Coopting Disruption

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Our economy is dominated by five aging tech giants – Alphabet, Amazon, Apple, Meta, and Microsoft. In the last twenty years, no company has commercialized a new technology in a way that threatens them. Why?

We argue that the tech giants have learned how to coopt disruption. They identify potentially disruptive technologies, use their money to influence the startups developing them, strategically dole out access to the resources the startups need to grow, and seek regulation that makes it harder for the startups to compete. When a threat emerges, they buy it off. And after they acquire a startup, they redirect its people and assets to their own innovation needs. These seemingly unrelated behaviors work together to enable the tech giants to maintain their dominance in the face of disruptive innovations.

We show how three important new technologies – artificial intelligence, virtual reality, and automated driving – are being coopted right now. And we argue that, even though consumers sometimes benefit when startups partner with incumbents, coopting disruption is bad for both competition and innovation in the long run. At best, consumers receive incremental improvements to the tech giants' existing products. They miss out on the more fundamental innovations that an independent company would have developed – both innovations that threaten an incumbent's core business and those that a company locked into an existing mindset (and revenue stream) might simply not appreciate. Cooption cements incumbency, undermining the Schumpeterian competition that drove innovation in the tech industry throughout the 20th century.

We propose reforms that would make it harder to coopt disruption. We can revitalize a century-old law that prevents people from serving as officers or directors of their competitors, extending it to prevent incumbents from controlling the direction of startups. We can prohibit incumbent monopolies from discriminating in the access they provide to their data or networks based on whether the company is a competitive threat. We can ensure incumbents cannot use regulation as a mechanism to undercut competition. And we can make it presumptively illegal for incumbent monopolies to acquire startups that might compete with them.

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INTRODUCTION

Our economy is dominated by five aging tech giants—Alphabet, Amazon, Apple, Meta, and Microsoft. Each of these firms was founded more than twenty years ago: Apple and Microsoft in the 1970s, Google and Amazon in the 1990s, and Facebook in 2004.[1] Each of them grew by successfully commercializing a disruptive technology—personal computers (Apple), operating systems (Microsoft), online shopping (Amazon), search engines (Google), and social networks (Facebook). Each of them displaced the incumbents that came before them. But in the last twenty years, no company has commercialized a new technology in a way that threatens the tech giants. Why?

While there are many reasons for the tech giants' continued dominance, we think an important and overlooked one is that they have learned how to coopt disruption. They identify potentially disruptive technologies, use their money to influence the startups developing them, strategically dole out access to the resources the startups need to grow, and seek regulation that will make it harder for the startups to compete. When a threat emerges, they buy it off. And after they acquire a startup, they redirect its people and assets to their own innovation needs.

In this paper, we identify the phenomenon of cooption and discuss the various forms it can take, from seemingly innocuous investments in startups to selective sharing of data access to more pernicious "killer acquisitions." We show how these seemingly different acts are part of a pattern tech companies and other incumbents use to maintain their dominance in the face of disruptive new innovations. And we document how three important new technologies—artificial intelligence (AI), virtual reality (VR), and automated driving—are being coopted. This is a critical legal issue right now. Indeed, after we wrote this paper, the Federal Trade Commission (FTC) announced that it would review incumbent investments into startups in one of the areas we identified – AI.[2]

Cooping disruption is a challenging problem for the law. Cooption can look a great deal like competition and innovation. And partnering with an incumbent can sometimes offer real benefits to both startups and their customers. Nonetheless, we think incumbents coopting disruption is bad for both

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[1] *See* LIBR. OF CONG., *The Founding of Apple Computer, Inc.*, https://guides.loc.gov/this-month-in-business-history/april/apple-computer-founded (last visited Jan. 15, 2024); MICROSOFT, *About Microsoft*, https://news.microsoft.com/about (last visited Jan. 15, 2024); GOOGLE, *From the Garage to the Googleplex*, https://about.google/intl/ALL_us/our-story (last visited Jan. 15, 2024); AMAZON, *Amazon.com Files for Initial Public Offering* (Mar. 24, 1997), https://press.aboutamazon.com/1997/3/amazon-com-files-for-initial-public-offering; Lily Rothman, *Happy Birthday, Facebook*, TIME (Feb. 4, 2015), https://time.com/3686124/happy-birthday-facebook.

[2] David McCabe, *Federal Trade Commission Launches Inquiry into A.I. Deals by Tech Giants*, N.Y. TIMES (Jan. 25, 2024), https://www.nytimes.com/2024/01/25/technology/ftc-ai-microsoft-amazon-google.html.

competition and innovation in the long run. At best, consumers receive incremental improvements to the tech giants' existing products. They miss out on the more fundamental innovations that an independent company would have developed – both innovations that threaten an incumbent's core business and those that a company locked into an existing mindset (and revenue stream) might simply not appreciate. And cooption cements incumbency, undermining the Schumpeterian competition – competition to become the next dominant firm – that drove innovation in the tech industry throughout the 20th century.

We suggest several ways the law can reduce the harm from coopting disruption. We can revitalize a century-old law that prevents people from serving as officers or directors of their competitors, extending it to prevent incumbents from controlling the direction of startups. We can make it illegal for incumbent monopolies to discriminate in the access they provide to their data or programs based on whether the company is a competitive threat. We can ensure incumbents cannot use regulation as a mechanism to undercut competition from startups. And we should make it presumptively illegal for incumbent monopolies to acquire startups developing innovations that might prove disruptive.

In Part I, we discuss innovation, competition, and the structural advantages to incumbency in the tech industry that set the stage for cooption. In Part II, we discuss the various strategies tech incumbents use to coopt disruptive technologies. In Part III, we explore several case studies of cooption going on right now in important new industries. Finally, in Part IV we discuss the policy implications of cooption and consider ways to combat it.

I. THE THREAT TO INNOVATION

In this Part, we start by acknowledging the ways in which large incumbents are better equipped to innovate than smaller, less established firms. Next, we explain why large incumbents nonetheless usually focus their R&D on incremental improvements, miss out on disruptive innovations, and get leapfrogged by startups. Then, we ask: if large incumbents are susceptible to disruption, why have the tech giants sustained their dominance for two decades? We evaluate possible theories before introducing our own.

A. Advantages of Large Incumbents

Schumpeter argued that large incumbents were better able to innovate than other firms.[3] First, he argued, large incumbents can take advantage of economies of scale.[4] They have already paid some of the fixed costs necessary for innovation by investing in talent, facilities, equipment, computing power, and data. Therefore, their marginal cost of commercializing a new technology is lower. Relatedly, large incumbents have pre-existing relationships with customers, distributors, suppliers, and regulators.[5] They have built a brand that gives them credibility in these interactions. Consequently, they can bring new products to market more quickly. He thought these advantages were so great that serial monopolies were the normal outcome. Competition, to Schumpeter, would come not in the form of rivals selling the same goods, but competition to take over the market itself and become the next monopoly in the series.

Large incumbents can also take advantage of economies of scope.[6] Innovation creates "involuntary spillovers"—new knowledge that has economic value beyond the specific product that the firm was developing.[7] If a company sells a broader portfolio of products, it is more likely to take advantage of those spillovers. Imagine the value that Alphabet could extract from a machine learning breakthrough in image classification—it might improve Google search, Google Maps, Android, YouTube, and other Alphabet products. The greater ex post value large incumbents can extract from innovation should make them more likely to innovate ex ante.

Perhaps most importantly, large incumbents can access capital at a lower cost.[8] A profitable firm can use its internal cash flows to fund innovation rather than raising capital from outside investors. This means that the firm can avoid the conflicts of interest that outside investors can introduce. And they can retain a larger share of the profits that the innovation generates.

Some large incumbents may have another potential advantage—a longer investment time horizon. A secure monopolist might develop some insulation from market pressures and be able to invest in projects that will not come to fruition for many years. This is one reason offered to explain the research

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[3] Joseph A. Schumpeter, CAPITALISM, SOCIALISM, AND DEMOCRACY 81–106 (3d ed. 1942).

[4] *Id.* at 100–01; Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L. J. 575, 578 (2007).

[5] Schumpeter, *supra* note 3, at 100–01; Baker, *supra* note 4, at 578.

[6] Baker, *supra* note 4, at 598; *See* Timothy F. Bresnahan et al., *Schumpeterian Competition and Diseconomies of Scope: Illustrations from the Histories of Microsoft and IBM*, *in* THE RATE AND DIRECTION OF INVENTIVE ACTIVITY REVISITED 203, 204 (Josh Lerner & Scott Stern eds., 2012).

[7] Baker, *supra* note 4, at 587–88 n.33; *see also* Giulio Frederico et al., *Antitrust and Innovation: Welcoming and Protecting Disruption*, 20 INNOVATION POL'Y & ECON. 125, 133 (2020).

[8] Schumpeter, *supra* note 3, at 87; Baker, *supra* note 4, at 578.

productivity of mid-century corporate R&D units like Bell Labs, IBM Research, and Xerox PARC.[9] Startups, by contrast, must raise new rounds of capital every 12-24 months.[10] And their VCs must exit within about five to seven years of their investment.[11] But at the same time, large incumbents arguably face more pressure to deliver short-term profits than a startup would. Public companies must disclose their financial statements every quarter.[12] Their executives must defend their investment decisions to analysts in quarterly earnings calls. And public companies that make large, long-term investments are vulnerable to attack by activist hedge funds.[13] For these reasons, while some large incumbents may have a longer leash than other firms, that is not always true.

Still, time horizons aside, large incumbents appear to have significant advantages in innovation. Why do they often lose out to new entrants riding an innovative idea? What happened to IBM? Chrysler? The answer is that large incumbents face predictable industrial organization problems that inhibit innovation.

B. Disadvantages of Large Incumbents

Large incumbents struggle to innovate because (1) their success will cannibalize their own market share, (2) their managers prefer to deliver incremental innovations to their existing customers, (3) their single veto point decision-making structure encourages risk-aversion, and (4) they cannot appropriately compensate employees working on innovation projects.

1. Arrow's Replacement Effect

The most important reason why large incumbents—and especially monopolists—don't innovate is that they don't gain anything by stealing their own market share. To illustrate this point, consider a market with two firms, Incumbent and Challenger.[14] Suppose Challenger introduces a new product. Some of Incumbent's existing customers will buy Challenger's product instead of Incumbent's product, so Challenger will "steal" some of Incumbent's business. Incumbent might respond by lowering its prices. Or it might respond by

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[9] Ashish Arora et al., *The Changing Structure of American Innovation: Some Cautionary Remarks for Economic Growth*, 20 INNOVATION POL'Y & ECON. 39, 41–43 (2020). Notably, however, while those research labs generated pioneering inventions, their corporate masters were much less adept at implementing those innovations.

[10] Elizabeth Pollman, *Startup Governance*, 168 U. PA. L. REV. 155, 173 (2019).

[11] Mark A. Lemley & Andrew McCreary, *Exit Strategy*, 101 B.U. L. REV. 1, 76 (2021).

[12] 17 C.F.R. § 240.13a-13 (2002).

[13] John C. Coffee, Jr. & Darius Palia, *The Wolf at the Door: The Impact of Hedge Fund Activism on Corporate Governance*, 41 J. CORP. L. 545, 552 (2016).

[14] *See* Frederico et al., *supra* note 7, at 139.

adding new features to its existing products or introducing a new product of its own. Either way, consumers benefit.

Now suppose instead that Incumbent buys Challenger.[15] After the deal, Incumbent no longer has to worry about Challenger stealing its business. And Incumbent could decide to sell the product that Challenger developed. But it has little incentive to do so because the sales of its former competitor's product would simply replace sales of its own product. More generally, a monopolist has diminished incentives to introduce new products, improve product quality, or lower prices because any new sales generated replace its existing sales. This is Arrow's replacement effect.[16]

The same applies to R&D.[17] Suppose that another firm, Adjacent, develops R&D capabilities that overlap with Incumbent's capabilities. Adjacent will not steal business immediately. But Incumbent will now expect that it is more likely that Adjacent will successfully commercialize a technology into a competing product that steals its business. Worse, R&D in a fast-moving industry might not just steal business; it might displace the market altogether by moving consumers to a new market. Ask the once-giant makers of photocopiers and film cameras how business is going.

Incumbent might respond by investing in its own R&D capabilities or by buying Adjacent.[18] If Incumbent decides to invest in R&D, consumers gain a greater chance of benefitting from innovation. If Incumbent decides to buy Adjacent, the combined firm will internalize the business-stealing effects of the R&D capabilities. Incumbent might shut down one of the R&D divisions, reducing the chance that consumers will benefit from innovation. And even if Incumbent integrates the innovation into its own products, it is unlikely to do so in a way that eliminates or disrupts its core market.

The general lesson is, all else equal, the larger a firm's market share and the less it is threatened by competition, the weaker its incentives to innovate. So we should expect large incumbents to not innovate much. And if they can dispense with the competitors rather than have to compete with them, they will do that.[19]

2. Bias Against Disruptive Innovations

Arrow's theory focuses on firm-level incentives. It dovetails with Christensen's theory of disruptive innovation, which focuses on the career incentives

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[15] *See id.* at 140.

[16] Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, *in* THE RATE AND DIRECTION OF ECON. ACTIVITIES: ECON. & SOC. FACTORS 609 (Richard Nelson ed., 1962).

[17] Frederico et al., *supra* note 7, at 140–41.

[18] *Id.* at 140–41.

[19] *See* Mark A. Lemley, *Free the Market: How We Can Save Capitalism from the Capitalists* (Working Paper, Jan. 11, 2024).

of middle managers.[20] Many managers, Christensen says, have built relationships with their firm's customers and have become attuned to satisfying those customers' needs.[21] They aim to protect and maybe modestly improve on the status quo, not to disrupt it. Incumbent managers have an incentive to deliver *sustaining innovations*—incremental improvements in quality to the firm's existing products that will please its existing customers.[22] But they have substantial disincentives to pursue projects that upset the apple cart, even if doing so would bring new customers to the firm.

Startup managers, by contrast, are not beholden to existing customers, so they are more willing to pursue *disruptive innovations* that target new customers and new markets.[23] These disruptive innovations may be inferior to the state-of-the-art products on some dimensions.[24] Think about the quality of photos on early generations of mobile phones. But startups can refine their disruptive innovations and ultimately leapfrog incumbents.[25] Middle managers at a camera company might be happy to improve their cameras if it meant their customers bought new ones. But it would never occur to them to do away with the camera altogether – and if it did, they would be horrified by the idea. This, Christensen says, is why creative destruction generally comes from outside.[26]

Christensen also argues that large incumbents face structural obstacles to information sharing.[27] The employees who have innovative ideas—the engineers who work on developing the firm's technologies—are often unable to convey those ideas up the chain of command. Again, the incentives of middle managers are to blame. They may not stand to benefit personally from the innovative ideas, or they may not simply realize the value of these ideas to the firm's overall strategy.[28] Either way, they can serve as an information bottleneck that prevents information from reaching executives. The leadership at smaller firms with less hierarchical structures are more likely to learn about their employees' innovative ideas.[29]

Even if senior management is interested in disruptive innovation – and they face many of the same incentives against it – large companies generally

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[20] CLAYTON M. CHRISTENSEN, THE INNOVATOR'S DILEMMA: WHEN NEW TECHNOLOGIES CAUSE GREAT FIRMS TO FAIL (1997).

[21] *Id.* at 4, 18–21.

[22] *Id.* at 10–13, 23–24.

[23] *Id.* at 9, 14–15, 19–21.

[24] *Id.* at xix, 15–18, 19–23.

[25] *Id.* at 16–18.

[26] *Id.* at 24.

[27] *Id.* at 29–30.

[28] *Id.* at 43, 54.

[29] *Id.* at 55.

don't succeed at building disruptive innovation in-house. Housing an innovation project inside a firm with diverse lines of business creates conflict with those other businesses.[30] Some firm assets—cash, cloud computing, equipment, facilities, and engineers' time—are rivalrous and finite, so executives must be willing to fight internal constituencies to devote those resources to innovation.

3. Veto Points

Another way in which large incumbents differ from startups is how they seek out funding. Inside a large incumbent, decisions about whether to fund an innovative project must pass through one veto point.[31] In the venture capital market, many competing investors independently decide whether to finance an innovative idea.[32] Inside a firm, an employee with an innovative idea must pitch an idea to managers who ultimately report to one executive gatekeeper. In the venture capital market, if a would-be startup founder pitches an idea to ten VC firms, and nine of them are not persuaded, the idea gets funded. The advantage of market-based finance over internal finance applies not just to the initiation but also the continuation of an innovation project. Inside a firm, an executive who has soured on a project can terminate it. In the venture capital market, when a startup's initial investors grow skeptical, the company can still pitch outsiders on infusing more cash.

Notably, this advantage largely disappears in a competitive market, because with ten competing firms, like ten VCs, one firm pursuing a new path may be enough. But in concentrated markets, it is individual firm leaders, not the disciplining effect of market competition, that call the shots. And while economists often describe markets as efficient, there is no reason to believe individual corporate executives make efficient (or even rational) decisions. Just ask Twitter. Markets work not because private executives make good decisions but because the ones who make bad decisions get driven out. But that dynamic only works with competition.[33]

4. Compensation and Agency Problems

Large incumbents can also struggle to set the right incentives for employees to execute innovation projects. Progress on an innovation project can be difficult to observe, especially if it requires years of experimentation.[34] If a firm

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[30] Bresnahan et al., *supra* note 6, at 205–06.

[31] *See* Ronald J. Gilson, *Locating Innovation: The Endogeneity of Technology, Organizational Structure, and Financial Contracting*, 110 COLUM. L. REV. 885, 904 (2010).

[32] *See id.* at 909.

[33] Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 UNIV. CHI. L. REV. 129, 149 (2004); *see also* Lemley, *supra* note 19.

[34] Matthew T. Wansley, *Moonshots*, 2022 COLUM. BUS. L. REV. 859, 864 (2023).

pays its engineers a flat salary, it might both give them insufficient motivation to turn the innovation into a product and insufficient reward if the project proves to be successful. And if it doesn't, it risks internal strife at the company.

Startups solve this problem by giving employees stock options. Every employee with significant equity knows that if the startup successfully exits, they will be rewarded.[35] Stock in a large, diversified public company does not create similar incentives. The incentives are diluted because the value of the stock will be affected by too many variables unrelated to the success of the specific innovation project.[36] Some large firms have tried to solve these problems with synthetic equity or "tracking stock," but in the absence of a market for the innovation project itself, employees are vulnerable to the firm undervaluing the project opportunistically.[37]

The compensation problem also inhibits large incumbents from acting on new ideas from their own employees. As Bankman and Gilson explain, large firms do not recognize internal "property rights" to innovations that employees develop.[38] If they did, employees might become reluctant to share information. But not protecting internal property rights gives innovative employees incentive to leave.[39] If employees at a large firm found their own startup and raise venture capital to fund it, they will earn a much greater share of the profits of the innovation. Indeed, the history of Silicon Valley is a repeated pattern of engineers leaving large incumbents, forming startups, developing new innovations, and then ultimately overtaking the incumbents.[40]

In theory, companies can employ legal mechanisms to discourage this. An employee who comes up with an idea while at work and then leaves to pursue it rather than disclosing it to their employer is misappropriating trade secrets, and the company might sue the startup to stop it.[41] But it can be hard to know when an idea was developed, and most companies pursue trade secrets cases only when there is hard evidence of an employee taking the company's own

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[35] Ronald J. Gilson, *Engineering a Venture Capital Market: Lessons from the American Experience*, 55 STAN. L. REV. 1083–84 (2003).

[36] Edward M. Iacobucci & George G. Triantis, *Economic and Legal Boundaries of Firms*, 93 VA. L. REV. 515, 568 (2007).

[37] *See id.* at 536–38.

[38] Joseph Bankman & Ronald J. Gilson, *Why Start-ups?*, 51 STAN. L. REV. 289, 304 (1999).

[39] *Id.* at 303–04.

[40] *See* SEBASTIAN MALLABY, THE POWER LAW: VENTURE CAPITAL AND THE MAKING OF THE NEW FUTURE 17–39 (2022) (recounting the story of the "Traitorous Eight" engineers who left the Schockley Semiconductor Laboratory to form the venture-backed startup Fairchild Semiconductor).

[41] *See* Timothy Murphy, *How Can a Departing Employee Misappropriate Their Own Creative Outputs*, 66 VILL. L. REV. 529, 531, 546–50 (2021); Brooklee Han, *Qualia Accuses Title Startup Settlor of Stealing Trade Secrets*, HOUS. WIRE (Jan. 18, 2024), https://www.housingwire.com/articles/qualia-accuses-title-startup-settlor-of-stealing-trade-secrets.

secrets.[42] And while companies could prevent employees from leaving at all by signing noncompete agreements, states are – with good reason – increasingly refusing to enforce those agreements, which inefficiently reduce innovation and economic growth.[43] An entrepreneurial employee stuck working for a bad company is likely to be a frustrated employee, not an innovative one for the employer. Other mechanisms designed to retain innovative employees – like stock options that vest over time – can help to some extent,[44] but they are subject to many of the same limits. Stock in a mature company doesn't have the upside potential of stock in a promising startup, so it may dampen the incentive to leave but it doesn't eliminate it.

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The disadvantages of large incumbents explain the historical pattern we have observed. Disruptive innovations overwhelmingly come from outsiders, typically venture-backed startups. Microsoft, not IBM, built the dominant desktop operating system. Google, not Microsoft, built the dominant search engine. Facebook, not Google, built the dominant social network.

C. The Tech Giants' Sustained Dominance

The last two decades, though, have told a different story. Alphabet, Amazon, Apple, Microsoft, and Meta have not faced a serious challenge from a disruptive new entrant in the past twenty years. And each of them holds a dominant share of at least one important market. Alphabet's Google search has 81% of the search market;[45] Chrome has 59% of the desktop browser market;[46] and, Android has 47% of the mobile operating system market,[47] which

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[42] Joseph Lavigne, *Do You Need Hard Proof of Data Theft to Bring Trade Secret Claims? Maybe Not*, TRADE SECRET INSIDER (May 30, 2019), https://www.tradesecretsinsider.com/do-you-need-hard-proof-of-data-theft-to-bring-trade-secret-claims-maybe-not.

[43] *See* Matthew S. Johnson et al., *Innovation and the Enforceability of Noncompete Agreements* 1–2 (Nat'l Bureau of Econ. Rsch., Working Paper No. 31487, 2023); Zachary Folk, *Which States Have Banned Non-Compete Clauses? Here's What to Know as New York Could be Next.*, FORBES (Dec. 6, 2023, 5:00 PM), https://www.forbes.com/sites/zacharyfolk/2023/12/06/which-states-have-banned-non-compete-clauses-heres-what-to-know-as-new-york-could-be-next/?sh=51f1e73495c0; Mark Lemley & Orly Lobel, *Banning Noncompetes is Good for Innovation*, HARV. BUS. REV. (Feb. 6, 2023), https://hbr.org/2023/02/banning-noncompetes-is-good-for-innovation; Press Release, Fed. Trade Comm'n, FTC Proposes to Ban Noncompete Clauses, Which Hurt Workers and Harm Competition (Jan. 5, 2023).

[44] *See* Yifat Aran, *Beyond Covenants Not to Compete: Equilibrium in High-Tech Startup Labor Markets*, 70 STAN. L. REV. 1235, 1263-67 (2018).

[45] H.R. REP. NO. 117-8, at 61.

[46] *Id.* at 106.

[47] *Id.* at 177.

enables the Google Play Store to have a significant share of the mobile app store market. Amazon has at least 40% of the online retail market,[48] and AWS has 24% of the cloud computing market—three times the share of its closest competitor, Microsoft Azure.[49] Apple's Safari has 56% of the mobile browser market,[50] and iOS has 52% of the mobile operating system market,[51] which enables Apple's App Store to have a significant share of the mobile app store market. Meta's dominance of the social network market is harder to quantify because the market is hard to define, but we know that globally Facebook has 1.8 billion users, WhatsApp has 2.0 billion users, and Instagram has 1.4 billion users.[52] And, despite its age, Microsoft Windows still has around 73% of the desktop operating system market.[53]

Have the tech giants solved the industrial organization problems that inhibit innovation at large firms? We doubt it. Instead, we think there are five reasons that together explain the tech giant's continuing dominance. Four are already widely known: network effects, self-preferencing, paying for defaults, and cloning. We introduce a fifth that is less well understood: coopting disruption.

1. Network Effects

The tech giants' core businesses are built on platforms. A platform is an intermediary in a two-sided market.[54] It connects users on one side of the market with users on the other side for transactions or interactions. For example, consumers want to download apps. App developers want to distribute their apps to consumers. Apple's App Store (or Google's Play store) is the platform that connects them. Alphabet has Google search and the Google Play Store on Android. The core of Amazon's business is its online marketplace connecting buyers and sellers. Meta has Facebook, Instagram, and WhatsApp, all of which are about connecting users to each other. And countless tech companies connect advertisers to customers by matching user interests.

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[48] *Id.* at 212–13.

[49] *Id.* at 93–94.

[50] *Id.* at 106.

[51] *Id.* at 84.

[52] *Id.* at 75.

[53] *See Desktop Operating System Market Share Worldwide*, STATCOUNTER https://gs.statcounter.com/os-market-share/desktop/worldwide [https://perma.cc/L7RY-AHSP].

[54] Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-sided Markets*, 1 J. EUR. ECON. ASS'N 990, 994 (2003).

Platforms tend to exhibit network effects—the addition of a new user increases the value of a platform to existing users and attracts new users.[55] When a new app developer makes its app available on the App Store, the App Store becomes more valuable to Apple's existing customers who want to download that app. Other consumers who were not previously Apple customers but want to download the app become more likely to buy an Apple device. Network effects can create a flywheel. As more consumers join the App Store, more developers will want to make their apps available.

Even many tech products that aren't platforms per se also exhibit network effects. Some of these involve interoperability. VHS tapes would historically play on a variety of VCR devices, but Betamax tapes would play only on a Sony device.[56] The larger market for VHS devices meant that there were more movies available for that platform, and the larger number of movies in turn encouraged people to buy VHS machines in the 1980s.[57] The same dynamic drove customers to the open PC platform over the closed Apple Mac in the 1990s,[58] and led to the success of DVD over DIVX as a successor to the VCR.[59] While interoperability has reduced the importance of technical compatibility as a network effect – PCs and Macs now talk to each other, for instance – learning a system can still create indirect network effects. Windows users can't costlessly switch to Mac and vice versa – not because they will lose their data, as was once true, but because they have to relearn a new system.[60]

Markets with network effects tend to be concentrated. Once a platform sets the network effect flywheel in motion, its position can be hard to dislodge. The is especially true if the platform's users face high switching costs. Switching costs may depend on whether most users in a market stick to one platform—"single-home"—or toggle between two or more platforms—"multi-home."[61] For example, a consumer might single-home in search by using

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[55] *Id.* at 994–96; Hal Varian and Carl Shapiro, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY (1999); Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CALIF. 479 (1998).

[56] CAPTURE, *Learn What Betamax is and How it Shaped Home Entertainment* (June 23, 2023), https://www.capture.com/blogs/insights/what-is-betamax.

[57] Stephen Clark, *The History of Format Wars and How Sony Finally Won... For Now*, PASTE (Aug. 2, 2016), https://www.pastemagazine.com/tech/sony/how-sony-finally-won-the-format-wars.

[58] Jay Yarow, *How Apple Really Lost Its Lead in the '80s*, BUS. INSIDER (Dec. 9, 2012), https://www.businessinsider.com/how-apple-really-lost-its-lead-in-the-80s-2012-12.

[59] Nate Williams, *The Real Reason DIVX Failed Spectacularly*, HIST. COMPUT. (Aug. 8, 2023), https://history-computer.com/the-real-reason-divx-failed-spectacularly.

[60] Lemley & McGowan, *supra* note 55, at 494. Other network effects can be psychological. iPhones and Android phones communicate seamlessly with each other via text, but the texts appear in different colors, and having a blue text box has become something of a status symbol.

[61] Rochet & Tirole, *supra* note 54, at 993–94.

Google search on all her devices but multi-home in social networks by having accounts on Instagram and LinkedIn. It is also a function of the difficulty of learning a new system.

The combination of strong network effects and high fixed costs can create barriers to entry. For example, developing a search engine requires crawling the internet to build an index of websites and crawling them again regularly to update. Google crawled the web, built an index, and established a dominant search engine early.[62] Microsoft created a competing index for Bing.[63] But now many website owners do not permit their sites to be crawled by any search engines other than Google and Bing.[64] Since Google dominates web traffic (with Bing a distant second), there is little upside for any individual website owner to allow other search engines to crawl its sites. This individually rational behavior creates a barrier to new entrants in the search market. Most other search engines today actually pay Google for access to its index.[65]

Network effects do not entail permanent monopolies.[66] But they change the nature of competition. In some cases, platforms do not compete for market share *in* a market. They compete *for* the market. The high margins that a platform company can extract attract competition. And the threat of business stealing can encourage platform innovation. One important way that companies compete for platforms is by riding waves of disruptive innovation. Microsoft Windows has sustained its dominance in the desktop operating system market. But the rise of smartphones created a new market for mobile operating systems where Windows' network effects were less relevant.

So part of the tech giants' dominance can be attributed to the network effects of their platforms. But if the channels of competition are open, we should expect their platforms to face challenges – if not head-to-head competition, at least technologies that change the nature of the market, creating a new platform – and a new incumbent. But that hasn't happened. Why not? One theory is that the tech giants are abusing the power of their platforms with exclusionary conduct.

2. Self-Preferencing

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[62] Daisuke Wakabayashi, *Google Dominates Thanks to an Unrivaled View of the Web*, N.Y. TIMES (Dec. 14, 2020), https://www.nytimes.com/2020/12/14/technology/how-google-dominates.html.

[63] *Id.*

[64] *Id.*

[65] *Id.*

[66] Herbert Hovenkamp, *Antitrust and Platform Monopoly*, 130 YALE L. J. 1952, 1984–87 (2021).

One kind of exclusionary conduct is "self-preferencing."[67] Amazon, for example, both invites third party vendors to sell their products in its online marketplace and sells its own house brands that compete with those vendors. Amazon has a powerful advantage in that competition. It has access to data on all of its competitors—who their customers are, which products are selling well, and which prices work best. And it controls which ads consumers see when they search for a specific product. Assuming Amazon uses that information to prefer its own products to those of its competitors (either by pricing strategically or by promoting its own products in search results) – something alleged but not yet proven in a pending antitrust case[68] -- the result is to bias competition. Vendors cannot realistically protest Amazon's self-preferencing (or just go elsewhere) because Amazon has such a dominant share in the online retail market. If they want to sell their goods online, they have to sell on Amazon and put up with rigged competition. Similar allegations have been made against Google, which appears to prefer its own search verticals to competitive sites even when its own search algorithm would dictate otherwise.[69]

Self-preferencing can explain some of the continued dominance by tech firms, but by no means all. It helps vertically integrated companies gain an edge over competitors in the market they integrate into; Amazon can outcompete other product suppliers on its platform because it boosts its own products on that platform. But it can't explain the continued dominance of the platform itself.

3. Payment for Defaults

Another form of exclusionary conduct is paying another company to make your service the default on another company's platform. To be sure, paying a company to exclude your competitors would certainly be anticompetitive. But if one company will be the default, can companies bid to take that position? For example, Alphabet pays Apple a reported $18 billion (with a b) each year for Google to be the default search engine on iOS devices.[70] Android and iOS together account for 99% of the U.S. mobile operating system market.[71] Consequently, almost everyone who uses a smartphone in America is accustomed

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[67] *See* Herbert Hovenkamp, *Monopolizing Digital Commerce*, 64 WM. & MARY L. REV. 1677, 1736-38 (2023) (discussing self-preferencing claims skeptically).

[68] Complaint at 84–123, Fed. Trade Comm'n v. Amazon.com, Inc., No. 23-cv-01495 (W.D. Wash Sept. 26, 2023).

[69] Complaint at 14, 49, 55–56, United States v. Google LLC, No. 23-cv-00108 (E.D. Va. Jan. 24, 2023).

[70] Nico Grant, *Inside Google's Plan to Stop Apple from Getting Serious About Search*, N.Y. TIMES (Oct. 26, 2023), https://www.nytimes.com/2023/10/26/technology/google-apple-search-spotlight.html.

[71] H.R. REP. NO. 117-8, *supra* note 45, at 82.

to Google search. Alphabet claims that "competition is just a click away."[72] But research and experience have shown that defaults can be somewhat sticky.[73] So controlling the default position can give Alphabet (or whoever wins the Apple bid) an advantage. That said, someone has to be the default, and it might be better for consumers if the default is the search engine most users already prefer. The real problem might be the idea of paying for placement, whoever wins the bidding war.

Paying for placement too is only a partial explanation. Google may gain an advantage from being the default search engine on iOS, but it faces competition to pay for that spot, and a challenger like Microsoft might have an even greater incentive to outbid Google in order to gain whatever advantage comes with sticky defaults.

4. Cloning

The tech giants also stand accused of "cloning" startups' products.[74] Cloning means identifying a potentially competitive product, developing a highly similar product or highly similar feature for its existing products, and then bringing it to market. For example, Meta has responded to the rising popularity of the short-form video app Tik Tok by adding a highly similar short-form video feature, Reels, to Instagram. Complaints about cloning are sometimes coupled with the concern that the tech giants have created a "kill zone" around their core markets.[75] Some startup founders have said that it is difficult to pitch VCs on ideas that would compete with the tech giants. The VCs, these founders say, worry that the tech giants will clone their idea and effectively kill off the startup.[76]

There is another name for cloning: competition. There is nothing illegal about copying business ideas that are not protected by intellectual property rights. If one of the tech giants can copy a startup's idea, improve on it, and outcompete it on the merits, that is a win for consumer welfare. This is the threat of business-stealing working as it is supposed to. Cloning is only objectionable if the tech giant wins out not by competition on the merits, but by

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[72] Miguel Helft, *Google Makes a Case That it Isn't So Big*, N.Y. TIMES (June 28, 2009), https://www.nytimes.com/2009/06/29/technology/companies/29google.html.

[73] Omar Vasquez Duque, *Active Choice vs. Inertia? An Exploratory Assessment of the European Microsoft Case's Choice Screen*, 19 J. COMPETITION L. & ECON. 60, 72 (2022) (finding less "stickiness" than might be expected around search engine defaults).

[74] H.R. REP. NO. 117-8, *supra* note 45, at 38.

[75] Sai Krishna Kamepalli et al., *Kill Zone* 5–7 (Nat'l Bureau of Econ. Rsch., Working Paper No. 27146, 2022).

[76] Transcript, *Venture Capital and Antitrust: Proceedings at the Public Workshop Held by the Antitrust Division of the United States Department of Justice* 35 (Feb. 12, 2020) ("If you build something complementary to an existing platform … you could sell it to the platform. But it's possible they could copy you and you wouldn't be able to sell it to the platform.").

exclusionary conduct. For example, if the tech giant's cloned product is inferior in quality, but the giant gets consumers to use it by self-preferencing, then consumer welfare is harmed. But the harm is due to the self-preferencing, not the cloning.

Further, it is remarkable how often cloning fails. Google+, Google's effort to build a social media service that combined the best of Facebook and Twitter was an abject failure.[77] Apple's effort to control the music world's move to streaming by offering its own alternative to Spotify hasn't prevented Spotify from dominating music streaming and eclipsing the once-vibrant (and Apple-dominated) market for music downloads.[78] Meta's effort to copy Snap, then TikTok, by introducing Stories and Reels has not proven terribly successful, and certainly has not prevented those companies from building their markets.[79] That is not to say cloning never works, of course. For instance, Microsoft integrated spellcheck into Word, eliminating the market for freestanding spellcheck software.[80] But it suggests that deep pockets, motivation, and the ability to copy software are not always enough to capture a new market from an entrant.

The most important point about cloning is one that we have not heard before. The ease with which the tech giants can clone many technologies developed by competing startups suggests that something deeper is going on when they decide to acquire a startup. If the product is cloneable, then why would you buy the company and burn cash paying off its VCs? Sometimes the answer is that the tech giant wants the talent, and the specific engineers the giant wants cannot be picked off and hired individually. This kind of deal is called an acquihire.[81] But if the deal is not just an acquihire, then it is likely that the tech giant may be worried about what the startup might become if it remains independent. And it may reflect recognition that there is something about many disruptive technologies that is hard to replicate.

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[77] Chris Fox, *Google Shuts Failed Social Network Google+*, BBC (Apr. 1, 2019, 7:07 AM), https://www.bbc.com/news/technology-47771927.

[78] Eamonn Forde, *Spotify Comfortably Remains the Biggest Streaming Service Despite its Market Share Being Eaten Into*, FORBES (Jan. 19, 2022, 12:01 PM), https://www.forbes.com/sites/eamonnforde/2022/01/19/spotify-comfortably-remains-the-biggest-streaming-service-despite-its-market-share-being-eaten-into; Anne Steele, *Spotify Dominates Audio Streaming, but Where Are the Profits?*, WALL ST. J. (Jan. 18, 2024, 12:01 AM), https://www.wsj.com/business/media/spotify-streaming-music-podcasts-audiobooks-3e88180d.

[79] Will Oremus & Naomi Nix, *Teens Still Love Snapchat. But its Business is Struggling to Grow Up*, WASH. POST (Sept. 11, 2022, 7:00 AM), https://www.washingtonpost.com/technology/2022/09/11/snapchat-layoffs-apple-tiktok.

[80] Sentius Int'l, LLC v. Microsoft Corp., No. 5:13-cv-00825, 2015 WL 51950 (N.D. Cal. Jan. 27, 2015).

[81] John F. Coyle & Gregg D. Polsky, *Acqui-Hiring*, 63 DUKE L. J. 281, 283–84 (2013).

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Each of these phenomena play a role in explaining why the cycles of Schumpeterian competition that have long characterized the tech industry have stalled in the internet space over the past twenty years. But even taken together, they can't be the whole story. Each of these effects was true to at least some extent in prior eras. Microsoft enjoyed strong network effects in the 1990s as the dominant maker of operating system software – far more dominant than it is today. It cloned internet browser technology from upstarts like Netscape, and it engaged in anticompetitive conduct designed to ensure that it, not Netscape, became the browser of choice.[82] But Microsoft's victory over Netscape was short-lived. New startups – Mozilla and then Google – came out of nowhere and took the market away from it. Microsoft still benefits from network effects, and it still uses cloning and self-preferencing to send users to its Edge browser. But it doesn't work. Microsoft employed all the tools of a dominant firm in a network market, but it still faced disruption.

Why, then, are there no similar disruptions today? In the face of what Cory Doctorow has called the "enshittification" of the internet[83]—the decline in quality of service from each of the dominant players—why don't we see new startups swooping in from nowhere to change the market? In Part II, we suggest that the modern story includes one critical element missing from prior accounts: efforts by incumbents to coopt that disruption.

II. THE COOPTION PLAYBOOK

We start with the premise that the tech giants are smart. Their executive suites are filled with MBAs and engineers who have read Christensen's book or absorbed its logic from their social milieu. They realize the power of disruptive innovation, and they don't want to become the next IBM. And though they would not say so publicly, they realize that as a large incumbent, they will struggle to overcome the diseconomies of scale and develop disruptive innovations in-house. Imagine yourself as an executive at one of the tech giants tasked with preventing the company from being leapfrogged by disruptive competition. Despite the advantages of network effects and the possibility of cloning, past experience has shown that your current monopoly status is no guarantee against future disruption. What to do?

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[82] United States v. Microsoft Corp., 253 F.3d 34, 58–79 (D.C. Cir. 2001).

[83] Cory Doctorow, *The Moral Injury of Having Your Work Enshittified*, MEDIUM (Nov. 25, 2023), https://doctorow.medium.com/the-moral-injury-of-having-your-work-enshittified-2860c586ed44; Cory Doctorow, *The 'Enshittification' of TikTok*, WIRED (Jan. 23, 2023, 12:44 PM), https://www.wired.com/story/tiktok-platforms-cory-doctorow.

We think you would take four steps. First, you would learn as much as you can about which companies had the capability to develop disruptive innovations and try to steer them away from competing with you – perhaps by partnering with them, or perhaps by investing in them. Second, you would make sure that those companies could not access the critical resources they would need to transform their innovation into a disruptive product. Third, you would tell your government relations team to seek regulation that would build a competitive moat around your position and keep disruption out. Fourth, if one of the companies you were tracking nevertheless did start to develop a disruptive product, you would want to extract that innovation—and choke off the potential competition—in an acquisition.

That is precisely what the tech giants are doing. They have built a powerful reconnaissance network covering emerging competitive threats by investing in startups as corporate VCs and by cultivating relationships with financial VCs. They have accumulated massive quantities of data that are essential for many software and AI innovations, and they dole out access to this data and to their networks selectively. They have asked legislators to regulate the tech industry—in a way that will buttress incumbents. And they have repeatedly bought potentially competitive startups in a way that has flown—until a few years ago—below the antitrust radar. Together, we call these strategies coopting disruption.

Cooption is hard to observe because each of these strategies are dual-purpose. A large incumbent tech firm without the slightest anticompetitive intent would want to learn about and perhaps invest in technologies relevant to their business, collect and carefully control the use of data and access to its network, influence the regulation of its business, and acquire startups with valuable technologies and talented engineers. In some cases, the executives undertaking these strategies may not even be consciously motivated by anticompetitive goals. But over time these strategies have rewired Silicon Valley so that disruptive innovation is less likely. Whether intentional or not, cooption has forestalled competition.

A. Coopting Venture Capital

The incubator of disruptive competition is the venture capital market. Each of the tech giants was born as a venture-backed startup. And today venture capital continues to fuel rapid growth. Even though venture-backed startups are increasingly likely to exit by acquisition than IPO,[84] companies that raise venture capital are still much more likely to have an IPO than other new businesses.[85] Once they go public, former venture-backed startups grow faster

[84] Lemley & McCreary, *supra* note 11, at 26.

[85] Lemley & McCreary, *supra* note 11, at 27–28.

than other newly public companies.[86] And the venture capital market does not just produce fast-growing companies—it produces more innovative companies. To take just one example, patents developed at venture-backed startups are more original, more generic, and more highly cited than patents at other companies.[87]

Venture capital relies on disruption. The business model takes significant risk in hopes that while most venture-backed companies will fail, a few will succeed spectacularly.[88] And when they do succeed, it is either by opening an entirely new market (rare) or disrupting an existing one. Indeed, you can't have a conversation in the VC world without the term "disruption" coming up repeatedly. Venture capital, then, is a well-recognized funding source for disruptive technologies, and its success has been one of the chief drivers of the cycle of Schumpeterian competition that has propelled US innovation beyond its foreign counterparts. That also means that tech giants hunting for disruptive competition know where to look.

The tech giants coopt the venture capital market in two ways. They invest directly in startups through corporate venture capital.[89] And they cultivate relationships with independent or financial VCs. These investments and relationships provide them with valuable competitive reconnaissance and influence over startups in their fields and help them steer startups in a direction that aligns with their competitive interests.

1. Corporate VC

Each of the tech giants has made large investments in startups. The structure through which they make these investments varies. Alphabet's GV (formerly Google Ventures) is the industry leader, with over $8 billion in assets under management.[90] Microsoft's VC arm, now called M12, was founded in

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[86] *See* Josh Lerner & Ramana Nanda, *Venture Capital's Role in Financing Innovation: What We Know and How Much We Still Need to Learn*, 34 J. ECON. PERSPS. 237, 239–40 (2020).

[87] Sabrina Howell, *How Resilient is Venture-Backed Innovation? Evidence from Four Decades of U.S. Patenting* 2 (Nat'l Bureau of Econ. Rsch. Working Paper No. 27150, 2020).

[88] Brian J. Broughman & Matthew T. Wansley, *Risk-Seeking Governance*, 76 VAND. 1299, 1318 (2023).

[89] For background on corporate venture capital, *see* Darian M. Ibrahim, *Corporate Venture Capital*, 24 UNIV. PA. J. BUS. L. 209, 222–24 (2021); Jennifer S. Fan, *Catching Disruption: Regulating Corporate Venture Capital*, 2018(2) COLUM. BUS. L. REV. 341, 350 (2018).

[90] GV - ABOUT, https://www.gv.com/about (last visited Jan. 18, 2024).

2016, but since then has made about 285 investments.[91] Amazon has a dedicated venture fund—the $1 billion Industrial Innovations Fund.[92] Meta created a New Products Experimentation team, which has made early-stage investments.[93] Apple is an active venture investor too—it famously invested $1 billion in Didi Chuxing, the Uber of China.[94] But it tends to keep its investments (like most of the rest of its plans) quiet.

Corporate venture investments provide valuable reconnaissance. Over a decade ago, Josh Lerner extolled corporate VC investments in the *Harvard Business Review*, explaining that a "venture fund can serve as an intelligence-gathering initiative, helping a company protect itself from emerging competitive threats."[95] In fact, corporate VCs don't even need to make an investment to begin the reconnaissance. It is typical for VCs to vet many more startups than they ultimately choose to invest in. Corporate VCs with the power to write a big check—and all the tech giants can write big checks—will find it easy to get startups to pitch to them. In these pitch meetings, the corporate VCs can learn about a startup's team, its technology, and its business plan. And they can ask follow-up questions about which companies the startup views as its competitors, what obstacles it foresees to bring the technology to market, and what early data suggests about market interest. The standard practice in pitch meetings is that VCs do not sign NDAs,[96] so information can flow back to the mothership. Since a pitch meeting does not trigger any legal obligation, the tech giants can use what they learn from vetting to clone the company's technology or recruit away its key engineers.

From the startups they vet, the tech giants can then select a smaller number of for investment. If they lead a financing round, they typically get the right to designate a person to serve on the board of directors.[97] Even if they merely

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[91] PITCHBOOK, *M12 Overview*, https://pitchbook.com/profiles/investor/160474-78#overview (last visited Jan. 19, 2024).

[92] Amazon Staff, *Learn About Amazon's $1 Billion Industrial Innovation Fund and How it's Expanding in 2024*, AMAZON (Jan. 17, 2024), https://www.aboutamazon.com/news/operations/amazon-industrial-innovation-fund.

[93] Sarah Perez, *Meta's NPE Team Takes a Global Focus with Seed-Stage Investments, Offices in Emerging Markets*, TECHCRUNCH (Dec. 2, 2021, 1:14 PM), https://techcrunch.com/2021/12/02/metas-npe-team-takes-a-global-focus-with-seed-stage-investments-offices-in-emerging-markets.

[94] Mike Isaac & Vindu Goel, *Apple Puts $1 Billion in Didi, a Rival Uber in China*, N.Y. TIMES (May 12, 2016), https://www.nytimes.com/2016/05/13/technology/apple-puts-1-billion-in-didi-a-rival-to-uber-in-china.html.

[95] Josh Lerner, *Corporate Venturing*, HARV. BUS. REV. (Oct. 2013), https://hbr.org/2013/10/corporate-venturing.

[96] Mike Lincoln, *Should You Require a Signed NDA From a Potential VC Investor?*, COOLEYGO (June 14, 2023), https://www.cooleygo.com/should-you-require-a-signed-nda-from-a-potential-investor.

[97] *See* NOAM WASSERMAN, THE FOUNDER'S DILEMMAS 285 (2012).

follow other investors, they can bargain for the right to name a board observer.[98] At board meetings, directors and observers get updates on the company's finances, technological progress, commercial deals, and important hires. Unlike in large public companies, startup boards get deeply involved in management.[99] They give strategic advice, make connections, and approve major corporate decisions.

Corporate VCs can use the information they gain from board meetings to assess the competitive threat and respond accordingly. If they decide the startup poses no threat, their loss is capped at their investment and their employee's time. They may learn that another startup in the same industry is the real threat and decide to acquire that startup instead. If they decide the startup is developing a potentially disruptive technology and does pose a competitive threat, they have a range of options. They can propose a corporate partnership. They can set up a joint venture. Or they can acquire the startup.[100]

A corporate VC serving as a startup director can also subtly influence the company's strategy. They can steer the company to develop the technology in a way that complements the tech giant's business or steer it towards a market where it will be less of a competitive threat. True, directors have a fiduciary duty to the companies they serve.[101] They are required to disclose conflicts of interest and recuse themselves if necessary.[102] But that law is rarely enforced because no one inside the board has an incentive to bring a lawsuit. The other directors will be founders, other senior managers, other corporate VCs, or financial VCs. Founders and managers don't want to alienate potential acquirors. And, as we will see below, financial VCs don't want to alienate potential acquirors either.

2. Financial VC

Most venture investments are made by independent or financial VCs—firms like Sequoia, Benchmark, or Andreesen Horowitz.[103] You might think

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[98] *See* Fan, *supra* note 89, at 413–14.

[99] Gilson, *supra* note 35, at 1085.

[100] *See* U.S. DEP'T JUST. & FED. TRADE COMM'N, MERGER GUIDELINES 17 (2023) ("A merger that gives the merged firm increased visibility into competitively sensitive information could undermine rivals' ability or incentive to compete aggressively or could facilitate coordination.").

[101] In re Trados Inc. S'holder Litig., 73 A.3d 17, 20 (Del. Ch. 2013).

[102] Antitrust law prohibits the same individual from serving on the boards of competing companies, but recent evidence shows that law is routinely violated. Anoop Manjunath et al., *Illegal Interlocks in Life Science Boards of Directors*, 10 J. L. & BIOSCIENCES (forthcoming 2024) (draft at 6–7). And in any event, managers or product developers at tech giants who serve on the boards of startups may not be officers or directors of their home institution, and so do not fit within the letter of the law. For evidence on the scale of this problem, *see* Mark A. Lemley & Rory van Loo, *Common Directorship* (Working Paper, 2024).

[103] Fan, *supra* note 89, at 351.

that investors who pride themselves on building new companies and invoke the rhetoric of disruptive innovation would be hostile to the tech giants. You might even think that they would support greater antitrust enforcement to level the playing field for the new entrants they fund. But in practice, many leading VCs are outspoken defenders of the tech giants.[104] It's good for business.

VCs make money when their funds deliver returns to their limited partners (LPs). VCs get to keep a share of the profits in the form of carried interest.[105] And they develop a track record that helps them raise new funds, which means more management fees and more opportunities for carried interest. A VC fund makes money when one or more of the companies in its portfolio has a successful exit.[106] Most successful exits are acquisitions or IPOs, and in recent years, startups are increasingly exiting by acquisition rather than IPO.[107]

Financial VCs and acquirors are repeat players. VCs know that there are a finite number of companies that can acquire the startups they fund. And they know that there are an even smaller number of companies that can acquire a startup at a price that will deliver the exponential returns on which their business depends. Venture returns follow a power law.[108] Most of the profits in a successful venture portfolio will come from a small number of exits—often just one—that return 10x or more.[109] And the returns of the top VC funds are even spikier—they have more strikeouts but also more grand slams.[110] VC careers are increasingly built on a small number of high value acquisitions. Therefore, it is extremely useful for VCs to be on good terms with the corporate development arms of the tech giants.

The tech giants understand all this, so they cultivate relationships with the leading VCs. Although there are many VC firms, the performance of VC firms is remarkably consistent over time.[111] This is in part because most startups want to take investment from the most prestigious VC firms, so the top VC firms often land the most promising startups. The tech giants only need relationships with a small number of firms to get a clear view of the competitive landscape and an inside track to acquiring potential competitive threats.

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[104] Transcript, *supra* note 76, at 7–8.

[105] Gilson, *supra* note 35, at 1072.

[106] Lemley & McCreary, *supra* note 11, at 36.

[107] Lemley & McCreary, *supra* note 11, at 26.

[108] *See* MALLABY, *supra* note 40, at 7–9.

[109] *Id.* at 8–9.

[110] Chris Dixon, *Performance Data and the 'Babe Ruth' Effect in Venture Capital*, ANDREESSEN HOROWITZ (June 8, 2015), https://a16z.com/performance-data-and-the-babe-ruth-effect-in-venture-capital.

[111] Ramana Nanda et al., *The Persistent Effect of Initial Success: Evidence from Venture Capital*, 137 J. FIN. ECON. 231, 237 (2020).

The upshot of the mutually beneficial relationship between the tech giants and elite financial VCs is that sometimes the tech giants don't even need to steer startups in their direction. Their good friends at Sequoia will do that for them.

Now, to be sure, the best strategy for founders and VCs may be subtle. The tech giants will pay more for a startup if they believe it poses a real competitive threat. Founders and VCs lose leverage by appearing desperate to sell. So a savvy startup may engage in costly behavior that signals that they are willing to compete, while at the same time engaging in friendly negotiations to sell. But even if they haven't invested themselves, the tech giants are in a position to monitor the startups funded by their friends in the VC community, and to offer them a profitable exit in the form of an acquisition if and when they view the startup as a risk.

B. Leveraging Access to Data and Networks

The tech giants have another powerful source of leverage for cooption—access to their data and their networks.

Tech companies famously have enormous amounts of data about their customers. Alphabet knows what we search for, which websites we visit, and where we travel, and, for half the population, what we are doing on our phones. Amazon knows what we shop for and how much we are willing to pay for a range of products and services. Apple knows, for the other half of the population, what we are doing on our phones. Meta knows who our friends are. Microsoft knows who our colleagues are.

The tech giants' data has tremendous value for their businesses.[112] It helps them develop better products and to decide how to market them and price them. The tech giants can train neural networks on this data, which will enable them to build more powerful artificial intelligence.

That value doesn't just come from the willingness of others to buy information; in many cases it is intrinsic to the success of the product itself.[113] Search engines that know from experience what people are looking for perform much better than those that don't. Social media firms need to know who you might want to connect to. And shopping sites want to be able to offer you the products you want. Incumbents have all that information. It would be difficult for a new entrant to acquire similar datasets independently because most of the markets that generate this data are highly concentrated and have strong network effects or other barriers to entry.

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[112] Maurice E. Stucke, *Should We Be Concerned About Data-opolies?*, 2 GEO L. TECH. REV. 275, 293–94 (2018).

[113] *Id.* at 294.

The same data also has tremendous value on the open market.[114] Accordingly, one might think that that tech giants would be eager to sell this data to any firm willing to pay the right price. But that would be taking a short-term view. Selling data to a startup could turn them from a potential competitor into a genuine threat. The savvier strategy is to use access to data as leverage to get potential competitors to cooperate.

We know that at least one of the tech giants selectively withholds data from its potential competitors. In 2013, a startup Six4Three introduced a creepy iPhone app called Pikinis, which enabled users to find their friends' swimsuit photos on Facebook.[115] In 2015, Facebook—quite reasonably!—cut off Six4Three's access to this data. Six4Three responded by suing Facebook, alleging unfair competition.[116] That lawsuit was going nowhere; Facebook wasn't in competition with Six4Three, and in any event had reason to cut off access to a company that was violating its terms of service. But internal Facebook documents produced in discovery in the Six4Three litigation leaked to the press.[117] The documents showed that Facebook was selectively doling out access to data to companies that were cooperating and withholding it from companies that were competing.[118]

For example, Facebook gave Amazon access to user data because they were advertising on Facebook.[119] But it cut off the startup MessageMe once it grew large enough that it looked like a potential competitor.[120] In one email, a Facebook manager proposed dividing apps into "three buckets: existing competitors, possible future competitors, [or] developers that we have alignment

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[114] *Id.* at 286, 294, 321–22.

[115] Nina Bahadur, *Pikinis App Will Let Facebook Friends Find Your Bikini Pictures Even Faster*, HUFFPOST, (Apr. 25, 2013, 10:34 AM), https://www.huffpost.com/entry/pikinis-app-facebook-bikini-pictures_n_3154275.

[116] Six4Three, LLC v. Facebook, Inc., No. 17-00359, 2017 WL 657004, at *1 (N.D. Cal. Feb. 17, 2017) (remanding Six4Three's unfair competition suit to Superior Court).

[117] Deepa Seetharaman, *Facebook's Latest Headache is a Bikini App That Shut Down in 2015*, WALL ST. J. (Nov. 25, 2018, 6:49 PM), https://www.wsj.com/articles/facebooks-latest-headache-is-a-bikini-app-that-shut-down-in-2015-1543189776.

[118] Gabriel J.X. Dance et al., *As Facebook Raised a Privacy Wall, It Carved an Opening for Tech Giants*, N.Y. TIMES (Dec. 18, 2018), https://www.nytimes.com/2018/12/18/technology/facebook-privacy.html; Deepa Seetharaman & Kirsten Grind, *Facebook Gave Some Companies Special Access to Additional Data About Users' Friends*, WALL ST. J. (June 8, 2018, 7:28 PM), https://www.wsj.com/articles/facebook-gave-some-companies-access-to-additional-data-about-users-friends-1528490406?mod=article_inline.

[119] Dance et al., *supra* note 118.

[120] Olivia Solon & Cyrus Farivar, *Mark Zuckerberg Leveraged Facebook User Data to Fight Rivals and Help Friends, Leaked Documents Show*, NBC NEWS (Apr. 16, 2019, 4:30 AM), https://www.nbcnews.com/tech/social-media/mark-zuckerberg-leveraged-facebook-user-data-fight-rivals-help-friends-n994706.

with on business models" and restricting data access accordingly.[121] Developers in the non-competing category "were able to regain access by agreeing to make mobile advertising purchases or provide reciprocal user data to Facebook."[122] Facebook presented these policy changes to the public as a win for user privacy.[123]

When tech giants selectively share and withhold data, they send messages to startups deciding how to commercialize their innovations. Develop it in a way that could lead to competition, and we will cut you out. Develop your technology in a way that complements our existing products, and we will give you the data you need. And in fact, if you really want to take advantage of our resources, you could join us.

Control over access isn't limited to data. Because of network effects, in many cases startups in adjacent fields need access to the incumbent's network itself. We're not talking here about opening access to direct competitors in the platform market itself; it's not surprising that that doesn't happen. But the platform companies for the most part got where they are today by opening their platform to all comers in adjacent markets – upstream suppliers and downstream consumers. Amazon made its fortune not just by selling products but by providing a platform where anyone could sell products. Facebook wants to connect everyone to each other, and Google declared its mission to be to organize all the world's information and make it accessible and useful.[124]

Once they became dominant, though, many platform companies saw an advantage in cutting off access to the platform to some companies they viewed as competitors, either because they were in an upstream market in which the platform also competed or because the platform feared the company might use its product as a springboard to bypass the platform altogether. Facebook, which long had open APIs allowing people to search its site and cross-post to multiple sites, closed those APIs in 2013, shortly after it won the social media competition.[125] Microsoft, fearful (with good reason, it turned out) that internet browsers might one day become "middleware" that would reduce or even eliminate the need for a PC operating system, sought to degrade Netscape

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[121] Katie Paul & Mark Hosenball, *Facebook Executives Planned 'Switcharoo' on Data Policy Change: Court Filings*, REUTERS (Nov. 6, 2019, 7:37 AM), https://www.reuters.com/article/us-facebook-antitrust/facebook-executives-planned-switcharoo-on-data-policy-change-court-filings-idUSKBN1XG1QP.

[122] *Id.*

[123] *Id.*; Rory Van Loo, *Privacy Pretexts*, 108 CORNELL L. REV. 101, 102 (2022).

[124] META, https://investor.fb.com/resources/default.aspx (last visited Jan. 18, 2024); GOOGLE, https://www.google.com/search/howsearchworks/our-approach, (last visited Jan. 18, 2024). Apple is a notable exception here; it has been a closed ecosystem from the outset.

[125] Substitute Amended Complaint at 4–5, F.T.C. v. Facebook, Inc., 581 F. Supp. 3d 34 (D.D.C. 2022).

Navigator's access to customers through their PCs.[126] And Apple, which controls whether you can load an app on your iPhone, has cut Epic Games off entirely from the app store after a dispute over Apple's 30% fee, and spent years slow-walking the access of sites like Spotify and Netflix that it saw as competing with its own music and video offerings.[127]

Even if they don't preclude access entirely, incumbents can interfere with their rivals in numerous small ways, from slow-walking approvals on the app store to delaying the shipping of goods to links that fail unexpectedly.[128] Firms with the ability and incentive to foreclose rivals dependent on access to their network exist at the mercy of the dominant firm.[129]

In a network market, cutting out participants costs money. It reduces the size and therefore the value of the network. Incumbents do it selectively, when they think that doing so will benefit them by heading off potentially disruptive competition.

C. Inviting Regulation

The next play in the cooption playbook is a surprising one: inviting regulation. One might be forgiven for assuming that regulation is something governments do to rein in big companies over their objection. And that is sometimes true. But not always.

Something remarkable began happening in 2019: Facebook began taking out full-page ads in major newspapers encouraging governments to regulate the internet.[130] Mark Zuckerberg even wrote an op-ed in the Washington Post arguing for greater regulation.[131] Others have gotten in on the act. OpenAI's CEO Sam Altman—whom we'll meet again below—told the U.S. Congress

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[126] United States v. Microsoft Corp., 253 F.3d 34, 50 (D.C. Cir. 2001); Robin Feldman, *Defensive Leveraging in Antitrust*, 87 GEO. L. J. 2079, 2098–99 (1999).

[127] Epic Games, Inc. v. Apple, Inc., 67 F.4th 946, 969 (9th Cir. 2023); Jill Disis, *Apple Relaxes App Store Rules for Services Such as Spotify and Netflix*, CNN BUS. (Sept. 3, 2021, 12:10 AM) https://www.cnn.com/2021/09/02/tech/apple-app-store-changes-intl-hnk/index.html.

[128] *See* Illumina, Inc. v. FTC, 88 F.4th 1036, 1053 (5th Cir. 2023) ("[T]here are myriad ways in which [a dominant firm] could engage in foreclosing behavior . . . such as by making late deliveries or subtly reducing the level of support services.").

[129] U.S. DEP'T JUST. & FED. TRADE COMM'N, *supra* note 100, at 14–15.

[130] Will Duffield, *About Those Facebook Ads Calling for More Internet Regulation*, CATO INST. (Feb. 7, 2022), https://www.cato.org/commentary/about-those-facebook-ads-calling-more-internet-regulation.

[131] Mark Zuckerberg, *Mark Zuckerberg: The Internet Needs New Rules. Let's Start in These Four Areas*, WASH. POST (Mar. 30, 2019, 3:00 PM), https://www.washingtonpost.com/opinions/mark-zuckerberg-the-internet-needs-new-rules-lets-start-in-these-four-areas/2019/03/29/9e6f0504-521a-11e9-a3f7-78b7525a8d5f_story.html.

that it should regulate AI.[132] So has Sundar Pichai, the head of Google,[133] Tim Cook of Apple,[134] and Microsoft President Brad Smith.[135]

What's going on here? To be sure, some of this is posturing. Companies can see the ways the political winds are blowing, and if they think regulation is inevitable, they may try to get out in front of the wave in hopes that they can shape the form of that regulation.

But we think there is more to it than that. While companies generally don't like regulation, the one thing they hate even more is competition.[136] And regulation often serves to restrict competition.[137] Sometimes it does so directly. A variety of regulations, passed for some combination of good and bad reasons, restrict or affirmatively prohibit competition in a series of important markets. Some were passed because we believed competition wouldn't work in the industry, and a promise to prevent competition was part of the bargain for price regulation. We abandoned those entry restrictions in a host of markets from the 1970s to the 1990s, and in virtually every case (ground transportation, air travel, telephony, electric power, taxis, and hotels) it turned out that both competition and innovation were possible in markets we once thought weren't amenable to competition.[138] The Biden Administration has taken further steps to try to eliminate regulatory rules that prevent entry.[139]

Many of the entry-preventing regulations seemed like a good idea when they were implemented. They served social goals. AT&T's monopoly stopped

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[132] Cecilia Kang, *OpenAI's Sam Altman Urges A.I. Regulation in Senate Hearing*, N.Y. TIMES (May 16, 2023), https://www.nytimes.com/2023/05/16/technology/openai-altman-artificial-intelligence-regulation.html.

[133] James Vincent, *Alphabet CEO Sundar Pichai Says There is 'No Question' That AI Needs to be Regulated*, VERGE (Jan. 20, 2020, 5:30 AM), https://www.theverge.com/2020/1/20/21073682/ai-regulation-google-alphabet-ceo-sundar-pichai.

[134] Jason Nelson, *AI Needs 'Rules of the Road': Apple CEO Tim Cook*, EMERGE (Nov. 21, 2023), https://decrypt.co/206985/tim-cook-on-ai-regulation-apple-ceo.

[135] David McCabe, *Microsoft Calls for A.I. Rules to Minimize the Technology's Risks*, N.Y. TIMES (May 25, 2023), https://www.nytimes.com/2023/05/25/technology/microsoft-ai-rules-regulation.html.

[136] *See* Lemley, *supra* note 19.

[137] George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON & MGMT. SCI. 3, 5 (1971).

[138] *See* Mark A. Lemley & Mark P. McKenna, *Unfair Disruption*, 100 B.U. L. REV. 71, 78–82 (2020).

[139] *FACT SHEET: White House Competition Council Announces New Actions to Lower Costs and Marks Second Anniversary of President Biden's Executive Order on Competition*, WHITE HOUSE (July 19, 2023), https://www.whitehouse.gov/briefing-room/statements-releases/2023/07/19/fact-sheet-white-house-competition-council-announces-new-actions-to-lower-costs-and-marks-second-anniversary-of-president-bidens-executive-order-on-competition.

the development of incompatible telephone networks that couldn't communicate with each other.[140] Power company monopolies were thought necessary to spur investment in a wide electric grid.[141] And taxi regulations theoretically served public safety by preventing unscrupulous people from robbing customers—and unscrupulous customers from robbing cabbies.[142] But in each case they also reduced consumer choice, reduced the incentive to invest in quality, and prevented full price competition.[143] Worse, they discouraged innovations that would have (and eventually did) make those technologies cheaper and better.

Even when barriers to entry were adopted for good reasons, long experience shows that the industry beneficiaries can and will game the regulatory system to protect themselves from competition.[144] There is good reason to regulate entry into the pharmaceutical industry, for instance, and good reason to reward innovation in that industry with a temporary monopoly in the form

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[140] *See* JERRY KANG & ALAN BUTLER, COMMUNICATIONS LAW AND POLICY: CASES AND MATERIALS 293 (7th ed. 2020) (describing how even "customer premises equipment" makers, once they finally won the right to connect to AT&T's network with their own handheld phones, initially had to use a "Protective Connection Arrangement" device in order to ensure the network survived).

[141] *See* Paul L. Joskow & Richard Schmalensee, *Incentive Regulation for Electric Utilities*, 4 YALE J. REGUL. 1, 35 (1986) (recounting traditional rationale for monopoly regulation).

[142] *See* GRAHAM RUSSELL GAO HODGES, TAXI!: A SOCIAL HISTORY OF THE NEW YORK CITY CABDRIVER 130–35 (2007) (describing incremental increases in regulation to combat crime, discrimination, and other issues in New York City).

[143] For telephony, see Nicholas Economides, Katja Seim & V. Brian Viard, *Quantifying the Benefits of Entry into Local Phone Service*, 39 RAND J. ECON. 699, 725 (2008) (finding welfare gains from firm differentiation and choice, though not from retail price).

For taxis and Uber, theory strongly suggests that Uber's entry would reduce cost, as foregone compliance costs and increased supply should act to reduce cost and price. *But cf.* Vsevolod Salnikov et al., OpenStreetCab: Exploiting Taxi Mobility Patterns in New York City to Reduce Commuter Costs 2 (Mar. 10, 2015) (unpublished manuscript), https://arxiv.org/abs/1503.03021 [https://perma.cc/MR68-95P4] (suggesting that Uber may only be cheaper in NYC for trips that would otherwise cost more than thirty-five dollars per cab).

For electricity sectors, see Paul L. Joskow, *Deregulation and Regulatory Reform in the U.S. Electric Power Sector* 121 (MIT Ctr. for Energy & Env't Pol'y Rsch., Working Paper No. 00-003, 2000), https://dspace.mit.edu/bitstream/handle/1721.1/44967/2000-003.pdf [https://perma.cc/4PFR-YMBY] (finding that deregulation led to "retail price reductions . . . in . . . states that have already implemented reforms," yet noting that these price reductions so far have been achieved less by market forces than by regulators managing the transition towards competition—and enjoying a strong bargaining position as a result).

[144] *See* Stacey L. Dogan & Mark A. Lemley, *Antitrust Law and Regulatory Gaming*, 87 TEX. L. REV. 685 (2009).

of patent protection.[145] But the industry has become expert at gaming both of those systems to extend control and prevent competition long after patents and regulatory exclusivity should have expired.[146] Companies in other regulated industries, like electric power, are also adept at capturing regulators and using regulation to prevent innovation that threatens their monopoly.[147] That doesn't mean we don't need behavioral regulation, but it does raise the specter of "regulatory capture" – of agencies that come over time to serve the interests of the capitalists they are supposed to be holding in check.[148]

Regulation can also inhibit competition in more subtle ways – ways that disproportionately target disruptive startups. First, regulation can impose standardization, with the government setting rules on what products can and can't do. That is precisely what the AI giants are calling for, for instance.[149] And regulation that limits product variety – that mandates a conception of what the industry should look like – tends to favor the players who have already built an industry around that vision and don't want it disrupted. Startups with a different model need not apply, because the regulators have regulated (generally in good faith) with a static vision of what the industry might do.

Second, complying with regulations takes time and money. Incumbents have both; startups generally don't. So persuading the government to impose rules that require companies to hire compliance officers, file reports, and especially to change how they design and build products are likely to disproportionately affect small startups who can least afford to bear those costs. Worse, the startups may not know the regulations even exist or have the in-house

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[145] *See* Roberto Mazzoleni & Richard R. Nelson, *The Benefits and Costs of Strong Patent Protection: A Contribution to the Current Debate*, 27 RSCH. POL'Y 273 (1998) (highlighting studies concluding that the pharmaceutical industry is one of the few sectors in which patents are consistently effective and necessary to recoup firms' financial investments).

[146] On the problems of evergreening of pharmaceutical patents, abuse of the regulatory exclusivity, and collusive settlements that pay competitors to stay out of the market, see HERBERT HOVENKAMP ET AL., 1 IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW chs. 15–16 (3d ed. 2011).

[147] *See* Lemley & McKenna, *supra* note 138, at 78 ("Incumbents often use regulation to insulate themselves from competition. A long literature discusses the history of incumbents warping regulations originally intended to check their power into tools for protecting themselves against disruptive entry."). In California, the electric utilities persuaded the Public Utilities Commission to radically increase the price and reduce the benefits of installing solar power because its success was a threat to their business model. *See* Deven R. Desai & Mark A. Lemley, *Scarcity, Regulation, and the Abundance Society*, *in* 7 FRONTIERS RESEARCH METRICS AND ANALYTICS 1 (Jan. 25, 2023) (discussing this history).

[148] To be fair, this kind of market-restrictive regulation can also provoke disruptive entry, as taxi regulation did for Uber and Lyft. *See, e.g.*, Bryan Casey, *Uber's Dilemma: How the ADA May End the On-Demand Economy*, 12 UNIV. MASS. L. REV. 124, 138–40 (describing transportation network company efforts to avoid traditional taxi regulations by claiming status as a mere "platform"); Lemley & McKenna, *supra* note 138; Stigler, *supra* note 137, at 9.

[149] *See e.g.*, Kang, *supra* note 132.

expertise to comply with them. That gives incumbents another opportunity to head off disruption by filing lawsuits and regulatory complaints. And as Lemley and McKenna have documented, incumbents regularly take advantage of this, using lawsuits and regulatory complaints to try to prevent competitors gaining a foothold.[150]

D. Acquiring Potential Competitors

The final weapon in the cooption arsenal is simple and effective: buy up the company that might otherwise disrupt you.

In the last two decades, each of the tech giants has acquired many startups that either competed in their market or in adjacent markets. Some of the most valuable deals include Google's acquisitions of DoubleClick and YouTube; Amazon's acquisitions of PillPack and Zappos; Apple's acquisitions of Beats Electronics and Shazam; Microsoft's acquisitions of GitHub and LinkedIn; and Facebook's acquisitions of Instagram and WhatsApp.[151] But those are the ones we've heard of, because the companies were sufficiently large and the products are still around. There are hundreds, probably thousands, of smaller acquisitions of companies you've never heard of – and now never will. Incumbent monopolists can and do often pay a premium over what other potential acquirers would pay, making a tech giant acquisition attractive for many startups.[152] The question is *why* tech companies are willing to pay more than others to buy a startup. It may be the promise of greater synergy, but it may also be a desire to coopt disruption.

The logic of cooptive acquisitions was well articulated by Mark Zuckerberg. In 2012, in an email to Facebook's COO, he wrote: "I've been thinking recently about how much we should be willing to pay to acquire mobile app companies like Instagram and Path that are building networks that are competitive with our own."[153] The companies are small, Zuckerberg stated, but they are growing quickly, "the networks are established, the brands are already meaningful and if they grow to a large scale they could be very disruptive to us."[154]

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[150] Lemley & McKenna, *supra* note 138.

[151] H.R. REP. NO. 117-8, *supra* note 45, at 344–47, 349–50, 355; *Microsoft to Acquire GitHub for $7.5 billion*, MICROSOFT (June 4, 2018), https://news.microsoft.com/2018/06/04/microsoft-to-acquire-github-for-7-5-billion; *Microsoft to Acquire LinkedIn*, MICROSOFT (June 13, 2016), https://news.microsoft.com/2016/06/13/microsoft-to-acquire-linkedin.

[152] Lemley & McCreary, *supra* note 11; C. Scott Hemphill & Tim Wu, *Nascent Competitors*, 168 UNIV. PA. L. REV. 1879 (2020).

[153] Casey Newton & Nilay Patel, *'Instagram can hurt us': Mark Zuckerberg Emails Outline Plan to Neutralize Competitors*, VERGE (July 29, 2020, 2:07 PM), https://www.theverge.com/2020/7/29/21345723/facebook-instagram-documents-emails-mark-zuckerberg-kevin-systrom-hearing.

[154] *Id.*

Zuckerberg tried to take back what he said the next morning. He wrote in another email: "I didn't mean to imply that we'd be buying them to prevent them from competing with us in any way. Buying them would give us the people and time to incorporate their innovations into our core products." But then in a private message on the day that Facebook bought Instagram, Zuckerberg told another colleague: "I remember your internal post about how Instagram was our threat and not Google+. You were basically right. The thing about startups though is you can often acquire them."[155]

Zuckerberg's own statements make it clear that Facebook's motivation for buying Instagram was at least partially anticompetitive. But the hard problem for antitrust law is that it is often hard to tell whether a startup acquisition is anticompetitive. These acquisitions do not resemble the mergers between established firms that antitrust law is accustomed to policing. In some cases, the merger will be horizontal (two firms in the same market), but the startup will have too small a market share at the time of the merger to be confident about the effects on concentration.[156] In some cases, the merger will be vertical (two firms at different points in the supply chain) and thus subject to less demanding scrutiny. And in some cases, the merger will be conglomerate (two firms in adjacent or unrelated markets), which are rarely successfully challenged.[157]

We will come back to antitrust law in Part IV. But for now, we want to focus on a different question—what impact do different kinds of startup acquisitions have on technological progress? Is the acquisition synergistic or coopting? We can gain insight into this question based on what the acquiror does with the startups' assets and employees after the acquisition.

1. Synergistic Acquisitions

A synergistic acquisition is a sale after which the assets and employees of an acquired startup are put to a more productive use after the acquisition. In a typical acquisition in which one of the tech giants buys a startup, this will be the defense. And the defense is sometimes meritorious.

Schumpeter's arguments for why the large incumbents are better equipped to innovate are relevant again here. The tech giants have economies of scale, easier access to markets, economies of scope (and thus the ability to internalize innovation spillovers), and a lower cost of capital. There are some products for which these capabilities are critical to successful commercialization.

The classic example of successful synergistic acquisitions is Cisco. In the 1990s, Cisco was the dominant player in the market for computer networking

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[155] *Id.*

[156] Robin C. Feldman & Mark A. Lemley, *Atomistic Antitrust*, 63 WM. & MARY L. REV. 1869, 1895–1900 (2022).

[157] Hovenkamp, *supra* note 66, at 2042.

software and hardware.[158] Cisco achieved a 65% share of the market for routers LAN networks.[159] In those years, networking technology was evolving quickly, and companies were experimenting with novel ideas. Even though Cisco was large firm, it did not have the R&D capabilities to try out every plausible idea. Cisco realized, though, according to Gilson, that "[i]f venture capitalists funded startups that pursued alternative solutions to the technology problem, then Cisco could acquire the company that won the technology race in time to have a product to market when it was needed."[160] Cisco would then pay a premium to the winner that would justify the VCs' bets. Cisco's "large market share and its extensive marketing and distribution system" got the new networking technologies to market faster than a startup might have.[161]

The Cisco story exemplifies how the venture capital market, as a market, is better at exploring a series of risky ideas than a firm with a single risk-averse gatekeeper. It also illustrates how the advantages of a large incumbent—in this case access to markets and existing customer relationships—can sometimes extract more market value out of a technology than a new entrant.

The tech giants like to present themselves as the modern-day Cisco. Barnett, drawing on the work of Geis, argues that Alphabet has shown the value of synergistic acquisitions with G Suite, its office productivity software.[162] He explains how each of its elements—Google Docs, Google Sheets, and Google Slides—was built on acquisitions of several startups.[163] Then he argues that G Suite as a package offers a more valuable competitor to Microsoft Office than any of the startups' individual applications would have been.[164] It is the ability to integrate startups' technologies and bring them to market, Barnett claims, that creates synergies.[165]

We do not dispute either of these examples. But we note that neither of them involves significant *post-acquisition innovation*. The startups did the innovating. The large incumbent provided the access to markets or the economies of scope. When a startup has developed its innovation to the point that something close to a product—and it cannot easily get traction in the market itself—it is plausible that combining it with the resources of an acquiror can add value. But that is often not the case.

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[158] Ronald J. Gilson, *Locating Innovation: The Endogeneity of Technology, Organizational Structure, and Financial Contracting*, 110 COLUM. L. REV. 885, 908 (2010).

[159] *Id.* at 908.

[160] *Id.* at 909.

[161] *Id.* at 909.

[162] Jonathan Barnett, *'Killer Acquisitions' Reexamined: Economic Hyperbole in the Age of Populist Antitrust*, 3 UNIV. CHI. BUS. L. REV. 36–41 (forthcoming 2024).

[163] *Id.* at 38–41.

[164] *Id.* at 40–41.

[165] *Id.* at 35.

Further, it is important to distinguish between scale and synergy. In many markets, including the ones we discuss in Part III, moving from startup to large player requires a healthy investment of money. Tech companies have plenty of money, and they can (and do) point to their ability to allow a startup to grow by investing the resources needed to scale the idea. But that's not synergy. The startup could also grow by borrowing money from a bank or getting an investment from a private equity firm, by going public, or by merging with a large company that is not in its market. And scaling in one of those ways, unlike acquisition by an incumbent, creates a new competitor in the marketplace.

Even if a combination is truly synergistic, there remains the further question of whether the acquisition by the incumbent was necessary to that synergy. In the G Suite example above, for instance, it is surely correct that combining a word processor, a slide generator, and a spreadsheet program into a single, compatible suite of products improves each of those products over the free-standing alternatives. People want to be able to move images, graphs, and text among their different files. But it doesn't necessarily follow that it was important that *Google* be the one to integrate those two. Perhaps Google being the integrator added value, or perhaps there is some reason the integration couldn't have been done by anyone else (though we are skeptical on the latter claim).

2. Cooptive Acquisitions

The flip side of a synergistic acquisition is a cooptive acquisition. Imagine a startup that has a good idea but still needs to develop the technology further to make it truly transformative. Maybe it has achieved a technical breakthrough but needs to turn it into a product. Maybe it has prototype that it needs to refine through beta testing. Or maybe it has developed a technology with multiple use cases, and it needs to experiment with different potential markets. In these cases, an acquisition – even one that also offers some potential synergies – could destroy a lot of value.

The tech giant will want to divert the development of the technology to reinforce its own dominance. It may kill the company altogether to avoid the risk of competition. Even if it doesn't, it may turn what could have been a disruptive innovation into a sustaining innovation. And even if the tech giant's executives sincerely want to continue to pursue the startup's innovation and disrupt their own business, industrial organization problems may prevent them from doing so. The middle managers in between the executives and the startup will fight to defend their turf. Risk-aversion will set in, now that the startup is attached to a larger conglomerate that can pay large judgments and suffer reputational damage. And the startup equity incentives will be replaced with the tech giant's stock, which will not track the value of the former startup's project.

Some of the tech giants have tried to hold onto the disruptive potential of new technology by converting startups into semi-autonomous units within

their companies.[166] They try to shield them from middle managers, give them an independent brand to encourage risk-taking, and compensate their employees with synthetic equity tied to the value of the semi-autonomous unit. But it's hard for the tech giants to credibly commit to give the former startup real autonomy, because if the semi-autonomous unit starts to build a product that would disrupt the industry, the tech giant's executives will have strategic reasons—and pressure from internal constituencies—to resist it. And a wealth of empirical evidence suggests that that is exactly what happens in large organizations.[167]

The most extreme kind of cooptive acquisition is a killer acquisition—a deal in which the acquiror buys the startup in order to shut down development of its technology. This kind of acquisition is an easy case for antitrust law. As Herbert Hovenkamp explains, "[e]conomically a merger-plus-shutdown is no different than the output reduction that attends a cartel. Indeed, the only reason these acquisitions occur is because the alternative of agreeing with a firm to shut down a plant in exchange for a payment of money would be unlawful per se."[168]

Cunningham, Ederer, and Ma provide evidence that about five to seven percent of biotech startup acquisitions by pharmaceutical companies are killer acquisitions.[169] They show that pharmaceutical companies are significantly more likely to shut down development of a drug from a startup they acquired if they already had a drug that serves the same market.[170]

The pharmaceutical market has some unique features that make it dissimilar from the markets where the tech giants operate. A drug is a discrete product—a specific chemical combination with a specific mechanism of action.[171] It targets a discrete market—the patients suffering from a particular medical condition. And the drug development process is unusually regimented. Each drug must pass through well-defined stages of clinical trials to win the approval of the Food and Drug Administration (FDA). For these reasons, it is easy to identify the drug that a startup was developing, determine if it competes with the acquiror's drug, and observe whether its development has been shut down.

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166 Wansley, *supra* note 34, at 911–12.

167 *See* Clayton Christensen et al., *The New M&A Playbook*, HARV. BUS. REV., https://hbr.org/2011/03/the-big-idea-the-new-ma-playbook (Mar. 2011) (noting that 70-90% of acquisitions fail).

168 Hovenkamp, *supra* note 66, at 2046.

169 Colleen Cunningham et al., *Killer Acquisitions*, 129 J. POL. ECON. 649, 693 (2021)

170 *Id.* at 680–81.

171 *Id.* at 652, 671.

That doesn't mean killer acquisitions are more common in pharmaceuticals than elsewhere; it may simply mean they are easier to spot.[172]

We do not doubt that the tech giants have acquired some startups solely for anticompetitive reasons and without any intention to use their assets or former employees. But we think the more typical case is messier. In an acquihire, for example, the acquiror plans to do *something* with the startup's assets and/or its employees.[173] The people go to work maintaining the existing monopoly, but the technology disappears. We think this still counts as a killer acquisition, but it will often be justified by a "failing firm" defense – the startup wasn't going to succeed, and the incumbent wasn't interested in the technology, either to squelch it or to employ it.[174]

The more complicated cases are ones with mixed motivations. An incumbent may buy a startup because it finds the technology intriguing *and* potentially threatening. It may improve the incumbent's product but also thwart potential competition. The question antitrust courts face is whether the synergies that the merger creates will offset the loss to competition and innovation from extinguishing an independent company. In other words, the court will need to determine whether the acquisition was, on the whole, more synergistic or coopting.

E. The Harms of Cooption

So what?, you might respond. If the merging parties are both OK with folding a disruptive startup into an existing bureaucracy, what's wrong with that?

The problem is that cooption harms innovation. Our claim here is that the same dynamics that inhibit disruptive innovation by longstanding employees of large incumbents inhibit disruptive innovation by new employees from acquired startups. Once a tech giant acquires a startup, the former startup employees will find themselves frustrated by diseconomies of scope. They will report to managers who value their relationships with the firm's existing customers and existing markets and prioritize sustaining innovations. They will find projects vetoed by risk-averse gatekeepers who do not want to jeopardize the company's core lines of business. And they will find the powerful equity incentives of the startup replaced with a guaranteed salary and stock options that have little to do with their everyday work. As a consequence, they will find their efforts directed away from the more disruptive innovations that their

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[172] Cunningham et al. also show that many killer acquisitions are structured to avoid antitrust scrutiny, with prices that cluster right below the Hart-Scott-Rodino threshold for notifying the government and getting clearance for a merger. *Id.* at 685.

[173] Coyle & Polsky, *supra* note 81, at 293–96.

[174] Lemley & McCreary, *supra* note 11, at 96–97.

startup was pursuing to the kind of incremental innovations that large incumbents prefer.

The tech giants win from coopting disruption even though it destroys social value. In fact, they benefit in two ways. They make faster incremental progress on the sustaining innovations that they want. They get the new code, the valuable intellectual property, and the fresh ideas of the startup. And, critically, they also kill off a competitor. They no longer have to worry about the startup actually developing the more disruptive innovation and leapfrogging them or other tech giants acquiring the startup and using its assets to compete with them.

The employees from the acquired startup may feel frustrated. They may miss working on more fundamental innovations they were developing at the startup. They may chafe at the acquiror's bureaucracy. But the founders and early employees will be newly wealthy. In some cases, they can quit and travel the world. In other cases—for example, if they are subject to a holdback agreement—they can "rest and vest." The successful exit will be a nice line on their resume. And they will have a well-paying job at a large tech company. And after all, they (or the leaders, at least) agreed to the acquisition in the first place.

Who loses? Everyone else. Consumers will not benefit from the disruptive innovations that the startup might have developed. And they will not benefit from the improvements in product quality or product variety or the price reductions that competition—the threat of business-stealing—would have pushed the incumbents to develop. The team that was developing the more fundamental innovations will—maybe rapidly, maybe gradually—be disintegrated. And the acquirors who destroyed them will not have the incentive or ability to push them forward on their original mission.[175]

And mergers are not just private affairs between the merging parties. We have regulated mergers for over a century precisely because mergers reduce competition. A century ago, that lost competition generally came in the form of higher prices or reduced consumer choice. In the tech world, the competition we lose is often the disruptive competition of a startup that is killed off or coopted. As the 2023 Merger Guidelines recognize, that is a problem even though the new technology is not yet competing with the incumbent.[176]

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[175] *Cf.* Maurice E. Stucke & Ariel Ezrachi, *Innovation Misunderstood*, 73 AM. U. L. REV. (forthcoming) (manuscript at 33) ("[M]onopolies like Meta, Google, Apple, Amazon, and Microsoft might disrupt large, well-established sectors with a significant potential payoff (such as automobiles and health care). But they have not (nor will they in the future) disrupted their own ecosystems' value chain.").

[176] U.S. DEP'T JUST. & FED. TRADE COMM'N, *supra* note 100, at 20 ("A merger may involve a dominant firm acquiring a nascent competitive threat – namely, a firm that could grow into a significant rival, facilitate other rivals' growth, or otherwise lead to a reduction in its power."); Feldman & Lemley, *supra* note 156; Lemley & McCreary, *supra* note 11.

III. DISRUPTIONS COOPTED

In this Part, we discuss three examples of disruptive technologies being developed right now. They serve as case studies of how incumbents are co-opting new markets.

A. Artificial Intelligence

Artificial intelligence is the clearest case of cooption. Each of today's leading AI companies—DeepMind, OpenAI, Anthropic, and Inflection—began as an independent startup. Each of them has sought to escape the grip of the tech giants. But each is now, to varying degrees, intertwined with them. It once seemed plausible that AI would be developed by a new generation of independent companies. Now it seems likely that the tech giants will shape the direction of AI development.

1. Disruptive Potential

Artificial intelligence is notoriously hard to define.[177] The term "AI" is often used as a placeholder for a new technology that could someday perform a cognitive task that technology can't perform today. But then when the technology arrives, it's no longer AI. The current wave of investment in AI, though, is focused on a specific kind of technology that is already here—generative AI. Generative AI makes something new – text, images, videos.

The generative AIs that have most captured the public's attention are Large Language Models (LLMs). An LLM is a program that can generate natural language text in response to a prompt.[178] At the core of an LLM is an artificial neural network, software with a structure that loosely resembles biological neurons.[179] Engineers train a neural network by feeding it large amounts of text and evaluating its output.[180] Over time, the neural network learns connections between words that help it decide what text to generate in response to a prompt.[181] The LLM's goal is just to predict what text that the user would like to generate, but it can *seem* as if the LLM is reasoning its way through the question that the prompt asked.[182]

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[177] Harry Surden, *Artificial Intelligence and Law: An Overview*, 35 GEO. ST. UNIV. L. REV. 1305, 1307 (2019).

[178] Barney Dixon, *What is a Large Language Model?*, AI BUS. (Oct. 25, 2023), https://aibusiness.com/nlp/what-is-a-large-language-model-#close-modal.

[179] SAMUEL R. BOWMAN, EIGHT THINGS TO KNOW ABOUT LARGE LANGUAGE MODELS 2 n.1 (Apr. 2, 2023).

[180] *Id.* at 5.

[181] *Id.* at 2 n.1.

[182] *Id.* at 5.

LLMs have proven themselves capable of performing tasks that we associate with human intelligence. For example, OpenAI's GPT-4 achieved a 90th percentile score on the Bar Exam, an 88th percentile score on the LSAT, and passing scores in a wide range of standardized tests in engineering, science, social science, and humanities.[183] Some LLM-enabled chatbots can also hold a conversation in such a natural voice that they raise fresh doubts about whether the Turing Test is a sufficient test of intelligence.[184]

LLMs today are unreliable. They are known to "hallucinate" facts that aren't facts and events that didn't happen.[185] They are easily tricked by certain kinds of logic problems.[186] And they show a limited ability to perform basic reasoning, like using math.[187] They are also still brittle. Changing how a prompt is phrased without changing its substance can lead the LLM to generate a different answer.[188] But LLMs are improving rapidly.[189] OpenAI's newest LLM chatbot, GPT-4, excelled at specific tasks with which GPT-3 struggled.[190] And some of the unpredictability comes from the fact that LLMs seem to communicate in such a natural, interactive way that we *expect* them to be reasoning in the way humans do, rather than what they are actually doing – using predictive models to connect words and concepts in a way that their training has shown text is likely to do.

AI has the potential to restructure the economy. LLMs and diffusion models that generate images are general purpose technologies.[191] They have the potential to perform many of the tasks currently performed by white-collar workers—particularly sales, marketing, customer operations, and software engineering.[192] And because these tasks cut across almost all sectors of the economy, the total addressable market is enormous.[193]

Generative AIs are expensive to develop.[194] They require massive amounts of data and computing power and the labor of highly compensated engineers. So LLMs are simultaneously the kind of disruptive technology that is harder

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[183] OpenAI, *GPT-4* (Mar. 14, 2023), https://openai.com/research/gpt-4.

[184] Celeste Biever, *ChatGPT Broke the Turing Test – The Race is On for New Ways to Assess AI*, NATURE (July 25, 2023), https://www.nature.com/articles/d41586-023-02361-7.

[185] BOWMAN, *supra* note 179, at 7; Peter Henderson, Tatsunori Hashimoto & Mark A. Lemley, *Where's the Liability in Harmful AI Speech?*, 3 J. FREE SPEECH L. 589 (2023).

[186] BOWMAN, *supra* note 179, at 5–7.

[187] *Id.* at 7.

[188] *Id.* at 7.

[189] *Id.* at 7–8.

[190] *Id.* at 2.

[191] Hal Varian, *Artificial Intelligence, Economics, and Industrial Organization*, *in* THE ECONOMICS OF ARTIFICIAL INTELLIGENCE: AN AGENDA 399, 399 (Ajay Agrawal et al., 2017).

[192] MCKINSEY & CO., THE ECONOMIC POTENTIAL OF GENERATIVE AI, 3 (2023).

[193] *Id.* at 50.

[194] BOWMAN, *supra* note 179, at 2 n.1.

to develop if you are an incumbent focused on sustaining innovations and the kind of costly technology that is easier to develop if you are rich in cash, data, and compute. That said, the costs are not so great that only a tech giant can play. While generative AI requires lots of compute, cloud computing companies sell that compute quite cheaply. While they require lots of data for training, much of that data is available for free on the internet.[195] And many of the AIs have been developed as open source models, including LLaMa and Stable Diffusion. And since Llama 2 was open-sourced last year, developers have downloaded it more than 100 million times, and created more than 16,000 derivative models.[196]

2. Cooption

The first modern AI company, DeepMind, was founded in London in 2010.[197] Its cofounders included two British researchers, Demis Hassabis and Mustafa Suleyman.[198] In its early days, DeepMind was known for training a neural network to beat classic video games like Pong and Space Invaders.[199] Even though the company was based in the U.K., Hassabis traveled to Silicon Valley and raised capital from Peter Thiel and Elon Musk.[200]

DeepMind's independence didn't last long. Both Google and Facebook offered to buy the company.[201] In those discussions, DeepMind's cofounders reportedly made two demands. First, the technology must not be used for military purposes.[202] Second, an independent board must govern its development.[203] Facebook offered more than Google, but it wouldn't agree to DeepMind's conditions.[204] In 2014, Google acquired DeepMind for $650 million.[205]

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[195] Michael Humor, *How Much Data from the Public Internet is Used for Training LLMs?*, MEDIUM (Sept. 25, 2023), https://blog.gopenai.com/how-much-data-from-the-public-internet-is-used-for-training-llms-dff5bc5ebb02.

[196] Andrew Bosworth, *Living in the Future*, META (Dec. 18, 2023), https://about.fb.com/news/2023/12/metas-2023-progress-in-ai-and-mixed-reality.

[197] DeepMind, *About*, https://deepmind.google/about (last visited, Jan. 25, 2024).

[198] David Rowan, *DeepMind: Inside Google's Super-Brain*, WIRED (June 22, 2015, 5:22 PM), https://www.wired.co.uk/article/deepmind.

[199] Cade Metz et al., *Ego, Fear and Money: How the A.I. Fuse was Lit*, N.Y. TIMES (Dec. 3, 2023), https://www.nytimes.com/2023/12/03/technology/ai-openai-musk-page-altman.html.

[200] *Id.*

[201] *Id.*

[202] *Id.*

[203] *Id.*

[204] *Id.*

[205] Amit Chowdhry, *Google to Acquire Artificial Intelligence Company DeepMind*, FORBES (Jan. 27, 2014, 1:54 AM), https://www.forbes.com/sites/amitchowdhry/2014/01/27/google-to-acquire-artificial-intelligence-company-deepmind/?sh=5d7e43b215b5.

DeepMind continued to produce important work after the acquisition, perhaps because part of the team was physically separate from the rest of Alphabet. In 2016, DeepMind's AlphaGo program beat one of the world's leading players of Go, a popular Chinese board game.[206] But DeepMind's founders grew concerned about how Google would use their technology.[207] The independent board that was supposed to oversee them met once and never met again.[208] In 2017, DeepMind's founders tried to quit.[209] But Google raised their salaries and gave them more stock, and they decided to stay.[210]

Google's acquisition of DeepMind disappointed Elon Musk because he lost his influence over how AI would be developed.[211] In 2015, Musk helped to found OpenAI, a new startup with Sam Altman, then the leader of the startup accelerator Y Combinator, as its CEO.[212] OpenAI raised $1 billion from Musk, Thiel, Amazon Web Services, and others.[213] The company was deliberately structured as a nonprofit to insulate it from commercial pressures that might compromise safety.[214]

Musk soon grew convinced, however, that OpenAI should become a for-profit company.[215] In 2017, he tried to take control of the OpenAI and combine it with Tesla.[216] Altman successfully resisted Musk's takeover, and in 2018, Musk left the company.[217] Musk's departure left OpenAI short on capital.[218] So Altman turned to one of the deepest pockets in tech, Microsoft. In 2019, OpenAI struck a deal in which Microsoft invested $1 billion in OpenAI's newly created for-profit subsidiary.[219] In 2020, OpenAI released its LLM GPT-

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[206] Metz et al., *supra* note 199.

[207] *Id.*

[208] *Id.*

[209] *Id.*

[210] *Id.*

[211] *Id.*

[212] *Id.*

[213] *Id.*

[214] *Id.*

[215] *Id.*

[216] *Id.*

[217] *Id.*

[218] *Id.*

[219] *Id.*

3.[220] The API was open to the public, but Microsoft was granted an exclusive license to the model.[221]

Some OpenAI engineers became concerned that their company was starting to prioritize commercial goals over safety—just as DeepMind's founders had a few years earlier. In 2021, the lead developer of GPT-3, Dario Amodei, and a group of other concerned engineers, tried to persuade OpenAI's board to remove Altman, whom they saw as insufficiently focused on safety.[222] When their coup failed, they quit. Amodei and fifteen other OpenAI engineers formed Anthropic, their own AI startup.[223] Anthropic was organized as a public benefit corporation with a mission to develop AI safely.[224]

In November 2022, OpenAI released ChatGPT, a chatbot built on its large language model.[225] OpenAI had planned the release as a "low key research preview"—a way to get some feedback to refine the system.[226] But it went viral. Within a few weeks of its debut, over 100 million people had used it.[227] ChatGPT triggered an arms race. Google released its own large language model chatbot, Bard.[228] And Meta released code for its large language model, LLaMA.[229]

ChatGPT's success fueled OpenAI's growth.[230] In January 2023, Microsoft invested an additional $10 billion in OpenAI on top of the $3 billion it had already invested.[231] Microsoft had also started to integrate generative AI into its products—including Bing, its code repository Github, and its cloud platform Azure.[232] But OpenAI's growth led to more internal conflict. In 2023, Helen Toner, an academic on OpenAI's nonprofit board, published a paper

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[220] *Id.*

[221] Kevin Scott, *Microsoft Teams Up with OpenAI to Exclusively License GPT-3 Language Model*, MICROSOFT (Sept. 22, 2020), https://blogs.microsoft.com/blog/2020/09/22/microsoft-teams-up-with-openai-to-exclusively-license-gpt-3-language-model.

[222] Metz et al., *supra* note 199.

[223] *Id.*

[224] Anthropic, *The Long-Term Benefit Trust*, (Sept. 19, 2023), https://www.anthropic.com/news/the-long-term-benefit-trust.

[225] Karen Weise et al., *Inside the A.I. Arms Race That Changed Silicon Valley Forever*, N.Y. TIMES (Dec. 5, 2023), https://www.nytimes.com/2023/12/05/technology/ai-chatgpt-google-meta.html.

[226] *Id.*

[227] *Id.*

[228] *Id.*

[229] *Id.*

[230] *Id.*

[231] *Id.*

[232] *Id.*

that (arguably) portrayed OpenAI in an unfavorable light relative to Anthropic.[233] Sam Altman was incensed and sought to have Toner removed from the board.[234] But instead the board fired Altman and issued a statement saying that he had not been "consistently candid in his communications with the board."[235]

Altman fought back with help from a powerful ally—Microsoft. He announced a plan to lead a new AI lab at Microsoft.[236] Over 700 of OpenAI's 770 employees signed a letter stating that they would leave the company to join Altman at Microsoft if OpenAI's board did not rehire him.[237] Altman's gambit worked. The board gave in. OpenAI rehired Altman.[238] A new board was formed that included only one member of the previous board.[239]

DeepMind also experienced an Anthropic-like exodus. In 2022, one of its cofounders, Mustafa Suleyman, founded a new startup, Inflection AI.[240] Like Anthropic, Inflection was incorporated as a public benefit company—again, to shield it from commercial pressure.[241] But like every AI startup, Inflection needed capital, so it raised $1.3 billion from Bill Gates, Eric Schmidt, Nvidia, and—sure enough—Microsoft.[242]

Anthropic, like Inflection, is still nominally independent. But in 2023, the startup raised $4 billion from Amazon and $2 billion from Google.[243] It is hard to imagine that sums of money that large won't come with strings attached. And they are not alone. Multiple overlapping companies are investing in a variety of AI companies – and often in the same one.

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[233] Andrew Imbrie, Owen J. Daniels & Helen Toner, *Decoding Intentions*, CTR. FOR SEC. & EMERGING TECH. (Oct. 2023).

[234] Meghan Bobrowsky & Deepa Seetharaman, *The OpenAI Board Member Who Clashed with Sam Altman Shares Her Side*, WALL ST. J. (Dec. 7, 2023), https://www.wsj.com/tech/ai/helen-toner-openai-board-2e4031ef.

[235] Cade Metz et al., *Five Days of Chaos: How Sam Altman Returned to OpenAI*, N.Y. TIMES (Nov. 22, 2023), https://www.nytimes.com/2023/11/22/technology/how-sam-altman-returned-openai.html.

[236] *Id.*

[237] *Id.*

[238] *Id.*

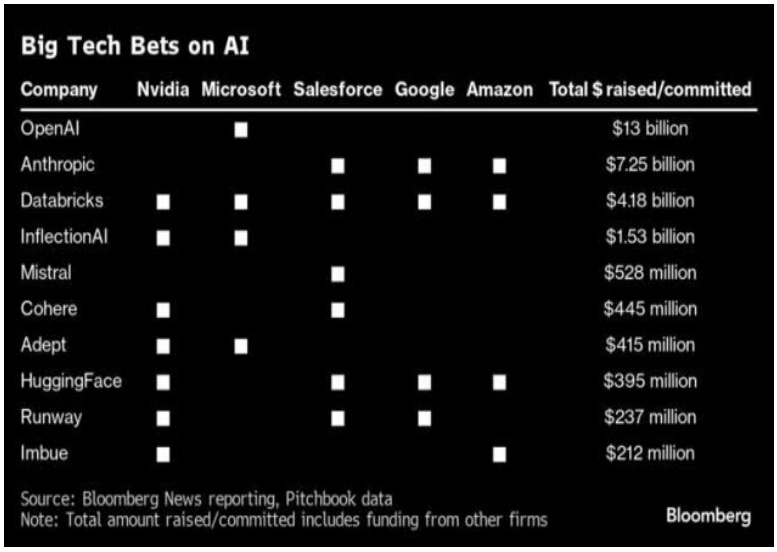
[239] *Id.*

[240] Mark Sullivan, *Why DeepMind Cofounder Mustafa Suleyman Left Google to Start a Human-Focused AI Company*, FAST CO. (Sept. 29, 2023), https://www.fastcompany.com/90959853/mustafa-suleyman-inflection-pi.

[241] Inflection, *An Inflection Point* (Mar. 8, 2023), https://inflection.ai/an-inflection-point.

[242] Rachel Metz, *Inflection AI Raises $1.3 Billion From Reid Hoffman, Bill Gates and Nvidia*, BLOOMBERG (June 29, 2023, 2:07 PM), https://www.bloomberg.com/news/articles/2023-06-29/inflection-ai-raises-1-3-billion-from-hoffman-gates-and-nvidia.

[243] Berber Jin, *Google Commits $2 Billion in Funding to AI Startup Anthropic*, WALL ST. J. (Oct. 27, 2023, 3:34 PM), https://www.wsj.com/tech/ai/google-commits-2-billion-in-funding-to-ai-startup-anthropic-db4d4c50.



The risk of overlapping investment is particularly great because it can facilitate collusion either between the tech giants (who meet and work together as part of their joint investment) or between the startups (who are funded and directed by the same companies). The Federal Trade Commission recently launched an investigation into these overlapping investments.[244]

While the core technologies behind generative AI all started out at startups and independent companies, they have gradually been drawn into the orbit of big tech. In 2023, Google gave up on the idea of having two separate AI labs. Google's homegrown AI lab, Google Brain, merged with DeepMind into Google DeepMind.[245] Microsoft has essentially locked up control of OpenAI and backed Inflection. And Google and Amazon have both made a significant play to invest in Anthropic.

Our concern with the structure of the emerging AI industry is that the tech giants will steer the companies they control or fund to develop innovations that preserve their dominance. For example, DeepMind developed a program called AlphaFold that beat out state-of-the-art methods in academic biology for predicting a protein's three-dimensional structure from its sequence of amino acids.[246] Now that Google merged DeepMind with Google Brain, will it still invest in protein folding research? Or will AI researchers will focus on

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[244] McCabe, *supra* note 2.

[245] Emma Roth & Jay Peters, *Google's Big AI Push Will Combine Brain and DeepMind into One Team*, VERGE (Apr. 20, 2023, 2:04 PM), https://www.theverge.com/2023/4/20/23691468/google-ai-deepmind-brain-merger.

[246] John Jumper et al., *Highly Accurate Protein Structure Prediction with AlphaFold*, 596 NATURE 583, 583 (2021).

building a better search engine (a rather dubious use of LLM technology in the first place)?

B. Virtual and Augmented Reality

Virtual reality (VR) and its cousin augmented reality (AR) took off in the past decade. Four major VR hardware platforms were deployed; so were many applications--mostly games, but also immersive news reporting and social experiments.[247]

1. Disruptive Potential

Some readers may be inclined to dismiss VR and AR as unimportant because they are "just" gaming platforms. That would be a mistake.[248] First, gaming itself is an enormous and underappreciated business and social phenomenon--worth studying in its own right,[249] and likely to become more so over time, since it is growing far faster than other forms of media. About 25 million Americans identify themselves as active video gamers.[250] The industry is a $30 billion annual business in the U.S., and $90 billion worldwide.[251] It has spawned its own popular television network, Twitch tv,

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[247] *See, e.g.*, *PlayStation VR to Debut in October for $399*, CNBC (Mar. 16, 2016, 12:21 PM), http://www.cnbc.com/2016/03/16/playstation-vr-to-debut-in-october-for-399.html [https://perma.cc/L32K-RQAA]; Signe Brewster, *Behind the Numbers of Virtual Reality's Sluggish Debut*, MIT TECH. REV. (Dec. 30, 2016), https://www.technologyreview.com/s/603208/behind-the-numbers-of-virtual-realitys-sluggish-debut [https://perma.cc/UP9Y-YPQA]; Darrell Etherington, *Google's Daydream View Made Me a Believer Again in Consumer VR*, TECHCRUNCH (Nov. 10, 2016), https://techcrunch.com/2016/11/10/googles-daydream-view-made-me-a-believer-again-in-consumer-vr [https://perma.cc/56D7-ULMD].

[248] For discussion of the importance of law in multi-player virtual worlds, *see* F. Gregory Lastowka & Dan Hunter, *The Laws of Virtual Worlds*, 92 CALIF. 1, 8-12 (2004).

[249] Edward Castronova, *Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier* 2 (Ctr. for Econ. Stud. & Ifo Inst. for Econ. Resch. Working Paper No. 618, 2001), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=294828 [https://perma.cc/VV9V-UXFL] ("[E]conomists believe that it is the practical actions of people, and not abstract arguments, that determine the social value of things. One does not study the labor market because work is holy and ethical; one does it because the conditions of work mean a great deal to a large number of ordinary people. By the same reasoning, economists and other social scientists will become more interested in Norrath and similar virtual worlds as they realize that such places have begun to mean a great deal to large numbers of ordinary people.").

[250] Maeve Duggan, *Gaming and Gamers*, PEW RSCH. CTR. (Dec. 15, 2015), http://www.pewinternet.org/2015/12/15/gaming-and-gamers [https://perma.cc/6SFP-RQHZ] (finding that 10% of American adults identify as "gamers").

[251] Press Release, Entm't Software Ass'n, U.S. Video Game Industry Generates $30.4 Billion in Revenue for 2016 (Jan. 19, 2017), http://www.theesa.com/article/u-s-video-game-industry-generates-30-4-billion-revenue-2016 [https://perma.cc/28BQ-LMUA]; Dean

and in 2015 more people tuned in to watch the finals of a League of Legends tournament than watched the NBA basketball finals.[252] Pokemon Go alone generated over $1 billion in revenue in 2017.[253]

But the use and promise of AR and VR are also not limited to gaming. Google's entry-level phone-based VR app, Cardboard, launched with immersive video news reporting, allowing users to visit a Syrian refugee camp and other news hot spots around the world, looking around (though not interacting).[254] VR programs like Tiltbrush are letting artists create art in three dimensions by working inside their creations.[255] VR art has already appeared in major museums.[256] VR systems will allow a new generation of computer-aided design of products.[257]

Other VR projects have included diversity training that lets people change their race or sex and see how others interact with them when they look different than they do outside VR.[258] VR will also doubtless be used for training

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Takahashi, *Worldwide Game Industry Hits $91 Billion in Revenues in 2016, with Mobile the Clear Leader*, VENTURE BEAT (Dec. 21, 2016, 7:00 AM), http://venturebeat.com/2016/12/21/worldwide-game-industry-hits-91-billion-in-revenues-in-2016-with-mobile-the-clear-leader [https://perma.cc/267T-74JX].

[252] David Segal, *Behind League of Legends, E-Sports's Main Attraction*, N.Y. TIMES (Oct. 10, 2014), https://www.nytimes.com/2014/10/12/technology/riot-games-league-of-legends-main-attraction-esports.html [https://perma.cc/W235-GRVR].

[253] Ross Todd, *Pokéstop: Judge Calls Timeout in Suit Against Pokémon Go Maker*, RECORDER (July 27, 2017, 5:18 PM), https://www.law.com/therecorder/sites/therecorder/2017/07/27/pokestop-judge-calls-timeout-in-suit-against-pokemon-go-maker [https://perma.cc/3S68-F5CX].

[254] *See, e.g.*, Susan Dominus, *The Displaced: Hana*, N.Y. TIMES (Nov. 5, 2015), https://www.nytimes.com/2015/11/08/magazine/the-displaced-hana.html [https://perma.cc/9GN4-J5T2] (an example of VR reporting by the New York Times).

[255] Frank Rose, *The Making of Virtually Real Art with Google's Tilt Brush*, N.Y. TIMES (Jan. 4, 2017), https://www.nytimes.com/2017/01/04/arts/design/the-making-of-virtually-real-art-with-googles-tilt-brush.html [https://perma.cc/4J4P-JXMZ].

[256] *Id.*

[257] Jilin Ye, Saurin Badiyani, Vinesh Raja & Thomas Schlegel, *Applications of Virtual Reality in Product Design Evaluation*, *in* HUMAN-COMPUTER INTERACTION, HCI APPLICATIONS AND SERVICES 1190, 1193 (Julie A. Jacko ed., 2007).

[258] Marco della Cava, *Virtual Reality Tested by NFL as Tool to Confront Racism, Sexism*, USA TODAY (Apr. 8, 2016), https://www.usatoday.com/story/tech/news/2016/04/08/virtual-reality-tested-tool-confront-racism-sexism/82674406 [https://perma.cc/FW63-VPEA] ("'Feeling prejudice by walking a mile in someone else's shoes is what VR was made for,' says Jeremy Bailenson, director of Stanford University's Virtual Human Interaction Lab."); *see also* Adam D. Thierer & Jonathan Camp, *Permissionless Innovation and Immersive Technology: Public Policy for Virtual and Augmented Reality* 46 (Mercatus Working Paper, 2017) (noting that VR applications can generally make viewers empathize more with others).

people for various physical tasks; think airplane simulators, but for activities that have much more complicated and dynamic controls.[259]

2. Cooption

VR is currently the province of a variety of proprietary headsets—at the time we write this, the main players are the Oculus Quest, the Vive, the Playstation VR, MagicLeap, and the HoloLens—though that will doubtless change. Each platform runs its own games, sometimes on different computer hardware. The first three devices are focused on VR, while the latter two have concentrated on AR. While we expect that more games and apps will be written to work on multiple platforms over time, for the foreseeable future those programs will not work across platforms. If I want to interact with a friend in a VR game or business meeting, we both have to wear the same type of headset.

That incompatibility has meant that companies are jockeying for position to be the leading platform for VR. Some of the technologies were developed by existing incumbents in the video game space – Microsoft's HoloLens and Sony's Playstation VR. One of them (Microsoft) is also a tech incumbent. The other technologies were developed by small startups. But each of them ended up partnering with or being acquired by larger players during the development process.

The most well-known example is Meta's (then Facebook's) acquisition of Oculus, an early pioneer in consumer VR technologies, for $2 billion in 2014.[260] Its line of popular Oculus Rift VR headsets are now being sold by Meta under the Meta Quest brand name.[261] But this acquisition was only the beginning for Meta, which in recent years has acquired several successful VR gaming studios and incorporated them into Meta's own in-house Oculus Studios.[262] It even

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[259] Daniel Newman, *Hyper-Training and the Future Augmented Reality Workplace*, FORBES (Sept. 20, 2016), https://www.forbes.com/sites/danielnewman/2016/09/20/hyper-training-and-the-future-augmented-reality-workplace/#1754b5e28b07 [https://perma.cc/88BT-U3UW]; Jonathan Vanian, *Farmers Insurance Is Using the Oculus Rift to Train Workers in Virtual Reality*, FORTUNE (Oct. 25, 2017), http://fortune.com/2017/10/25/oculus-rift-headsets-farmers-insurance [https://perma.cc/R2UH-YHBZ] ("[I]t's impractical to create a real-life house riddled with every possible problem. That's where VR comes in.").

[260] Josh Constine, *Facebook's $2 Billion Acquisition of Oculus Closes, Now Official*, TECHCRUNCH (July 21, 2014), https://techcrunch.com/2014/07/21/facebooks-acquisition-of-oculus-closes-now-official.

[261] Erica Sweeney, *Oculus: Virtual Reality Company's Complete History and Device Development*, BUS. INSIDER (Oct. 27, 2023), https://www.businessinsider.com/what-is-oculus.

[262] Lucas Matney, *Facebook Buys VR Studio Behind Beat Saber*, TECHCRUNCH (Nov. 26, 2019), https://techcrunch.com/2019/11/26/facebook-buys-the-vr-studio-behind-beat-saber; Nick Statt, *Meta Acquires Three New VR Game Developers for Oculus Studios*, PROTOCOL (Oct. 11, 2022), https://www.protocol.com/bulletins/meta-oculus-studios-game-developer..

managed to acquire VR fitness app developers Within – maker of Supernatural, the chief VR fitness competitor to Beat Saber, which it also acquired – despite over a year of legal challenges from the FTC.[263]

Meta's competitors have also bolstered their VR/AR offerings by acquiring cutting-edge hardware and software startups. Sony, the leading seller of VR/AR headsets behind Meta,[264] acquired startups specializing in VR sports experiences,[265] video games,[266] and gesture tracking technology.[267] Apple likewise acquired several VR and AR startups prior to the release of its Vision Pro headset, including NextVR, which focused on VR live-streaming, Spaces, which provided location-based VR experiences, and Mira, and AR headset manufacturer.[268] And GoPro acquired French startup Kolor, a developer of software for VR content creation, and incorporated Kolor's software into its own platform.[269] Even those platforms that have remained independent – HTC's Vive and MagicLeap – have done so by partnering with larger players in the game or technology spaces (Vive with Valve, the maker of the Steam game platform, and MagicLeap with Google and AT&T). The result is that once again, a technology developed by startups is increasingly coopted by tech giants.

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263 Amanda Silberling, *Meta Acquires Within Despite FTC Concerns*, TECHCRUNCH (Feb. 9, 2023), https://techcrunch.com/2023/02/09/meta-acquires-within-despite-ftc-concerns.

264 Team Counterpoint, *Global XR (AR & VR Headsets) Market Share: Quarterly*, COUNTERPOINT (Dec. 18, 2023), https://www.counterpointresearch.com/insights/global-xr-ar-vr-headsets-market-share.

265 Demond Cuerton, *Sony Acquires Beyond Sports to Expand Metaverse Solutions,* XR TODAY (Nov. 25, 2022), https://www.xrtoday.com/mixed-reality/sony-acquires-beyond-sports-to-expand-metaverse-solutions.

266 Ben Lang, *Sony Acquires Insomniac Games, Delivering a Strategic Blow to Oculus Studios in the Process*, ROAD TO VR (Aug. 21, 2019), https://www.roadtovr.com/sony-acquires-insomniac-games-strategic-blow-oculus-studios.

267 Eric Johnson, *Sony Acquires SoftKinetic, Which Can Track Hands for Virtual Reality*, VOX (Oct. 8, 2015), https://www.vox.com/2015/10/8/11619386/sony-acquires-softkinetic-which-can-track-hands-for-virtual-reality.

268 Todd Spangler, *Apple Buys Spaces, VR Startup That Blends Avatars into Videoconferences*, VARIETY (Aug. 25, 2020), https://variety.com/2020/digital/news/apple-acquires-spaces-vr-startup-1234747851; Zoe Schiffer & Alex Heath, *Apple Has Bought An AR Headset Startup Called Mira*, VERGE (June 6, 2023), https://www.theverge.com/2023/6/6/23751350/apple-mira-ar-headset-startup.

269 Nick Statt, *GoPro Acquires Virtual Reality Technology Company*, CNET (Apr. 28, 2015), https://www.cnet.com/tech/computing/gopro-acquires-virtual-reality-technology-company; *The 360 of Gopro VR Featuring Omni*, GOPRO (May 5, 2016), https://gopro.com/en/us/news/the-360-of-gopro-vr-featuring-omni.

C. Automated Driving

Automated driving is different from our other case studies. The deployment of automated driving technology does not threaten the tech giants' dominance in their core markets, except perhaps for Amazon's logistics business. Instead, the technology threatens to disrupt the incumbent automakers. We discuss it here because it illustrates how all large incumbents have incentives to attempt cooption; the tech giants just seem better at executing it.

1. Disruptive Potential

An automated driving system (ADS) is a combination of sensors, software, and computers that can together replace a human driver.[270] A truly "self-driving" or "driverless" or "autonomous" vehicle is an ADS-equipped vehicle. The deployment of ADSs could become highly disruptive if ADSs can become safer and cheaper than human drivers.[271]

The safety argument for automated driving starts with their potential to avoid common and costly human errors.[272] ADSs will never drive drunk, drowsy, or distracted. They can be programmed to follow the rules of the road, drive defensively, and leave space for vulnerable road users. The catch is that while they avoid many of the problems with human drivers, today's ADSs are still making errors that human drivers would not make.[273] ADS-equipped vehicles have been involved in hundreds of minor crashes and a smaller number of more serious crashes.[274] But the trajectory of ADS development is promising. By late 2023, the leading ADS—developed by Alphabet's Waymo—had driven about 7 million miles without a backup driver.[275] Its injury crash rate was lower than one would expect for a human driver,[276] though the sample size is still too small to make meaningful comparisons.[277]

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[270] SAE INT'L, SURFACE VEHICLE RECOMMENDED PRACTICE 6 (Apr. 2021).

[271] In certain use cases, ADSs have other potential advantages over human drivers in addition to cost and safety. They can drive long, monotonous, and repetitive trips without getting bored. ADS-equipped vehicles without passengers can travel through dangerous areas, like war zones or regions hit by natural disasters.

[272] *See* Matthew T. Wansley, *The End of Accidents*, 55 U.C. DAVIS L. REV. 269, 271–72 (2021).

[273] *See id.* at 292–95.

[274] *See* NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEPT. TRANSP., *Standing General Order on Crash Reporting*, https://www.nhtsa.gov/laws-regulations/standing-general-order-crash-reporting (last visited Jan. 28, 2024).

[275] KRISTOFER D. KUSANO ET AL., COMPARISON OF WAYMO RIDER-ONLY CRASH DATA TO HUMAN BENCHMARKS AT 7.1 MILLION MILES 1 (2023).

[276] NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., DOT HS 813 527, TRAFFIC SAFETY FACTS 2021 13 (2023), https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813527.

[277] *See* NIDHI KALRA & SUSAN M. PADDOCK, RAND CORP., DRIVING TO SAFETY 10 (explaining that an ADS would need to drive 125 million miles to achieve 95% confidence that its injury crash rate was within 20% of the human injury crash rate).

The cost argument for automated driving is also still a work in progress. History suggests that the cost of producing physical goods tends to decline over time. The cost of human labor, thankfully, does not. ADS components—particularly sensors—have already seen significant cost reductions.[278] If these costs continue to decline, a ride in ADS-equipped vehicle could become much cheaper than a ride in an Uber. For now, though, ADS-equipped vehicles are very expensive.[279] And they are also being deployed with the assistance of remote command centers staffed by warm-blooded humans.[280] For ADSs to become cheaper than human drivers, both the cost of components and the ratio of support staff to vehicles must fall.

Automated driving is not yet ready to replace drivers in all but a few specialized use cases. But it is possible to see how increasing safety and declining costs could turn automated driving from an expensive R&D project to a disruptive force. One way that might happen is to change what a car or truck looks like. In principle, any kind of vehicle can be equipped with an ADS—cars, trucks, vans, or specialized vehicles. The startup Nuro is developing small, passenger-less, ADS-equipped delivery vehicles.[281] The public company Aurora is developing ADS-equipped 18-wheelers.[282] Industries that make money from road transportation—taxis, rental cars, and trucking—are vulnerable to disruption. Industries that use land vehicles in production—farming, mining, and manufacturing—may be impacted as well.

The most consequential threat, though, is to the auto industry. This threat is particularly disruptive, in Christensen's sense of the term, because automated driving challenges not just the automakers' market shares, but also their business model.

The auto industry's business model is familiar. The automaker builds a brand around luxury, safety, affordability, or a certain kind of driving experience. It designs a suite of models with a menu of features. It sources components from suppliers. It assembles those components into vehicles. Then it sells the vehicles to its dealerships, and the dealerships sell them to individual consumers. Those customers use their cars for only a small fraction of any given day.

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[278] Johannes Deichman, *Autonomous Driving's Future: Convenient and Connected*, MCKINSEY & CO. (Jan. 6, 2023), https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/autonomous-drivings-future-convenient-and-connected.

[279] Tripp Mickle et al., *G.M.'s Cruise Moved Fast in the Driverless Race. It Got Ugly.*, N.Y. TIMES (Nov. 3, 2023), https://www.nytimes.com/2023/11/03/technology/cruise-general-motors-self-driving-cars.html.

[280] *Id.*

[281] Dave Ferguson, *Introducing R2, Nuro's Next Generation Self-Driving Vehicle*, MEDIUM (Feb. 6, 2020), https://medium.com/nuro/introducing-r2-nuros-next-generation-self-driving-vehicle-a9974ff6c2e0.

[282] Aurora, *Aurora Horizon—the Dawn of Autonomous Freight is Here*, https://aurora.tech/aurora-horizon (last visited Jan. 23, 2024).

Automated driving makes possible a new business model—the robotaxi.[283] A rider hails a robotaxi on an app. The robotaxi arrives, transports the rider to their destination, and then moves on to the next rider. The robotaxi company owns the vehicles, not the consumer. The company also handles maintenance, cleaning, and insurance. There are no consumer-facing dealerships, repair shops, parts stores, or car washes. The make and model of the vehicle are largely irrelevant—when was the last time you cared what kind of vehicle your Uber driver was driving?[284]

Robotaxis upend the value chain.[285] In the auto industry's existing business model, the critical link is the vehicle manufacturer. In the robotaxi model, the critical link is the ADS. Vehicles become commodities. If the robotaxi business model prevails, the bulk of the profits will go to ADS developers. Auto brands and dealerships become stranded assets.

Why are ADS-equipped vehicles being deployed as robotaxis? For now, it is a practical necessity. Most ADSs are dependent on highly precise, pre-programmed digital maps.[286] The leading ADS developers have only mapped a small number of mostly warm-weather cities in the United States.[287] No one wants to buy a car that can only drive around Phoenix and its suburbs.[288]

In the long run, though, the economic advantage of the robotaxi business model is higher utilization rate.[289] Most cars and trucks waste most of their days depreciating in parking lots and garages. When a robotaxi drops off one rider, it moves on to the next. A robotaxi network could serve the same transportation demand with a much smaller fleet.[290] Robotaxis therefore change how many cars car companies will sell. Except in the densest cities most

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[283] Brad Templeton, *Some Say Self-Driving Robotaxi Isn't a Business; Billions Are Being Bet That It Is*, FORBES (Oct. 25, 2021, 8:00 AM), https://www.forbes.com/sites/bradtempleton/2021/10/25/some-say-self-driving-robotaxi-isnt-a-business--billions-are-being-bet-that-it-is.

[284] Uber imposes certain restrictions on what cars can be used. They must have four doors and meet certain minimum size constraints, excluding sports cars, for instance. Uber, *Vehicle Requirements in Your Country*, https://www.uber.com/us/en/drive/requirements/vehicle-requirements [https://perma.cc/SV5U-2H3A] (last visited Jan. 25, 2024).

[285] Templeton, *supra* note 283.

[286] *See e.g.*, *The Waymo Driver Handbook: How Our Highly-Detailed Maps Help Unlock New Locations for Autonomous Driving*, WAYMO (Sept. 21, 2020), https://waymo.com/blog/2020/09/the-waymo-driver-handbook-mapping.

[287] Rajesh Rajamani, *Addressing Challenges for Autonomous Vehicles on Winter Roads*, UNIV. MINN. CTR. TRANSP. STUD., https://www.cts.umn.edu/research/featured/futureofmobility/rajamani (last visited Jan. 23, 2024).

[288] Mike Volpi, *Not So Fast: Driverless Cars Will Change Everything—But Not Anytime Soon*, FAST CO. (Mar. 26, 2019), https://www.fastcompany.com/90324427/not-so-fast-driverless-cars-will-change-everything-but-not-anytime-soon.

[289] Templeton, *supra* note 283.

[290] Marco Pavone, *Autonomous Mobility-on-Demand Systems for Future Urban Mobility*, AUTONOMOUS DRIVING 2, 10 (Markus Maurer et al. eds., 2016).

Americans own their own car. But there is no need to own a car (and pay for insurance, maintenance, and a garage) if robotaxis are ubiquitous and cheap. Far better to get a ride when you need one, free to spend the time in your car doing something safer and more interesting than driving. And because people spend most of their time *not* in their cars, a robotaxi service can use far fewer cars than individual owners demand. Those cars won't sit idle most of the day.

Robotaxis could also bring social benefits. They could eliminate the need for parking and free up valuable land in cities. They could expand access to mobility for elderly people and people with disabilities. And they could reduce the cost of transportation—a net benefit as long as the robotaxis are electric and the energy and congestion externalities are taxed.[291]

To be sure, it not clear whether Americans will adopt the robotaxi lifestyle. The auto industry has devoted a century of marketing to turning cars into status symbols. Automobile owners may not feel the same sense of freedom relying on a robotaxi fleet. And even in the best case scenario, it will be a long time before robotaxis serve rural areas. But it is clear that robotaxis represent an existential threat to incumbent automakers, a threat they are trying to coopt.

2. Cooption

Like many disruptive technologies, automated driving was not developed by incumbents. The history begins with the Defense Advanced Research Projects Agency (DARPA)—the same federal agency that helped to develop the internet (once known as ARPANET).[292] In the late 2000s, DARPA held a series of races, the DARPA Challenges, for robotic vehicles in the Mojave Desert.[293] Most of the competitors came from robotics labs at research universities like Stanford and Carnegie Mellon.[294] Google cofounders Sergey Brin and Larry Page watched the second DARPA Challenge and grew interested in trying to commercialize the technology.[295]

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[291] *See* Gregory H. Shill, *Should the Law Subsidize Driving?*, 95 N.Y.U. L. REV. 498 (2020) (noting the various ways in which car culture has shaped the design of our society).

[292] SHARON WEINBERGER, THE IMAGINEERS OF WAR (2017).

[293] Alex Davies, *An Oral History of the DARPA Ground Challenge, the Grueling Robot Race That Launched the Self-Driving Car*, WIRED (Aug. 3, 2017, 9:00 AM), https://www.wired.com/story/darpa-grand-challenge-2004-oral-history.

[294] *See Stanford Team Wins Robot Race*, NBC NEWS (Oct. 7, 2005, 3:07 PM), https://www.nbcnews.com/id/wbna9621761.

[295] Arjun Kharpal, *Google's Larry Page Disguised Himself During a Driverless Car Race to Hire the Founder of His Moonshot Lab*, CNBC (July 31, 2017, 7:49 AM), https://www.cnbc.com/2017/05/11/google-larry-page-moonshot-lab.html.

In the early 2010s, Google started to develop an ADS.[296] The Google team met with some of the automakers, but they showed little interest.[297] The automakers were focused instead on a sustaining innovation related to self-driving—driver assistance systems. These systems can help a driver steer, brake, and accelerate, but they cannot replace a human driver.[298] For example, one widely available driver assistance feature, adaptive cruise control, can automatically adjust a vehicle's speed when the vehicle ahead speeds up or slows down.[299] Another driver assistance feature, lane centering assistance, can nudge a vehicle's steering so it stays in its lane.[300] Driver assistance systems can make driving less effortful, but they do not threaten the automaker's business model. They are just another vehicle feature that automakers can sell to their customers.

Around the middle of the last decade, the automakers appeared to have a change of heart. The first company to change its mind was another outsider—Uber. In 2015, Uber hired a team of roboticists from Carnegie Mellon to develop an ADS for robotaxis.[301] In 2016, GM acquired Cruise, a small venture-backed startup working on ADS, in an acquisition that was reportedly worth $1 billion.[302] When it announced the deal, GM said that Cruise would focus on robotaxis.[303] In early 2017, Ford promised to invest $1 billion in a company called Argo AI, which also planned to develop an ADS for robotaxis.[304] Other

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[296] *See* John Markoff, *Google Cars Drive Themselves, in Traffic*, N.Y. TIMES (Oct. 9, 2010), https://www.nytimes.com/2010/10/10/science/10google.html [https://perma.cc/B4UJ-QYN2].

[297] *Toyota to Launch Advanced Driving Support System Using Automated Driving Technologies in Mid-2010s*, TOYOTA (Oct. 10, 2013), https://pressroom.toyota.com/toyota-advanced-driving-support-system-technology.

[298] Matthew T. Wansley, *Regulating Driving Automation Safety*, 73 EMORY L. J. 101, 105 (2024).

[299] *See* Keith Barry, *Guide to Adaptive Cruise Control*, CONSUMER REPS. (May 9, 2022), https://www.consumerreports.org/cars/car-safety/guide-to-adaptive-cruise-control-a9154580873.

[300] Keith Barry, *Guide to Lane Departure Warning & Lane Keeping Assist*, CONSUMER REPS. (May 9, 2022), https://www.consumerreports.org/cars/car-safety/lane-departure-warning-lane-keeping-assist-guide-a7087080070.

[301] Clive Thompson, *Uber Would Like to Buy Your Robotics Department*, N.Y. TIMES (Sept. 11, 2015), https://www.nytimes.com/2015/09/13/magazine/uber-would-like-to-buy-your-robotics-department.html.

[302] Dan Primack & Kirsten Korosec, *GM Buying Self-Driving Tech Startup for More Than $1 Billion*, FORTUNE (Mar. 11, 2016, 9:36 AM), https://fortune.com/2016/03/11/gm-buying-self-driving-tech-startup-for-more-than-1-billion.

[303] Gautham Nagesh, *GM Closes Acquisition of Cruise Automation*, WALL ST. J. (May 13, 2016, 11:49 AM), https://www.wsj.com/articles/gm-closes-acquisition-of-cruise-automation-1463154595.

[304] Mike Isaac & Neal E. Boudette, *Ford to Invest $1 Billion in Artificial Intelligence Start-Up*, N.Y. TIMES (Feb. 10, 2017), https://www.nytimes.com/2017/02/10/technology/ford-invests-billion-artificial-intelligence.html.

automakers followed suit. Toyota invested $500 million in Uber's robotaxi program.[305] Honda invested in Cruise.[306] Volkswagen invested in Argo.[307] Hyundai invested in a robotaxi company called Motional.[308] For a moment, it looked like the automakers had decided to disrupt their own industry.

The tech giants also started to pour money into automated driving. Google spun out its ADS program into Waymo.[309] Amazon spent $1.3 billion to acquire the robotaxi startup Zoox.[310] And after years of leaks, Apple admitted that it was testing ADS-equipped vehicles.[311]

For some of the automakers, though, disruption proved too costly. In the late 2010s, it became clear that automated driving technology would take longer to develop and would require more sustained infusions of capital than the automakers could tolerate.[312] Ford shut down Argo in what it said was a strategic decision to focus on driver assistance systems—coopting the fruits of its ADS development for a sustaining innovation.[313] GM forced out the CEO of Cruise in part because he wanted Cruise to focus solely on robotaxis, while GM wanted Cruise to devote some effort to its driver assistance systems.[314]

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[305] Greg Bensinger & Chester Dawson, *Toyota Investing $500 Million in Uber in Driverless-Car Pact*, WALL ST. J. (Aug. 27, 2018, 10:57 PM), https://www.wsj.com/articles/toyota-investing-500-million-in-uber-in-driverless-car-pact-1535393774.

[306] Andrew J. Hawkins, *GM's Cruise Will Get $2.75 Billion From Honda to Build a New Self-Driving Car*, VERGE (Oct. 3, 2018, 8:51 AM), https://www.theverge.com/2018/10/3/17931786/gm-cruise-honda-investment-self-driving-car.

[307] Keith Naughton et al., *The Self-Driving Car Race Heats Up as Volkswagen Seals its $2.6 Billion Investment in Argo AI*, FORTUNE (June 3, 2020), https://fortune.com/2020/06/03/autonomous-cars-volkswagen-ford-argo-ai.

[308] Ian Thomas, *Hyundai Plans $5 Billion Investment in U.S. on Mobility Technology Such as Autonomous Driving and Robotics*, CNBC (May 23, 2022, 11:08 AM), https://www.cnbc.com/2022/05/22/hyundai-plans-5-billion-investment-in-us-on-mobility-technology.html.

[309] Daisuke Wakabayashi, *Google Parent Company Spins Off Self-Driving Car Business*, N.Y. TIMES (Dec. 13, 2016), https://www.nytimes.com/2016/12/13/technology/google-parent-company-spins-off-waymo-self-driving-car-business.html.

[310] Brad Templeton, *Amazon Buys Self-Driving Company Zoox for $1.2B and May Rule the World*, FORBES (June 26, 2020, 2:31 PM), https://www.forbes.com/sites/bradtempleton/2020/06/26/amazon-buys-self-driving-company-zoox-for-12b-and-may-rule-the-world.

[311] APPLE, OUR APPROACH TO AUTOMATED DRIVING SYSTEM SAFETY 2 (2019).

[312] Cade Metz, *The Costly Pursuit of Self-Driving Cars Continues On. And On. And On.*, N.Y. TIMES (Sept. 15, 2021), https://www.nytimes.com/2021/05/24/technology/self-driving-cars-wait.html.

[313] Alan Ohnsman, *Argo AI, Ford's Self-Driving Venture with Volkswagen, Is Shutting Down*, FORBES (Oct. 26, 2022, 3:58 PM), https://www.forbes.com/sites/alanohnsman/2022/10/26/argo-ai-fords-self-driving-venture-with-volkswagen-is-shutting-down/?sh=6da89e6e7241.

[314] *See* David Welch, *GM's Barra Dismissed Cruise CEO Ammann Over Mission, IPO*, BLOOMBERG (Dec. 20, 2021, 9:45 AM), https://www.bloomberg.com/news/articles/2021-12-

Uber rushed its deployments, and one of its ADS-equipped vehicles stuck and killed a pedestrian.[315] Uber eventually sold its program to a startup for no cash.[316]

Most automakers, such as BMW, Mercedes, and Toyota, are focused on sustaining innovations—driver assistance systems and other partially automated features for individually-owned vehicles.[317] Tesla is pursuing a sustaining innovation strategy but calling it disruption. Tesla's driver assistance systems—Autopilot and "Full Self-Driving"—require a human behind the wheel.[318] And they are sold as features on the existing vehicles Tesla sells to its customers.[319]

Today, Alphabet is still enthusiastically pursuing disruption. Waymo's robotaxis are driving on public roads in California and Arizona without any driver behind the wheel.[320] Zoox's robotaxis are also being tested in San Francisco, but with test drivers and on a much smaller scale.[321] Some observers speculate that Amazon will eventually divert Zoox's resources to logistics, a field where it is a dominant incumbent.[322] Apple seems to have abandoned its attempt to build an ADS and is settling for building an electric car with driver assistance.[323]

19/gm-s-barra-dismissed-cruise-ceo-ammann-over-mission-ipo-timing [https://perma.cc/4KE6-84YD].

[315] Daisuke Wakabayashi, *Self-Driving Uber Car Kills Pedestrian in Arizona, Where Robots Roam*, N.Y. TIMES (Mar. 19, 2018), https://www.nytimes.com/2018/03/19/technology/uber-driverless-fatality.html.

[316] Heather Somerville, *Uber Sells Self-Driving-Car Unit to Autonomous-Driving Startup*, WALL ST. J. (Dec. 7, 2020, 7:41 PM), https://www.wsj.com/articles/uber-sells-self-driving-car-unit-to-autonomous-driving-startup-11607380167.

[317] See Daniel Golson, *We Put Our Blind Faith in Mercedes-Benz's First-of-its-Kind Autonomous Drive Pilot Feature*, VERGE (Sept. 27, 2023, 8:00 AM), https://www.theverge.com/2023/9/27/23892154/mercedes-benz-drive-pilot-autonomous-level-3-test.

[318] Letter from Eric C. Williams, Assoc. Gen. Couns. Regul., Tesla, to Miguel Acosta, Chief, Autonomous Vehicles Branch, Cal. Dep't of Motor Vehicles (Nov. 20, 2022).

[319] Tesla, *Autopilot and Full Self-Driving Capability*, https://www.tesla.com/support/autopilot (last visited Jan. 24, 2024).

[320] Andrew J. Hawkins, *Waymo's Robotaxis Are Now Available to Tens of Thousands of People Across All of San Francisco*, VERGE (Oct. 10, 2023, 11:20 AM), https://www.theverge.com/2023/10/10/23911190/waymo-robotaxi-san-francisco-customers-waitlist.

[321] Zoox, *Get to Know Our Autonomous Test Fleet*, https://zoox.com/journal/l3-autonomous-fleet (last visited Jan. 23, 2024).

[322] Michelle Evans, *Amazon Could Slash Delivery Costs with $1 Billion Zoox Acquisition*, FORBES (June 26, 2020, 3:08 PM), https://www.forbes.com/sites/michelleevans1/2020/06/26/amazon-could-slash-delivery-costs-with-1-billion-zoox-acquisition/?sh=39ec829150ca.

[323] Mark Gurman, *Apple Dials Back Car's Self-Driving Features and Delays Launch to 2028*, BLOOMBERG (Jan. 23, 2024, 1:40 PM), https://www.bloomberg.com/news/articles/2024-01-23/apple-car-ev-set-to-debut-in-2028-with-limited-autonomous-driving.

Driver assistance systems likely won't improve safety much. In fact, there is mounting evidence that they cause crashes by lulling drivers into complacency.[324] Driver assistance systems also won't bring the other social and consumer advantages of robotaxis—freeing up valuable land, increasing the efficiency of the vehicle fleet, expanding mobility, and reducing the cost of transportation. But driver assistance systems generate profits for the automakers and give them the patina of innovation. More important from the perspective of the car companies, it doesn't risk a world in which people don't buy cars as a default matter.

The example of automated driving supports Christensen's claim that disruption doesn't come from incumbents. Even if incumbents can see the appeal of disruptive innovations, their organizations are built to settle for cooption. Disruption comes from new competition. Therefore, in the sectors of the economy that the tech giants don't already dominate, they can sometimes play the role of white knight supporting disruptive innovation. But in the sectors they control, their incentive is to coopt disruption.

IV. REMEDIES

What can we do to open the market to disruptive competition? In this Part, we offer several ideas for how to disrupt the coopting of disruption.

A. Unlocking Directorates

As we noted in Part II, one way incumbents can coopt disruptive startups is by monitoring and potentially controlling their process at an early stage, long before any possible acquisition. And a central way they are in a position to do that is by funding the startups themselves, either directly or indirectly. That funding comes with privileges – often a board seat and participation in management of the company, but always with access to company financials, plans, and customer projections. Access to that market intelligence allows them to see competitive threats coming and react to them, to decide whether to buy the company to head off competition altogether, and to use their influence to steer potentially disruptive startups in ways that don't threaten the incumbent's core business.

An obscure provision of antitrust law offers a potential solution to the problem of incumbents serving on the boards or management teams of startups. Since 1914, the Clayton Antitrust Act has made it unlawful for competitors to share directors (and since 1990, to share officers).[325] This rule contains exemptions only for companies that have less than $4.1 million in competitive sales or where the competitive overlap between the companies is less

[324] Mickle et al., *supra* note 279.

[325] Clayton Antitrust Act § 8, 15 U.S.C. § 19.

than 2% of their sales.[326] Notably, interlocking officers and directors between companies that compete, even in part, are illegal *per se* – without any inquiry into whether the companies in fact restrained competition because of their overlapping interests or whether the conduct offered procompetitive benefits.[327]

One rationale for this rule is to prevent conflicts of interest, since officers and directors have fiduciary responsibilities to their corporations, and having responsibilities to competing companies is likely to prevent them from competing vigorously. An interlocked board member may encounter conflicts of interest because directors engage in documented meetings at regular intervals and have influence over corporate behavior at each company they help oversee – giving them the needed information and opportunity to make decisions that ultimately restrain competition between their companies. A high-profile example involves Google, whose CEO sat on the board of Apple until the FTC intervened in 2009, despite the fact that the two companies are the largest makers of smartphone operating systems.[328] Another justification is to reduce the risk that competitors coordinate their pricing and product decisions.[329] Interlocks provide opportunities for firms to pursue and conceal cartels. Companies with interlocked boards have been shown to act in parallel more and share knowledge amongst themselves.[330] Interlocked companies in the life sciences may be more likely to engage in cartels or other anticompetitive behavior

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[326] Press Release, Fed. Trade Comm'n, FTC Announces Annual Update of Size of Transaction Thresholds for Premerger Notification Filings and Interlocking Directorates (Jan. 24, 2022).

[327] *See, e.g.,* Protectoseal Co. v. Barancik, 484 F.2d. 585, 589 (7th Cir. 1973); Jicarilla Apache Tribe v. Supron Energy Corp., 782 F.2d 855 (10th Cir. 1986); United States v. Sears, Roebuck & Co., 111 F. Supp. 614 (S.D.N.Y. 1953).

[328] Press Release, Fed. Trade Comm'n, Statement of Bureau of Competition Director Richard Feinstein Regarding the Announcement that Google CEO Eric Schmidt Has Resigned from Apple's Board (Aug. 3, 2009).

[329] *See* PHILIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION ¶ 1300 (4th ed. 2016); Anoop Manjunath et al., *Analysis of Over 2,200 Life Science Companies Reveals a Network of Potentially Illegal Interlocked Boards*, 9 J. L. BIOSCIENCES (forthcoming 2024).

[330] Daan Westra et al., *Understanding Competition Between Healthcare Providers: Introducing an Intermediary Inter-Organizational Perspective*, 121 HEALTH POL'Y 149 (2017); Diliara Valeeva, Eelke M. Heemskerk & Frank W. Takes, *The Duality of Firms and Directors in Board Interlock Networks: A Relational Event Modeling Approach*, 62 SOC. NETWORKS 68 (2020); Johan S. G. Chu & Gerald F. Davis, *Who Killed the Inner Circle? The Decline of the American Corporate Interlock Network*, 122 AM. J. SOCIO. 714 (2016); Val Burris, *Interlocking Directorates and Political Cohesion Among Corporate Elites*, 111 AM. J. SOCIO. 249 (2005); Liang Qu, Yuanjie Xu & Yajing Guo, *Research on the Influence of Network Position on Corporate Social Responsibility: Moderating Effect Based on Ownership Concentration*, 13 FRONT PSYCH. 1 (2022).

such as pay for delay settlements, just as prior research has shown that companies with interests in both branded and generic drugs compete less vigorously as generics.[331]

While they were a subject of significant attention in the 1950s and 1960s,[332] interlocking directorates have received little government or scholarly attention in recent decades. In part because the rule had fallen into disuse, one recent study found rampant violations of the rule against interlocks.[333] But that may be changing. In the past few years both the Antitrust Division of the U.S. Department of Justice and the Federal Trade Commission called attention to the issue and brought actions against companies with illegal interlocks, forcing the compromised directors to resign.[334]

Interlocks are illegal under current law only if the companies involved have more than $4.1 million in revenue and compete with each other for at least a small percentage of that revenue.[335]D That current definition excludes many nascent competitors in the tech industry, who may be pre-revenue while developing a product. It also excludes early-stage companies in the biotech industry. The highly regulated nature of the biotechnology industry means that companies frequently plan to compete in an industry years before they actually enter the market and generate revenue.

But pre-revenue interlocks may have many of the same competitive harms as the ones the law currently prohibits. Indeed, coopting disruption can happen without violating existing law so long as the company is pre-revenue, or so long as its revenue stream is one that is currently in direct competition with the incumbent. We suggest that the law should be extended to companies that are in "nascent competition"—they do not yet have revenue in a market but have indicated an intent to enter the market.

Another limitation of the current rule on interlocking directorates is who it covers. Traditionally it applied only to the same individual sitting on the boards of directors of two competing companies. In 1990 the rule was extended to cover officers as well as directors. But even that broader rule omits many cases when the competitive risks of interlocks are significant. For instance, Lemley and van Loo show that the same venture and private equity firms fund many different startups in the same space.[336] Different partners

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[331] Michael A. Carrier, Mark A. Lemley & Shawn Miller, *Playing Both Sides: Branded Sales, Generic Drugs, and Antitrust Policy*, 71 HASTINGS L. J. 307 (2020).

[332] AREEDA & HOVENKAMP, *supra* note 329; Mark S. Mizruchi, *What Do Interlocks Do? An Analysis, Critique, and Assessment of Research on Interlocking Directorates*, 22 ANN. REV. SOCIO. 271 (1996); P.C. Dooley, *The Interlocking Directorate*, 59 AM. ECON. REV. 314 (1969).

[333] Manjunath et al., *supra* note 329.

[334] Speech, Off. Pub. Affs., U.S. Dep't Just., Assistant Attorney General Jonathan Kanter Delivers Opening Remarks at 2022 Spring Enforcers Summit (Apr. 4, 2022).

[335] *See* Dooley, *supra* note 332.

[336] Mark A. Lemley & Rory Van Loo, *Common Directorship* (Working Paper, 2024).

from the same venture fund may sit on the boards of different companies, but they still owe their ultimate loyalty to the venture fund, and they can easily share information across the fund's multiple investors.

A similar problem exists with incumbent investors. The risk that Sundar Pichai or Mark Zuckerberg will sit on the board of a disruptive startup is quite small. But Alphabet or Meta might well dispatch a vice president of corporate development or a team section head to serve in that role. They are not technically officers of Alphabet or Meta, so they don't trigger the interlock rule even if they serve as a director at the startup. But their presence on the board presents the same worries about conflict of interest, collusion, and steering. The Clayton Act could not have contemplated the size of modern tech giants or the ecosystem of startups they face.

We think the rule against interlocking directorates should be expanded to apply to nascent and potential competitors, and to any manager (not just an officer or director) at one company who serves as an officer or director at a competing company. And we think that the rule should also be expanded to apply to board observers too. In startups, a board observer can have just as much influence over management—and just as much access to information—as a director. These reforms would not solve the problem of the close ties between financial VCs and the tech giants. But it would eliminate the most direct forms of intelligence gathering and influence that incumbents use to coopt disruption.

B. Limiting Leveraging of Data and Networks

Another way we can deter cooption is to prevent the tech giants from leveraging their access to data and networks against competitors. Specifically, we would impose on incumbent tech monopolists a presumptive duty of nondiscrimination in access where the defendant (1) provides or sells data or network access to at least some unaffiliated companies and (2) refuses to provide or sell the same data or network access to the plaintiff company on comparable terms, but (3) the plaintiff does not operate a competing network or otherwise compete with the defendant in the market from which it collected the relevant data. That presumption could be rebutted by a showing that there was a bona fide reason for the discriminatory treatment that was unrelated to competition, but the mere desire to choose whether to deal with a defendant would not be a sufficient justification.

In general, antitrust law protects a company's right to choose the parties with which it deals.[337] That makes sense—companies have more information than courts or enforcers about which deals will create the most value. In some networked industries, especially in the communications and transportation

[337] Erik Hovenkamp, *The Antitrust Duty to Deal in the Age of Big Tech*, 131 YALE L. J. 1483, 1487 (2022).

sectors, regulation may impose a duty to deal.[338] But those rules are outside the scope of antitrust law.

The courts have, however, found antitrust liability for refusals to deal in certain circumstances. The leading case is *Aspen Skiing v. Aspen Highlands Skiing*.[339] In *Aspen Skiing*, two competing ski resorts in Aspen, Colorado had for years sold an "all-Aspen" pass that would allow customers to ski at both resorts for six days.[340] But after a dispute, the defendant, which was the larger of the two resorts, dropped out of the all-Aspen agreement.[341] The plaintiff, the smaller resort, tried to negotiate and even offered to buy the defendant's lift tickets at retail price, but the defendant wouldn't budge.[342] The plaintiff sued, arguing that the defendant monopolized the Aspen skiing market under section 2 of the Sherman Act.[343] The Supreme Court upheld liability for the defendant because the evidence showed that "the monopolist made a deliberate effort to discourage its customers from doing business with its smaller rival."[344] Further, because there was already an established business relationship, defendant couldn't plausibly argue that it was unprofitable to do business with the plaintiff. The evidence clearly suggested that the refusal to business was an effort by a business that had acquired three of the four area resorts to drive the one remaining competitor out of the market.[345]

In a more recent decision, *Verizon v. Trinko*, the court cast doubt on refusal to deal claims.[346] The plaintiff, a customer of AT&T's local telephone service, argued that Verizon had denied its rivals access to interconnection services in an attempt to monopolize the market.[347] *Trinko* is a complicated case—Verizon had already paid a penalty for the challenged conduct in a settlement with telecom regulators.[348] The Supreme Court held that the Sherman Act did not create liability for a refusal to deal in addition to the liability under regulation.[349] The ruling was primarily based on the regulatory structure of the telecommunications market, which the Court held preempted antitrust enforcement.[350] In dictum, Justice Scalia wrote that "[t]he opportunity to charge monopoly

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[338] *Id.* at 1535.

[339] Aspen Skiing Co. v. Aspen Highlands Skiing Corp., 472 U.S. 585 (1985).

[340] *Id.* at 589.

[341] *Id.* at 592–93.

[342] *Id.* at 593.

[343] *Id.* at 595.

[344] *Id.* at 610.

[345] *Id.* at 610.

[346] Verizon Commc'ns Inc. v. Law Offs. of Curtis V. Trinko, LLP, 540 U.S. 398 (2004).

[347] *Id.* at 407.

[348] *Id.* at 413.

[349] *Id.* at 409.

[350] *Id.* at 407. For criticism of that conclusion, *see* Dogan & Lemley, *supra* note 144, at 685.

prices—at least for a short period—is what attracts business acumen in the first place; it induces risk taking that produces innovation and economic growth."[351] In order "[t]o safeguard the incentive to innovate," he explained, "the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct."[352] Scalia distinguished *Aspen Skiing* on the ground that that Verizon, unlike the defendant ski resort in *Aspen*, had not voluntarily dealt with its rivals in the past and did not sacrifice any profits by refusing to deal with them.[353]

We agree with Scalia that the opportunity to be the first mover in a new market and temporarily extract monopoly profits can motivate innovation. Requiring a monopolist to provide or sell that innovation to rivals might undermine the incentives for investment (though the fact that the defendants must be monopolists means they have almost certainly recouped their investment many times over already). But as Erik Hovenkamp has pointed out, the investment argument is at its strongest when applied to rivals *in the same market*.[354] There is less need to protect putative future investments in vertical integration by allowing a vertically integrated monopolist to disadvantage upstream or downstream competitors.

Consider again Facebook's decision to stop selling Facebook user data to the messaging app startup MessageMe, which we discussed in Part II.[355] Facebook was an innovator in the social network market. If the VCs who invested in Facebook had believed that antitrust law would one day force Facebook to provide or sell data to other startups building social networks, which those startups could then use to compete with Facebook, they might have been less likely to invest. But the VCs wouldn't have worried about antitrust law that forced Facebook to provide or sell data to a startup in an adjacent market like messaging. In fact, at first, Facebook wasn't even in the messaging business. Facebook didn't add a chat function until 2008 and a standalone messaging app until 2010.[356] The reason Facebook and its VCs invested in innovating in social networking is because they thought social networks would be profitable, not messaging.

More generally, we agree with Erik Hovenkamp that courts should distinguish between "primary" and "secondary" refusals to deal.[357] A monopolist

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[351] Trinko, 540 U.S. at 407 (internal quotations omitted).

[352] *Id.*

[353] *Id.* at 409.

[354] Hovenkamp, *supra* note 337, at 1536.

[355] Solon & Farivar, *supra* note 120.

[356] Meta, *Announcement: Facebook Launches Facebook Chat* (Apr. 6, 2008), https://about.fb.com/news/2008/04/announcement-facebook-launches-facebook-chat; Miguel Helft, *Facebook Offers New Messaging Tool*, N.Y. TIMES (Nov. 15, 2010), https://www.nytimes.com/2010/11/16/technology/16facebook.html.

[357] Hovenkamp, *supra* note 337, at 1527–29.

should be able to refuse to share the components of an innovation in the market that the innovation targeted—that's a primary refusal to deal. They shouldn't be able to leverage their monopoly power by refusing to deal with companies that compete with them in *other* markets—that's a secondary refusal to deal.

The clearest examples of anticompetitive refusals to deal will be cases in which the defendant voluntarily dealt with the plaintiff and then stopped, as with Facebook and MessageMe.[358] Facebook's initial willingness to sell data to MessageMe, like the *Aspen Skiing* defendant's willingness to collaborate with its smaller rival, suggests that it was a profitable deal. In those cases, a court can reasonably draw the inference that the defendant's decision to stop dealing was anticompetitive.

We wouldn't, however, limit policing of secondary refusals to deal to cases in which the defendant had a preexisting contractual relationship with the plaintiff. If a plaintiff can show that the defendant provides or sells access to its data or networks to other companies but won't deal with the plaintiff, then the court should be able to hold the defendant liable. But in these cases, we think, the court should be more receptive to a defendant's argument that its refusal to deal was motivated by reasons other than choking off a potential competitor. Courts should inquire into what motivated the refusal to deal, looking in particular for evidence (direct or indirect) of a motivation to stop disruptors. Legitimate concerns about privacy or cybersecurity, like those that probably motivated Facebook's blocking Six Four Three's "bikini harvester," should be permissible justifications for a refusal to deal, but the mere "right" to choose who you deal with should not be a sufficient business justification.

Finally, we recognize concerns that creating such a cause of action would open the floodgates to disgruntled businesses who didn't get the deal they wanted. To make the cause of action manageable, we propose that it would be enforceable only by the state and federal governments, not by private plaintiffs. That was the approach the AICOA bill proposed, and we think it makes sense. While it risks underenforcement, particularly in an administration hostile to antitrust, the presence of state enforcers reduces that risk.

C. Regulating Regulation

The most challenging tool for cooption is the perversion of regulation to protect incumbency. Done right, regulation of technology can be beneficial and even necessary to the development of that technology, minimizing the risk of harm to third parties and ensuring that the world views the technology as safe and trustworthy. But all too often regulation has become a way to insulate incumbents from competition, with predictable results. We spent 70 years in the clutches of a regulated telephone monopoly that made some remarkable

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[358] *Id.* at 1500.

innovations in its research labs, from the transistor to the laser to solar cells, but deployed virtually none of it in its core (and protected) market. Only when we broke up the regulated monopoly did we unleash a wave of innovation in telecommunications. AT&T didn't innovate when it was a regulated monopoly because it didn't have to. It was insulated from competition by statute, and it found common cause with regulators in coming up with reasons not to take a risk on new technologies. As one remarkable example, AT&T and regulators blocked the Hush-a-Phone, a rubber device that reduced the sound made by an old-fashioned telephone handset, out of fears that connecting a rubber device to the end of a plastic phone receiver might somehow damage the network itself.[359]

It is hard to respond to efforts to coopt regulation because sometimes the concerns that spur regulation are real, and regulators – who gain most of their information from the incumbents themselves – may not be able to tell real concerns from spurious ones. Nonetheless, there are a few things we can do to reduce the likelihood of regulatory capture and cooption.

First, lawmakers and regulators need to be aware of the problem. When incumbents ask to be regulated, large alarm bells should be going off in Washington. That doesn't mean we shouldn't regulate them; there may be good reasons to do so. But we should know that they are trying to coopt disruption, and we should vet the regulations accordingly.

Second, legislators and agencies should proceed with caution when they regulate new technology. Some technologies—like vaping devices marketed to teenagers—may require urgent action may be necessary to prevent irreversible harms. And some technologies may become harder to regulate once the interest groups backing them become entrenched.[360] But regulating too early in the history of a new technology is often counterproductive. We should be particularly aware of the risk that early regulation that shapes how products can and can't be made will be driven by profile and recency bias. Regulators should take care not to overreact to AI chatbots that sometimes hallucinate or ADSs that are involved in a small number of serious crashes. It can take time to observe the net impact that a new technology will have on health, safety, the environment, economic growth, democracy, or other social values. Regulation that treats new technologies more harshly than existing ones, conscious or not, is a key means of coopting disruption.[361] The temptation to regulate something

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[359] Lauren Young, *The Battle Over Net Neutrality Started With the 1920s-Era 'Hush-A-Phone'*, ATLAS OBSCURA (Aug. 16, 2016), https://www.atlasobscura.com/articles/the-battle-over-net-neutrality-started-with-the-1920s-era-hushaphone.

[360] *See* Matthew T. Wansley, *Regulation of Emerging Risks*, 69 VAND. L. REV. 401, 414-15 (2016).

[361] It is also likely to be ineffective. Several examples from recent history involve early legislation that subsequent technological changes rendered irrelevant. *See* Semiconductor Chip Protection Act of 1984, 17 U.S.C. §§ 901–914 (Supp. IV 1986) (an entirely new IP right to protect semiconductor "mask works" that was only ever used twice, because the way we make

because it is new can be overwhelming for legislators and agencies whose job it is to write rules. But often the best approach is "don't just do something, stand there!"

Third, we should disfavor regulations that limit market entry. Those regulations most directly prevent disruption, and they have almost always turned out to be a bad idea. Health and safety rules for technologies are one thing, but limiting who can enter the market at all is quite another. And companies quite frequently seek to impose such rules. Hotels sought to ban Airbnb;[362] taxi companies sought to require Lyft and Uber to charge more money than they do.[363] Fantasy sports companies are trying to ban their competitors.[364] The list goes on. Even if there is reason to regulate a new technology, there is rarely a good reason to ban it – and almost never at the behest of a competitor who stands to benefit from eliminating competition.

Finally, we should be conscious of the burden regulatory compliance imposes on startups and the fact that costly regulation disproportionately favors incumbents. We aren't fans of new rules that apply only to individual identified companies, which seem to be in vogue in Europe these days. But there is a good case for exempting small companies from certain regulations for a limited period to enable them to get their footing.[365]

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semiconductors changed); R. Jason Richards, *The Utah Digital Signature Act as "Model" Legislation: A Critical Analysis*, 17 J. MARSHALL J. COMPUT. & INFO. L. 873, 876 (1999) (discussing the weakness of the Utah Digital Signature Act of 1995 as "model" legislation for electronic signature technology); Jane K. Winn, *The Emperor's New Clothes: The Shocking Truth About Digital Signatures and Internet Commerce*, 37 IDAHO L. REV. 353, 353–88 (2001) (explaining how laws written in the 1990s to regulate electronic commerce rapidly became obsolete because they didn't anticipate how people would behave); Ryan Calo, *Artificial Intelligence Policy: A Primer and Roadmap*, 51 UNIV. CAL. DAVIS 399, 428 (2017) ("the Electronic Communications Privacy Act ("ECPA"), passed in 1986, interacts poorly with a post Internet environment in part because of ECPA's assumptions about how electronic communications would work.").

362 Katie Benner, *Inside the Hotel Industry's Plan to Combat Airbnb*, N.Y. TIMES (Apr. 16, 2017), https://www.nytimes.com/2017/04/16/technology/inside-the-hotel-industrys-plan-to-combat-airbnb.html.

363 Roger Lowenstein, *Uber, Lyft and the Hard Economics of Taxi Cab Medallions*, WASH. POST (Mar. 24, 2019), https://www.washingtonpost.com/business/economy/uber-lyft-and-the-hard-economics-of-taxi-cab-medallions/2019/05/24/cf1b56f4-7cda-11e9-a5b3-34f3edf1351e_story.html.

364 Sean McQuillan, *Daily Fantasy Sports Battle Over Pick'Em Games is LSR's Top Story of 2023*, LEGAL SPORTS REPS. (Jan. 5, 2024), https://www.legalsportsreport.com/157511/2023-daily-fantasy-sports-battle-over-pickem-games-lsr-story-of-the-year; Sean McQuillan, *Sports Betting Lobbyist Asked for Wyoming Inquiry Into Pick'Em Fantasy Sports*, LEGAL SPORTS REPS. (Oct. 26, 2023), https://www.legalsportsreport.com/145759/sports-betting-lobbyist-asked-for-wyoming-inquiry-into-fantasy-sports.

365 JEFF KOSSEFF, THE TWENTY-SIX WORDS THAT CREATED THE INTERNET (2019); Anupam Chandler, *How Law Made Silicon Valley*, 63 EMORY L. J. 639 (2014).

D. Blocking Cooptive Acquisitions

The sharpest weapon to fight cooption is the power to block acquisitions. The antitrust statutes confer on the government broad authority to stop anti-competitive mergers. Section 2 of the Sherman Act bans monopolization and acquisitions that a monopolist undertakes to maintain its monopoly.[366] Section 7 of the Clayton Act goes further. It prohibits acquisitions even if there is no actual or likely monopoly if the effect "may be substantially to lessen competition."[367] But the case law interpreting these statutes is ill-suited to acquisitions of small startups in unrelated markets that create long-term competitive threats.[368]

Antitrust law classifies mergers by the markets in which the acquiror and target operate.[369] When they compete in the same market, the merger is horizontal. When they operate at different points in a supply chain, the merger is vertical. And when they operate in unrelated markets, the merger is conglomerate. All else equal, horizontal mergers are the easiest to challenge, vertical mergers are more difficult to challenge, and conglomerate mergers are nearly impossible to challenge.[370] But while some cooptive acquisitions are of direct competitors, in many cases the relationship between the firms is more complicated. They may be potential future competitors, companies with adjacent or complementary products, or companies that won't directly compete at all but may change the nature of the incumbent's market.[371] Consequently, in many cooptive acquisition cases, enforcers will start with unfavorable case law. And even when one of the tech giants seeks to acquire a startup that competes in one of its core market, enforcers may still struggle to show that the merger would significantly increase concentration if the startup has only a modest market share.[372] In many cooptive acquisitions, the startup will not have started to compete at all.

A further problem is that startups are by their nature uncertain bets on the future. Any given startup might or might not disrupt an incumbent's market. An incumbent buying the startup is often buying, not protection from competition that would certainly have occurred, but insurance against the possibility of disruption.[373] Unfortunately, antitrust law has developed (incorrectly, in the case of section 7) to require proof that it was more likely than not that a merger

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[366] 15 U.S.C. § 2.

[367] 15 U.S.C. § 18.

[368] Feldman & Lemley, *supra* note 156.

[369] Hovenkamp, *supra* note 66, at 1958.

[370] *Id.* at 2041–42.

[371] Lemley & McCreary, *supra* note 11.

[372] Hovenkamp, *supra* note 66, at 1964.

[373] Feldman & Lemley, *supra* note 156.

would have excluded competition. That standard is hard to meet with cooptive acquisitions of startups.[374]

Enforcers must also wield their power to block acquisitions carefully. VCs rely on acquisitions to generate the returns they need to deliver to their LPs. A ban on all startup acquisitions could reduce the number of successful exits, diminish returns to LPs, and lead to less investment in the next generation of promising startups.[375] We can—and should—encourage alternatives to acquisition by, among other things, reviving the IPO market and liberalizing the secondary market for trading primary company securities.[376] If there is to be a merger, we should encourage purchases by other entrants in the market rather than by incumbents. And at the end of the day, a company that is started with the goal of being swallowed by a tech giant probably isn't contributing much to society.[377] But in the near term, many venture-backed startups need potential paths to acquisition to raise capital.

For these reasons, antitrust enforcers need a strategy for blocking cooptive acquisitions that works within existing case law (or plausible improvements to that law) and is surgical enough to avoid chilling investment.

1. Nascent Competitors

We aren't the first to recognize the challenges of blocking anticompetitive acquisitions. In a recent article, Hemphill and Wu argue that the government should block acquisitions of "nascent competitors."[378] We endorse their plan, but we think enforcement needs to take a step further.

Hemphill and Wu's approach "emphasizes prospective innovation by a future direct competitor."[379] Their main examples are Microsoft's exclusionary conduct towards Netscape, the gene sequencing company Illumina's aborted acquisition of another gene sequencing company, PacBio, and Facebook's acquisitions of Instagram and WhatsApp.[380] In each of these cases, Hemphill and Wu argue, the new entrant was an innovator, they had the potential for future innovations, and they posed a threat to the incumbent.[381]

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[374] *Id.* (discussing this problem).

[375] D. Daniel Sokol, *Vertical Mergers and Entrepreneurial Exit*, 70 FLA. L. REV. 1357, 1357 (2018).

[376] Lemley & McCreary, *supra* note 11, at 72–81; Wansley, *supra* note 34, at 1250–53.

[377] Lemley & McCreary, *supra* note 11.

[378] Hemphill & Wu, *supra* note 152, at 1881; Lemley & McCreary, *supra* note 11 (making a similar recommendation).

[379] Hemphill & Wu, *supra* note 152.

[380] *Id.* at 1883–86.

[381] *Id.* at 1886.

Hemphill and Wu propose that the government show that acquisitions of nascent competitors are anticompetitive by providing evidence of an anticompetitive plan.[382] They argue that documentary evidence, a pattern of anticompetitive acquisitions, or a price that amounts to an economic sacrifice could establish the acquiror's anticompetitive intent.[383] And they also argue that courts should be receptive to evidence revealed after the acquisition that suggests it was anticompetitive, such as changes in price, product quality, and market position.[384]

For cooptive acquisitions like Facebook/Instagram deal, we think Hemphill and Wu's strategy makes sense. Zuckerberg's email arguing for acquiring startups like Instagram because "they could be very disruptive to us" is a smoking gun of anticompetitive intent.[385] And although Instagram didn't have a large share of the social media market at the time of the acquisition, it is easy to see how its rapid growth could lead to greater competition in the counterfactual world in which the acquisition was blocked.

But we think some of the most important cooptive acquisitions might stretch the limits of Hemphill and Wu's view of nascent competitors. Consider Google's acquisition of DeepMind in 2014. Was DeepMind—a small group of engineers in London teaching a neural network how to play Pong—a "future direct competitor"? If so, in what core Google market would they compete? Would discovery reveal an email in which a Google executive characterized DeepMind as a long-term competitive threat? And today—a decade later—are there any changes in market conditions that would convince a skeptical court that the acquisition was anticompetitive?

To their credit, Hemphill and Wu are careful to acknowledge that how an innovation might develop is fraught with uncertainty and that some important innovations are "general purpose technologies."[386] They write that "[u]ncertainty about what products the incumbent and the nascent competitor will actually offer in the future" can lead to "uncertainty about the degree to which those products will actually compete."[387] We agree, and we think this uncertainty suggests that enforcers may need to take a more unconventional approach in some cooptive acquisitions.

2. Potentially Disruptive Technologies

We think the government should focus its challenges to cooptive acquisitions on the startup's innovation capabilities. If we are to prevent the tech

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[382] *Id.* at 1903–04.

[383] *Id.* at 1904.

[384] *Id.* at 1906–07.

[385] Newton & Patel, *supra* note 153.

[386] Hemphill & Wu, *supra* note 152, at 1887.

[387] *Id.* at 1887–88.

giants from diverting a startup's disruptive innovation capabilities to the development of sustaining innovations, enforcers will sometimes need to act before it is clear how the startup will turn its innovation into a product. If antitrust enforcers were to have a case against Google's acquisition of DeepMind in 2014, the case would need to have been based not on its current or immediate future products but on its capability to innovate.

Of course, an approach to policing startup acquisitions based on innovation capabilities need limits. Many startups have some innovation capabilities that could have a significant effect on competition. We can cabin enforcement in three ways—by focusing on specific technologies and specific firms and by looking at the cumulative effects of multiple acquisitions.

We think the DOJ and the FTC should announce that they will presumptively challenge acquisitions developing one of a list of specific "potentially disruptive technologies" by a specific set of acquirors—Alphabet, Amazon, Apple, Microsoft, and Meta.[388] To rebut that presumption, the merging parties would have to demonstrate that the startup will not succeed without the merger *and* that no company besides the incumbent is positioned to acquire it.[389]

Our list of potentially disruptive technologies would start with our first two examples here, generative AI and virtual and augmented reality. As we observed in the Introduction, each of the tech giants grew by developing a new disruptive technology. Those same companies are now attempting to coopt startups that might leapfrog them the way they leapfrogged earlier incumbents. Restricting the companies with the most ability and incentive to coopt—the tech giants—from coopting the startups that pose the greatest long-term competitive threat—that is, the startups developing potentially disruptive technologies—is the best way to restore Schumpeterian competition without chilling investment in startups.

The government's precommitment to challenge a specific set of mergers would create socially desirable incentives for startups. A startup developing one of the listed technologies would gain stronger incentives to turn its innovations into the products that its management team believed would garner the highest value on the open market—rather than the one most valuable to the tech giants. They would also gain stronger incentives to build a truly independent business and go public since an acquisition by the tech giants would be a less likely exit.

One might worry that startups trying to develop one of the listed technologies would find it harder to raise capital because some of the richest acquirors would be off the table. But the technologies that the government would list

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[388] *Cf.* Samuel N. Weinstein, *Anticompetitive Merger Review*, 56 GA. L. REV. 1057, 1112 (2022) (proposing that the government should "announce a 'merger watchlist': a set of highly concentrated markets in which they are likely to immediately challenge any merger between competitors absent a credible failing-firm defense.").

[389] Lemley & McCreary, *supra* note 11.

would be the kind that already attracted strong VC interest. We doubt VCs' enthusiasm for investing in AI startups would stop if the government committed to challenge the tech giants' acquisition of those startups today. Any prospective acquiror other than those five companies could still offer a lucrative exit, and in fact, they might be more likely to propose an acquisition if they expected they would not be stuck in bidding war with one of the tech giants. And as Lemley and McCreary have noted, there are plenty of other ways for startups to make money besides an acquisition, including the old-fashioned way: selling products.[390]

To be sure, our approach would create some line-drawing problems. The government would have to define its listed technologies carefully and will need to update them as new technologies replace old ones as potential disruptors. But that task is in loosely analogous to the kind of market definition problems that antitrust enforcers and courts deal with routinely. The government might also need to update its list of acquirors. We admit to some ambivalence about whether Nvidia—which in some ways resembles the tech giants—should be included. But if the government found itself changing the list of acquirors frequently, that would mean that the tech giants are facing new competitors, precisely the problem we are aiming to solve.

We think the list of presumptively anticompetitive merger spaces can be supplemented by a focus on the forest (the cumulative effect of all mergers in a space), not just the trees of individual mergers.[391] Antitrust agencies should be more wary of a pattern of acquisitions in a new technological space. Such a pattern may suggest that the company sees disruptive potential in a technology that is not yet on the agency's radar screen.

CONCLUSION

Innovation and competition are central to economic progress. Disruptive technologies offer innovation that brings competition. And competition in turn brings disruptive innovation – a virtuous cycle that gives us the best of both worlds. The tech giants have increasingly found ways to coopt that disruption – sometimes squelching innovation altogether, and at best using it to protect monopolies rather than destroy them. If we are to restore competition to the tech industry, and so preserve innovation, we need to find ways to ensure that disruptive technologies do what they are supposed to do – disrupt.

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[390] *Id.*

[391] Feldman & Lemley, *supra* note 156.