

FRAGILE GIANTS: REASSESSING MARKET POWER IN PLATFORM ECOSYSTEMS



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THE IMPACT OF ECONOMIC ANALYSIS ON MARKET DEFINITION IN THE CONTEXT OF DIGITAL PLATFORMS

By Nestor Duch-Brown & Wouter Vergote



PLATFORM MARKET DEFINITION IN EU ANTITRUST LAW: THE CASE OF *ANDROID*

By Liliane Giardino-Karlinger & Rossitza Kotzeva



HOW TO APPROACH THE CALCULATION OF OVERCHARGE BY MULTISIDED PLATFORMS

By Rosa M. Abrantes-Metz & Albert D. Metz



COMPARE THE MARKETS: TWO-SIDED MARKET DEFINITION IN THE *COMPARETHEMARKET* CASE

By Andreea Antuca, Gunnar Niels & Helen Ralston-Smith



MARKET DEFINITION AND THREE 19A DESIGNATIONS UNDER GERMAN ANTITRUST LAW: ALPHABET, META, AND AMAZON

By Jens-Uwe Franck & Martin Peitz



A DEFINITION OF PLATFORMS WITH MEANINGFUL POLICY IMPLICATIONS

By Jørgen Veisdal



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It is widely assumed that platform technology markets are inherently prone to monopoly outcomes in which a single firm or a handful of firms enjoy market power due to network effects and switching costs. This assumption supports dramatic changes, both proposed and enacted, to the application of competition and antitrust law in platform markets. Remarkably, this assumption rests on weak empirical support. The history of technology markets shows that incumbent platforms have been repeatedly challenged successfully by innovative entrants. Consistent with this pattern, a close examination of the cloud computing market finds little evidence to support assertions of platform entrenchment or user lock-in that would justify intervention by competition regulators.

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It has become conventional wisdom that incumbent platforms enjoy market power as a result of a combination of network effects and switching costs that lock in users and lock out competitors. This assumption has driven far-reaching changes in competition law and policy in the European Union, the People’s Republic of China, and other significant jurisdictions. In the United States, this assumption underlies urgent calls by legislators, regulators, and some commentators for “reforms” that would shift U.S. antitrust law from a regime based primarily on the balancing analysis embodied in the rule of reason to a regime based substantially on rules of quasi-per se illegality concerning a wide array of business practices engaged in by market platforms. Some commentators, legislators, and regulators (including the current Chair of the Federal Trade Commission)² even analogize incumbent platforms to natural monopolies, which would suggest that these entities should be removed from the free play of competitive forces and placed inside a regulatory framework of continuous supervision.

Given the significant departure that these reforms, both enacted and proposed, represent relative to the surgical balancing-type analysis that has principally characterized antitrust enforcement in both the U.S. and Europe, it would be expected that the underlying market power assumption would rest on persuasive empirical grounds. In this contribution, I provide evidence strongly suggesting that is not the case.

Historical evidence on the rise and fall of incumbents in platform markets, and close examination of a platform market that stands at the heart of the digital economy, cloud-computing services, suggest that leading platforms often, if not typically, face substantial discipline from actual or potential competitors. Platform markets do tend to converge on a small number of providers—a good thing since scale is necessary to generate the cost-efficiencies that arise from technologies that efficiently intermediate between complementary user groups. However, over a reasonable period of time, even established platforms with large market shares have been repeatedly and successfully challenged by firms that offer lower-cost, higher-quality, or more innovative products. Given these tendencies over a broad range of markets and periods, it appears that the widely supported shift in competition law and policy may often rest on a theoretical construct, rather than empirical reality.

I. UNCONVENTIONAL LESSONS FROM PLATFORM HISTORY

Popular commentary, policy discussions, and scholarly analysis currently exhibit an inordinate focus on the purportedly unique competitive risks posed by incumbent platforms, also known as “Big Tech.” Yet platform markets — defined broadly as markets in which a provider plays an intermediation function with respect to two or more complementary user populations — are nothing new. We can therefore use history to gain insight into the typical longevity of leading platforms. That exercise identifies multiple cases in which seemingly unbeatable incumbents were rapidly and unexpectedly toppled by a more innovative competitor. For example:

- eBay pioneered online shopping in the late 1990s using an auction model, but was overcome in the late 2000s by Amazon, which used an integrated distribution model.
- AOL dominated internet dial-up access service in the late 1990s (and, at its peak, acquired Time Warner for \$165 billion in 2000), but failed to adapt to the shift to broadband internet access starting in the early 2000s.
- PalmPilot pioneered handheld communications in the late 1990s, but was overtaken in the early 2000s by cellphone technology commercialized by firms such as Nokia and Blackberry.
- Nokia and Blackberry dominated the worldwide cellphone market in the early to mid-2000s but were eclipsed by Apple once it introduced the iPhone in 2007.

Contrary to the narrative of perpetually entrenched monopolies that drives the current regulatory consensus, technology history presents an iterated sequence of repeated and successful challenges to market leaders by innovative entrants. (The exception that proves the rule is AT&T, which was sheltered for decades by a statutory monopoly.) Repeatedly, seemingly indomitable firms with large market shares, apparently unbeatable technology, and abundant capital and technical expertise, were unable to fend off competitive threats posed by a firm with a superior product or service, especially a product or service that rendered the incumbent’s product obsolete. Entrepreneurial innovation, rather than regulatory intervention, has consistently disrupted concentrated markets.

To appreciate in more detail the surprising fragility of incumbent platforms, it is helpful to review the evolution of the social networking market. In the mid-2000s, some commentators characterized the market pioneer, MySpace, as an entrenched “natural monopoly.” Apparently sharing a similar view, News Corporation purchased the platform for \$580 million in 2005. Both commentators and Rupert Murdoch were soon

² Lina M. Khan, *The End of Antitrust History Revisited*, 133 HARV. L. REV. 1655, 1664 (2020) (stating that technology platforms “seem to exhibit natural monopoly features”).

proved wrong. By 2008, MySpace had been overtaken by Facebook, which rapidly secured market leadership, and News Corporation sold MySpace for \$35 million in 2011. In turn, Facebook is today widely characterized by regulators, commentators, and some scholars as a clear case of a monopoly—including in two pending lawsuits by the Federal Trade Commission—yet escalating user migration to a new challenger, TikTok, says otherwise. A decline of over two-thirds in the market value of Meta Platforms, Facebook’s parent, in the 12-month period preceding December 27, 2022 is hard to reconcile with an allegedly secure monopoly that warrants antitrust intervention.

II. REVISITING THE PLATFORM MONOPOLY THESIS

For any rigorous practitioner of antitrust analysis, this apparent discrepancy between fact and theory necessitates revisiting whether conventional wisdom has been overly confident in its attribution of market power to incumbents in platform markets. In particular, it is important to clarify, and assess the strength of, the underlying assumptions that support the view that platform markets are inherently prone to converge on monopoly outcomes. These assumptions ultimately drive the view that regulators should act preemptively to protect competitive conditions rather than waiting for the market to inevitably fail.

There are several critical assumptions behind the currently prevailing regulatory paradigm. Only one of these assumptions is likely to be consistently satisfied in real-world platform environments.

A. Network Effects

First, it must be the case that the relevant market exhibits network effects—either directly among members of the same user population (for example, cellphone users) or indirectly through the interaction of complementary user populations mediated by the platform (for example, smartphone users and developers). This is generally the case in platform markets and explains why these markets tend to evolve toward a state of affairs in which most users use only a handful of leading platforms and, as a result, enjoy great efficiencies compared to unmediated transactions. Yet this fact by itself does not necessarily show that prevailing platforms are immune from competitive challenges.

B. Switching Costs

Second, it must be the case that platform users bear high switching costs (or relatedly, cannot easily use multiple platforms concurrently). This assumption is often not satisfied. For example, while it is difficult for existing users of MS Word to switch to Google Docs, it is not difficult at all for new users. It appears that younger users prefer not only Google Docs but often Google’s G office productivity suite over MS Office, which has been losing significant market share. Similarly, users in the food-delivery service market commonly use more than one of the leading providers (DoorDash, Grubhub, and Uber Eats), while vendors similarly often use all leading platforms concurrently. In markets where users can easily switch to competing providers, or can use multiple providers concurrently, even substantial market shares are unlikely to translate into market power for the simple reason that users can “vote with their feet” (or clicks).

C. Homogenous Goods

Third, it must be the case that the relevant market is characterized by a homogenous (or more precisely, inherently homogenous) good or service. When this assumption is not satisfied, potential challengers can divert users from the incumbent platform by developing differentiated services that appeal to a significant subset of the user population. Again, examples are easy to find. In the general search market, Google dominates; however, other services lead in more specialized search markets — Zillow and Redfin in residential real estate, Expedia and Booking in travel, Yahoo! and Bloomberg in finance, and Amazon and Walmart (and now Pinduoduo’s Temu shopping platform³) in general online shopping. Moreover, boundaries between platform market segments are often fluid. While DoorDash, Grubhub, and Uber Eats lead in food-delivery services, other firms are prominent in closely adjacent service markets, such as direct restaurant-to-consumer delivery (Domino’s) or instant-delivery services (Instacart, Gopuff). If boundaries between market segments are permeable, then even an apparently dominant firm in a “core” platform market may anticipate competition from providers in adjacent markets, who can divert users away from the core market. Suggesting awareness of this threat, Google has invested substantial resources to enter adjacent shopping and travel search verticals (Google Shopping, Google Trips), although it has failed in both cases.

³ Shen Lu, *American Bargain Hunters Flock to a New Online Platform Forged in China*, WALL ST. J., Dec. 24, 2022.

D. Summing Up

Closer examination shows that real-world markets often and perhaps typically do not conform substantially to the assumptions that underlie the prevailing regulatory paradigm. This is not to say that these assumptions are never substantially satisfied, in which case antitrust concerns concerning a *specific* platform would be warranted. The fundamental point is simply, as a matter of antitrust analysis and enforcement, there does not seem to be sufficient ground to believe that platform ecosystems in general are prone to converge toward market failure. If that is the case, there is little reason to depart from the fact-intensive, case-specific approach that regulators, and courts adjudicating antitrust claims, have historically pursued.

To gain further insight into these points, I examine the cloud-computing market, which has been characterized by regulators and some commentators as a market that raises antitrust concerns in light of the purportedly dominant positions held by leading providers. Closer scrutiny illustrates the erroneous conclusions to which regulators and commentators can be led when relying reflexively on the now-dominant paradigm of an entrenched platform monopoly, rather than engaging in fact-intensive inquiry into real-world market conditions.

III. IS THE CLOUD REALLY THE NEXT PLATFORM MONOPOLY?

Regulators in the U.S., EU, and UK have raised concerns about competitive conditions in the cloud-computing services market. Amazon's AWS, the market pioneer, is currently under investigation by US, European, and British competition regulators⁴, Microsoft's practices in the cloud market have attracted scrutiny from European regulators⁵, and the cloud businesses of Amazon, Microsoft, and Google are currently under investigation by the UK's Office of Communications.⁶ The Majority Staff Report issued by the US House Judiciary Committee in 2020 warned ominously that Google was investing "heavily" in its cloud computing service, "positioning itself to dominate the 'internet of things.'"⁷ A report commissioned by CISPE, an organization that represents European cloud infrastructure providers, claimed in 2021 that leading cloud computing services were taking actions that "are already affecting the cloud computing market . . . threatening its contestability and distorting competition."⁸

These predictions of imminent market failure rely on two related observations. First, regulators and some commentators have expressed concern over the substantial market shares attributed to AWS, the market pioneer and largest cloud provider (and more recently Microsoft Azure), implicitly or explicitly inferring that high concentration levels indicate actual or potential market power. Second, regulators have expressed concern that users face high switching costs when moving from one cloud provider to another and therefore are "locked in" and exposed to anticompetitive practices by dominant providers. (In this discussion of the cloud ecosystem, "users" will generally refer to business users, rather than individual end-users.)

Several features of the cloud ecosystem not only cast doubt on these concerns but suggest that the ecosystem is generating far-reaching efficiency effects by lowering entry barriers, increasing user convenience, and delivering cost-savings to an impressively large population of business users and end-users across a broad range of industries. By implication, this suggests that regulatory intervention is not only unnecessary but would potentially impose significant social costs by distorting the market's organic development of efficient market structures for deploying cloud-enabled technologies. Contrary to the suggestions made by regulators and some commentators, it is empirically ungrounded antitrust intervention, rather than cloud providers' business practices, that threatens to "distort" competitive conditions.

IV. ARE CLOUD LEADERS REALLY DOMINANT?

Regulators' concerns have derived in part from the large revenue shares attributed to AWS, and more recently, Microsoft Azure, and Google Cloud ("GC"), the largest cloud service providers. It is not clear, however, that regulators have considered thoroughly the components of what is referred to as the "cloud services market." To evaluate whether the apparent concentration of revenues among AWS, Azure, and GC plausibly gives

4 COMPETITION MARKETS AUTHORITY, *CMA investigates Amazon over suspected anti-competitive practices*, July 6, 2022; EUROPEAN COMMISSION, *Antitrust: Commission opens investigation into possible anti-competitive conduct of Amazon*, July 17, 2019; David McLaughlin, Dina Bass, and Naomi Nix, *Amazon Cloud Unit Draws Antitrust Scrutiny from FTC's Khan*, BLOOMBERG, Dec. 22, 2021.

5 Paresh Dave, *Microsoft's cloud business targeted by EU antitrust regulators*, REUTERS, Apr. 2, 2022.

6 Joe Hoppe & Sam Schechner, *Amazon, Microsoft, Google Face Cloud-Services Examination in U.K.*, WALL ST. J., Sept. 22, 2022.

7 MAJORITY STAFF REPORT, COMMITTEE ON THE JUDICIARY, U.S. HOUSE OF REPRESENTATIVES 37 (Oct. 2020).

8 FRÉDÉRIC JENNY, *CLOUD INFRASTRUCTURE SERVICES: AN ANALYSIS OF POTENTIALLY ANTI-COMPETITIVE PRACTICES* (Oct. 2021), <https://cispe.cloud/studies/fairsoftware>.

rise to antitrust concerns, it is necessary to distinguish among three principal segments of the cloud ecosystem. These include the infrastructure-as-a-service (“IaaS”), platform-as-a-service (“PaaS”), and software-as-a-service (“SaaS”) segments. Firms (especially larger firms) can also assemble “private clouds,” which are only used by a single entity, as an alternative to a “public cloud” service, which is used by thousands of entities, that is provided by entities such as AWS, Azure, and GC. Additionally, all firms may retain significant usage of on-premises systems for certain data storage functions or data pools. The critical point is that antitrust analysis that focuses on revenues sourced from one segment of the cloud ecosystem — namely, public cloud IaaS services — does not reflect users’ full menu of service options and may therefore reach an unfounded inference of market power.

Even within the public cloud IaaS segment, the factual basis for attributing market power to leading providers is contestable. Based on data estimates from Gartner as of 2021, AWS held 39 percent, Azure held 21 percent, and GC held 7 percent of worldwide revenue share in the IaaS public cloud segment, trailed by Oracle, IBM, and other smaller providers.⁹ None of these revenue shares approach the threshold that would normally give rise to antitrust concern. Moreover, the public cloud IaaS segment has become *more* competitive over time — precisely contrary to the standard model of platform entrenchment. Since 2015, AWS’s revenue share has been stable, but Azure has gained a large and increasing share, and GC has secured a substantial although smaller share. If the public-cloud IaaS segment is broken down by user type, competitive conditions improve even further: based on survey evidence as of 2021, Azure had outmatched AWS among large-firm users of IaaS services in several regions and industries.¹⁰

These tendencies toward increased competition stand in contrast to the observation in the House Judiciary Committee’s 2020 report that AWS “is the unquestioned leader in the cloud computing market.”¹¹ Whether or not that statement was plausible in 2020, that is clearly not the case in 2022. Even if we focus only on the IaaS public-cloud segment, at least two well-resourced entrants, Azure and GC, have already challenged AWS’s initial dominance and the IaaS segment is now evolving toward apparently intense competition among the largest providers. Additionally, Oracle and IBM, which are well-resourced competitors with deep technical expertise, are latecomer entrants that may exert competitive discipline. If we also take into account that users, especially large-entity users, can allocate some data-storage functions to private cloud services or on-premises systems (as discussed in more detail below), there is substantial reason to doubt the reflexive attribution of market power to the largest cloud services providers based merely on revenue share in a specific segment of a broader technology ecosystem.

V. ARE CLOUD USERS REALLY LOCKED IN?

Regulators and some commentators have asserted that users incur high costs when moving data from one provider to another, which in turn purportedly provides cloud services providers with an opportunity to take adverse actions — raising price or degrading service — toward “locked-in” users. Market reality casts doubt on this assertion. Users do incur significant costs when ending a relationship with a provider and moving data to a competitor. However, users widely anticipate lock-in risk and take extensive steps to mitigate it. Specifically, users adopt “multi-cloud” strategies that allocate data applications and data pools across multiple public cloud services providers and, at least in the case of large-entity users, private cloud and on-premises systems. Additionally, a rich market of secondary providers supplies software tools and applications that intermediate between users and cloud providers to facilitate multi-cloud strategies. This is a far cry from the monolithic “cloud market” dominated by two or three providers that appears to have elicited regulatory concern.

The “facts on the ground” in the cloud ecosystem illustrate the oversimplification behind the regulatory model of platform entrenchment and user lock-in, which implausibly assumes that sophisticated business users have no foresight, the state of technology is frozen, and users face a cloud provider monopoly. So long as users anticipate lock-in risk and can adopt strategies to mitigate it (and can select from a menu of data-storage options), cloud service providers cannot take opportunistic actions toward existing users without suffering a market penalty and, as a result, may have little rational incentive to do so. Any immediate gains from opportunistic actions would almost certainly be outweighed by existing users’ reluctance to increase usage of the cloud provider’s service and potential users’ reluctance to subscribe to the cloud provider’s service at all. Future revenue losses could be exceptionally large given that much of the potential cloud market remains unserved (that is, substantial volumes of data have yet to be moved to the cloud) and the future universe of cloud-enabled applications remains by definition uncultivated.

9 GARTNER, *Gartner Says Worldwide IaaS Cloud Services Market Grew 41.4% in 2021*, June 2, 2022. Alibaba held 9.5 percent share on a worldwide basis but does not appear to source substantial revenues from North American and European markets.

10 TURBONOMICS, 2021 STATE OF MULTICLOUD 26 (2021), <https://www.ibm.com/downloads/cas/VKW3RNDP>.

11 MAJORITY STAFF REPORT, *supra* note 6, at 113.

VI. CONCLUSION

Platform markets inherently converge on a small number of providers, which simply reflects the fact that network effects are necessary to unleash the transformative efficiencies generated by the information technologies that underlie these markets. Yet it has long been established, but increasingly overlooked, that high concentration only plausibly raises concerns as a matter of competition policy to the extent that it translates into market power (which must then be shown to rest on exclusionary practices that impede competition on the merits). The conventional wisdom that now prevails among competition regulators and a good deal of scholarly commentary takes the view that the winner-take-most outcomes of platform markets necessarily raise such a high level of competitive risk that preemptive intervention based on quasi-per se liability rules is warranted. Both the history and economics of platform markets cast great doubt on this proposition. Technology history shows that incumbent platforms are often if not typically vulnerable to entry and can rapidly lose market leadership to a more innovative entrant. Given the discrepancy between actual market performance and the theoretical models on which policymakers have relied in proposing and implementing substantial changes from long-standing competition policies, it is time to rethink and reverse course.



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