or services. Buyer power depends in part on the captivity of the sellers in producing and selling that product.[195] An apple orchard owner, facing a powerful buyer, may have fewer options than a carrot farmer, who may more readily switch to another crop (such as beets or turnips) the following year. Another factor is whether the seller "invested in dedicated

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[193] BLAIR & HARRISON, *supra* note, at 58-59; see also Peter C. Carstensen, *Buyer Power, Competition Policy, and Antitrust: The Competitive Effects of Discrimination Among Suppliers*, 53 ANTITRUST BULL. 271, 278 (2008).

[194] If "the equation for measuring market power in monopsony is a mirror image of the relationships that create market power in a seller[]," then a "greater availability of substitute buyers indicates a smaller quantum of market power on the part of the buyers in question." Todd v. Exxon Corp., 275 F.3d 191, 202 (2d Cir. 2001) (Sotomayor, J.) (citation and internal quotation marks omitted); Sprint Nextel Corp. v. AT&T Inc., CIV.A. 11-1600 ESH, 2011 WL 5188081 (D.D.C. Nov. 2, 2011).

[195] 2023 Merger Guidelines, *supra* note, at 27 (noting how "labor markets often exhibit high switching costs and search frictions due to the process of finding, applying, interviewing for, and acclimating to a new job").

facilities to serve the existing downstream buyer(s), such as rail infrastructure," which reduces the seller's ability to switch to other buyers.[196]

To illustrate, suppose two firms in two different industries: Firm A has a 65 percent market share; Firm B has a 45 percent market share. If η and ε are the same in both industries, then we can conclude that Firm A enjoys more buyer power in its industry than Firm B in its industry. But if we change the values of η and ε, then Firm B, despite its lower market share, can enjoy greater buyer power.

Suppose in Firm A's industry,

- $\eta=2$, in that the elasticity of demand of the fringe buyers is greater as they are willing to buy more of the sellers' products should Firm A lower its purchase price, and

- $\varepsilon=2$, in that sellers, if Firm A lower its price, can more readily switch from producing widgets to other things.

Firm B, despite its lower market share, now enjoys greater buyer power than Firm A if the elasticity of demand of the fringe buyers and the elasticity of supply are lower (e.g., both η and ε equal 1).

So, although this issue has come up less frequently, the numerator bias can lead to false negatives. Courts dismiss monopolization cases when the

[196] Oxera, *Buyer Power in a Regulatory Context: Myth or Reality?,* OXERAAGENDA 2 (Nov. 2012); *see also* Adams v. Pilgrim's Pride Corp., 2:09-CV-397, 2011 WL 5330301 (E.D. Tex. Sept. 30, 2011) (noting that a "chicken grower without a buyer for its services is more economically vulnerable than an employee of an integrator. The independent grower, unlike an employee who works for a poultry complex, has incurred the expense of constructing or purchasing physical facilities beneficial to only the integrator in exchange for compensation for grower services.").

defendant's market share is too low. But a low market share may understate defendant's market power. Thus, rather than focusing on defendant's market share (which we'll again call the numerator), agencies and courts should also consider other factors, including η and ε (the denominator). As Professor Dan Crane aptly noted, "Determining market power through randomly established market-share cutoffs was already arbitrary in the industrial age, but it is entirely ill fitting as to the digital age."[197]

B. The Numerator Bias for Ecosystems

Courts recognize that they must "hew to the fundamental antitrust principle that courts must consider the commercial realities of the industry involved when defining the relevant market."[198] Courts will be hard pressed on justifying the current market definition tools' application to ecosystems when the result does not reflect the economic reality. Thus, faced with evidence of monopoly power, they cannot retreat to SSNIP tests. As one court candidly observed, "the law and economics of market power is a confusing mess."[199] So some courts recognize that ecosystems can convey monopoly power, without elaborate market definition and market share calculations. Antitrust plaintiffs will have the incentive to call any interlocking platform an ecosystem. Once labelled an ecosystem,

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[197] Daniel A. Crane, *Tying Law for the Digital Age*, 99 NOTRE DAME L. REV. 821, 864 (2024).

[198] Fed. Trade Comm'n v. Hackensack Meridian Health, Inc., 30 F.4th 160, 169 (3d Cir. 2022).

[199] In re Loestrin 24 Fe Antitrust Litig., 433 F. Supp. 3d 274, 299–300 (D.R.I. 2019), quoting Louis Kaplow, *Why (Ever) Define Markets?*, 124 HARV. L. REV. 437, 440 (2010) ("Defects [of the market definition/market share paradigm] have been identified by courts, enforcement agencies, and both legal and economic commentators. No one believes that the market definition process is flawless or that market power inferences drawn from market shares are uniformly reliable, or even nearly so.").

defendant's antitrust risks increase, even if they lack monopoly power. As the ecosystem designation becomes central, it can play an outsized role (just as market definition does currently) on the antitrust outcome. The risk is that the courts focus on the numerator, which is the ecosystem itself. For example, suppose tech firm ABC controls many interlocking platforms, products, and services. Internally, company executives refer to the company controlling an ecosystem. And suppose the ecosystem records billions of dollars annually in revenues. How does the agency and court put these headline numbers in context to avoid the numerator fallacy?

The courts' specific approach to avoid the numerator bias in assessing market power will not work with ecosystems. In contrast to the *Tampa Electric* case, one cannot put an ecosystem's revenues in context with other ecosystems' revenues, as this does not illuminate whether the ecosystem has monopoly power. For example, referencing Apple's revenues against the other Tech Barons' revenues does not reveal whether Apple derives monopoly power from its ecosystem. It only tells us that Apple makes more or less money than other ecosystems.

Nor can one look at entry barriers and contestability for narrow markets to assess the durability of the ecosystem's power. For example, each Tech Baron has had its graveyard of product failures (just consider https://killedbygoogle.com). Some of the Tech Baron's market segments are more contestable than other segments, and the Barons may face more competition in other countries for some of their products and services. So, one cannot inductively conclude that because parts of the ecosystem are contestable, the ecosystem itself is contestable.

Consequently, to address the numerator bias when assessing the ecosystem's power, one must consider other factors.

First is direct evidence of monopoly power and anticompetitive effects.

Returning to the *Epic* case, when Apple coerces others to do things it could not do in a competitive market, then it possesses a lot of market power. Rather than try to source that market power to a narrow product market, the court should inquire whether it arises from the defendant's power and control over the ecosystem itself.

Absent such direct evidence of monopoly power and anticompetitive effects, the agencies and courts should examine (1) indicia of defendant's power over the ecosystem, and (2) how this control provides defendant with monopoly power. Some of the practical indicia include:

- the openness of the ecosystem generally;
- the ecosystem's value chain and the percentage/amount of that value chain that goes to the defendant;
- defendant's control in defining, enforcing and arbitrating the ecosystem's rules;
- defendant's control over data, including personal data, circulated within the ecosystem;
- defendant's control over interoperability and functionality within the ecosystem; and
- defendant's control over who is admitted to or excluded from the ecosystem.

In addition, the agency and court must consider the disruption of the ecosystem itself, whether (a) *internally*, by other firms' ability and incentive to displace defendant's control over the ecosystem, and (b) *externally*, by dynamic disruption that displaces the current ecosystem with a new value chain.

CONCLUSION

Despite the increased political partisanship, antitrust in the United

States has witnessed over the past five years a bi-partisan resurgence. But the federal and state antitrust agencies are hampered by the US courts, who are mired in market definition exercises. When it comes to ecosystems, the courts current face two opposing risks:

Failure to update their analysis for ecosystems, or being too slow to implement it, will result in under-enforcement. As many competition officials have candidly admitted to us, their agencies missed or underappreciated the digital market dynamics that lead to "a winner-take-most-or-all" that have led to the present Big Tech Barons. As the experience with the Big Tech Barons reflects, antitrust enforcement, if too little (e.g., primarily monetary fines) or too late (cases that take years to develop and litigate), will not restore competition and innovation levels. There is little doubt as to the need to integrate ecosystem analysis into modern antitrust enforcement.

On the other hand, *failure to identify limiting principles to ecosystem analysis may lead to numerator bias and possible over-enforcement.* If courts simply accept ecosystems as a source of monopoly power, there is the risk that this simplified view could encourage frivolous private enforcement.

Under both situations, consumers and those that compete within those ecosystems lose out. Thus, judges must reorient their analysis to market realities: if an ecosystem acts like a monopoly, then it likely is a monopoly. But if the ecosystem does not act like a monopoly, it may or may not be one. So, the court must dig further and assess several additional factors, while leaving the SSNIP test behind for toilet paper and other brick-and-mortar products.