ARTICLE

Techno-Federalism: How Regulatory Fragmentation Shapes the U.S.-China AI Race

Jason Jia-Xi Wu[*1]

ABSTRACT

The United States and China are engaged in a regulatory arms race over artificial intelligence (AI). Yet, existing debates often overlook a critical factor shaping this AI race: federalism, or the division of regulatory authority between central and local governments. In the United States, states lead in AI regulation, with the federal government taking a limited, backseat role. In China, although authority remains more centralized, local governments have played a pivotal role in implementing and experimenting with AI policies. While institutional differences remain, both countries exhibit signs of partial convergence towards a fragmentary approach to AI governance.

What explains this convergence? The Article argues that the answer lies in industry self-governance. In both countries, the tech industry is increasingly acting as a co-regulator of AI systems alongside traditional central and local authorities. As gatekeepers, suppliers, and beneficiaries of disruptive AI technologies, the tech industry imposes market discipline on regulators at both levels, often by leveraging local protectionism and jurisdictional variation to advance its interests. However, as national security takes center stage in this AI race, the tech industry is assuming both commercial and geopolitical roles, emerging as a third regulatory force that reshapes center-local relations.

This new paradigm reflects what this Article terms "techno-federalism." Blending "technocracy" with "federalism," techno-federalism captures how emerging AI norms both disrupt and transform center-local relations by empowering the private sector to embed itself in public policymaking. It challenges the dominant view that the U.S.-China AI race is merely a "battle of values" between

liberal democracy and techno-autocracy. By highlighting the tripartite interplay between central, local, and market power, techno-federalism offers a more nuanced perspective, addressing the limits of conventional geostrategic approaches to the U.S.-China AI race.

CONTENTS

I. INTRODUCTION

It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.

— Louis D. Brandeis, U.S. Supreme Court Justice[2]

The Chinese point-to-surface approach entails a policy process that is initiated from individual experiment[s] and driven by local initiative… [It] gives room to local officials to develop models of their own, while ultimate control over ... spreading model experiments rests with top-level decision-makers.

— Sebastian Heilmann, Author of *Red Swan*[3]

Artificial intelligence (AI) has become the new frontier of global geopolitics. AI is already widely employed in services, manufacturing, and finance—the backbones of global commerce.[4] Yet, this is only the beginning. Sovereign states now prioritize AI as a national security imperative, given its potential to disrupt critical infrastructures[5] and erode trust in government institutions.[6] As the global trading system remains in flux, nations are vying for control over markets, capital, and resources essential for AI development.[7]

At the core of this contest lies the U.S.-China AI rivalry. The Chinese Communist Party (CCP) views AI as a strategic asset to reshape its economy for geopolitical ends.[8] In March 2022, China became the first nation to

---

[2] New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932).

[3] Sebastian Heilmann, *From Local Experiments to National Policy: The Origins of China's Distinctive Policy Process*, 59 THE CHINA J. 1, 2 (2008). *See generally* SEBASTIAN HEILMANN, RED SWAN: HOW UNORTHODOX POLICY MAKING FACILITATED CHINA'S RISE (2018).

[4] *See, e.g.*, Anupam Chander, *Artificial Intelligence and Trade*, BIG DATA AND GLOB. TRADE L. 115 (Mira Burri ed., 2021); Joshua Meltzer, *The Impact of Artificial Intelligence on International Trade*, BROOKINGS INST. (Dec. 13, 2018), https://www.brookings.edu/articles/the-impact-of-artificial-intelligence-on-international-trade/ [https://perma.cc/475L-B9QL].

[5] *See* Sienna Tompkins et al., *The Geopolitics of Artificial Intelligence*, LAZARD 7–18 (Oct. 2023), https://www.lazard.com.au/media/juwntcdp/lazard-geopolitical-advisory_geopolitics-of-artificial-intelligence_-oct-2023.pdf [https://perma.cc/Y2XX-SWJ8]; *see also* KELLEY M. SAYLER, CONG. RSCH. SERV., R45178, ARTIFICIAL INTELLIGENCE AND NATIONAL SECURITY 20–27 (2020), https://www.congress.gov/crs-product/R45178 [https://perma.cc/9SNW-EVRF].

[6] *See* Ian Bremmer & Mustafa Suleyman, *The AI Power Paradox*, FOREIGN AFFS. (Aug. 16, 2023), https://www.foreignaffairs.com/world/artificial-intelligence-power-paradox [https://perma.cc/L68U-LWTU].

[7] *See* Barry Pavel et al., *AI and Geopolitics: How Might AI Affect the Rise and Fall of Nations?*, RAND CORP. (Nov. 3, 2023), https://www.rand.org/pubs/perspectives/PEA3034-1.html [https://perma.cc/V9ZQ-68KH].

[8] *See* 国务院 [STATE COUNCIL], 35 号 [DOC. NO. 35], 新一代人工智能发展规划的通知 [NOTICE ON THE DEVELOPMENT PLAN FOR A NEW GENERATION OF ARTIFICIAL

introduce comprehensive AI regulations, spanning R&D, e-commerce, healthcare, and services.[9] These rules aim to fortify CCP control over information ecosystems, achieve technological self-sufficiency, and ensure that AI content aligns with "socialist core values."[10]

The United States approaches AI with a blend of caution and opportunity, recognizing it as a double-edged sword for security, privacy, and democracy. In the wake of the Cambridge Analytica, ByteDance, and Huawei scandals, Congress warned that the rise of "digital authoritarianism" could undermine democratic processes and threaten "the American way of life."[11] In response, the Biden administration issued the *AI Bill of Rights* in October 2022, setting guidelines to protect against harmful AI applications that erode "foundational American civil rights and democratic values."[12] A year later, the Biden administration issued Executive Order 14110, addressing a wide array of concerns: national security risks, unfair competition, and disinformation.[13] More recently, in January 2025, the Trump administration reinforced the security imperative in Executive Order 14179, making "retaining global

---

INTELLIGENCE] (2017) (China) https://www.gov.cn/zhengce/content/2017-07/20/content_5211996.htm [https://perma.cc/GH82-TGK7].

[9] *See, e.g.,* 网信办 工业和信息化部 公安部 市场监管总局 [CYBERSPACE ADMIN. OF CHINA, MINISTRY OF IND. AND INFO. TECH., MINISTRY OF PUB. SEC., STATE ADMIN. FOR MKT. REGUL.], 第 9 号 [DOC. NO. 9], 互联网信息服务算法推荐管理规定 [REGULATIONS ON THE MANAGEMENT OF INTERNET INFORMATION SERVICE ALGORITHM RECOMMENDATIONS] (2023) (China) https://www.gov.cn/zhengce/zhengceku/2022-01/04/content_5666429.htm [https://perma.cc/UAS6-W4LU]; 网信办 [CYBERSPACE ADMIN. OF CHINA] ET AL., 互联网信息服务深度合成管理规定 [REGULATIONS ON THE MANAGEMENT OF DEEP SYNTHESIS OF INTERNET INFORMATION SERVICES] (2022) (China) https://www.gov.cn/zhengce/zhengceku/2022-12/12/content_5731431.htm [https://perma.cc/P6F2-U646]; 网信办 [THE CYBERSPACE ADMIN. OF CHINA] ET AL., 生成式人工智能服务管理暂行办法 [INTERIM MEASURES FOR THE ADMINISTRATION OF GENERATIVE ARTIFICIAL INTELLIGENCE SERVICES] (2023) (China) https://www.gov.cn/zhengce/zhengceku/202307/content_6891752.htm [https://perma.cc/W3QE-MD8A].

[10] *See* Matt O'Shaughnessy, *What Chinese Regulation Proposal Reveals About AI and Democratic Values*, CARNEGIE ENDOWMENT FOR INT'L PEACE (May 16, 2023), https://carnegieendowment.org/posts/2023/05/what-a-chinese-regulation-proposal-reveals-about-ai-and-democratic-values?lang=en [https://perma.cc/C9CS-APPX].

[11] Adrian Shahbaz, *The Rise of Digital Authoritarianism*, FREEDOM HOUSE (last visited Nov. 8, 2023), https://freedomhouse.org/report/freedom-net/2018/rise-digital-authoritarianism [https://perma.cc/E64M-E9AE].

[12] OFF. OF SCI. & TECH. POL'Y, EXEC. OFF. OF THE PRESIDENT BLUEPRINT FOR AN AI BILL OF RIGHTS (2022), https://bidenwhitehouse.archives.gov/ostp/ai-bill-of-rights/ [https://perma.cc/QGU5-WHMN] [hereinafter BLUEPRINT FOR AN AI BILL OF RIGHTS].

[13] *See* Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence, 88 Fed. Reg. 75191 (Oct. 30, 2023).

leadership in AI" an explicit policy priority.[14] These actions reflect the growing intersection of tech policy and national security in AI governance.

A.   *Existing Policy Discussion*

As more AI regulations unfold, a distinct geopolitical dynamic emerges: a race between the United States and China to set global AI standards and compete for technology leadership[15] Existing policy discussions often frame the U.S.-China AI race as an external geopolitical confrontation, overlooking the role of sub-national institutions in shaping this race. Many view it as a battle of values[16] between an incumbent superpower striving to restore faith in liberal democracy and a rising hegemon seeking alternative sources of legitimacy.[17] In this view, AI merely adds new flavor to the old rivalry. As Graham Allison puts it, the U.S.-China AI race signifies an ideological warfare, with China leveraging AI to advance its "authoritarian model of governance" and claim "superiority to today's dysfunctional democracy."[18]

In Washington, two dominant perspectives shape the policy debate: realism and idealism. Realists argue that China's authoritarian regime offers a strategic advantage by enabling mass data collection to train algorithms for surveillance and control.[19] They also emphasize China's capacity to mobilize industrial resources for AI development. With explicit goals of surpassing the United States in high-tech sectors, Chinese AI policy embodies a centralized, state-driven approach.[20] Realists contend that, to win the AI race, the United

---

[14] *See* Removing Barriers to American Leadership in Artificial Intelligence, 90 Fed. Reg. 8741 (Jan. 23, 2025).

[15] *See* NAT'L INST. OF STANDARDS & TECH., U.S. DEP'T OF COM., US LEADERSHIP IN AI: A PLAN FOR FEDERAL ENGAGEMENT IN DEVELOPING TECHNICAL STANDARDS AND RELATED TOOLS (Aug. 9, 2019), https://www.nist.gov/system/files/documents/2019/08/10/ai_standards_fedengagement_plan_9aug2019.pdf [https://perma.cc/6DWN-SULD] (prepared in response to Exec. Order 13859); *see also* Mercy A. Kuo, *China's Bid to Lead the World in AI*, THE DIPLOMAT (July 6, 2024), https://thediplomat.com/2024/07/chinas-bid-to-lead-the-world-in-ai/ [https://perma.cc/27PV-FZZY].

[16] *See* Emmie Hine & Luciano Floridi, *Artificial Intelligence with American Values and Chinese Characteristics: A Comparative Analysis of American and Chinese Governmental AI Policies*, 39 AI & SOC'Y 247, 268–70 (2024).

[17] *See* Benjamin Larsen, *The Geopolitics of AI and the Rise of Digital Sovereignty*, BROOKINGS INST. (Dec. 8, 2022), https://www.brookings.edu/articles/the-geopolitics-of-ai-and-the-rise-of-digital-sovereignty/ [https://perma.cc/7B3K-FR2A].

[18] Graham Allison & Eric Schmidt, *Is China Beating the US to AI Supremacy?*, HARV. BELFER CTR. FOR SCI. & INT'L AFFS. (Aug. 2020), https://www.belfercenter.org/publication/china-beating-us-ai-supremacy [https://perma.cc/9TVE-CMY6].

[19] *See* Daniel Oberhaus, *Authoritarian Regimes' AI Innovation Advantage*, HARV. MAG. (Apr. 6, 2022), https://www.harvardmagazine.com/2022/04/right-now-authoritarian-regimes-artificial-intelligence [https://perma.cc/G3BC-DUCK].

[20] *See* Demetri Sevastopulo, *China On Track to Surpass US as 'AI Superpower', Congress Warned*, FIN. TIMES (Mar. 1, 2021), https://www.ft.com/content/37cf699a-1d5e-4dfd-be65-84682cb15532 [https://perma.cc/3C9A-H43X].

States must mirror certain aspects of China's strategy, including enlarging the federal defense budget for military R&D.[21] The idea is that the United States must become China to beat China.

Idealists, by contrast, advocate for a deeper commitment to liberal democratic values.[22] They argue that China's techno-authoritarian tools—including the AI-powered social credit system,[23] automated courts,[24] and mass surveillance[25]—are unstable and will ultimately undermine the regime.[26] For idealists, these systems symbolize the injustice of China's approach, showcasing the moral superiority of liberal democracy.[27]

Both perspectives, however, reduce the U.S.-China AI race to a binary narrative of "democracy versus autocracy."[28] This oversimplification is misleading, as it obscures the private sector's role in shaping this AI race. While China's AI-powered mass surveillance and social engineering incite fear, similar concerns exist within the United States, albeit driven by different actors and manifest in distinct forms.[29] In the United States, Big Tech—not federal bureaucrats—dominates the cybersphere. The tech industry wields immense power over people's digital lives, creating surveillance systems in

---

[21] *See* Michael T. Klare, *Meet the New Military-Industrial Complex*, THE NATION (Apr. 22, 2024), https://www.thenation.com/article/world/ai-military-power-war-china-taiwan-silicon-valley/ [https://perma.cc/CV5T-VRS6].

[22] *See* POL'Y PLAN. STAFF, U.S. DEPT. OF STATE, THE ELEMENTS OF THE CHINA CHALLENGE (Dec. 2020), https://2017-2021.state.gov/the-elements-of-the-china-challenge/ [https://perma.cc/6HPR-XATP]; *see also* Alfred D. Hull et al., *Why the United States Must Win the Artificial Intelligence (AI) Race*, 7 THE CYBER DEF. REV. 143, 151 (2022).

[23] *See* MICHAEL SUTHERLAND, CONG. RSCH. SERV., IF11342, CHINA'S CORPORATE SOCIAL CREDIT SYSTEM (2020); *see also* Wen-Hsuan Tsai, Hsin-Hsien Wang & Ruihua Lin, *Hobbling Big Brother: Top-Level Design and Local Discretion in China's Social Credit System*, 86 THE CHINA J. 1–4 (2021).

[24] *See* Straton Papagianneas & Nino Junius, *Fairness and Justice Through Automation in China's Smart Courts*, 51 COMPUT. L. & SEC. REV. 1, 10–11(2023).

[25] *See* Xiao Qiang, *The Road to Digital Unfreedom: President Xi's Surveillance State*, 30 J. DEMOCRACY 53, 63–64 (2019).

[26] *See, e.g.*, Edward Graham, *Pentagon Official Says US Values Will Outcompete Beijing in AI*, NEXT GOV (Mar. 5, 2024), https://www.nextgov.com/artificial-intelligence/2024/03/pentagon-official-says-us-values-will-outcompete-beijing-ai/394700/ [https://perma.cc/9974-3MLW].

[27] *See* Valerie Shen & Jim Kessler, *Competing Values Will Shape US-China AI Race*, THIRD WAY (July 17, 2024), https://www.thirdway.org/report/competing-values-will-shape-us-china-ai-race [https://perma.cc/5HNC-XXKB].

[28] *See* Nir Kaldero, *Considering the Fine Line Between AI Democracy and Autocracy*, FORBES (July 26, 2022), https://www.forbes.com/councils/forbestechcouncil/2022/07/26/considering-the-fine-line-between-ai-democracy-and-autocracy/ [https://perma.cc/2P4P-C6EB].

[29] *See generally* SHOSHANA ZUBOFF, THE AGE OF SURVEILLANCE CAPITALISM: THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER (2019) (observing, *inter alia*, private surveillance authorized in private contracts such as end user license agreements, privacy policies, and terms of service).

marketplaces, workplaces, and other spheres of "private government."[30] Such challenges are not the result of foreign infiltration, but are homegrown issues intrinsic to the structure of informational capitalism, necessitating legislative responses from within.[31] As AI continues to evolve, these challenges will test the regulatory capacity and resilience of both the American "liberal-democratic" system and the Chinese "techno-authoritarian" model.

Furthermore, the "democracy versus autocracy" dichotomy limits the political imagination needed to craft innovative AI regulations.[32] By framing the U.S.-China AI rivalry as an ideological clash, this dichotomy neglects the complex institutional and market forces that truly drive the AI race. It also implies a false choice for the United States—adopting either "big government" interventionism or "small government" minimalism.[33] Yet, it leaves out viable alternatives, such as public-private partnerships [34] or community-based collective governance.[35] A more nuanced framework is therefore essential—one that transcends the binary constraints of the current policy discourse.

B.   Argument

This Article has two objectives. First, it broadens the debate by analyzing how sub-national institutions shape national AI policy. Existing scholarship has largely focused on central or federal governments, ignoring the critical roles of state and local governments.[36] Yet, most legislations shaping AI occur at state and local levels.[37] Key laws governing the development and use of AI products or services—*e.g.*, contract, property, corporate, licensure, and tort

---

[30] *See generally* ELIZABETH ANDERSON, PRIVATE GOVERNMENT: HOW EMPLOYERS RULE OUR LIVES (AND WHY WE DON'T TALK ABOUT IT) (2017) (arguing that the workplaces of Corporate America are increasingly exerting control over the lives of employees like "private authoritarian governments" through mechanisms of market and labor discipline).

[31] *See* Julie E. Cohen, *Informational Capitalism as a Phase Shift: Challenges for Digital Constitutionalism*, *in* THE OXFORD HANDBOOK OF DIGIT. CONST. (Giovanni De Gregorio et al., eds. 2024).

[32] *See* Wendell Wallach, *The Battle Between Autocracy and Democracy Has Blinded Us to the AI Oligopoly*, FORTUNE (Jun. 16, 2022), https://fortune.com/2022/06/16/ethics-autocracy-democracy-blinded-tech-oligopoly-artificial-intelligence-politics-wendell-wallach/ [https://perma.cc/4HYR-P8PV].

[33] *See, e.g.*, Joe McKendrick, *AI Regulation: Too Much Too Soon, Or Not Enough?* FORBES (Nov. 12, 2024), https://www.forbes.com/sites/joemckendrick/2024/11/12/ai-regulation-too-much-too-soon-or-not-enough/ [https://perma.cc/8MUR-V8VA]; Sarah Rearick, *What Trump's AI Deregulation Means for Compliance in 2025*, SECURITYPAL AI (Nov. 11, 2024), https://www.securitypalhq.com/blog/what-trumps-ai-deregulation-means-for-compliance-in-2025 [https://perma.cc/FT85-VK9F].

[34] *See* K. Rajendra Prasad et al., *AI in Public-Private Partnership for IT Infrastructure Development*, 35 J. HIGH TECH. MGT. RSCH. 100496 (2024).

[35] *See* Pieter Verdegem, *Dismantling AI Capitalism: the commons as an alternative to power concentration of Big Tech*, 9 AI & SOC'Y 1, 732–35 (2022).

[36] *See* Rachel Wright, *Artificial Intelligence in the States: Emerging Legislation*, THE COUNCIL OF STATE GOV'TS (Dec. 6, 2023), https://www.csg.org/2023/12/06/artificial-intelligence-in-the-states-emerging-legislation/ [https://perma.cc/TZH2-4HDM].

[37] *See* discussion *infra* Sections III(C)(2).

law—fall within the exclusive domain of states. [38] Moreover, domains of concurrent federal and state authority—*e.g.*, data governance, algorithmic accountability, and digital privacy—are becoming pivotal battlegrounds for legislative change.[39]

Second, this Article examines how legal paradigms drive the ongoing U.S.-China AI race. Though the two countries hold opposing ideologies on AI, their regulatory measures are deeply interconnected.[40] Each country responds to the other's actions, adopting countermeasures as they compete for control over global AI supply chains. [41] This dynamic has led both countries to converge on a fragmentary regulatory approach. [42] U.S. AI policies increasingly prioritize national security objectives, departing from decades of neoliberal free-market principles. However, constitutional constraints on federal power means that states and market actors are often tasked with implementing these objectives, resulting in inconsistencies. [43] In parallel, Chinese AI policies are shifting from a purely centralized regime to a model that blends national security with decentralized innovation.[44] While China's central government maintains overall control, local authorities retain discretion in implementing—and sometimes innovating—national policies. [45] Both countries are moving towards a middle ground, converging from opposite ends of the ideological spectrum.

What explains this convergence? This Article argues that the answer lies in industry self-governance. In both countries, the tech industry is increasingly acting as a co-regulator of disruptive AI systems alongside traditional central

---

[38] *See* discussion *infra* Section III(C)(2).

[39] *See id.*

[40] For example, the Cambridge Analytica scandal in the United States has heightened Chinese authorities' concerns about the risks of content recommendation algorithms on political discourse and their capacity to intensify political polarization. However, rather than enacting stronger digital privacy laws to protect individual autonomy, the Chinese government responded by tightening censorship. *See* Angela Zhang, *The Promise and Perils of China's Regulation of Artificial Intelligence*, 63 COLUM. J. TRANSNAT'L L. 1, 5 (2025).

[41] *See* Matt Sheehan, *China's Views on AI Safety Are Changing—Quickly*, CARNEGIE ENDOWMENT FOR INT'L PEACE (Aug. 27, 2024), https://carnegieendowment.org/research/2024/08/china-artificial-intelligence-ai-safety-regulation?lang=en [https://perma.cc/H369-H7CW].

[42] *See, e.g.*, Tom Petro, *The Risks of Fragmented Privacy and AI Regulations*, DIRECTORS & BDS. (Mar. 22, 2024), https://www.directorsandboards.com/board-issues/ai/the-risks-of-fragmented-privacy-and-ai-regulations/ [https://perma.cc/K2XJ-DXS3]; Benjamin Cedric Larsen & Sabrina Küspert, *Regulating general-purpose AI: Areas of convergence and divergence across the EU and the US*, BROOKINGS INST. (May 21, 2024), https://www.brookings.edu/articles/regulating-general-purpose-ai-areas-of-convergence-and-divergence-across-the-eu-and-the-us/ [https://perma.cc/CLK3-YUHL].

[43] *See* discussion *infra* Section III(C)(2).

[44] *See* discussion *infra* Section IV(C).

[45] *See* Shaoda Wang & David Y. Yang, *Policy Experimentation in China: the Political Economy of Policy Learning* 5 (Nat'l Bureau of Econ. Rsch., Working Paper, Paper No. 29402, 2021), https://www.nber.org/papers/w29402 [https://perma.cc/3XMC-KR8L].

and local authorities. As gatekeepers, suppliers, and beneficiaries of disruptive AI technologies, tech firms exert market discipline on regulators at both levels, often by exploiting jurisdictional differences and leveraging local protectionism to advance their interests. However, as national security takes center stage in this AI race, the tech industry is assuming both commercial and geopolitical roles. This further intensifies regulatory fragmentation.

This new paradigm reflects what this Article terms "techno-federalism." Combining "technocracy" with "federalism," it describes how AI fosters tech industry self-governance in ways that redefine center-local relations in both countries.[46] Through self-governance, the tech industry acts as a third domain of regulatory power counterbalancing federal and state authority. While traditional federalism focuses on *bilateral* federal-state relations, techno-federalism captures the *tripartite* interplay between federal, state, and market power.[47] Despite its novel dimensions, techno-federalism retains key aspects of traditional federalism: (1) constraining vertical federal power over states by diffusing regulatory authority across multiple political subdivisions of the state apparatus, and (2) encouraging horizontal regulatory competition among states to develop innovative, often business-friendly, policies.[48] This "laboratory" approach to policy-making—once a unique hallmark of American democracy—is now increasingly embraced by China.[49]

However, techno-federalism departs from traditional federalism in three aspects. *First*, techno-federalism does not originate from deliberate constitutional design. Rather, it emerged organically in response to AI's ever-evolving landscape, leading to blurred regulatory boundaries across federal, state, and local levels.[50] *Second*, techno-federalism is marked by legal uncertainty, particularly over which regulatory entities are responsible for what aspects of AI governance.[51] This contrasts with traditional federalism, which is marked by clean divisions of authority through clear congressional (non)delegations of power.[52] *Third*, techno-federalism is primarily shaped by

---

[46] For background on how federalism addresses AI, see, e.g., Chad Squitieri, *Federalism in the Algorithmic Age*, 19 DUKE L. & TECH. REV. 139, 146–47 (2021); Benjamin T. Seymour, *The New Fintech Federalism*, 24 YALE J.L. & TECH. 1 (2022); Tejas N. Narechania & Erik Stallman, *Internet Federalism*, 34 HARV. J. L. & TECH. 547 (2021). For variations of federalism outside the U.S., see Anna Jobin et al., *AI Federalism: Shaping AI Policy within States in Germany*, UNIV. OF BREMEN INST. FOR INTERNET & SOC'Y (2021), https://arxiv.org/pdf/2111.04454 [https://perma.cc/7M7V-BW94].
[47] *See* discussion *infra* Sections III(D) and IV(C).
[48] *See* Squitieri, *supra* note 46.
[49] *See* discussion *infra* Sections III(D) and IV(C).
[50] *See* discussion *infra* Sections II(B), III(D), and IV(C).
[51] *See* discussion *infra* Section III(C)(2).
[52] *See, e.g.*, Jessica Bulman-Pozen, *Federalism as a Safeguard of the Separation of Powers*, 112 COLUM. L. REV. 459 (2012) (arguing that federalism acts as bulwark against tyranny that promotes the rule of law through clear delegations of governmental authority); Erin F. Delaney & Ruth Mason, *Solidarity Federalism*, 98 NOTRE DAME L. REV. 617 (2022) (arguing that one of the virtues of federalism is promoting state-wide solidarity and legal certainty across state lines, through clear delegations of power).

the market norms of tech firms—platforms, developers, and data intermediaries—that operate under a patchwork of state and local laws.[53] Unlike traditional federalism, which centers on governmental decision-making, techno-federalism captures how market forces shape regulatory outcomes.[54]

C.   Roadmap

The remainder of this Article proceeds as follows. Part II defines the theoretical basis of techno-federalism by outlining AI governance across three dimensions: software, hardware, and infrastructure. This pluralist approach highlights the bottom-up dynamics of AI governance, emphasizing the critical role of market forces in shaping geopolitics.

Part III examines the political-economic foundations of techno-federalism in the U.S., tracing its roots in neoliberal tech regulation. It critiques the inability of both neoliberalism and traditional federalism to address AI's complexities and explore how techno-federalism offers a more adaptable framework for regulating AI software, hardware, and infrastructure.

Part IV turns to China's version of techno-federalism, which emerges from informal bureaucratic and market dynamics rather than codified law. It explores China's corporatist model, decentralizing trends, and the application of techno-federalism within the same three dimensions of AI governance.

Part V explores the policy implications of techno-federalism, examining its impact on the future trajectory of the U.S.-China AI race. It further proposes legal guardrails to protect market-driven AI governance while promoting state collaboration under regulatory fragmentation. Part VI concludes the discussion.

II. CONCEPTUAL FRAMEWORK

This Part unpacks the core elements of techno-federalism. Section II(A) dissects the various concepts embedded in the nebulous term "AI governance." Rather than adopting a singular, rigid definition, I take a pluralist approach that recognizes the multifaceted nature of AI, focusing on three dimensions: software, hardware, and infrastructure. Section II(B) discusses how these three dimensions of AI governance function within techno-federalism, diverging from policies shaped by traditional federalism. This approach highlights the unique bottom-up, sub-national dynamics that drive AI governance— dynamics frequently overlooked in conventional geopolitical analyses.

A.   *What is AI Governance, Really?*

---

[53] *See* Niva Elkin-Koren & Karni A. Chagal-Feferkorn, *Lex AI: Revisiting Private Ordering by Design*, 36 BERKELEY TECH. L.J. 915 (2021).
[54] *See* discussion *infra* Section II(B).

AI governance is a concept in flux—an elusive idea that is not yet easily captured by legal contours.[55] Broadly, it refers to the processes, institutions, and norms that guide the development, deployment, and societal impact of AI.[56] The purpose of AI governance is to align AI technologies with societal interests, addressing both immediate risks—such as privacy encroachments, bias, and misinformation—as well as long-term, more speculative threats like the loss of human control or geopolitical power shifts.[57]

Confusion surrounding AI governance begins with its definition.[58] Engineers typically describe methods that detect patterns and make predictions from large datasets as "ML," or "machine learning." Yet, in policy discussions, these techniques are often labeled as "AI," evoking images of superhuman capabilities rather than narrow, fallible algorithms.[59] In some cases, technologies marketed as AI are so straightforward that their engineers would consider them classic statistical methods.[60] However, many legislative actions fail to distinguish those from more complex "deep learning" models, which utilize advanced ML methods such as artificial neural networks.

Moreover, existing legislative efforts struggle to account for AI's multidimensional nature, which spans software, hardware, and infrastructure—each posing distinct policy challenges.[61] AI software involves training methods and input data, requiring governance through standards for algorithm design, data scrutiny, and model behavior evaluations to align AI systems with societal values.[62] Hardware, on the other hand, includes computing devices such as semiconductor microchips. Hardware is often regulated through export controls limiting market access to AI's physical

---

[55] *See* Araz Taeihagh, *Governance of Artificial Intelligence*, 40(2) POL'Y & SOC'Y 137, 144 (2021).

[56] *See* Michael J. D. Vermeer, *Historical Analogues That Can Inform AI Governance*, RAND CORP. (Aug. 2024), www.rand.org/t/RRA3408-1 [https://perma.cc/4TGK-RBRT].

[57] *See* Allan Dafoe, *AI Governance: A Research Agenda*, CTR. FOR GOV. OF AI, OXFORD UNIV. (Aug. 27, 2018), https://cdn.governance.ai/GovAI-Research-Agenda.pdf [https://perma.cc/H37J-268J].

[58] *See generally* Dewey Murdick, James Duham & Jennifer Melot, *AI Definitions Affect Policymaking*, CTR. FOR SEC. & EMERGING TECH., GEO. UNIV. (June 2, 2022) (explaining that definitional choices impact AI policymaking), https://cset.georgetown.edu/publication/ai-definitions-affect-policymaking/ [https://perma.cc/2JNV-N7U5].

[59] At its most abstract, "AI" can refer to "superintelligence," *i.e.*, non-human sentient machines. *See generally* NICK BOSTROM, SUPERINTELLIGENCE: PATHS, DANGERS, STRATEGIES (2014).

[60] *See* Matt O'Shaughnessy, *One of the Biggest Problems in Regulating AI Is Agreeing on a Definition*, CARNEGIE ENDOWMENT FOR INT'L PEACE (Oct. 2022), https://carnegieendowment.org/posts/2022/10/one-of-the-biggest-problems-in-regulating-ai-is-agreeing-on-a-definition?lang=en [https://perma.cc/Y3PH-P2T4].

[61] *See* Lennart Heim, Markus Anderljung, Emma Bluemke & Robert Trager, *Computing Power and the Governance of AI*, CTR. FOR GOVERNANCE AND AI (Feb. 2024), https://www.governance.ai/analysis/computing-power-and-the-governance-of-ai [https://perma.cc/CY3V-NXUR].

[62] *See* Vermeer, *supra* note 56.

building blocks.[63] Infrastructure consists of physical facilities that host and operate AI cyber-physical systems, including cloud servers and data storage equipment. Infrastructure is governed by local laws on the acquisition, development, and operations of commercial property.[64]

Put simply, AI governance encompasses a broad and fragmented patchwork of regulations that affect virtually every sector of the national economy. Given AI's rapid advancement, a widely accepted legal definition is unlikely to emerge soon. For purposes of this Article, "AI governance" refers to an interconnected set of regulatory ecosystems—both legal and extralegal—that shape AI development, exchange, and use across markets. It includes both "hard rules" promulgated by state actors and "soft norms" that coordinate private sector activities.[65] Figure 1 below maps out the three dimensions of AI governance: (1) software governance; (2) hardware governance; and (3) infrastructure governance.[66]

Figure 1. *Dimensions of AI Governance*

	Software Governance	Hardware Governance	Infrastructure Governance
Technical Content	• Algorithms • Middleware • AI Models	• Advanced Computers • Quantum Computing • AI Accelerators	• Cloud Infrastructure • Energy Infrastructure
Building Blocks	• Machine Learning • Training Data • Reinforcement Learning Systems	• Semiconductor Chips • Graphics Processing • Fabrication Processes • High Bandwidth Memory	• Data Storage Systems • Internet Servers • 5G Networks • Cloud Services
Market Actors	• Programmers • Data Aggregators • Data Brokers • Investors • Users	• Manufacturers • Defense Contractors • Researchers • Consumers • Investors	• Cloud Service Providers • Energy Suppliers • Data Centers • Investors
Governing Law	• Licensure * • Registration * • Copyright ** • Anti-discrimination ** • Data Privacy *** • Data Transparency ***	• Torts * • Contracts * • Patents ** • Subsidies ** • Tax Credits ** • Export Controls**	• Zoning * • Corporations * • Real Property * • Data Localization * • Energy Regulation ** • Public Utilities ***

---

[63] *See* discussion *infra* Sections III(D)(2) and IV(C)(2).

[64] *See* discussion *infra* Sections III(D)(3) and IV(C)(3).

[65] *See* Wojtek Buczynski et al., *Hard Law and Soft Law Regulations of Artificial Intelligence in Investment Management*, 24 CAMBRIDGE Y.B. EUR. LEGAL STUD. 262, 263 (2022).

[66] Figure 1 is based on a working paper by researchers at Yale University and the University of Bologna. *See* Joyce Guo et al., *Energy Consumption Ramifications of the U.S.-China AI Competition*, SSRN ELEC. J. (updated Jun. 19, 2024), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4839772 [https://perma.cc/49EX-P34D].

* Governed by the States	** Governed by the Federal Government	*** Concurrent State and Federal Power

By rethinking AI governance through the lenses of software, hardware, and infrastructure, this framework resolves two key conceptual confusions surrounding the U.S.-China AI race. *First*, existing research often lacks clarity on what the two countries are actually competing over—some focus broadly on technological capacity or computing power, while others frame it as an ideological struggle over "AI ethics." [67] I bridge these views by showing technology and ideology as interlinked, each shaping the other. *Second*, current scholarship often tries to fit AI within established legal definitions by analogizing AI to a familiar legal concept. [68] Instead, I accept AI as *sui generis*, allowing for a discussion of its governance while bypassing the debate over legal classifications. The next section applies the multidimensional framework to techno-federalism.

B.   *Where AI Governance Meets Techno-Federalism*

Federalism manifests in various forms. Generally, it refers to the division of sovereign authority within a federalist form of government. In the United States, this division is embedded in the structure of the Constitution: Article I, Section 8 grants Congress the "enumerated powers" of national legislation, while the Tenth Amendment reserves for the states those "residual powers" not delegated to the federal government. [69] Under the Supreme Court's modern Tenth Amendment jurisprudence, federalism primarily operates through the "anti-commandeering" doctrine—which posits that states, as independent sovereigns, retain spheres of regulatory autonomy beyond the reach of federal coercion. [70]

---

[67] *See, e.g.*, Neal Hejib & Earl Carr, *Beyond Tech, the US-China AI Race is a Tussle Over Ethics*, S. CHINA MORNING POST (Aug. 22, 2024), https://www.scmp.com/opinion/china-opinion/article/3275130/beyond-tech-us-china-ai-race-tussle-over-ethics [https://perma.cc/LGY8-FAKC].

[68] For further discussions of legal analogies in data governance, *see* Jason Jia-Xi Wu, *Beyond Free Markets and Consumer Autonomy: Rethinking Consumer Financial Protection in the Age of Artificial Intelligence*, 13 N.Y.U. J. INTELL. PROP. & ENT. L. 56, 122 (2023) [hereinafter Wu, *Beyond Free Markets and Consumer Autonomy*].

[69] U.S. CONST. amend. X. Historically, Tenth Amendment doctrine has undergone several transformations. Beginning with *McCulloch v. Maryland*, 17 U.S. 316 (1819), which held that the Tenth Amendment does not limit Congress's exercise of implied and incidental powers, the federal government has actively preempted state regulations. This became the norm for the early-to-mid 20th century expansion of the federal administrative state. *See* United States v. Darby, 312 U.S. 100, 124 (1941) (citing McCulloch, 17 U.S. at 405-06). However, beginning in the late 1970s, the Tenth Amendment regained significance as courts struck down federal laws encroaching on "the states['] freedom to restructure integral operations in areas of traditional government functions." Nat'l League of Cities v. Usery, 426 U.S. 833, 852 (1976).

[70] *See, e.g.*, New York v. United States, 505 U.S. 144, 161 (1992) (holding that the Tenth Amendment prohibits Congress from "commandeering" the states—directly compelling

In contemporary American political imagination, federalism is commonly associated with two liberal democratic virtues: decentralized innovation and local autonomy.[71] The twin ideals trace their roots to John Locke and Friedrich Hayek. Philosophically, federalism idealizes the Lockean notion of decentralized sovereignty—conceived as a social contract among the people, the states, and the federal government.[72] Economically, federalism aligns with the Hayekian vision that decentralization enables free markets to accommodate diverse policy preferences and aggregate knowledge from the bottom up.[73] Justice Brandeis praised federalism for creating "laboratories of democracy" which drive policy innovation.[74]

However, what is often overlooked in the American political discourse is how non-democracies can also display traits of federalism. Certain elements of federalism—decentralized innovation and local autonomy—do not necessitate liberal democratic norms. As China's AI governance exemplifies, decentralization can emerge from informal institutional bargains across various levels of government, even without a formal social contract established by a liberal constitution.[75] In cases where local governments are supported by the private sector, local experimentation can flourish, even as the central government maintains overall control and oversight over broader policy objectives.[76]

These traits of federalism are evident across each dimension of AI governance. In software governance, technological innovation is efficient when markets are open and competitive.[77] Developer communities play a crucial role in fostering innovation through bottom-up and horizontal knowledge sharing, which keeps software ecosystems dynamic and up-to-

---

them to enact or enforce a federal regulatory program); Murphy v. National Collegiate Athletic Association, 584 U.S. 453 (2018); Pintz v. United States, 521 U.S. 898 (1997).

[71] *See generally* Brian Galle & Joseph Leahy, *Laboratories of Democracy? Policy Innovation in Decentralized Governments*, 58 EMORY L.J. 1333 (2009).

[72] *See, e.g.*, Jaren Wilkerson, *Disappearing Together? American Federalism and the Social Contract Theory*, 17 UNIV. PA. J. CONST. L. 569, 571 (2014); William B. Turner, *Putting the Contract into Contractions: Reproductive Rights and the Founding of the Republic*, 2005 WIS. L. REV. 1535, 1542–43 n.30 (2005); *see also* JOHN LOCKE, THE SECOND TREATISE OF GOVERNMENT: AN ESSAY CONCERNING THE TRUE ORIGINAL EXTENT AND END OF CIVIL GOVERNMENT 83 (George Bonham ed., 1798).

[73] *See* Hjalte Lokdam, *Beyond Neoliberal Federalism? The Ideological Shade of the Eurozone's Constitutional Order After the Eurozone Crisis*, EUR. CONST. IMAGINARIES: BETWEEN IDEOLOGY AND UTOPIA 296, 310 (Jan Komárek ed., 2023); *see also* Friedrich A. Hayek, *The Economic Conditions of Interstate Federalism*, INDIVIDUALISM AND ECON. ORDER 255–72 (1948).

[74] New State Ice Co., 285 U.S. at 311 (1932).

[75] *See* discussion *infra* Section IV(C)

[76] *See* ANGELA HUYUE ZHANG, HIGH WIRE: HOW CHINA REGULATES BIG TECH AND GOVERNS ITS ECONOMY 82–86 (2024) [hereinafter ZHANG, HIGH WIRE].

[77] *See* Daryl Lim, *AI & IP: Innovation & Creativity in an Age of Accelerated Change*, 52 AKRON L. REV. 813, 847–55 (2018) (discussing how fair use doctrine impacts innovation in AI software).

date.[78] To support this decentralized model, both U.S. and Chinese regulators have granted autonomy to developers and digital platforms.[79] In some cases, states and local governments even recognize corporate policies and industry standards as part of the legal framework for AI design and use liability.[80]

In contrast, hardware governance traditionally involves stronger central government intervention.[81] Given its national security importance, central governments historically exercised more control, coordinating development through industrial policy while granting limited autonomy to the private sector.[82] However, in the algorithmic era, central governments no longer dominate hardware governance.[83] The globalized supply chain for AI hardware components has created opportunities for cross-border arbitrage, allowing tech firms to exploit jurisdictional differences. This led to a fragmentary legal landscape. Despite operating under state law, tech firms now play critical roles in the U.S.-China supply chain war, acting as both targets and enforcers of national security strategies.

Regulatory fragmentation is even more pronounced in infrastructure governance. Since infrastructure involves physical facilities located on state territories, its governance typically aligns with local interests and falls under state and local governments.[84] Yet, the geopolitical significance of AI infrastructure—linked to national security and even military considerations—brings heightened central oversight.[85] This dynamic exacerbates the regulatory fragmentation seen in hardware governance, as both United States and Chinese regulators struggle to balance national security, local protectionism, and market efficiency.

These dynamics suggest that traditional traits of federalism—local autonomy and decentralized innovation—do not always align with liberal democracy. Instead, they can emerge from institutional consensus among regulators, shaped by the need to balance competing national priorities while navigating an economic terrain that transcends traditional borders. Despite their constitutional differences, both the United States and China enable

---

[78] *See, e.g.*, Siobhán O'Mahony, *The Governance of Open Source Initiatives: What Does It Mean to be Community Managed?* 11 J. MGMT. & GOVERNANCE 139, 140 (2007); Georg von Krogh, Sebastian Spaeth & Karim R. Lakhani, *Community, Joining, and Specialization in Open Source Software Innovation: A Case Study*, 32 RSCH. POL'Y 1217, 1218 (2003).

[79] *See* discussion *infra* Sections III(D) and IV(B)(2).

[80] *See* discussion *infra* Section IV(B)(2).

[81] *See* discussion *infra* Section III(D)(2).

[82] *See generally* Joshua M. Pearce, *Strategic Investment in Open Hardware for National Security*, 10 TECHNOLOGIES 53 (2022).

[83] *See* discussion *infra* Sections III(D)(2) and IV(C)(2).

[84] *See* discussion *infra* Sections III(D)(3) and IV(C)(3).

[85] *See* Raluca Csernatoni, *Governing Military AI Amid a Geopolitical Minefield*, CARNEGIE ENDOWMENT FOR INT'L PEACE (July 17, 2024), https://carnegieendowment.org/research/2024/07/governing-military-ai-amid-a-geopolitical-minefield?lang=en [https://perma.cc/9TEA-X8V9].

industry self-governance, creating an ecosystem where bottom-up market discipline checks both central and local authorities.[86] This new paradigm, which this Article calls "techno-federalism," reflects a new form of governmentality where the private sector increasingly assumes quasi-regulatory roles, acting as both gatekeepers and enforcers of market discipline.[87]

III. Techno-Federalism in the United States

This Part examines the political-economic foundations that shape techno-federalism in the United States. Section III(A) traces the historical roots of the United States's neoliberal tech policy and its evolution since the late 1970s. Section III(B) examines how the ascendancy of AI challenges the existing neoliberal order. Section III(C) describes the current state of AI regulation. It focuses on how traditional federalism, informed by neoliberal free-market paradigms, fails to address the societal and economic challenges brought by AI. Section III(D) explores how the emerging paradigm of techno-federalism arises from these regulatory failures and manifests across the key domains of AI governance: software, hardware, and infrastructure.

A. *Neoliberal Roots of U.S. Tech Policy*

This section begins by discussing the ideological foundation of U.S. tech policy and its contemporary reverberations. Like other areas of economic policy, U.S. tech policy has been highly decentralized, with regulatory agencies scrambling over a diverse and complex legal terrain. Much of this owes to the influence of neoliberalism, the dominant ideology shaping the U.S. political discourse from the 1970s to the 2010s.

Neoliberalism, in its broadest sense, refers to "a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade," with the state's role confined to "creat[ing] and preserv[ing] an institutional framework appropriate to such practices."[88] In the popular discourse, "neoliberalism" evokes ideologies of laissez faire

---

[86] *See* discussion *infra* Sections III(D) and IV(C).

[87] The term "governmentality" fuses "government" with "mentality"—capturing the idea of governance through collective mentalities. Governmentality was first introduced by Michel Foucault, in his collection of lectures on biopolitics and governmental power in 1979. *See generally* MICHEL FOUCAULT, THE FOUCAULT EFFECT: STUDIES IN GOVERNMENTALITY (Graham Burchell, Colin Gordon & Peter Miller eds., 1991). These lectures explored the evolving face of (neo)liberalism as a political project. For Foucault, governmentality meant combined strategies of organizational governance in a broad sense, as well as self-governance by those made subjects of organizational governance. *See* Stewart Clegg, *Governmentality*, 50 PROJECT MGMT. J. 266, 267 (2019).

[88] DAVID HARVEY, A BRIEF HISTORY OF NEOLIBERALISM 2 (2005).

regulatory minimalism that are deemed responsible for hardened social stratification and rising global inequality—hallmarks of the late 20th century political-economic landscape. [89] For purposes of this Article, I invoke "neoliberalism" in a narrow, instrumentalist sense: a regulatory paradigm that emerged since the 1970s, with the aim of fostering market efficiency through a series of deregulatory measures: *e.g.*, privatization, free trade, tax cuts, regulatory outsourcing, and reduction in public spending.[90]

Before the neoliberal turn in the 1970s, the federal government played a central role in financing and directing technological development. Under the Cold War "triple helix" model[91]—where technological progress was achieved through top-down coordination among the government, academia, and industry—advancements in computing were primarily driven by national security, not commercial interests. [92] The Department of Defense (DOD), through its R&D arm Defense Advanced Research Projects Agency (DARPA), developed computers and electronic communications networks. [93] Among DARPA's achievements was the ARPANET, the precursor to today's internet.

Then, the Cold War "triple helix" began to unravel in the late 1970s. With the advent of the neoliberal paradigm, federal involvement in technological development, especially in computers and telecommunications, markedly declined. [94] Across sectors, federal funding was cut aggressively under the mantra of enhancing government efficiency. DOD funding for computer science reached a two-decade low in 1975. [95] By 1980, federal agencies began outsourcing regulatory responsibility to the private sector, giving rise to quasi-regulatory industry coalitions backed by venture capital.[96] This shift introduced a new, market-driven model for technological

---

[89] *See generally* Tibor Rutar, *What is Neoliberalism Really? A Global Analysis of Its Real-World Consequences for Development, Inequality, and Democracy*, 62 Soc. Sci. Info. 295 (2023).

[90] *See* David J. Hess, *The Green Transition, Neoliberalism, and the Technosciences*, *in* Neoliberalism and Technoscience 210 (Marja Ylönen & Luigi Pellizzoni eds., 2012).

[91] *See* Henry Etzkowitz & Loet Leydesdorff, *The Triple Helix: University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development*, 14 EASST Rev. 14, 16-19 (1995); *see also* Bolu Adesanmi et al., *Innovating How We Innovate: The Triple Helix of University-Industry-Government Relations*, Wilson Ctr. (Oct. 15, 2024), https://www.wilsoncenter.org/article/innovating-how-we-innovate-triple-helix-university-industry-government-relations [https://perma.cc/QW2R-ZSGD].

[92] *See* Susannah Glickman, *AI and Tech Industrial Policy: From Post-Cold War Post-Industrialism to Post-Neoliberal Re-Industrialization*, *in* AI Nationalism(s): Glob. Indus. Pol'y Approaches to AI (Amba Kak ed., 2024), https://ainowinstitute.org/wp-content/uploads/2024/03/AI-Nationalisms-Global-Industrial-Policy-Approaches-to-AI-March-2024.pdf [https://perma.cc/J92J-XP6M].

[93] *See* Paul Starr, *How Neoliberal Policy Shaped the Internet—and What to Do About It Now*, The Am. Prospect (Oct. 2, 2019), https://prospect.org/power/how-neoliberal-policy-shaped-internet-surveillance-monopoly/ [https://perma.cc/E5M8-Z554].

[94] *See* Glickman, *supra* note 92.

[95] *Id.*

[96] *See id.* at 23–24.

development—one where large firms like Bell Labs led computational research by relying on government contracts and prioritizing commercial application.[97] Politically, neoliberal deregulation garnered bipartisan support, as progressives saw regulatory agencies as captured by industry special interests and viewed deregulation as an alternative to better serve the public interest.[98]

This neoliberal framework has significantly shaped the growth of the U.S. tech industry over the past two decades. As President Bill Clinton and Vice President Al Gore stated in 1997, "governments must adopt a non-regulatory, market-oriented approach to electronic commerce."[99] By fostering market autonomy, formalizing intellectual property rights, and idolizing limited government, the United States established conditions that spurred the rapid commercial development of computer and telecommunications technologies.[100] The late 1990s saw the decline of proprietary intranets controlled by telecom monopolies and the rise of an open, "end-to-end" internet infrastructure that enabled users to directly create and distribute value online without the need of going through a central network manager. The "end-to-end" network fueled the 2000s dot-com boom. And, building on the same internet infrastructure, online platforms like Google (Alphabet) and Facebook (Meta) led the social media revolution in the 2010s.[101] These decentralized innovations thrived under a lax regulatory environment that prioritized private sector dominance over public interests.

B.   *How AI Disrupts the Neoliberal Order*

The digital economy's explosive growth in the 1990s and the early 2000s seemed to validate the idea that markets and technologies thrive when left alone. The millennial internet was neoliberalism's poster child. As the federal government retreated and opened cyberspace to commercial development, digital entrepreneurship surged, creating new online markets, networks, and communities. In 2001, Lawrence Lessig praised the internet for unleashing

---

[97] *See id*. at 24.

[98] The New Left engaged with neoliberal principles through revolting against what it regarded as the "over-organization and bureaucratization of American society resulting from New Deal reform." Left-leaning and progressive legislators in Congress, led by Senator Ralph Nader from Connecticut, sought to build a political alliance to "free the consumer from repressive corporate and government elites" via deregulation. GARY GERSTLE, THE RISE AND FALL OF THE NEOLIBERAL ORDER: AMERICA AND THE WORLD IN THE FREE MARKET ERA 8–9 (2022).

[99] WILLIAM J. CLINTON & ALBERT GORE, JR., A FRAMEWORK FOR GLOBAL ELECTRONIC COMMERCE (1997), https://clintonwhitehouse4.archives.gov/WH/New/Commerce/read.html [https://perma.cc/E78K-378S].

[100] *See* Starr, *supra* note 93.

[101] *See* Louie Chudziak, *The 2010s: A Social Revolution*, MEDIUM (Dec. 30, 2019), https://medium.com/bud-blog/the-2010s-a-social-revolution-6b5e1e5d9ad8 [https://perma.cc/CQ3S-C7GT].

unprecedented creativity through decentralized innovation.[102] Echoing Lessig, Yochai Benkler's 2006 book *The Wealth of Networks* highlighted the liberative potential of this internet-based decentralized economy, which enables users and developers to bypass corporations in sharing the fruits of their labor through peer production.[103]

However, two decades later, the promises of free internet shattered as the flaws of neoliberalism surfaced. Just as the millennial internet created the illusion that it supports market competition, so too has it fostered the illusion that it protects individual autonomy.[104] After all, users are not forced to make purchases or disclose their identities online, suggesting a digital realm that respects freedom and choice.[105] Yet, while the internet remains largely open, the social relations of production in today's digital economy are vastly different—and far more oppressive—than they were two decades ago.[106]

Two technological shifts have upended the social relations of production under the neoliberal status quo: advances in information and computation. The advent of big data has altered people's relationship with corporations by changing how data is produced, circulated, and consumed.[107] Two decades ago, data had limited commercial value, as few companies had the capacity to collect or process it at scale. Today, however, the surge in online activity across digital platforms has fueled commercial demand for data, driving the growth of data brokers specializing in large-scale data extraction, processing, and sale.[108] As users engage in online activities, they leave digital footprints that reveal sensitive personal information. Platforms utilizing data broker services gain detailed insights into users' daily lives and the user demographic.[109] This enables an unprecedented system of market-based digital surveillance, led by the private sector rather than the government.

---

[102] *See* Lawrence Lessig, *Innovation, Regulation, and the Internet*, THE AM. PROSPECT (Dec. 19, 2001), https://prospect.org/features/innovation-regulation-internet/ [https://perma.cc/7FCZ-8NHN]; *see generally* LAWRENCE LESSIG, THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD (2001).

[103] *See generally* YOCHAI BENKLER, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM (2006).

[104] *See* Starr, *supra* note 93.

[105] *See id.*

[106] *See* Jack Goldsmith, *The Failure of Internet Freedom*, KNIGHT FIRST AMEND. INST. AT COLUM. UNIV. (June 13, 2018), https://knightcolumbia.org/content/failure-internet-freedom [https://perma.cc/A69E-CSVT].

[107] *See* Salomé Viljoen, *A Relational Theory of Data Governance*, 131 YALE L.J. 573 (2021).

[108] *See* Jason Jia-Xi Wu, *Algorithmic Fairness in Consumer Credit Underwriting: Towards a Harm-Based Framework for AI Fair Lending*, 21 BERKELEY BUS. L.J. 65, 78 (2023) [hereinafter Wu, *Algorithmic Fairness in Consumer Credit Underwriting*].

[109] FED. TRADE COMM'N, DATA BROKERS: A CALL FOR TRANSPARENCY AND ACCOUNTABILITY (2014)., https://www.ftc.gov/system/files/documents/reports/data-brokers-call-transparency-accountability-report-federal-trade-commission-may-2014/140527databrokerreport.pdf [https://perma.cc/N5RF-3XAW].

In parallel, rapid advances in computational power through AI have magnified the informational harms inflicted by big data.[110] With the aid of AI models, tech firms can now predict—and even shape—user behavior by delivering content that prompts specific responses.[111] This development has enabled exploitative practices like algorithmic price discrimination and microtargeting, allowing companies to profit from engineering user preferences and manipulating psychological responses.[112] This shift embodies what Shoshana Zuboff calls "surveillance capitalism"—where corporations like Google, Meta, and Amazon harvest vast data about individuals' lives and make predictive decisions "for commercial extraction and sale."[113] Whereas the internet of the 2000s empowered users to bypass corporate decision-making, the internet of the 2020s allows tech firms to regain control over users by subverting free choice and manufacturing consent.[114]

These technological shifts have created a legitimacy crisis for neoliberal modes of tech governance.[115] Traditionally, the success of neoliberalism hinges on markets that are transparent, competitive, fair, and open. Yet, three developments in the algorithmic era are undermining the foundational conditions for an efficient neoliberal market economy:

(i) *Algorithmic Price Manipulation*: The most significant challenge to neoliberalism is pricing distortion. With platform giants like Google, Amazon, and Meta controlling data production in the digital economy, market prices are no longer shaped by the individual choices and freedoms of market participants. Algorithmic pricing mechanisms and microtargeting practices allow platforms to engineer market expectations and distort prices.[116] For example, ride-sharing apps use matching algorithms that differentiate users based on their biographical data, demographics, habits, preferences, and location—enabling platforms to maximize profit in real time by pairing drivers willing to accept minimal compensation with users willing to pay the highest rates.[117] As Evgeny Morozov observes, "in today's data-saturated markets, where venture capitalists, sovereign wealth funds, and deep-pocketed tech platforms subsidize services to the point where no one really knows what they cost,"

---

[110] *See* Wu, *Beyond Free Markets and Consumer Autonomy*, *supra* note 68, at 74–75.

[111] *See id.* at 72–74.

[112] *See id.* at 89–92.

[113] *See generally* SHOSHANA ZUBOFF, THE AGE OF SURVEILLANCE CAPITALISM: THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER (2019).

[114] *See* Wu, *Beyond Free Markets and Consumer Autonomy*, *supra* note 68, at 66 (describing consent manufacturing as the "processes of information control that manipulate [user] desire and influence [users] to make market decisions against their [best] interests.").

[115] *See* Salomé Viljoen, *Ferment Is Abroad: Techlash, Legal Institutions, and the Limits of Lawfulness*, LPE PROJECT BLOG (Apr. 20, 2021), https://lpeproject.org/blog/ferment-is-abroad-techlash-legal-institutions-and-the-limits-of-lawfulness/ [https://perma.cc/PY3Z-WSSD].

[116] *See* Salomé Viljoen, *Informationalism Beyond Managerialism*, 86 LAW & CONTEMP. PROBS. 257, 267 (2023).

[117] *See id.*

prices increasingly resemble those of the Soviet system just before its collapse.[118] This pricing distortion challenges the very foundations of the neoliberal market economy, which is built on the Hayekian principle that transparency is bedrock for efficient resource distribution, consumer choice, and market freedom.

(ii) *Platforms as Unelected Governments*: Another disruption to the neoliberal status quo is the monopoly power of "too-big-to-regulate" digital platforms.[119] As Shoshana Zuboff notes, digital platforms have become the *de facto* sovereign authorities controlling people's social and economic lives, leaving people with few alternatives.[120] Opting out of the digital economy can mean exclusion from full participation in modern society. The rise of platform overlords results in both the encroachment of individual autonomy as well as the enclosure of the once-open internet infrastructure.

Federal inaction on data governance exacerbates this issue. While other democracies have enacted comprehensive data protection frameworks—such as the EU's General Data Protection Regulation (GDPR)[121]—the United States still lacks a unified statutory regime.[122] The GDPR treats data protection as a fundamental right[123] and imposes sweeping obligations on all market actors, whether public or private entities.[124] In contrast, U.S. law treats data privacy mainly as an aspect of individual liberty threatened by the government, not by the market.[125] Although some U.S. federal statutes regulate data in areas such

---

[118] *See* Evgeny Morozov, *Digital Socialism? The Calculation Debate in the Age of Big Data*, 116/117 NEW LEFT REV. 33, 35 (2019).

[119] *See* John Herrman, *What If Platforms Like Facebook Are Too Big to Regulate?* N.Y. TIMES (Oct. 8, 2017), https://www.nytimes.com/2017/10/04/magazine/what-if-platforms-like-facebook-are-too-big-to-regulate.html [https://perma.cc/XS7U-JP5H].

[120] *See generally* SHOSHANA ZUBOFF, THE AGE OF SURVEILLANCE CAPITALISM: THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER (2019).

[121] *See* Council Regulation 2016/679, 2016 O.J. (L 119); *see also* Adam Satariano, *G.D.P.R., A New Privacy Law, Makes Europe World's Leading Tech Watchdog*, N.Y. TIMES (May 24, 2018), https://www.nytimes.com/2018/05/24/technology/europe-gdpr-privacy.html [https://perma.cc/899Y-RBFA].

[122] *See* Cecilia Kang, *As Europe Approves New Tech Laws, the U.S. Falls Further Behind*, N.Y. TIMES (Apr. 22, 2022), https://www.nytimes.com/2022/04/22/technology/tech-regulation-europe-us.html [https://perma.cc/9CLT-MYBT].

[123] *See* Council Regulation 2016/679, Recital 1, 2016 O.J. (L 119), https://gdpr-info.eu/recitals/no-1/ [https://perma.cc/DU5Z-DBKD].

[124] *See* Eur. Data Prot. Bd., *Guidelines 07/2020 on the Concepts of Controller and Processor in the GDPR, Version 1.0* (Sept. 2, 2020), https://www.edpb.europa.eu/sites/default/files/consultation/edpb_guidelines_202007_controllerprocessor_en.pdf [https://perma.cc/LKB5-FQFU].

[125] *See, e.g.*, Carpenter v. United States, 585 U.S. 296, 316 (2018) (holding that the government's consent-less access to defendant's sensitive cell phone location data was a warrantless search that invaded his reasonable expectation of privacy, violating the Fourth Amendment); United States v. Jones, 565 U.S. 400, 404–11 (2012) (holding that the government's attachment of a GPS tracking device to a vehicle, and its subsequent use of that device to monitor the vehicle's movements on public streets, constitutes a warrantless search in violation of the Fourth Amendment); *cf.* California v. Ciraolo, 476 U.S. 207, 215

as healthcare and consumer credit reporting, these statutes predate the internet and are ill-equipped to handle the complex challenges of modern surveillance capitalism.[126]

(iii) *Platform Monopolization and Decline of Networked Communities*: The final challenge to neoliberal tech governance is the erosion of the networked communities that neoliberalism once championed. While the internet infrastructure of the 2000s largely remains, data production and circulation are now monopolized by digital platforms.[127] This reduces the autonomy of networked communities and chills decentralized innovation. Big Tech has been lobbying Congress to prevent nationwide antitrust action.[128] The libertarian ethos of Web 3.0, fueled by advances in decentralized ledger technology, partly reflects a reaction against the monopoly power and control of Web 2.0 by Silicon Valley oligarchs.[129] This push for decentralization underscores a desire to reclaim the autonomy and communal nature of the digital economy that has been eroded by Big Tech's dominance.

C.   *Traditional Federalism's Failure to Regulate AI*

This section turns to how AI's rise exposes the structural limitations of traditional federalism. Before the algorithmic era, traditional federalism functioned alongside neoliberal tech governance. Neoliberalism, which favors minimal federal intervention, allowed states to regulate key aspects of technological commercialization—contracting, proprietorship, licensing, and corporate governance—keeping them within the domains of state law. Proponents of traditional federalism have used it as the legal framework to shield private ordering from federal regulatory interference that defies market logic.[130]

(1986) (holding that the government's warrantless aerial observation of a fenced-in backyard within the curtilage of defendant's home does not invade his reasonable expectation of privacy).

[126] *See* Wu, *Beyond Free Markets and Consumer Autonomy*, *supra* note 68, at 57.

[127] *See id.*

[128] *See* Taylor Giorno, *Big Tech Lobbying Push Helped Block Bipartisan Bill That Aimed to Curb Alleged Anti-Competitive Behavior*, OPEN SECRETS (Dec. 20, 2022), https://www.opensecrets.org/news/2022/12/big-tech-lobbying-push-helped-block-bipartisan-bills-that-aimed-to-curb-alleged-anti-competitive-behavior/ [https://perma.cc/XK4H-JLWQ].

[129] *See* YBB Capital, *Freedom, Utopia, Bearing*, MEDIUM (June. 20, 2023) ("By combining the traditional internet with blockchain technology, [Web 3.0] aim[s] to create the next generation of the internet—a system that is characterized by individual freedom, decentralization, and is collectively created and maintained by all participants."), https://medium.com/ybbcapital/freedom-utopia-bearing-9bd89fab95a0 [https://perma.cc/8V9V-TRU8].

[130] Private ordering refers to governance by private entities through norms, as opposed to public ordering through state policies and enforced by government mandates. *See generally* Niva Elkin-Koren & Karni Chagal-Feferkorn, *Lex AI: Revisiting Private Ordering by Design*, 36 BERKELEY TECH. L.J. 915 (2021).

Under traditional federalism, federal regulation is largely confined to interstate spillovers—negative externalities that individual states cannot effectively manage, such as interstate commerce, international trade, and national industrial policy. [131] Traditional federalism also fosters interstate competition, a market-driven feature often lauded by neoliberals.[132] Grounded in the Hayekian vision of market-oriented limited government,[133] traditional federalism functions as a "market preserving" safeguard against disruptive and inefficient regulations stemming from federal government failures.[134]

However, as disruptive AI technologies mature, this traditional federalism model that once safeguarded decentralized governance now struggles to address the multifaceted regulatory demands of AI. This shift reveals two structural shortcomings:

First, traditional federalism offers the federal government limited tools to address new market failures emerging in the algorithmic age. Historically, market failures—such as monopolies, demerit goods, or informational opacity—are contained within individual markets. [135] To minimize market disruption, federal agencies have traditionally addressed these issues by singling out bad actors responsible for such failures through "activities based" regulation—that is, regulating business entities based on what types of commercial activities they engage in, rather than the type of business they operate.[136] Constitutionally, federalism also constrains the agencies' power to pursue "entity based" regulation because that could intrude upon the states' exclusive jurisdiction over corporate governance. [137] However, algorithmic market failures permeate across sectors. Unrelated AI systems may draw from the same biased data sources through unsupervised data mining, scraping, and

[131] *See* Robert P. Inman & Daniel L. Rubinfeld, *Rethinking Federalism*, 11 J. ECON. PERSPECTIVES 43, 45 (1997) ("The principle of economic federalism prefers the most decentralized structure of government capable of *internalizing all economic externalities*[.]") (emphasis added).

[132] *See* Benedikt Springer, Building Markets? Neoliberalism, Competitive Federalism, and the Enduring Fragmentation of the American Market, 130–48 (June 2018) (Ph.D. dissertation, University of Oregon), https://core.ac.uk/download/pdf/162196874.pdf [https://perma.cc/BRC3-QRSH].

[133] *See* HJALTE LOKDAM, BEYOND NEOLIBERAL FEDERALISM?, EUR. CONST. IMAGINARIES: BETWEEN IDEOLOGY AND UTOPIA 296, 310 (Jan Komárek ed., 2023) ("In Hayek's theory of federalism, one of the crucial limits on the governmental capacity of the federal level is the heterogeneity of the constituent parts. As long as the plurality of economic conditions and values exists within the federation, it will inevitably be more difficult to agree on the active use of federal power to regulate economic affairs."); *see generally* Friedrich A. Hayek, *The Economic Conditions of Interstate Federalism*, INDIVIDUALISM AND ECON. ORDER 255-72 (1948).

[134] *See generally* ADAM HARMES, THE POLITICS OF FISCAL FEDERALISM: NEOLIBERALISM VERSUS SOCIAL DEMOCRACY IN MULTILEVEL GOVERNANCE (2019).

[135] *See Market Failure: What It Is in Economics, Common Types, and Causes*, INVESTOPEDIA (June 25, 2024), https://www.investopedia.com/terms/m/marketfailure.asp [https://perma.cc/6JXZ-LCLE].

[136] *See* Seymour, *supra* note 46, at 12.

[137] *See id*; *see also* discussion *supra* Section II(B)

mutual-learning, amplifying biases across markets.[138] This interconnection of algorithmic market failures exposes the inadequacy of traditional federalism approaches to AI, since "activities based" regulation struggles to address AI's cross-contaminating effects.

Second, traditional federalism creates a "race to the bottom" among states. Current federalism doctrine—rooted in the Supreme Court's Tenth Amendment jurisprudence—focuses primarily on vertical power relations between state and federal governments. But it does not address horizontal power relations among states.[139] In reality, states compete not only in policy experimentation but also for resources, talent, capital, revenue, and influence. Unlike traditional markets, where interstate competition rarely requires state encroachment on federal domains, AI governance imposes unprecedented burden on states to regulate interstate spillovers—especially as the federal government has retreated from its customary role in managing interstate externalities through preemption.[140] AI governance demands substantial state investment in capital-intensive sectors and the development of new digital infrastructures, making states increasingly reliant on private sector wealth to enforce their regulations. This dependency heightens states' susceptibility to tech industry lobbying, as states often lack the financial and institutional resources to resist special influence while remaining competitive. Consequently, state legislatures become vulnerable to capture by tech industry interests. They are also ill-equipped to handle interstate regulatory arbitrage, where tech companies exploit jurisdictional inconsistencies for economic gain. The following subsections examine these two structural limitations in depth.

1. Fragmentary Federal AI Governance

Existing federal AI governance is scattered and incomplete. Although the White House has issued broad executive guidelines—such as the 2022 *AI Bill of Rights*[141] and, more recently, the 2025 *AI Action Plan*[142]—those initiatives are largely aspirational and have not been enacted into law or backed

---

[138] *See* Wu, *Beyond Free Markets and Consumer Autonomy*, *supra* note 68, at 87.

[139] *See* Allan Erbsen, *Horizontal Federalism*, 93 MINN. L. REV. 493, 495 (2008). ("[S]cholars rarely [con]ceptualize horizontal federalism as an integrated field . . . Judicial regulation of interstate activity similarly lacks the broad perspective necessary to engage constitutional values animating and connecting strands of doctrine, leading to [juris]prudence that is often unprincipled, unsatisfying, and un[sta]ble.") (footnote omitted).

[140] *See* Jennifer Huddleston, *Is a State AI Patchwork Next? AI Legislation at a State Level in 2024*, CATO INST. (Aug. 19, 2024), https://www.cato.org/blog/state-ai-patchwork-next-ai-legislation-state-level-2024 [https://perma.cc/AAL5-V6P8].

[141] *See* BLUEPRINT FOR AN AI BILL OF RIGHTS, *supra* note 12.

[142] *See* OFF. OF SCI. & TECH. POL'Y, EXEC. OFF. OF THE PRES., WINNING THE AI RACE: AMERICA'S AI ACTION PLAN (July 2025), https://www.whitehouse.gov/wp-content/uploads/2025/07/Americas-AI-Action-Plan.pdf [https://perma.cc/LZ6V-57G2] [hereinafter AMERICA'S AI ACTION PLAN].

by binding legislative mandates.[143] Compounding this uncertainty is a 180-degree turn in executive policy: the 2025 *AI Action Plan*, issued under the Trump administration, reverses the regulatory vision of Biden's 2022 *AI Bill of Rights*.[144] While the *AI Bill of Rights* emphasized enhancing algorithmic accountability and civil rights protections through proactive federal oversight, the *AI Action Plan* embraces a deregulatory agenda that calls for industry self-regulation and federal non-interference.[145] This reversal underscores the absence of a stable, long-term federal consensus on AI governance in the executive branch.

Congress, for its part, has yet to enact a comprehensive statutory framework tailored specifically to AI.[146] At present, consistent federal oversight extends only to AI applications that fall within the ambit of existing regulatory regimes. For instance, the Consumer Financial Protection Bureau (CFPB) monitors AI models used by financial institutions, but only in connection with consumer credit transactions.[147] Similarly, the Federal Trade Commission (FTC) has jurisdiction over AI only when regulated entities engage in "unfair or deceptive" market practices.[148] Constitutionally, federal jurisdiction is constrained to two primary bases: (1) "activities based" regulation that govern specific uses of AI in specific markets in domains of exclusive federal jurisdiction; and (2) "entity based" regulation of federally-chartered institutions to the extent their AI uses affect interstate commerce, as authorized under the Commerce Clause.[149]

In the absence of a comprehensive federal AI regulatory framework, federal efforts to regulate AI have been piecemeal and ad hoc, relying heavily on preemption. Under the Supremacy Clause, federal law overrides conflicting

---

[143] *See* Jiayan Chen et al., *White House Releases "America's AI Action Plan,"* MCDERMOTT WILL & SCHULTE (July 25, 2025), https://www.mwe.com/insights/white-house-releases-americas-ai-action-plan/ [https://perma.cc/8AHY-4KEZ].

[144] *See* Adam Aft et al., *AI Tug-of-War: Trump Pulls Back Biden's AI Plans*, THE EMPLOYER REPORT, BAKER MCKENZIE (Jan. 25, 2025), https://www.theemployerreport.com/2025/01/ai-tug-of-war-trump-pulls-back-bidens-ai-plans/ [https://perma.cc/GH29-3B84].

[145] *See* Colleen Theresa Brown et al., *The Trump Administration's 2025 AI Action Plan—Winning the Race: America's AI Action Pla—and Related Executive Orders*, SIDLEY AUSTIN PRIVACY & CYBERSECURITY UPDATE (Jul. 30, 2025), https://www.sidley.com/en/insights/newsupdates/2025/07/the-trump-administrations-2025-ai-action-plan [https://perma.cc/82GJ-FVPJ].

[146] *See* Hope Anderson, Earl Comstock & Erin Hanson, *AI Watch: Global Regulatory Tracker—United States*, WHITE & CASE (May 13, 2024), https://www.whitecase.com/insight-our-thinking/ai-watch-global-regulatory-tracker-united-states [https://perma.cc/3T3M-F6LS].

[147] *See* Wu, *Algorithmic Fairness in Consumer Credit Underwriting*, *supra* note 108, at 123–42.

[148] *See* FTC, *FTC Announces Crackdown on Deceptive AI Claims and Schemes* (Sep. 25, 2024), https://www.ftc.gov/news-events/news/press-releases/2024/09/ftc-announces-crackdown-deceptive-ai-claims-schemes; *see also* Anthony DiResta, *The FTC Is Regulating AI: A Comprehensive Analysis*, HOLLAND & KNIGHT (Jul. 25, 2023), https://www.hklaw.com/en/insights/publications/2023/07/the-ftc-is-regulating-ai-a-comprehensive-analysis [https://perma.cc/U4AB-HT8U].

[149] *See* Seymour, *supra* note 46, at 9, 12.

state law.[150] Preemption takes three forms: (1) express preemption, where federal law explicitly overrides state law; (2) conflict preemption, where state law undermines the objectives of a federal statute; and (3) field preemption, where federal regulation is so comprehensive that it leaves no room for state regulation in that area.[151] Federal preemption is applied sparingly, as courts presume against preemption unless Congress intends otherwise.[152] Existing case law requires either a "clear statement" in a federal statute that state law is preempted, or compelling evidence that preemption is the "clear and manifest purpose" of Congress.[153]

Although debates about the proper limits of federal preemption once seemed settled, they have resurfaced today as Congress considers new AI legislation.[154] To understand the critical role that preemption has played in shaping the fragmented landscape of federal AI regulations, the following subsections examine: (i) how preemption facilitated a national market since the neoliberal turn in the 1970s; and (ii) why conventional preemption approaches no longer equip federal agencies to address the novel challenges of the AI era.

(i) *Neoliberalism and Federal Preemption*: Although federal preemption is often linked with expansive state-building, it is not inherently at odds with neoliberalism. On the contrary, neoliberalism actually endorsed preemption because it could be deployed for market-building. Specifically, federal preemption has been instrumental in two key areas: nationalizing deregulation and addressing nationwide market failures.

Federal preemption has long served as a mechanism for dismantling state laws that conflict with neoliberal free-market principles. Although preemption is often framed as a means for consolidating federal power, Congress has historically wielded it to shield private entities from state legislations. Since the Reagan administration, lawmakers have used preemption to impose *national ceilings* that limit the states' power to burden business and

---

[150] *See* U.S. CONST. art. VI, para. 2 ("This Constitution, and the laws of the United States which shall be made in pursuance thereof; and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land.").

[151] *See* BRYAN L. ADKINS ET AL, CONG. RSCH. SERV., R45825, FEDERAL PREEMPTION: A LEGAL PRIMER (2023), https://sgp.fas.org/crs/misc/R45825.pdf [https://perma.cc/T7T7-V5VM].

[152] *See id*. at 22.

[153] *See, e.g*., Medtronic, Inc. v. Lohr, 518 U.S. 470, 485 (1996) (citing Rice v. Santa Fe Elevator Corp., 331 U.S. 218, 230 (1947)).

[154] *See* Dean W. Ball & Alan Rozenshtein, *Congress Should Preempt State AI Safety Legislation*, LAWFARE (June 17, 2024), https://www.lawfaremedia.org/article/congress-should-preempt-state-ai-safety-legislation [https://perma.cc/5UVN-V3MT]. For examples of recent legislative proposals, see, e.g., Artificial Intelligence and Critical Technology Workforce Framework Act of 2025, S. 1290, 119th Cong. (Apr. 3, 2025); Health Technology Act of 2025, H.R. 238, 119th Cong. (Jan. 7, 2025).

commerce.[155] At the same time, Congress legislated *national floors* to protect economic rights, particularly in areas like consumer protection. This dual function—curbing state power while establishing a baseline of market protections—has made preemption a politically versatile tool, attracting bipartisan support.[156] Presidents Bill Clinton and George W. Bush each signed 64 federal preemption statutes into law, with Bush notably refraining from vetoing any preemption bills during his two terms.[157] More recently, in May 2025, House Republicans sought to extend this tradition of nationalizing deregulation by invoking the Supremacy Clause to propose a 10-year federal ban on state AI legislation. [158] This move reflects a neoliberal paradox: although the ideology advocates for decentralization and the devolution of power from the national government to the states, its practical application has often expanded federal authority in the service of market liberalization.

Neoliberalism also acknowledges the need for centralized solutions to manage externalities that transcend state boundaries. Congress saw preemption as a critical tool to achieve that goal. Since the 1970s, Congress expansively preempted state actions to address resource maldistribution and information asymmetries. Fair lending laws, such as the Equal Credit Opportunity Act (ECOA)[159] and the Fair Housing Act (FHA),[160] targeted housing and credit discrimination. Consumer disclosure laws, including the Truth in Lending Act (TILA) [161] and Fair Credit Reporting Act (FCRA), [162] tackled information failures in credit reporting. Importantly, the market failures these laws addressed were largely confined to their respective sectors, without spillover into unrelated industries. This sector-specific containment enabled preemption to effectively resolve discrete economic challenges.

(ii) *Preemption's Limits in AI Governance*: However, AI exposes the limitations of federal preemption by introducing market failures that ripple across multiple sectors. For example, pricing distortions in ride-sharing can contaminate the e-commerce industry because seemingly unrelated pricing algorithms may draw on the same biased data sources.[163] This cross-market data reliance perpetuates and amplifies algorithmic biases, as AI systems

---

[155] *See* Mallory E. SoRelle & Alexis N. Walker, *Partisan Preemption: the Strategic use of Federal Preemption Legislation*, 46 PUBLIUS 486, 492 (2016).

[156] *See id.*

[157] *See id.*

[158] *See* Matt Brown & Matt O'Brien, *House Republicans include a 10-Year ban on US states regulating AI in 'big, beautiful' bill*, AP NEWS (May 16, 2025), https://apnews.com/article/ai-regulation-state-moratorium-congress-39d1c8a0758ffe0242283bb82f66d51a [https://perma.cc/4UXN-CLFV].

[159] *See* 15 U.S.C. §§ 1691, *et seq.*

[160] *See* 42 U.S.C. §§ 3601, *et seq.*

[161] *See* 15 U.S.C. §§ 1601, *et seq.*

[162] *See* 15 U.S.C. §§ 1681, *et seq.*

[163] Wu, *Beyond Free Markets and Consumer Autonomy*, *supra* note 68, at 87; *see also* Julie E. Cohen, *The Biopolitical Public Domain: The Legal Construction of the Surveillance Economy,* 31 PHIL. & TECH. 213, 222 (2017).

inadvertently reinforce distortions learned from shared datasets. [164] Furthermore, information failures related to opaque data inputs and training processes can similarly propagate across markets. [165] These cross-contaminating effects make the traditional "activities based" regulation ineffective. Addressing issues in one market often leads to their migration into another, resulting in a "whack-a-mole" regulatory dynamic that fails to resolve the underlying systemic problems.

This "whack-a-mole" dynamic significantly hampers comprehensive federal AI regulation. Currently, federal agencies rely on preemption to implement limited "activities based" regulation for AI. Under the Dodd-Frank Act, the CFPB has issued data disclosure rules requiring algorithmic lenders to provide consumers access to data collected about them, [166] effectively preempting state-level disclosure mandates. [167] Invoking its power to prohibit "unfair or deceptive acts or practices in or affecting [interstate] commerce" under Section 5 of the FTC Act, [168] the FTC has exercised preemption by issuing a final rule prohibiting fraudulent AI-generated consumer reviews and social media bots in e-commerce. [169] However, neither rule constitutes a comprehensive regulatory scheme for AI.

To address these gaps, Congress has considered establishing new federal agencies to manage disruptions caused by AI. [170] On July 27, 2023, Senators Elizabeth Warren and Lindsey Graham introduced a bill to create the Digital

---

[164] *See* Wu, *Algorithmic Fairness in Consumer Credit Underwriting*, *supra* note 108, at 89.

[165] *See id.* at 87–91.

[166] Consumer Access to Financial Records, 85 Fed. Reg. 71003 (Nov. 6, 2020) (Dodd-Frank Act section 1033 (codified at 12 U.S.C. § 5533) provides that "subject to the rules proscribed by the [CFPB], a consumer financial services provider must make available to a consumer information in the control or possession of the provider concerning the consumer financial product or service that that consumer obtained from the provider.").

[167] *See, e.g.*, Press Release, CFPB Newsroom, CFPB Finalizes Rule to Create a New Data Set on Small Business Lending in America (Mar. 30, 2023), https://www.consumerfinance.gov/about-us/newsroom/cfpb-finalizes-rule-to-create-a-new-data-set-on-small-business-lending-in-america/ [https://perma.cc/W6PG-AM6H]; Press Release, CFPB Newsroom, CFPB Kicks Off Personal Financial Data Rights Rulemaking (Oct. 27, 2022), https://www.consumerfinance.gov/about-us/newsroom/cfpb-kicks-off-personal-financial-data-rights-rulemaking/ [https://perma.cc/M3XU-SV7H].

[168] *See* 15 U.S.C. § 45; *see also* FED. RSRV. BD., FEDERAL TRADE COMMISSION ACT SECTION 5: UNFAIR OR DECEPTIVE ACTS OR PRACTICES, CONSUMER COMPLIANCE HANDBOOK (2017).

[169] *See* Colleen Theresa Brown et al., *U.S. FTC's New Rule on Fake and AI-Generated Reviews and Social Media Bots*, SIDLEY AUSTIN (Aug. 30, 2024), https://datamatters.sidley.com/2024/08/30/u-s-ftcs-new-rule-on-fake-and-ai-generated-reviews-and-social-media-bots/ [https://perma.cc/9LAV-HNJS].

[170] *See* Benjamin J. Cote et al., *Congress Contemplates Creating a New Federal AI Regulatory Agency*, PILLSBURY (2024), https://www.pillsburylaw.com/en/news-and-insights/congress-federal-ai-regulatory-agency.html [https://perma.cc/CPX2-6BN8]; *see also Oversight of A.I.: Rules for Artificial Intelligence Hearing Before the S. Subcomm. on Priv., Tech., and the L. of the S. Comm. on the Judiciary*, 118th Cong. (May 16, 2023), https://www.judiciary.senate.gov/committee-activity/hearings/oversight-of-ai-rules-for-artificial-intelligence [https://perma.cc/5KJP-J3UB].

Consumer Protection Commission (DCPC), [171] an independent agency designed to "prevent online harm, promote free speech and competition, guard Americans' privacy, and protect national security."[172] The proposed DCPC would share jurisdiction with the FTC and DOJ.[173] However, that bill failed to garner sufficient support and expired with the conclusion of the 118th Congress on January 3, 2025. [174] Since then, momentum for creating an independent AI regulatory agency has declined, particularly as the Senate's Republican majority has increasingly aligned with the Trump administration's deregulatory approach to AI governance.[175]

Even if the DCPC were established, its capacity to address the fragmented landscape of federal AI regulation would likely be limited. Because the DCPC's authority would stem from the Clayton Act, it would not possess powers beyond those already vested in the FTC and DOJ.[176] Critically, the DCPC would lack the authority to regulate AI development and deployment outside the context of antitrust and unfair market practices. [177] Thus, like those other agencies, the DCPC would remain tethered to "activities-based" regulation and thus ill-equipped to respond to the fast-moving, cross-sectoral nature of AI systems.[178] In this sense, the DCPC would risk becoming yet another siloed regulator in an already patchwork regulatory environment— unable to meaningfully address the "whack-a-mole" dynamics of AI governance.

In parallel, Congress is also considering legislation such as the Federal Artificial Intelligence Risk Management Act (FAIRMA)[179] and the Artificial Intelligence Research, Innovation, and Accountability Act (AIRIAA). [180]

---

[171] *See* Digital Consumer Protection Commission Act of 2023, S. 2597, 118th Cong. (2023).

[172] *See* Lindsey Graham & Elizabeth Warren, *When It Comes to Big Tech, Enough Is Enough*, N.Y. TIMES (July 27, 2023), https://www.nytimes.com/2023/07/12/magazine/semiconductor-chips-us-china.html [https://perma.cc/8GXA-EWBU].

[173] *See* Press Release, Warren, Graham Unveil Bipartisan Bill to Rein in Big Tech (July 27, 2023), https://www.warren.senate.gov/newsroom/press-releases/warren-graham-unveil-bipartisan-bill-to-rein-in-big-tech [https://perma.cc/W7AN-LGYA].

[174] *See S. 2597 (118th): Digital Consumer Protection Commission Act of 2023*, GOVTRACK.US, https://www.govtrack.us/congress/bills/118/s2597 [https://perma.cc/EPG9-GJDA].

[175] *See* Anthony Adragna & Mohar Chatterjee, *Trump's Allies Wanted to Strip States' Powers on AI. It Backfired*, POLITICO (July 2, 2025), https://www.politico.com/news/2025/07/02/ai-regulation-trump-allies-state-powers-00428337 [https://perma.cc/2E82-AMTP].

[176] *See* Elizabeth Warren, *Digital Consumer Protection Commission Act: Section-by-Section*, https://www.warren.senate.gov/imo/media/doc/DCPC%20Section-By-Section.pdf [https://perma.cc/KPE9-ZK8R].

[177] *See id.*

[178] *See id.*

[179] *See* Federal Artificial Intelligence Risk Management Act of 2023, S.3205, 118th Cong. (2023).

[180] *See* Artificial Intelligence Research, Innovation, and Accountability Act, S.3312, 118th Cong. (2023).

However, these bills focus narrowly on internal regulatory accountability within existing federal agencies and do not address the broader fragmentation of AI governance. Given the constitutional constraints imposed by federalism and the limited scope of proposed legislation, even bipartisan support may struggle to produce a comprehensive federal strategy for AI regulation.

2.   Inconsistent State AI Regulations

In the absence of comprehensive federal AI regulation, states have taken the lead. Under traditional federalism, states regulate many AI-related economic activities through exercising their inherent "police powers" to "protect public health and safety"—provided that they do not violate due process or equal protection.[181] However, the lack of federal preemption has not only reinforced state police powers but also pushed states into traditionally federal domains—exacerbating legal inconsistencies across jurisdictions.

State regulation of professional standards for AI users and developers remains a traditional domain of state authority.[182] As licensed practitioners increasingly use AI to aid—or even substitute—their professional judgement, concerns over AI misuse have grown.[183] State courts have fined and disbarred lawyers for submitting fictitious AI-generated case law.[184] Many state legislatures have also established AI ethics codes to manage professional standards. Additionally, states regulators are now moving towards AI licensure regimes for software engineers in sectors tied to law, medicine, government services, and public safety.[185] Some states, such as Pennsylvania, have even established AI registries akin to those developed in China.[186]

---

[181] *See* Laura Temme, *How the Fourteenth Amendment Limits State Police Powers*, FIND L. (Aug. 1, 2024), https://constitution.findlaw.com/amendment14/annotation07.html [https://perma.cc/FBM2-V58B].

[182] *Cf.* Ohralik v. Ohio State Bar Association, 436 U.S. 447, 460 (1978) ("State[s] bear[] a special responsibility for maintaining standards among members of the licensed professions.").

[183] *See* Chad Squitier, *Federalism in the Algorithmic Age*, 19 DUKE L. & TECH. REV. 139, 147 (2021).

[184] *See, e.g.*, Sara Merken, *New York Lawyers Sanctioned for Using Fake ChatGPT Cases in Legal Brief*, REUTERS (June 26, 2023), https://www.reuters.com/legal/new-york-lawyers-sanctioned-using-fake-chatgpt-cases-legal-brief-2023-06-22/ [https://perma.cc/9NGL-5AWC]; Thy Vo, *Colorado Attorney Suspended For Using 'Sham' ChatGPT Case Law*, LAW360 (Nov. 27, 2023), https://www.law360.com/articles/1770085/colo-atty-suspended-for-using-sham-chatgpt-case-law [https://perma.cc/V65Q-ZJSM].

[185] *See, e.g.*, Chinmayi Sharma, *AI's Hippocratic Oath*, 99 WASH. U. L. REV. (forthcoming 2025); *Setting a Higher Bar: Professionalizing AI Engineering*, LAWFARE (Dec. 12, 2023), https://www.lawfaremedia.org/article/setting-a-higher-bar-professionalizing-ai-engineering [https://perma.cc/R596-KE9V].

[186] *See Pennsylvania Bill Would Establish a State AI Registry*, IAPP NEWS (Nov. 3, 2022), https://iapp.org/news/b/pennsylvania-bill-would-establish-a-state-ai-registry [https://perma.cc/BFV3-98WE].

Beyond areas traditionally within states' "police powers," states are now crafting tailor-made AI legislations in domains of concurrent federal and state authority. In 2023 alone, lawmakers in at least 31 states introduced more than 190 AI-related bills[187]—a 440% increase from 2022 and more than the previous two years combined.[188] Although only 29 of those bills were eventually enacted into law, the volume of proposed AI legislations has surged drastically.[189] By November 2024, state legislatures are considering nearly 750 pieces of AI-related legislation, addressing issues such as consumer protection, government AI use, generative AI, and data privacy.[190] However, many of these laws define AI differently, leading to significant legal inconsistency across states.[191]

At present, states have adopted two competing regulatory approaches: (1) the risk-based approach, focusing on identifying high-risk AI applications for regulatory scrutiny; and (2) the occupation-based approach, leveraging state authority to regulate professional standards.

Colorado exemplifies the risk-based approach, with the passage of the Colorado Act Concerning Consumer Protections in Interactions with Artificial Intelligence Systems (the "Colorado AI Act") in May 2024.[192] Modeled after the EU AI Act, the Colorado AI Act identifies high-risk AI applications across sectors such as education, labor, finance, healthcare, housing, and insurance. It requires businesses operating in Colorado to conduct periodic AI assessments, disclose AI usage to consumers, and explain AI decisions that adversely impact consumers—particularly in areas prone to algorithmic discrimination.

By contrast, Utah's Artificial Intelligence Policy Act (the "Utah AI Act"), enacted on March 13, 2024, adopts the occupation-based approach.[193] The

---

[187] *See* Logan Kolas, *The Mess States Are Making of AI Regulation*, GOVERNING (July 29, 2024), https://www.governing.com/policy/the-mess-states-are-making-of-ai-regulation [https://perma.cc/TF9R-NM4W].

[188] *See* Matthew Lenz & Abigail Wilson, *2023 State AI Legislation Summary*, THE SOFTWARE ALLIANCE (Sep. 22, 2023), https://www.bsa.org/files/policy-filings/10242023statelegsummary.pdf [https://perma.cc/PNS9-TFG4].

[189] *See id.*

[190] *See Artificial Intelligence (AI) Legislation*, MULTISTATE AI (last visited Oct. 6, 2025), https://www.multistate.ai/artificial-intelligence-ai-legislation [https://perma.cc/3477-ULS6].

[191] *See* Sam Crombie & Jack Nicastro, *Defining "Artificial Intelligence" in State Legislation: An Analysis of the Current Landscape*, NOW + NEXT (July 17, 2024), https://nowandnext.substack.com/p/defining-artificial-intelligence [https://perma.cc/CX53-7H38].

[192] *See* Marian A. Waldmann Agarwal & Marijn Storm, *Navigating New Frontiers: Colorado's Groundbreaking AI Consumer Protection Law*, MORRISON & FOERSTER (May 31, 2024), https://www.mofo.com/resources/insights/240531-navigating-new-frontiers-colorado-s-groundbreaking-ai [https://perma.cc/M2YW-6TPE].

[193] *See* Stuart D. Levi et al., *Utah Becomes First State to Enact AI-Centric Consumer Protection Law*, SKADDEN (Apr. 5, 2024), https://www.skadden.com/insights/publications/2024/04/utah-becomes-first-state [https://perma.cc/R9QK-BW53].

Utah AI Act targets licensed professionals such as lawyers and accountants. It mandates heightened standards and disclosure requirements for AI usage in professional services. It also grants consumers the right to request manual reviews of consequential AI decisions.

Each approach has trade-offs. The risk-based approach is more business-friendly, as it imposes risk assessment and reporting obligations without dictating how companies use AI or implement their policies. However, it offers limited consumer protection. Businesses can often meet assessment requirements without making meaningful changes. In practice, companies can use "Explainable AI"[194] to retroactively generate plausible justifications for AI-driven decisions, reducing assessments to mere procedural formalities. In contrast, the occupation-based approach enforces higher ethical standards and ensures greater oversight of AI-assisted decision-making within the regulated professions. However, its scope is narrow, applying only to licensed professions while excluding broader commercial applications. A hybrid model could theoretically address these limitations, combining risk-based flexibility with occupation-based safeguards. Yet, no state has adopted such a model, as it could impose significant compliance costs—potentially driving businesses to relocate to states with more permissive AI regulations.

D.   *Industry Self-Governance Under Techno-Federalism*

The combination of federal inaction and inconsistent state legislation underscores a key limitation of traditional federalism—its inability to address the multidimensional regulatory demands of AI governance. Under traditional federalism, responsibilities for tech regulation are divided along state and federal lines. Shifts in constitutional doctrines concerning preemption (Supremacy Clause), state sovereignty (Tenth Amendment), and nationwide economic externalities (Commerce Clause) reflect both historical and present changes in the balance of bilateral federal-state relations.

Techno-federalism, however, introduces a third regulatory force: market discipline. Under this new paradigm, the tech industry actively participates in AI policymaking through self-governance, stepping into the regulatory void left by federal inaction and inconsistent state laws. With government action lagging, tech firms increasingly take initiative to influence state legislatures to shape AI laws. As state legislatures become key battlegrounds for new tech industry interests, [195] industry players—such as AI software developers,

---

[194] *See* Violet Turri, *What is Explainable AI?*, SOFTWARE ENG'G INST. CARNEGIE MELLON UNIV. (Jan. 17, 2022), https://insights.sei.cmu.edu/blog/what-is-explainable-ai/ [https://perma.cc/M3FF-D4WJ] ("[E]xplainable AI refers to the set of processes and methods that allows human users to comprehend and trust the results and output created by machine learning algorithms.").

[195] *See* Emmie Hine, *Artificial Intelligence Laws in the US States are Feeling the Weight of Corporate Lobbying*, NATURE (Sep. 2024), https://www.nature.com/articles/d41586-024-02988-0 [https://perma.cc/6KU7-463R].

microchip manufacturers, and data intermediaries (*e.g.*, data brokers and data centers)—navigate fragmented state regulations to advance their interests.[196] The tech industry has become increasingly "proactive" in response to the surge in state AI laws.[197]

Industry self-governance is achieved through three main strategies: (1) *corporate lobbying*, where tech companies directly influence state legislative processes to create favorable laws; (2) *regulatory arbitrage*, where companies utilize favorable laws in one jurisdiction to circumvent stricter regulations elsewhere; and (3) *norm-building*, where companies establish industry-wide norms and model laws to gain legal recognition from states. Collectively, these strategies shape AI governance across three critical domains: software, hardware, and infrastructure, which I will explore in detail.

1. Software Governance

The tech industry wields its greatest influence over software governance, leveraging jurisdictional differences across states and actively shaping state AI legislation. Currently, the software development market is dominated by a few Silicon Valley tech giants—including Google, Meta, Amazon, OpenAI, Anthropic, and Inflection.[198] This market consolidation has reshaped state-federal dynamics. In response to federal regulatory gaps, Silicon Valley has pushed the California legislature to take the lead in national software governance for experimental AI systems.[199] With its large economy and pro-regulation Democrat majority, California—home to 32 of Forbes' top 50 global AI companies—has become the *de facto* national regulator for AI software.[200]

Against this backdrop, leading software developers are shaping AI legislation through norm-building and lobbying. A standout example is Workday, Inc., a California-based software vendor in human resources and workplace management systems.[201] Workday's AI software automate tasks

---

[196] *See generally* William H. Dutton, *Technology and the Federal System*, 34 THE COMMC'NS REVOLUTION IN POLS. 109 (1982) (providing general background on the intersection between federalism in American technology policy).

[197] *See* Brendan Bordelon, *As States Move on AI, Tech Lobbyists Are Swarming In*, POLITICO (Sep. 8, 2023), https://www.politico.com/news/2023/09/08/tech-lobby-state-ai-efforts-00114778 [https://perma.cc/E3NS-QGQ4].

[198] *See* Paul Triolo & Kendra Schaefer, *China's Generative AI Ecosystem in 2024: Rising Investment and Expectations*, NAT'L BUREAU ASIAN RSCH. (June 27, 2024), https://www.nbr.org/publication/chinas-generative-ai-ecosystem-in-2024-rising-investment-and-expectations/ [https://perma.cc/4YKR-XQ3R].

[199] *See* Joshua Turner & Nicol Turner Lee, *Can California Fill the Federal Void on Frontier AI Regulation?* BROOKINGS INST. (June 4, 2024), https://www.brookings.edu/articles/can-california-fill-the-federal-void-on-frontier-ai-regulation/ [https://perma.cc/H7WY-9GSW].

[200] *See* Kenrick Cai, *AI 50*, FORBES (Apr. 11, 2024), https://www.forbes.com/lists/ai50/ [https://perma.cc/7J5W-7ZVC].

[201] *See* Suzanne Smalley, *How Software Giant Workday is Driving State Legislation to Regulate AI*, THE REC.: RECORDED FUTURE NEWS (Mar. 7, 2024),

such as payroll, scheduling, employee boarding, time tracking, talent management, and performance evaluations. [202] Used by over 10,000 organizations worldwide, Workday's software governs critical processes like hiring, benefits administration, and even termination decisions.[203]

Workday is also a major proponent of risk-based AI regulation, particularly for automated workplace decision tools. Its lobbying began in its home state California, where, in March 2024, a draft of its model AI bill was circulated among state lawmakers.[204] Language from Workday's model AI bill appears verbatim in AI Acts introduced not only in California, but also in Illinois, Rhode Island, Connecticut, New York, and Washington. Today, Workday lobbyists are engaging with lawmakers in at least five states, while its executives lead multistate working groups to coordinate proposed AI legislation.[205]

Workday is not alone. Beyond shaping laws on AI's market applications, industry leaders are also influencing state legislation on the building block of AI: training data. In July 2024, New Jersey State Senator Raj Mukherji introduced a data privacy bill granting consumers the right to prevent their personal data from being harvested by third-party data brokers.[206] In response, the tech industry promoted a weaker model bill, based on the Connecticut Data Privacy Act of 2022.[207] TechNet, an association representing companies like Apple, Comcast, Google, and Meta, lobbied New Jersey legislators against the Mukherji bill.[208] TechNet argued that allowing a private right of action for data violations would encourage frivolous lawsuits, harming innovation. The group also opposed (1) requirements limiting the amount of information companies

---

https://therecord.media/human-resources-artificial-intelligence-state-legislation-workday [https://perma.cc/7Q87-K958].

[202] *See AI in HR: Applications, Benefits, and Examples*, WORKDAY, INC. (last visited Oct. 7, 2025), https://www.workday.com/en-us/pages/what-is-ai-in-hr.html [https://perma.cc/7UPK-SBGB]; *see also* Hiranya Valli, *What is Workday & Overview of Various Workday Modules*, CLOUD FOUND. (last visited Oct. 7, 2025), https://cloudfoundation.com/blog/what-is-workday/ [https://perma.cc/FS3N-P6QM].

[203] *See generally Workday Customer List*, WORKDAY, INC. (last visited Oct. 7, 2025), https://www.workday.com/en-us/customer-list.html [https://perma.cc/Q3QA-TFZP].

[204] *See* Smalley, *How Software Giant Workday is Driving State Legislation*, *supra* note 201.

[205] *See id.*

[206] *See* Suzanne Smalley, *In Patchwork of State Privacy Legislation, Tech Lobby Sees a Single Battlefield*, THE REC.: RECORDED FUTURE NEWS (Jan. 30, 2024), https://therecord.media/state-data-privacy-legislation-technology-industry-lobbying [https://perma.cc/MC4G-VC7B] [hereinafter Smalley, *In Patchwork of State Privacy Legislation*].

[207] *See* Office of Atty. General William Tong, *The Connecticut Data Privacy Act* (last visited Nov. 26, 2024), https://portal.ct.gov/ag/sections/privacy/the-connecticut-data-privacy-act [https://perma.cc/5WVN-KGJV].

[208] *See* Smalley, *In Patchwork of State Privacy Legislation*, *supra* note 206.

are allowed to retain; (2) opt-in consent for microtargeting; and (3) broad legal definitions of data sale.[209]

Beyond sponsoring business-friendly state AI legislation through norm-building and lobbying, tech firms are preventing states from enacting restrictive laws via regulatory arbitrage. This occurs in two forms: (i) horizontal regulatory arbitrage, where companies leverage favorable laws in one state to undermine unfavorable laws in another, and (ii) vertical regulatory arbitrage, where companies exploit jurisdictional gaps by lobbying the federal government to preempt strict state AI laws using existing federal statutes.

(i) *Horizontal Regulatory Arbitrage*: In February 2024, California State Senator Scott Wiener introduced SB 1047, the Safe and Secure Innovation for Frontier Artificial Intelligence Models Act.[210] Poised to become "the strictest legal framework around AI in the U.S.," The bill would have required AI users and developers in California meeting certain thresholds to implement a "kill switch" and conduct periodic model testing under government supervision. It also proposed protections for whistleblowers to report violations to the California attorney general and granted individuals a right to sue companies for damages caused by AI safety incidents.[211]

The bill met fierce opposition from the software developer community. Industry leaders like OpenAI and Anthropic criticized the bill as overly restrictive,[212] while AI start-ups threatened to leave California and relocate to states with more lenient or nonexistent AI laws.[213] Despite this backlash, the California legislature passed SB 1047 in August 2024, sending it to Governor Gavin Newsom for presentment and approval.[214] On September 29, however, Newsom vetoed the bill, citing concerns that it was overly broad and could stifle innovation.[215] His veto emphasized the need to maintain California's status as the national hub for AI development and prevent businesses from moving to more permissive states.

(ii) *Vertical Regulatory Arbitrage*: To advance their interests, industry leaders have also turned to federal regulators to preempt restrictive state AI legislation. In August 2024, the American Bankers Association (ABA), joined

---

[209] *See id*.

[210] *See* Emma Roth & Wes Davis, *California Governor Vetoes Major AI Safety Bill*, THE VERGE (Sep. 29, 2024), https://www.theverge.com/2024/9/29/24232172/california-ai-safety-bill-1047-vetoed-gavin-newsom [https://perma.cc/NT2B-CMLQ].

[211] *See id.*

[212] *See* Wes Davis, *All the News About SB 1047, California's Bid to Govern AI*, THE VERGE (Sep. 29, 2024), https://www.theverge.com/2024/9/3/24233767/california-ai-regulation-news-stories [https://perma.cc/5F7B-QB3R].

[213] *See* George Hammond & Hannah Murphy, *OpenAI Joins Opposition to California AI Safety Bill*, FIN. TIMES (Aug. 21, 2024), https://www.ft.com/content/bdba5c71-d4fe-4d1f-b4ab-d964963375c6 [https://perma.cc/2PF9-PDG7].

[214] *See* Roth & Davis, *supra* note 210.

[215] *See id.*

by 21 state banker associations, urged the Department of Treasury to preempt state AI laws covering banking regulation.[216] The ABA argued that existing federal laws already address AI applications in banking, and that new state AI laws impose "onerous and duplicative" obligations on banks.[217] The ABA's letter also requested an AI model risk management guidance from the federal prudential regulators to clarify that federal banking laws supersede conflicting state AI laws—particularly concerning generative AI use in consumer lending and credit reporting.[218]

In theory, federal preemption could resolve inconsistencies across state laws if the federal government were actively developing comprehensive AI regulations. However, given the current state of federal inaction, preemption would effectively nullify state efforts to craft more robust AI regulations. By relying on outdated and vague federal laws that fail to address AI specifically, this strategy advances the banking industry's interests at the expense of state-led innovation in AI governance.

2.   Hardware Governance

In the hardware domain, industry self-governance relies on coalition-building and direct collaboration with state governments, rather than traditional corporate capture. This contrasts with the software domain, where self-governance relies on a mix of corporate lobbying, norm-building, and regulatory arbitrage tactics.

The AI competition over hardware revolves around semiconductor microchips, often referred to as the "brains of modern electronics." [219] OpenAI's ChatGPT was reportedly trained on "10,000 of the most advanced [micro]chips currently available," manufactured by Nvidia.[220] Both the United

---

[216] *See* Banking Exchange Staff, *Banks Associations Urge Federal AI Law to Supersede State Laws*, BANKING EXCH. (Aug. 19, 2024), https://www.bankingexchange.com/news-feed/item/10079-banks-associations-urge-federal-ai-law-to-supersede-state-laws [https://perma.cc/NSP2-3B3U].

[217] *Id.*

[218] *See generally* Ryan T. Miller, *Joint Letter to the Treasury on the Request for Information on Uses, Opportunities, and Risks of Artificial Intelligence in the Financial Services Sector*, AM. BANKERS ASS'N (Aug. 12, 2024), https://www.aba.com/advocacy/policy-analysis/joint-ltr-treas-rfi-ai [https://perma.cc/P244-8B2U].

[219] *See Industry Impact: Building America's Innovation Economy*, SEMICONDUCTOR INDUS. ASS'N (last visited Dec. 4, 2024), https://www.semiconductors.org/industry-impact/ [https://perma.cc/A3V5-FTAH].

[220] Alex W. Palmer, *'An Act of War': Inside America's Silicon Blockade Against China*, N.Y. TIMES (Jul. 12, 2023),https://www.nytimes.com/2023/07/12/magazine/semiconductor-chips-us-china.html [https://perma.cc/R5F2-CULH].

States and China view semiconductor microchips as a "military lynchpin," crucial for powering defense-related AI systems.[221]

Given the geopolitical importance of semiconductors and the private sector's lead in microchip innovation, the federal government has a strong incentive to embed itself in the hardware industry. The federal government's role in hardware governance is far more pronounced than in software, reflecting a more protectionist stance—using tools including outbound investment review and export restrictions on AI microchips to China. In August 2022, Congress passed the Creating Helpful Incentives to Produce Semiconductors and Science Act (the "CHIPS Act"), aimed at limiting U.S. microchip supply chain exposure to "foreign entities of concern."[222] The CHIPS Act allocates $280 billion in federal subsidies through tax credits,[223] loans and loan guarantees,[224] and direct grants,[225] including $53 billion for semiconductor research and $39 billion for manufacturing incentives.[226]

Under the CHIPS Act, the Department of Commerce (DOC) wields significant discretion in deciding which projects receive subsidies.[227] The DOC has leveraged these subsidies to implement federal industrial policy through contracts with industry leaders like Intel.[228] Importantly, CHIPS Act subsidies come with strings attached.[229] They often include "national security guardrails" that require recipients to cut ties with entities supporting AI

---

[221] Anu Bradford, Eileen Li & Matthew C. Waxman, *How Domestic Institutions Shape the Global Tech War*, 16 HARV. NAT'L SEC. J. 1, 5 (2025).

[222] *See* 15 U.S.C. §§ 72A, *et seq*. *See also* The White House, *Fact Sheet: CHIPS and Science Act Will Lower Costs, Create Jobs, Strengthen Supply Chains, and Counter China* (Aug. 9, 2022), https://bidenwhitehouse.archives.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/ [https://perma.cc/D6PR-FXTS] [hereinafter The White House, *Fact Sheet: CHIPS and Science Act*].

[223] The CHIPS Act tax credit is equal to 25% of the qualified investment for the taxable year for semiconductor manufacturing. *See Advanced Manufacturing Investment Credit*, INTERNAL REVENUE SERV. (last visited Dec. 5, 2024), https://www.irs.gov/credits-deductions/advanced-manufacturing-investment-credit [https://perma.cc/2A3H-PDM2].

[224] *See* NAT'L INST. OF STANDARDS & TECH, CHIPS FOR AMERICA FACT SHEET: FEDERAL PROGRAMS SUPPORTING THE U.S. SEMICONDUCTOR SUPPLY CHAIN AND WORKFORCE 4 (Mar. 18, 2024), https://www.nist.gov/system/files/documents/2024/04/22/Fact%20Sheet%20-%20Federal%20Incentives-updated-508C.pdf [https://perma.cc/33QW-BSNY].

[225] *See id*.

[226] *See* The White House, *Fact Sheet: CHIPS and Science Act*, *supra* note 222.

[227] *See generally* Tyler D. Robbins & Michael C. Herrera, *CHIPS Act Allocates $52 Billion in Subsidies to Revitalize Semiconductor Manufacturing*, PERKINS COIE (Sep. 2, 2022), https://perkinscoie.com/insights/update/chips-act-allocates-52-billion-subsidies-revitalize-semiconductor-manufacturing [https://perma.cc/MP7F-KNXW].

[228] *See id*.

[229] *See* Ana Swanson, *Congress Is Giving Billions to the Chips Industry. Strings Are Attached*, N.Y. TIMES (Aug. 3, 2022), https://www.nytimes.com/2022/08/03/business/economy/chip-industry-congress.html [https://perma.cc/DQU5-KTDH].

development or semiconductor manufacturing in China.[230] These guardrails also allow the DOC to "claw back" subsidies if they are misused.[231] Despite campaign promises to reduce federal subsidies, the Trump administration is likely to continue CHIPS Act subsidies due to its protectionist agenda.[232] A hawkish stance on China remains a rare bipartisan consensus capable of bypassing legislative deadlock in Congress.[233]

The CHIPS Act's greatest beneficiaries are multinational hardware manufacturers with U.S.-based supply chains. As of 2024, Intel has received the largest federal investment, securing $8.5 billion in loans and tax credits to build semiconductor factories in Arizona, New Mexico, Oregon, and Ohio.[234] Foreign companies are also eligible for CHIPS Act benefits, provided that they establish microchip plants in the United States and cut supply chain exposure to China and other countries of national security concern. The Taiwan Semiconductor Manufacturing Company (TSMC), the world's largest microchip producer, received $6.6 billion in federal funding to build factories in Arizona.[235] South Korea's Samsung received $6.4 billion to finance its facilities in Texas.[236]

Federal subsidies for semiconductor research and manufacturing have created a new hardware governance model based on coalition-building and government collaboration. Intel, for example, has partnered with local industry associations like the Midwest Microelectronics Consortium (MMEC) to establish microchip plants in the Midwestern states using CHIPS Act subsidies.[237] The MMEC includes academic institutions, state government stakeholders, and local hardware producers.[238] This partnership enables

---

[230] *See* Sujai Shivakumar, Charles Wessner & Thomas Howell, *"Guardrails" on CHIPS Act Funding to Restrict Investments in China May Restrict Participation in CHIPS Act Incentives*, CTR. FOR STRATEGIC & INT'L STUD. (Nov. 7, 2023), https://www.csis.org/blogs/perspectives-innovation/guardrails-chips-act-funding-restrict-investments-china-may-restrict [https://perma.cc/E4UG-2585].

[231] *See id*.

[232] *See* Dylan Butts, *Trump Likely to Uphold CHIPS Act Despite His Campaign Rhetoric, Policy Experts Say*, CNBC (Nov. 7, 2024), https://www.cnbc.com/2024/11/07/trump-likely-to-uphold-chips-act-despite-his-campaign-rhetoric-experts-say.html [https://perma.cc/S4L8-UQK4].

[233] Bradford et al., *supra* note 221, at 11.

[234] *See* Emilia David, *Where the CHIPS Act Money Has Gone*, THE VERGE (Jun. 7, 2024), https://www.theverge.com/24166234/chips-act-funding-semiconductor-companies [https://perma.cc/3CYV-4ZP3].

[235] *See id*.

[236] *See id*.

[237] *See The MMEC Receives Microelectronics Common Project Awards*, MMEC (Sep. 19, 2024), https://mmeconsortium.org/wp-content/uploads/2024/09/MMEC_ProjectAwards_2024.pdf [https://perma.cc/VS5J-WJZR].

[238] *See Biden-Harris Administration Finalize $7.86 Billion Funding Award Under US CHIPS Act*, INTEL CORP. (Nov. 26, 2024), https://www.intel.com/content/www/us/en/newsroom/news/intel-chips-act.html#gs.if1wk4 [https://perma.cc/Q26H-XDXA].

MMEC stakeholders to access CHIPS Act subsidies indirectly through Intel, while providing Intel with entry into regional markets to promote its model AI bills and technical standards.[239] In return, Intel implements workforce diversity programs, employment benefits, and labor standards. This arrangement allows Congress to oversee the industry and advance federal public policy without enacting new legislation, while maintaining autonomy for industry leaders. Regulation through government contracting also bypasses the legal constraints on federal power imposed by traditional federalism principles.

Despite the federal government's heavy involvement in AI hardware, states play an indispensable role in managing the AI microchip supply chain. Arizona, in particular, is leading the nation in implementing the CHIPS Act and its national security objectives.[240] Through state-led research consortiums and state government contracts, Arizona has attracted over 35 semiconductor projects and $65 billion in investment, establishing itself as the national hub for semiconductor manufacturing. [241] The Arizona governor also retains significant discretion over how CHIPS Act recipients manage resources through government contracting and participation in local industry associations.

The CHIPS Act marks a paradigm shift in U.S. hardware governance. It signals a new form of federal reengagement, driven by national security priorities and the retreat from neoliberal free-market politics, though a stable equilibrium has yet to emerge.[242] This is ideal for industry self-governance. Though regulatory responsibilities remain undefined, a new division of labor is taking shape: the federal government provides funding incentives, states coordinate policy implementation, and industry leaders supply market resources.

3. Infrastructure Governance

Unlike other domains, AI infrastructure is shaped exclusively by state commercial laws. The tech industry shapes infrastructure governance through sophisticated contracting that fills existing legal lacunas. Its dominance over AI infrastructure centers on the physical facilities that support AI systems—such as cloud servers and data storage systems. AI infrastructure relies on the construction of data centers—building complexes that store companies' harvested data and connect them to cloud servers via network equipment.[243] Every digital platform requires data centers to store and manage its online

---

[239] *See id.*

[240] *See How Arizona is Competing for the CHIPS Act: State Leads Unprecedented Effort to Maximize Semiconductor Opportunities*, ARIZ. COM. AUTH. (Mar. 11, 2024), https://www.azcommerce.com/news-events/news/2024/3/how-arizona-is-competing-for-the-chips-act/ [https://perma.cc/U54V-7DBY].

[241] *See id.*

[242] *See* Bradford et al., *supra* note 221, at 10.

[243] *See What is a Data Center?*, AMAZON WEB SERV. (last visited Dec. 6, 2024), https://aws.amazon.com/what-is/data-center/ [https://perma.cc/NG3D-QGZ2].

information. In real estate terms, a data center acts as the "landlord" leasing digital storage space for "tenants" such as Microsoft, Google, or Meta.[244]

Since data centers are capital-intensive projects involving complex business transactions, industry players often strategically mix and match state laws to achieve the most cost-efficient outcomes. As a result, a data center is governed by a patchwork of state laws, creating a "Frankenstein" legal landscape. The lifecycle of a single data center typically encompasses several stages, each governed by laws of different states:

(i) *Property Acquisition Stage*: Building a data center begins with acquiring land. Site selection depends on factors such as real estate costs, telecommunications connectivity, energy supply, labor availability, and local tax incentives.[245] The property is typically acquired by a developer specializing in industrial projects, with ownership held by a special purpose entity (SPE) of an investment fund.[246] Each component is governed by different state laws: land transactions fall under the jurisdiction of the state where the site is located, while the SPE is often set up as a Delaware limited liability company. This structure ensures maximum manager protection and investor insulation from SPE insolvency risks.[247]

(ii) *Construction Stage*: Once the site is selected, a new group of parties participate in the data center's construction. These projects are usually executed under a *Engineering, Procurement, and Construction Agreemen*t (an "EPC Contract"), which forms a joint venture between an independent engineer, the construction company, and the developer.[248] EPC Contracts are highly detailed and complex, with customized obligations for multiple parties to address the unique aspects of the project. Depending on the state jurisdiction and the nature of the project, these EPC Contracts may require specialized licenses or environmental risk assessments. Nearly every EPC Contract

---

[244] *See, e.g.*, Leah Rubega, *Data Center Leasing Considerations*, NEW ENG. REAL EST. J. (Feb. 26, 2021), https://nerej.com/data-center-leasing-considerations-by-leah-rubega [https://perma.cc/MN7K-RYPV].

[245] *See* Robert A. James & Matt Olhausen, *Anatomy of a Data Center*, PILLSBURY GRAVEL2GRAVEL (Sept. 20, 2024), https://www.gravel2gavel.com/what-is-data-center/ [https://perma.cc/K2DQ-BXBA].

[246] *See id.*

[247] *See* Alicia Davis, *What's So Special About Special Purpose Entities?*, CADWALADER (Apr. 29, 2021), https://www.cadwalader.com/ref-news-views/index.php?nid=29&eid=142 [https://perma.cc/AW8F-GMU2]; *see also* Norman M. Powell, *Delaware Entities Favored in Structured Finance*, CORP. COUNSEL BUS. J. (May 1, 2007), https://ccbjournal.com/articles/delaware-entities-favored-structured-finance [https://perma.cc/Q3SG-4YE6].

[248] *See* Robert A. James, *A Guide to EPC Agreement Provisions*, PILLSBURY WINTHROP SHAW PITTMAN (2015), https://www.pillsburylaw.com/a/web/157254/EPC-Agreement-Provisions.pdf [https://perma.cc/ZA5R-DP36].

includes detailed forum-selection and choice-of-law clauses—allowing the parties to select favorable laws.[249]

(iii) *Project Financing Stage*: After the construction begins, the investment fund sponsoring the SPE seeks additional funding from investors or banks to finance the data center's construction. Different laws apply depending on how the transaction is structured. In a *securities-based transaction*, the SPE issues securities (*e.g.*, project bonds, secured notes) in secondary markets to raise funds.[250] Investors in these securities are repaid from the cash flow generated by the data center—including income from leases and services fees charged to tenants for data storage and management.[251] While investors assume default risks associated with the securities, they are shielded from insolvency risks tied to the data center's construction. [252] These transactions must comply with federal securities laws governing initial offerings, exemptions, and periodic disclosures.[253] Conversely, in a *loan-based transaction*, the investment fund pools multiple SPEs into a portfolio and borrows directly from banks without accessing secondary markets. [254] To protect banks from SPE insolvency risks, loans are made separately to each SPE, though an aggregate credit commitment is negotiated with the investment fund.[255] Since most banks are located in New York, loan-based transactions are typically governed by New York contract law.[256] UCC Article 9 also

---

[249] For background on the enforceability of forum-selection and choice-of-law clauses in private contracts, see generally Tanya J. Monestier, *When Forum Selection Clauses Meet Choice of Law Clauses*, 69 AM. U. L. REV. 325 (2019).

[250] *See* Steven L. Schwarcz, *Bankruptcy-Remote Structuring: Reallocating Risk Through Law*, 97 AM. BANKR. L.J. 1, 9-10 (2023).

[251] *See id.*

[252] *See id*.

[253] In the United States, project bonds are securities subject to the Securities Act of 1933 (codified at 15 U.S.C. §§ 77b(a)(1)), the Securities Exchange Act of 1934 (codified at 15 U.S.C. §§ 78c(a)(10)), and the Trust Indenture Act of 1939 (codified at 15 U.S.C. §§ 77ccc(1)), and the SEC rules promulgated under these statutes. *See* David Armstrong & Robert Warfield, *Bond Markets and Debt Placement*, PROJECT FIN. L. REV. 16, 21 (2019).

[254] *See* Patrick Lam, *Financing for New Data Center Construction: An In-Depth Guide*, DATA CTR. KNOWLEDGE (Aug. 22, 2024), https://www.datacenterknowledge.com/investing/financing-for-new-data-center-construction-an-in-depth-guide [https://perma.cc/EW6D-V7NJ].

[255] *See* Jim Cotins, Matt Lyons & Asena May, *Data Center Financings: What's Next?*, CLIFFORD CHANCE (Feb. 2023), https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2023/02/Data%20Center%20financings-What%27s%20next.pdf [https://perma.cc/H7SU-U3XB].

[256] *See* Allan Marks, *Chambers Global Practice Guide: Project Finance*, MILBANK 1, 8 (2019) ("The laws of the State of New York are often selected to govern financing agreements for larger projects or for projects funded by multinational banks or institutional investors."), https://www.milbank.com/a/web/109308/Chambers-Project-Finance-2019-Guide.pdf [https://perma.cc/T452-ZA7J].

governs the transaction to the extent the SPE's data center equipment, financial assets, and real property are pledged as collateral to the banks.[257]

(iv) *Operation Stage*: Upon completion, a data center begins soliciting tenants and managing their data. Data centers are categorized by business models into four main types: (1) enterprise data centers, which support a single organization; (2) colocation data centers, offering storage space to multiple tenants; (3) hyperscale data centers, designed to support large-scale IT systems with specialized network requirements; and (4) edge/modular data centers, which are smaller plug-and-go facilities that provide instantaneous connectivity to enhance real-time data processing.[258] The applicable state laws vary depending on the business model. Data transfers within enterprise data centers are treated as internal corporate affairs and are governed by the state of incorporation (usually Delaware).[259] In contrast, data transfers involving colocation and hyperscale data centers are treated as external transactions, requiring compliance with state-level data privacy, localization, and cybersecurity regulations.[260] Regardless of the business model, all data centers must adhere to local real estate laws governing landlord-tenant relationships with their data tenants.

Currently, no federal or state law specifically governs data centers, leaving them to operate under real estate laws, which analogize data tenancies to traditional landlord-tenant relationships.[261] However, these laws fall short of addressing the complexities unique to data centers, raising thorny issues: How should data be "evicted" after a tenant breaches the tenancy agreement? What rights exist for holdover data tenants? To what extent can data centers or cloud service providers access tenant data for routine cybersecurity maintenance

---

[257] *See* Carolyn Zander Alford, Michael Urschel, Kathryn Weiss & Amber Zinn, *Best Practices for Security and Perfection of Digital Infrastructure Assets*, JDSUPRA (Mar. 24, 2021), https://www.jdsupra.com/legalnews/best-practices-for-security-and-4162159/ [https://perma.cc/62EX-7VPT].

[258] *See Understanding the Differences Between 5 Common Types of Data Centers*, DATA CTR. FRONTIER (May 18, 2022), https://www.datacenterfrontier.com/sponsored/article/11427373/belden-understanding-the-differences-between-5-common-types-of-data-centers [https://perma.cc/TZ7X-3GA8].

[259] *See generally* Jeff Howell, *Enterprise Data Center: The Complete Guide [2024]*, ENCORE ADVISORS (Oct. 23, 2024), https://encoradvisors.com/enterprise-data-center/ [https://perma.cc/FN44-HR7K].

[260] *See, e.g.*, *Colocation Compliance With Cybersecurity Standards*, DATABANK (Mar. 15, 2024), https://www.databank.com/resources/blogs/colocation-compliance-with-cybersecurity-standards/ [https://perma.cc/NWW6-UP8M]; *Colocation Compliance With Data Privacy Laws*, DATABANK (Mar. 6, 2024), https://www.databank.com/resources/blogs/colocation-compliance-with-data-privacy-laws/ [https://perma.cc/JW5E-4YNX].

[261] *See generally* Daniel Greene, *Landlords of the Internet: Big Data and Big Real Estate*, 52 SOCIAL STUD. SCI. 904 (2022); *see also* Nina Roket & Jessica Stanton, *Considerations for Landlords and Tenants in Leasing Data Center Space*, N.Y. REAL ESTATE. J. (Apr. 26, 2022), https://nyrej.com/considerations-landlords-tenants-leasing-data-center-space-by-nina-roket-jessica-stanton [https://perma.cc/YKA5-Y45G].

without violating tenants' rights to quiet enjoyment? To navigate these issues, parties engage in contract-based "legal engineering," crafting extensive, tailor-made contracts that define every risk scenario and allocate control rights.[262] These contracts align parties with market standards and industry norms, which are heavily influenced by powerful data tenants like Microsoft and Amazon. These dominant players shape market expectations for data tenancy relations, creating a *de facto* interstate consensus.

In essence, industry self-governance fosters horizontal collaboration across states. Recent scholarship has begun to explore "solidarity federalism," which refers to emerging state-to-state cooperation within the traditional federalism framework.[263] However, this focus is limited to state governments and overlooks market forces. Techno-federalism fills this lacuna by illustrating how industry self-governance creates state solidarity through market discipline. Through lobbying, regulatory arbitrage, and norm-building, the private sector pressures states to adopt business-friendly AI laws to remain competitive.

While it is too early to determine whether industry self-governance will resolve the "race to the bottom" problem seen in traditional federalism, one thing is certain: it leverages market discipline to shape an emerging nationwide consensus for AI governance. However, this consensus remains nascent and lacks the robust legal guardrails necessary for long-term stability, as it depends on industry leaders to voluntarily tie their own hands.

IV. TECHNO-FEDERALISM IN CHINA

This Part investigates the political-economic counterpart in China. Unlike the United States, where techno-federalism builds on the preexisting constitutional mechanisms of federalism, China's version is fluid and amorphous. Notably, China lacks a developed constitutional jurisprudence that separates central and local governmental power in the way the United States "splits its atom of sovereignty."[264] But divisions of power operate through informal bureaucratic and market dynamics—often referred to as "Federalism, Chinese Style."[265]

---

[262] *See* Emily Naughton, *Service Level Agreements: Understanding Practical Remedies in Data Center Leases*, DATA CTR. KNOWLEDGE (Sep. 18, 2017), https://www.datacenterknowledge.com/management/service-level-agreements-understanding-practical-remedies-in-data-center-leases [https://perma.cc/J5SC-VHRF].

[263] *See generally* Erin F. Delaney & Ruth Mason, *Solidarity Federalism*, 98 NOTRE DAME L. REV. 617 (2022).

[264] U.S. Term Limits, Inc. v. Thornton, 514 U.S. 779, 838 (1995) (Kennedy, J., concurring). Justice Kennedy's metaphor about "splitting the atom of sovereignty" is one of the most famous emblems of U.S. federalism.

[265] *See generally* Gabriella Montinola, Yingyi Qian & Barry R. Weingast, *Federalism, Chinese Style: The Political Basis for Economic Success in China*, 48 WORLD POLITICS 50 (1995).

To analyze China's version of techno-federalism in depth, this Part is divided into three sections. Section IV(A) discusses the corporatist tradition within China's tech policy and AI strategy, often described by commentators as centralized and authoritarian. Section IV(B) complicates this narrative by underscoring how recent AI developments, fueled by bottom-up market dynamics, are decentralizing the system and empowering the private sector. Section IV(C) examines how China's techno-federalism operates across three domains: software, hardware, and infrastructure.

A.   *China's Corporatist Tech Governance*

Despite a long history of state intervention, China is a relative newcomer to coordinated technological development. Since the founding on the People's Republic in 1949, Chinese tech policy has evolved through five distinct phases.[266] The first phase (1949-1959) centered on heavy industrialization, driven by central planning and Soviet expertise. The second phase (1959-1976), spanning from the Great Leap Forward to the end of the Cultural Revolution, was marked by stagnation and ideological control over science. The third phase (1978-2001) saw rapid westernization via technology transfers and imitation, beginning with Deng Xiaoping's market reforms and continuing through Jiang Zemin's administration. In the fourth phase (2001-2013), the focus shifted to high-tech R&D under Hu Jintao's leadership. The fifth and current phase (2013-present), beginning with Xi Jinping's ascendancy to power, saw the return of central planning aimed at achieving technological self-sufficiency and global leadership. Today, technology occupies the center of China's political discourse. Policymakers often invoke it as an emblem of regime resilience against "western encroachment" and a marker of national strength— a symbol of recovery from "the century of humiliation" etched in collective memory.[267]

Under Xi's central planning, China is often perceived as adopting a "corporatist" approach to tech governance—evoking notions of centralized authoritarianism in the Anglo-American imagination.[268] Corporatism, broadly

---

[266] *See generally* Joel R. Campbell, *Becoming a Techno-Industrial Power: Chinese Science and Technology Policy*, BROOKINGS INST. (Apr. 29, 2013), https://www.brookings.edu/articles/becoming-a-techno-industrial-power-chinese-science-and-technology-policy/ [https://perma.cc/MF25-SPVA] (describing the first four phases of Chinese tech policy beginning from the PRC's founding in 1949 to Xi Jinping's rise in 2013). For further information on Chinese tech policy since 2013, see Douglas B. Fuller & Richard L. Kotz, *Technology Policy Under Xi Jinping, 2012-2022*, *in* CHINESE POLITICS: THE XI JINPING DIFFERENCE (Daniel Lynch & Stanley Rosen eds., 2024).

[267] The "century of humiliation" narrative shapes China's perception of national security based on a worldview of zero-sum competition and realpolitik. *See generally* Yi Wang, *'The Backward Will Be Beaten': Historical Lesson, Security, and Nationalism in China*, 29 J. OF CONTEMP. CHINA 887 (2020).

[268] *See, e.g.*, Reza Hasmath, *The Century of Chinese Corporatism*, 4 AMERICAN AFFS. 136 (2020); Jonathan Unger & Anita Chan, *China, Corporatism, and the East Asian Model*, 33 AUSTL. J. CHINESE AFFS. 29 (1995).

understood, is "a system of social and political organization in which major interest groups are integrated into the governmental system, often on a monopolistic basis or under state guidance, tutelage, and control, to achieve coordinated national development."[269] In articulating this concept, Philippe C. Schmitter, the leading political theorist on corporatism, defines it as follows:

> Corporatism … [is] a system of interest representation in which the constituent units are organized into a limited number of singular, compulsory, noncompetitive, hierarchically ordered and functionally differentiated categories, recognized or licensed (if not created) by the state and granted a deliberated representational monopoly within their respective categories in exchange for observing certain controls on their selection of leaders and articulation of demands and supports.[270]

Schmitter further divides corporatism into state corporatism and societal corporatism, based on the autonomy social organizations have from state control.[271] In state corporatism, social organizations are reliant on state sponsorship, while in societal corporatism, social organizations remain autonomous. Based on Schmitter's definition, this Article identifies nine key factors that differentiate these two forms of corporatism, summarized in Figure 2 below:[272]

Figure 2. *State Corporatism Versus Societal Corporatism*

Factors	Description
Limited Number	Is integration driven by government-imposed restrictions or inter-organizational arrangements?
Singularization	Is integration the result of government-imposed elimination of noncompliance or recalcitrant social organizations, or market-driven competitive dynamics?
Compulsory Membership	Is organizational membership enforced through government decrees, or maintained by socioeconomic pressure?
Non-Competitiveness	Is integration enforced by state repression of internal oligarchic pressure, or achieved through voluntary agreements among social organizations?
Hierarchical Order	Is integration caused by government-mandated centralization, or organic organizational growth and consolidation?

---

[269] *See* HOWARD WIARDA, CORPORATISM AND COMPARATIVE POLITICS: THE OTHER GREAT "ISM" ix (1997).

[270] Philippe C. Schmitter, *Still the Century of Corporatism?* 36 REV. POL. 85 (1974).

[271] *See id.*

[272] *See* Kazuko Kojima, Jae-Young Choe, Takafumi Ohtomo & Yutaka Tsujinaka, *The Corporatist System and Social Organizations in China*, 8 MGMT. & ORG. REV. 609, 610 (2012).

Functional Differentiation	Does the government establish occupational or vocational categories, or do organizations voluntarily agree on their respective roles in maintaining professional or industry standards in the economy?
State Recognition	Is state recognition a top-down condition for economic survival, or does it arise from bottom-up autonomous organization?
Representation Monopoly	Is monopoly status of social organizations granted by the government, or achieved through market competition?
Leadership Selection	Is leadership succession in social organizations imposed by the government through force, or decided by mutual consensus to ensure stable alliances?

Scholars have long characterized China's tech governance system as quintessentially state corporatist.[273] They focus on the CCP's unparalleled ability to integrate the social fabric with the administrative state. Under the CCP's supervision, social organizations such as scientific communities, professional associations, nonprofits, and private firms—especially those of geopolitical importance such as "national champion" companies—are compelled to make decisions that align with national policy objectives.[274] The CCP has party cells in each of these organizations that it deems strategically important. This feature is particularly salient in the tech industry, where the state and market actors often perform their divisions of labor under a single industrial plan. The proliferation of developmental initiatives,[275] military-civil fusion programs,[276] and public-private partnerships[277] illustrate this state-corporatist approach. It aims to align the country's bureaucracy, military, universities, research institutions, state-owned enterprises, and the private

---

[273] *See, e.g.*, Hasmath, *supra* note 268, at 136.; Li Chen, *China's Central State Corporatism: The Party and the Governance of Centrally Controlled Businesses*, *in* THE CHINESE COMMUNIST PARTY IN ACTION (Lance L. P. Gore & Zheng Yongnian eds., 2019).

[274] *See, e.g.*, Thomas A. Hemphill & George O. White III, *China's National Champions: The Evolution of a National Industrial Policy—Or a New Era of Economic Protectionism*, 55 THUNDERBIRD INT'L BUS. REV. 193 (2013); *Governing China's "National Champions": Political Control and Corporate Governance in China's Central State-Owned Enterprise Sector*, INT'L PUBLIC POL'Y ASS'N (last visited Oct. 14, 2024), https://www.ippapublicpolicy.org/file/paper/594a34c58c61c.pdf [https://perma.cc/92PX-N5FP].

[275] *See* Lorand Laskai, *Beijing's AI Strategy: Old-School Central Planning with a Futuristic Twist*, COUNCIL ON FOREIGN RELS. (2017), https://www.cfr.org/blog/beijings-ai-strategy-old-school-central-planning-futuristic-twist [https://perma.cc/GW8N-V4GD].

[276] *See* Elsa B. Kania & Lorand Laskai, *Myths and Realities of China's Military-Civil Fusion Strategy*, CTR. FOR NEW AM. SEC. (2021), https://www.cnas.org/publications/reports/myths-and-realities-of-chinas-military-civil-fusion-strategy [https://perma.cc/YC7H-H4QU]. *See also* U.S. DEP'T OF STATE (DOS), THE CHINESE COMMUNIST PARTY'S MILITARY-CIVIL FUSION POLICY (2021), https://2017-2021.state.gov/military-civil-fusion/ [https://perma.cc/BE63-MJD8].

[277] *See* Ngor Luong & Zachary Arnold, *China's Artificial Intelligence Industry Alliance: Understanding China's AI Strategy Through Industry Alliances*, CTR. FOR SEC. & EMERGING TECH. (May 2021), https://cset.georgetown.edu/publication/chinas-artificial-intelligence-industry-alliance/ [https://perma.cc/7WCG-Q2TB].

sector towards an overarching goal: surpassing the United States in technological leadership.[278]

The following subsections examine three areas of party-building that scholars often identify as illustrating China's state-corporatist system: (i) central planning, (ii) the administrative state, and (iii) CCP control over corporate governance in the tech sector.

(i) *Central Planning*: Existing scholarship frequently cites China's reliance on central planning in AI governance as indicative of its state corporatist model.[279] Historically, Five Year Plans have been integral to the CCP's governance strategy, with the CCP Central Committee using them to announce key policy shifts and lay out broad political-economic objectives for the country.[280] In the era of AI, Five Year Plans continue to shape technology policy. Following the 2016 National 13th Five Year Plan, China's State Council unveiled the New Generational AI Development Plan (NGAIDP) in 2017, setting ambitious targets to scale up China's AI industry in three five-year stages: 2020, 2025, and 2030.[281] To implement the NGAIDP, the Ministry of Science and Technology (MST) established 12 experimental districts in major cities across China.[282]

(ii) *Administrative State*: Beyond central planning, China's state corporatist ethos is also evident in the CCP's efforts to embed its presence in all aspects of the administrative state through top-down state control.[283] AI is

---

[278] *See* Angela Huyue Zhang, *China's Short-Sighted AI Regulation*, PROJECT SYNDICATE (Dec. 8, 2023), https://www.project-syndicate.org/commentary/risks-of-beijing-internet-court-ruling-allowing-copyright-of-ai-generated-content-by-angela-huyue-zhang-2023-12 [https://perma.cc/8BZP-9632]. *See also* Jing Cheng, *Contextualizing China's AI Governance*, GLOB. POL'Y J. (Jun. 1, 2023), https://www.globalpolicyjournal.com/blog/01/06/2023/contextualizing-chinas-ai-governance [https://perma.cc/RLE6-C7FV].

[279] *See* Lorand Laskai, *Beijing's AI Strategy: Old-School Central Planning with a Futuristic Twist*, COUNCIL ON FOREIGN RELS. (2017), https://www.cfr.org/blog/beijings-ai-strategy-old-school-central-planning-futuristic-twist [https://perma.cc/N7EN-QQFM].

[280] *See What is China's Five-Year Plan?* THE ECONOMIST (Mar. 4, 2021), https://www.economist.com/the-economist-explains/2021/03/04/what-is-chinas-five-year-plan [https://perma.cc/WTR9-45ZZ].

[281] *See generally* The European Parliament, *China's Ambitions in Artificial Intelligence* (2021), https://www.europarl.europa.eu/RegData/etudes/ATAG/2021/696206/EPRS_ATA(2021)696206_EN.pdf [https://perma.cc/ZPT6-59GQ].

[282] *See* PRC Ministry of Science and Technology, *China Creates National New Generation Artificial Intelligence Innovation and Development Pilot Zones*, CTR FOR SEC. & EMERGING TECH. (March 11, 2020) (translated by Ben Murphy), https://cset.georgetown.edu/publication/china-creates-national-new-generation-artificial-intelligence-innovation-and-development-pilot-zones/ [https://perma.cc/N3ZV-GK63].

[283] Because Chinese courts lack judicial independence, they are often susceptible to political influence and regarded as part of the administrative state. *See generally* Minhao Benjamin Chen & Zhiyu Li, *Courts Without Separation of Powers: The Case of Judicial Suggestions in China*, 64 HARV. INT'L L.J. 203 (2023). According to the Law on Organization of People's

the lynchpin of this strategy, embedding the CCP's influence into the citizens' interaction with government institutions. In December 2022, the Supreme People's Court of China issued a directive instructing lower courts to incorporate AI into various judicial functions, with the goal of full integration by 2030.[284] This directive called for the use of AI in mediation, procedural filings, and assessing lower court judges' adherence to the Supreme People's Court's ethics codes and guiding cases.[285]

Similarly, the State Council has mandated the automation of China's bureaucracy, instructing regulatory agencies to use AI to collect and analyze public comments on proposed rulemaking. The State Council has ordered agencies to use of AI systems to report bureaucrat misconduct and manage compliance.[286] The Cyberspace Administration of China (CAC) has employed AI-driven facial recognition technologies for law enforcement and digital surveillance, further entrenching state control over social and political life.[287] While individual data privacy rights remain relevant in China's state corporatist system, these rights matter insofar as they serve to reinforce the CCP's political legitimacy and uphold the symbiotic relationship between the state and the market.[288]

(iii) *Corporate Governance*: Another manifestation of state corporatism is the CCP's influence over corporate decision-making in the private sector. Since the enactment of the PRC Company Law in 1993, all companies operating in China—including those domiciled, incorporated, or doing

---

Courts, Chinese courts are formally regarded as the trial organs of the state. *See China's Judiciary*, CHINA ORG. (last visited Nov. 11, 2024), http://www.china.org.cn/english/Judiciary/31280.htm [https://perma.cc/EWH9-UM2A].

[284] *See generally* 最高人民法院 [SUPREME PEOPLE'S COURT OF CHINA], 最高人民法院关于规范和加强人工智能司法应用的意见 [THE SUPREME PEOPLE'S COURT'S OPINIONS ON REGULATING AND STRENGTHENING THE APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN THE JUDICIAL FIELDS] (2022), https://ipc.court.gov.cn/zh-cn/news/view-2131.html [https://perma.cc/6GRS-X8UH].

[285] *See, e.g.*, Cao Yin, *Chinese Courts Must Implement AI System by 2025*, CHINA DAILY (Dec. 9, 2022), https://www.chinadaily.com.cn/a/202212/09/WS6392fa3ba31057c47eba3a3f.html [https://perma.cc/7XBS-CKLQ]; Stephen Chen, *China's Court AI Reaches Every Corner of Justice System, Advising Judges and Streamlining Punishment*, S. CHINA MORNING POST (Jul. 13, 2022), https://www.scmp.com/news/china/science/article/3185140/chinas-court-ai-reaches-every-corner-justice-system-advising [https://perma.cc/SZ26-35XQ].

[286] *See* 国务院 [STATE COUNCIL], 国务院关于加强数字政府建设的指导意见 [GUIDING OPINIONS OF THE STATE COUNCIL ON STRENGTHENING THE BUILDING OF A DIGITAL GOVERNMENT] (2022), https://www.gov.cn/zhengce/content/2022-06/23/content_5697299.htm [https://perma.cc/6CCN-7L3V].

[287] *See* Ilaria Mazzocco, *The AI-Surveillance Symbiosis in China*, BIG DATA CHINA (Jul. 27, 2022), https://bigdatachina.csis.org/the-ai-surveillance-symbiosis-in-china/ [https://perma.cc/7HUN-SPD4].

[288] *See* Mark Jia, *Authoritarian Privacy*, 91 UNIV. CHI. L. REV. 733, 733 (2024) ("Central to China's privacy turn is the party-state's use of privacy law to shore up its legitimacy amid rampant digital abuse.").

business there—have been required to allow the CCP to establish party cells if ordered by the government.[289] Article 19 of the PRC Company Law outlines the political obligations of corporations, stating:[290]

> In companies, Communist Party organizations shall, in accordance with the provisions of the Constitution of the Communist Party of China, be set up to carry out activities of the Party. Companies shall provide the necessary conditions for the Party organizations to carry out their activities.

In private companies, these CCP party cells supervise the decisions of the board of directors, ensuring that all corporate activities align with the principles of the CCP. To establish a party cell, a company must have at least three party members as employees.[291]

For the first decade of the 21st century, the private sector remained a frontier for party-building. However, since Xi's ascendancy to power, the private sector has become a center for expanding the party's influence. In 2012, the CCP's Organization Department called for "comprehensive coverage" of the private sector.[292] By 2018, over 48% of all registered companies in China had established a party cell, with the manufacturing, internet, and technology sectors being particularly targeted. By 2023, this figure has risen dramatically, with more than 92% of large companies in China establishing party cells.[293] Every major Chinese tech firm—including Huawei, Tencent, Alibaba, Xiaomi, Jingdong, Baidu, ZTE—now has substantial CCP representation, with various CCP organs directly overseeing the corporate decision-making of the board and its shareholders.[294]

B.   How AI Is Decentralizing China's Corporatist System

---

[289] *See* Jerome Doyon, *CCP Branches Out Into Private Businesses*, EAST ASIA FORUM (Aug. 11, 2023), https://eastasiaforum.org/2023/08/11/ccp-branches-out-into-private-businesses/ [https://perma.cc/2HPR-5S8W].

[290] *See* STANDING COMM. NAT'L PEOPLE'S CONG., 中华人民共和国公司法 [Company Law of the People's Republic of China] (2024), https://www.gov.cn/yaowen/liebiao/202312/content_6923395.htm [https://perma.cc/BP3Z-7YXA].

[291] Under chapter V, article 29, any organization with three or more CCP members must establish a party cell. *See* 中国共产党章程 [CONSTITUTION OF THE COMMUNIST PARTY OF CHINA], 19th Nat'l People's Cong. (2017). http://www.xinhuanet.com//english/download/Constitution_of_the_Communist_Party_of_China.pdf [https://perma.cc/X9DR-MA6G].

[292] *See* Doyon, *supra* note 289.

[293] *See id.*

[294] *See* Danielle Cave, Samantha Hoffman, Alex Joske, Fergus Ryan & Elise Thomas, *Mapping China's Tech Giants*, AUSTL STRATEGIC POL'Y INST. (Apr. 18, 2019), https://www.aspi.org.au/report/mapping-chinas-tech-giants [https://perma.cc/9MVK-M25W] ("China's internet and technology companies have been reported to have the highest proportion of internal CCP party committees within the business sector.").

However, much of this centralization is aspirational and rhetorical.[295] What is often omitted is the bottom-up trend of market-led decentralization in China. Despite China's entrenched state corporatist political tradition, recent AI developments are nudging China towards a form of societal corporatism. Notably, AI implementations in the legal system and the platform economy are driving this change by increasing the influence of the tech industry. While these advancements do not thwart the CCP's central plans or promote greater political inclusivity, they have created opportunities for regulatory arbitrage by tech firms, which are now able to exploit regulatory gaps.

Since 2023, advancements in natural language processing (NLP)[296] have further accelerated these changes, reshaping the power balance between state and private actors in China. The rise of advanced large language models (LLMs)[297]—generative AI models that utilize deep learning architecture such as artificial neural networks for textual analysis—have driven the creation of China's own generative pre-trained transformers (GPTs). [298] As the government continues to promulgate new industrial policies and central plans aimed at automating the administrative state, tech firms find new avenues to integrate proprietary AI technologies within state functions. Industry self-governance is subtly transforming China's state corporatist AI governance system, enabling tech companies to exert greater influence in traditional state domains—even as the state maintains overall control.

1. Private Sector Involvement in the Automation of Chinese Courts

One area where this shift is most salient is in the legal system. Through public-private partnerships, tech firms are gaining increasing influence by introducing AI systems to the local judiciary. In July 2024, the Shenzhen Intermediate People's Court launched the "AI-assisted adjudication system"—the first fully automated smart trial program in China.[299] Powered by an LLM model developed by a Shenzhen company, DiBo Enterprise Risk Management

---

[295] *See* Karman Lucero, *Artificial Intelligence Regulation and China's Future*, 33 COLUM. J. ASIAN L. 94 (2019).

[296] *See generally* Cole Stryker & Jim Holdsworth, *What is NLP (Natural Language Processing)?*, IBM (Aug. 11, 2024), https://www.ibm.com/topics/natural-language-processing [https://perma.cc/78AP-4ZM5].

[297] *See generally What Are Large Language Models (LLMs)?*, IBM (last visited Dec. 7, 2024), https://www.ibm.com/topics/large-language-models [https://perma.cc/D73H-RWB6].

[298] *See generally* Ivan Belcic & Cole Stryker, *What is GPT (Generative Pretrained Transformer)?* IBM (Sep. 18, 2024), https://www.ibm.com/think/topics/gpt [https://perma.cc/G4WN-F8VL].

[299] *See* 广东省深圳市中级人民法院 [INTERMEDIATE PEOPLE'S COURT OF SHENZHEN, GUANGDONG PROVINCE], 深圳中院今日上线人工智能辅助审判系统 [THE SHENZHEN INTERMEDIATE PEOPLE'S COURT LAUNCHES THE AI-ASSISTED ADJUDICATION SYSTEM TODAY] (2024), https://enipc.court.gov.cn/zh-cn/news/view-3143.html [https://perma.cc/MUF8-B3T4].

Technology Co. Ltd., the program extracts data from past cases, constructs litigant profiles, and recommends judicial orders to the presiding judge using AI-generated boilerplate language.[300] Primarily used in contractual disputes and complex commercial trials, the program harnesses deep learning algorithms that learn from large volumes of multimodal pre-training data sourced from public as well as proprietary databases, including e-commerce digital platforms, the social credit system, and corporate registries.[301] This program is one of the many local judicial AI experiments in which the private sector is a driving force behind technological development and implementation.

To be sure, China's local courts have employed AI tools to assist judicial decision-making long before the advent of Shenzhen's smart trial program. But what distinguishes the recent trend is the level of private sector involvement in automating court processes. As early as 2019, the Hangzhou Basic People's Court has been using an AI program called XiaoZhi 3.0, also known as "Little Wisdom," to adjudicate simple civil disputes in small claims cases.[302] XiaoZhi 3.0 performs mostly mechanical tasks such as scheduling hearings, announcing court procedures, entering default judgments, verifying litigant information, and calculating court fees or civil damages.[303]

Unlike Shenzhen's "AI-assisted adjudication system," however, XiaoZhi 3.0 was not developed by private companies. Instead, it was developed by the Zhejiang Provincial Government in collaboration with researchers at Zhejiang University.[304] As a regression-based AI system that predates the GPT era, XiaoZhi 3.0 does not utilize deep learning. XiaoZhi 3.0 has limited capabilities in textual analysis and does not require large volumes of multimodal pre-training data to complete its tasks. This meant its development did not necessitate extensive technological expertise from the private sector. Nor did local government authorities need to grant collaborators access to government databases. XiaoZhi 3.0 starkly contrasts with the latest generation of "smart

---

[300] *See* 引领司法创新！迪博助力深圳法院上线 AI 辅助审判系统 [*Leading Judicial Innovation! DiBo Assists Shenzhen Court with Launching the AI-Assisted Adjudication System*], SINA (Jul. 5, 2024), https://finance.sina.cn/2024-07-12/detail-inccvttz7986361.d.html?cre=tianyi&mod=wlocal&loc=10&r=0&rfunc=67&tj=cxvertical_wlocal&tr=1047&pos=362 [https://perma.cc/Z4TT-Q7RH].

[301] *See* 陶韵西 [Tao Yunxi], 全国首个司法审判垂直领域大模型在深圳正式启用 [The Nation's First Large Language Model in the Vertical Fields of Judicial Trials Was Officially Launched in Shenzhen], 凤凰网 [IFENG NEWS] (Jul. 1, 2024), https://sz.ifeng.com/c/8arMvTLvksI [https://perma.cc/YU6B-AK75].

[302] *See* Alena Zhabina, *How China's AI is Automating the Legal System*, DW (Jan. 20, 2023), https://www.dw.com/en/how-chinas-ai-is-automating-the-legal-system/a-64465988 [https://perma.cc/779X-HLY3].

[303] *See* 江耘 [Jiang Yun], AI 助理上岗辅助法官 30 分钟完成十案联审，已服务 2300 多当事人 [AI Assistant Helps Judge Decide 10 Cases in 30 Minutes, Already Providing Service to 2300 Litigants], 中国日报 [CHINA DAILY] (Oct. 8, 2021), https://chuangxin.chinadaily.com.cn/a/202110/08/WS615fa340a3107be4979f140b.html [https://perma.cc/3R48-WEEJ].

[304] *See id.*

court" AI programs. Deep learning AI smart trial programs like the one in Shenzhen require significant private sector technological expertise and access to vast amounts of data.

Scholars have long underscored how these "smart court" programs bolster the CCP's political oversight by limiting judicial discretion. [305] However, what is often omitted is how the automation of courts through AI also empowers private sector actors. Private companies that develop the AI software and manage data collection for local courts gain control over the algorithms that dictate case outcomes and enjoy preferential access to government databases. Moreover, the judiciary increasingly relies on these companies for cybersecurity and system updates, granting them leverage over the local judiciary. This growing reliance on private sector developers marks a shift in the power dynamics within China's state corporatist system, as they have become indispensable to the functioning of "smart courts."

2. Digital Platforms as Emerging Local Co-Regulators

China's drive to enhance judicial efficiency through "smart court" programs has also expanded the autonomy of digital platforms.[306] Since the majority of cases managed by "smart courts" involve small claims and e-commerce disputes, courts rely on commercial rules established by e-commerce platforms to inform their judgments. Today, more than 3,000 courts and 10,000 tribunals have implemented some form of "smart court" system.[307] The AI systems in these courts are trained on data supplied by digital platforms.[308] They are also programmed to make recommendations that align with platform-specific policies. Through those programs, local courts are not only endorsing the platforms' self-regulatory practices but also delegating to platforms critical judicial functions.

This makes China's digital platforms the *de facto* co-regulators alongside the local government and courts. Consider Alibaba's TaoBao, China's largest e-commerce platform. Behaving much like an independent agency, TaoBao

---

[305] *See, e.g.,* Rachel E. Stern, Benjamin L. Liebman, Margaret Roberts & Alice Z. Wang, *Automating Fairness? Artificial Intelligence in the Chinese Court*, 59 COLUM. J. TRANSNAT'L L. 515, 529 (2021); Straton Papagianneas, *Automating Intervention in Chinese Justice: Smart Courts and Supervision Reform*, 10 ASIAN J. L. & SOC'Y 463, 464 (2023).

[306] *See* ZHANG, HIGH WIRE, *supra* note 76, at 206.

[307] *See id.*

[308] *See* 全国首个！深圳法院"龙藤"人工智能辅助执行系统正式上线 [Nation's First! Shenzhen Court Launches the "Longteng" AI-Assisted Enforcement System], 法宣在线 [FAXUAN NEWS] (Jun. 9, 2025), http://www.ifaxuan.com/news/t/3599.html [https://perma.cc/4DYF-V8Y6] (describing how Shenzhen's AI-assisted court enforcement system integrates data from 21 different digital platforms, including private consumer finance databases, public law-enforcement databases, and the "Hawk-Eye" mass-surveillance database).

has developed a sophisticated legal system to handle day-to-day disputes.[309] TaoBao wields investigative and enforcement powers and even has its own constitution.[310] TaoBao's constitution prescribes the basic obligations of users and merchants and sets procedural rules for dispute resolution. TaoBao also frequently promulgates and amends its platform rules, guidelines, standards, and policies across a range of regulatory domains.[311] TaoBao's regulatory power extends well beyond typical e-commerce contracts, encompassing areas such as data collection, storage management, products liability, content promotion, and algorithmic advertisement. Those platform rules are legally binding because all users and merchants must contractually agree to comply with them to access Taobao's services,[312] and Chinese courts have recognized such rules as enforceable under the PRC E-Commerce Law.[313]

An empirical study by Angela Zhang reveals the extent of judicial deference towards platforms. From 2019 to 2021, approximately 94% of e-commerce cases in China were handled by the Hangzhou Internet Court, a special "smart court" for internet disputes located in Alibaba's headquarters city.[314] Only 1% of those cases resulted in the court holding TaoBao liable for actions affecting users or merchants on the platform.[315] And, in over 98% of the e-commerce cases, the court upheld the enforcement actions and rules set by the e-commerce platforms themselves.[316] This pattern not only suggests

---

[309] *See* ZHANG, HIGH WIRE, *supra* note 76, at 206.

[310] *See* 淘宝平台规则 [TaoBao Platform Rules] (last visited Sept. 14, 2025), https://zhongyiyuan.alitrip.com [https://perma.cc/28FZ-HTDM].

[311] In response to widespread complaints against consumer fraudulent sales committed by inventory-less online stores, Taobao amended three platform rules in March 2025: the Taobao Store Opening Rules (淘宝网开店规范), the Taobao Market Management and Violation Punishment Rules (淘宝网市场管理与违规处理规则), and the Taobao Implementation Rules on Stores Without Inventory (淘宝网关于无货源店铺实施细则). *See* 陈言 [Chen Yan], 淘宝省级平台规则，治理羊毛党和恶意店群，为好商家创造好环境 [Taobao Updates Platform Rules to Curb Coupon Exploiters and Malicious Store Networks, Creating a Better Environment for Reputable Merchants], 上观 [SHANGHAI OBSERVER] (Mar. 11, 2025), https://www.jfdaily.com/staticsg/res/html/web/newsDetail.html?id=873879 [https://perma.cc/SJ7A-BLWA].

[312] *See* 淘宝平台服务协议 [Taobao Platform Service Agreement] (last visited Sept. 14, 2025), https://terms.alicdn.com/legal-agreement/terms/TD/TD201609301342_19559.html?spm=a2145.7268393.0.0.f9aa5d7cSDR9SE [https://perma.cc/Y4J7-59LG].

[313] *See* 中华人民共和国电子商务法 [E-COMMERCE LAW OF THE PEOPLE'S REPUBLIC OF CHINA] (promulgated by the Standing Comm. Nat'l People's Cong., Aug. 31, 2018) https://www.mofcom.gov.cn/zhrmghgdzswf/index.html [https://perma.cc/6HCQ-GZX2]; *see also* 谢平 [Xie Ping] & 丁禹之 [Ding Yuzhi], 论电商平台的价格调控权及控权机制：以淘宝对口罩市场调控为起点 [On E-Commerce Platforms' Power to Regulate Prices and the Mechanisms of Control: Starting with Taobao's Regulation of the Face Mask Market], East & Concord Partners (last visited Sept. 14, 2025), http://www.east-concord.com/zygd/Article/20222/ArticleContent_2709.html [https://perma.cc/A8J9-H5SX].

[314] *See* ZHANG, HIGH WIRE, *supra* note 76, at 207.

[315] *See id*.

[316] *See id*.

significant home jurisdiction bias but also underscores the judiciary's growing deference towards platforms as co-regulators. In essence, the courts increasingly recognize platforms like TaoBao as semi-autonomous regulatory entities, effectively granting them considerable latitude to shape and enforce their own laws within the digital economy.

This model of co-regulation became particularly salient during COVID, when local governments partnered with Alibaba and Tencent to design a health code and contact-tracing system to contain the outbreak in each region.[317] Embedded within their popular mobile apps, Alipay and WeChat, the health code system assigned each citizen a color-coded status that determined their access to public spaces and public transportation.[318] The code also automatically alerted local health officials if a user violated quarantine measures and assigned users into risk categories.[319] Without these apps, citizens faced severe restrictions on mobility and were effectively denied full participation in social life.[320] Through health codes, the platforms assisted local health officials in predictive policing.[321]

Although health codes have lost their relevance in the post-COVID era, the digital infrastructure behind these codes—the databases, networks, and AI models developed by major platforms—has laid the groundwork for new collaborative mass surveillance projects between the platforms and their local government sponsors. With more than 1.1 billion users, today WeChat has evolved into a "mega-platform" that integrates a wide array of functions that span social media, banking, investment, delivery, business meetings, public transportation, medical appointments, and government services.[322] WeChat is equivalent to Instagram, Uber/Lyft, Google, Experian, Amazon, Zoom, Meta, and Robinhood combined.[323] Working closely with various local governments,

---

[317] *See* June Ko, *The Chinese Government Used Technology to Get a Grip on Coronavirus— and Take Control of Its People*, THE INDEP. (Apr. 14, 2020), https://www.independent.co.uk/voices/coronavirus-china-technology-mass-surveillance-privacy-human-rights-a9463586.html [https://perma.cc/749N-7STM].

[318] *See* Fan Liang, *COVID-19 and Health Code: How Digital Platforms Tackle the Pandemic in China*, SOCIAL MEDIA + SOC'Y (2020), https://journals.sagepub.com/doi/full/10.1177/2056305120947657 [https://perma.cc/56PR-K4VT].

[319] *See id.*

[320] *See id.*

[321] *See* Xiaohan Zhang, *Decoding China's COVID-19 Health Code Apps: The Legal Challenges*, 10 HEALTHCARE 1479, 1484 (2022).

[322] *See* Peter W. Liu & Justin M. Liu, *The Dark Side of WeChat*, MONMOUTH: THE MAG. OF MONMOUTH UNIV. (2020), https://www.monmouth.edu/magazine/the-dark-side-of-wechat/ [https://perma.cc/89GD-NVFP].

[323] *See* Zeyi Yang, *The Dark Side of a Super App Like WeChat*, MIT TECH. REV. (Oct. 18, 2022), https://www.technologyreview.com/2022/10/18/1061899/dark-side-super-app-wechat/ [https://perma.cc/RVG2-HBXL]; *see also* Benjamin Talin, *WeChat Explained— Understanding the Chinese Super App*, MORETHANDIGITAL (Mar. 28, 2024), https://morethandigital.info/en/wechat-explained-understanding-the-chinese-super-app/ [https://perma.cc/NX4A-JL6E].

WeChat has a real-time AI censorship system that automatically detects and removes text and images flagged for content restrictions.[324] The platform's extensive data collection, which includes vast volumes of user biographical information, also buttresses local law enforcement's efforts to build surveillance facial recognition systems and feeds personal user information into the social credit database shared with financial authorities.[325] For many, leaving WeChat would mean a disconnect from social and daily life from China, making the app indispensable.[326]

Existing scholarship views these changes as signs of growing state-business fusion in China's AI "Big Brother" regime. [327] However, this perspective overlooks how private sector AI developers and digital platforms—the "Big Brother's Little Helpers" [328] —are also strategically betting *against* central government authority for economic gain while carrying out public regulatory functions. Much like U.S. tech firms lobbying at the state level, Chinese tech firms leverage their influence over local governments to exploit regulatory gaps. The next section delves into how Chinese tech firms, through regulatory arbitrage, reshapes center-local dynamics against the backdrop of the U.S.-China decoupling.

C.   *Techno-Federalism, Chinese Style*

Recent AI developments are not only reshaping state-business relations but also intensifying center-local divisions within the Chinese bureaucracy. In China, inter-governmental dynamics between central and local authorities are often policed through informal power structures, rather than formal administrative law or constitutional doctrine. [329] Nevertheless, despite the

---

[324] *See, e.g.*, Arthur Herman, *WeChat: China's Other Trojan Horse,* FORBES (Feb. 3, 2023), https://www.forbes.com/sites/arthurherman/2023/02/03/wechat-chinas-other-trojan-horse/ [https://perma.cc/3AD5-9FXN]; *see generally* Jeffrey Knockel et al., *We Chat, They Watch: How International Users Unwittingly Build Up WeChat's Chinese Censorship Apparatus*, THE CITIZEN LAB (May 7, 2020), https://citizenlab.ca/2020/05/we-chat-they-watch/ [https://perma.cc/2VCN-ZRX7].

[325] *See generally* Wan Li, *Data Privacy and China's "Super App" WeChat*, 12 PENN. ST. J.L. & INT'L AFFS. 69, 100 (2024).

[326] *See* Beina Xu, *Media Censorship in China*, COUNCIL ON FOREIGN RELATIONS (Feb. 17, 2017), https://www.cfr.org/backgrounder/media-censorship-china [https://perma.cc/UH7V-85TK].

[327] *See, e.g.*, JEAN-PIERRE CABESTAN, POLITICAL AND SOC. CONTROL IN CHINA 159-81 (Ben Hillman & Chien-Wen Kou eds., 2024); Charles Parton, *China's Bigger Brother*, 74 THE WORLD TODAY 24, 27 (2018).

[328] *See* David Gray, *Is Google a State Agent?* 27 STAN. TECH. L. REV. 206 (2024).

[329] Although China has a formal administrative procedure law that technically permits judicial review, its courts lack independence from the CCP. Private citizens also lack the right to meaningfully challenge administrative decisions. *See* Su Lin Han, *Administrative Enforcement in China*, PAUL TSAI CHINA CTR., YALE L. SCH. (Dec. 2017), https://law.yale.edu/china-center/resources/administrative-enforcement-china [https://perma.cc/RJE4-Z35T]. Chinese courts are subject to external political pressures that constrain their ability to exercise independent judicial authority. Local governments frequently intervene in judicial proceedings to protect local industries or, in administrative

absence of delegation doctrines characteristic of the U.S. federal system of separation of powers, Chinese administrative authorities derive their legitimacy from the central government's delegation of power.[330]

Across all levels, from local county officials to top administrators, officials evaluate performance through a Target-based Responsibility System (TRS),[331] a system organized around upward accountability.[332] The TRS establishes standards for rewarding or punishing local bureaucrats by measuring how well local bureaucrats align with central policy objectives— thus making local bureaucrats particularly sensitive to policy shifts from the CCP Central Committee.[333] However, since the TRS only measures *whether* a bureaucrat achieves a given objective without regard to *how* the bureaucrat achieves it, local bureaucrats are often incentivized to exploit the upward accountability system. This allows local governments to engage in experimental policymaking to meet central targets while maintaining discretion in their methods of implementation.[334]

Gabriella Montinola describes this special type of institutionalized decentralization as "Federalism, Chinese Style"—drawing parallels to the U.S. system of divided power.[335] Echoing this view, many researchers have highlighted policy experimentation as a defining feature of China's governance model.[336] Sebastian Heilmann and Yasheng Huang, for instance, have

---

lawsuits, to shield themselves from liability. Such influence is possible because local governments control local judicial salaries, court finances, and judicial appointments. The CCP also exerts direct influence within courts. Party groups within the judiciary enforce Party discipline and oversee judicial appointments and promotions. *See* Cong.-Exec. Comm'n on China, *Judicial Independence in the PRC* (last visited Sept. 15, 2025), https://www.cecc.gov/judicial-independence-in-the-prc [https://perma.cc/5P4M-QZMX].

[330] *See* Angela Huyue Zhang, *The Promise and Perils of China's Regulation of Artificial Intelligence*, 63 COLUM. J. TRANSNAT'L L. 1, 14 (2025) [hereinafter Zhang, *The Promise and Perils of China's Regulation of Artificial Intelligence*].

[331] Established in the 1980s, the TRS—or "*mubiao zerenzhi*" ("目标责任制")—sets specific targets that align with central government priorities and assesses CCP cadres based on their ability to meet these goals. *See* Ning Leng & Cai Zuo, *Tournament Style Bargaining within Boundaries: Setting Targets in China's Cadre Evaluation System*, 133 J. OF CONTEMP. CHINA 116, 119 (2022).

[332] *See* Xueguang Zhou, *Organizational Response to Covid-19 Crisis: Reflections on the Chinese Bureaucracy and Its Resilience*, 16 MGMT. ORG. REV. 473, 479 (2020).

[333] *See* Zhang, *The Promise and Perils of China's Regulation of Artificial Intelligence*, *supra* note 330, at 14.

[334] *See* Gao Jie, *Political Rationality vs. Technical Rationality in China's Target-Based Performance Measurement System: The Case of Social Stability Maintenance*, 34 POL'Y & SOC'Y 37, 40 (2015).

[335] *See generally* Gebriella Montinola, Yingyi Qian & Barry R. Weingast, *Federalism, Chinese Style: The Political Basis for Economic Success in China*, 48 WORLD POL. 50 (1995).

[336] *See* Shaoda Wang & David Y. Yang, *Policy Experimentation in China: the Political Economy of Policy Learning*, NBER Working Paper No. 29402 NAT'L BUREAU ECON. RSCH. 1, 8–12 (2021).

attributed China's remarkable economic rise since the 1980s to the flexibility of local governments.[337] Notably, China's first statute on corporate governance, the PRC Company Law, emerged from experiments in Shanghai and Shenzhen aimed at reforming state-owned enterprises to attract foreign investment.[338] China's first data privacy statute, the PRC Personal Information Protection Law, followed a similar trajectory of local experiment preceding nationwide adoption.[339]

Despite unprecedented power centralization under Xi Jinping, local policy experimentation persists.[340] Owing to China's vast economic geography, the central government often struggles with direct oversight over local policy-making,[341] and principal-agent problems persist across various tiers of government.[342] Local authorities retain discretion in implementing national technology initiatives, particularly in AI investment.[343] This allows them to adapt national directives to local needs, pushing the boundaries of central plans.[344] In the algorithmic era, this dynamic continues to drive decentralized

---

[337] *See* Sebastian Heilmann, *Policy Experimentation in China's Economic Rise*, 43 STUD. COMP. INT'L DEV. 1, 26 (2008); *see also* Yasheng Huang, *How Did China Take Off?* 26 J. ECON. PERSP. 147, 148–49 (2012).

[338] *See* Preston M. Torbert, *China's Evolving Company Legislation: A Status Report*, 14 NW. J. INT'L L. & BUS. 1, 2–4 (1993).

[339] *See generally* Igor Calzada, *Citizens' Data Privacy in China: The State of the Art of the Personal Information Protection Law*, 5 SMART CITIES 1129, 1150 (2022).

[340] *See* Shaleen Khanal, Hongzhou Zhang & Araz Taeihagh, *Development of New Generation of Artificial Intelligence in China: When Beijing's Global Ambitions Meet Local Realities*, J. CONTEMP. CHINA 19, 20 (2024).

[341] For example, China's central government is responsible for maintaining fiscal stability and controlling inflation. Yet local governments have frequently overinvested and fueled inflation, often in direct or tacit defiance of central directives. At times, local governments have even undertaken foreign policy initiatives, despite that foreign affairs are typically understood to fall within the exclusive prerogative of the national government. *See* John A. Donaldson, *Introduction: Understanding Central-Local Relations in China*, *in* ASSESSING THE BALANCE OF POWER IN CENTRAL-LOCAL RELATIONS IN CHINA 3 (2017) (arguing that China's central government often "struggles to control" local governments with respect of fiscal stability, foreign policy, and developmental and industrial policymaking).

[342] *See generally* Qiang Wang & Alex Jingwei He, *Central-Local Relations, Accountability, and Defensive Administration: Unraveling the Puzzling Shrinkage of China's Urban Social Safety Net*, 54 J. SOC. POL'Y 1 (2025) (arguing that the "complex principal-agent structure" embedded within China's bureaucracy "and the resultant information asymmetry make it difficult for the national principal to monitor the behavior of subnational agents, resulting in prevalent mis-targeting of welfare benefits and petty corruption.").

[343] Over the past decade, local officials have exercised broad discretion in policy experimentation, such as by launching industrial and innovation zones, initiating pilot programs and demonstration projects, and allocating public investment to strategic technology sectors. However, this has often given rise to local protectionism. In response, the central government has begun to recalibrate its industrial strategy, tightening central administrative control over how national programs are implemented to curb local discretion. *See* Jeroen Groenewegen-Lau, *Whole-of-Nation Innovation: Does China's Socialist System Give it an Edge in Science and Technology?*, MERICS (Mar. 5, 2024), https://merics.org/en/report/whole-nation-innovation-does-chinas-socialist-system-give-it-edge-science-and-technology? [https://perma.cc/499P-56SE].

[344] *See id.*

innovation, even as the political climate has shifted towards greater central government coordination in technological development. [345] Since 2019, China's technology regulations have followed a laboratory approach—piloting policy experiments at local levels before scaling them nationally. [346] This process reflects the enduring significance of local policy experimentation, which remains a vital instrument in China's AI governance toolkit despite concerns over its decline under Xi's centralization campaigns since 2013. [347]

However, important differences distinguish "Federalism, Chinese style" from U.S. federalism. In the United States, federalism enables diverse policies tailored to local business needs. In contrast, China's policy experimentation subordinates business needs to local political priorities, such as maintaining regional social stability and regime legitimacy. [348] Unlike the U.S. system, which constrains federal overreach into state regulatory affairs, the Chinese system enables the CCP Central Committee to review, suspend, amend, or spread local experiments. [349] China's central authorities always had the power to regulate local governments—what it lacked was the capacity, not the authority, to do so effectively.

The following subsections illustrate how emerging disruptive AI technologies are redefining center-local relations in China by examining each dimension of AI governance: software, hardware, and infrastructure.

1.   Software Governance

China's AI software industry is notably diffuse. [350] Approximately 50 companies are currently developing different AI models and competing for investment. [351] This stands in sharp contrast to the United States, where only a handful of deep-pocketed Silicon Valley firms dominate the landscape. [352]

---

[345] *See id.*

[346] *See* Bo-qiang Lin & Yu-xin Yang, *Building Efficiency: How the National AI Innovation Pilot Zones Enhance Green Energy Utilization? Evidence from* China, 387 J. ENV'T MGMT. 1, 2 (2025).

[347] *See* Abbey S. Heffer & Gunter Schubert, *Policy Experimentation Under Pressure in Contemporary China*, 253 THE CHINA QUARTERLY 35, 36 (2023).

[348] *See* Sebastian Heilmann, *Policy Experimentation in China's Economic Rise*, 43 STUD. COMP. INT'L DEV. 1, 5 (2008) (contrasting China's top-down "experimentation under hierarchy" with pluralistic, locally-driven policy experimentation in democracies); *see also* Xufeng Zhu & Yan Wang, *Policy Experimentation as Communication with the Public: Social Policy, Shared Responsibility and Regime Support in China*, 258 THE CHINA QUARTERLY 400, 401 (2024) (arguing that China's policy experimentation bolsters regime support by signaling responsiveness and diffusing responsibility, thereby building social consensus).

[349] *See* Sebastian Heilmann, *From Local Experiments to National Policy: The Origins of China's Distinctive Policy Process*, 59 THE CHINA J. 1, 2 (2008).

[350] Paul Triolo & Kendra Schaefer, *China's Generative AI Ecosystem in 2024: Rising Investment and Expectations*, NAT'L BUREAU ASIAN RSCH. (Jun. 27, 2024).

[351] *See id.*

[352] *See id.*

While China's private sector as a whole has gained autonomy in AI development, individual firms often lack access to the level of investment and computational capacity required for large-scale AI development. Economic downturn has added further strain, pressuring software developers to commercialize their products and services prematurely, often before the technology is fully ripe for deployment. This dispersion has led some industry leaders, such as Baidu's CEO Robin Li, to question the proliferation of AI models.[353] Li has argued that China only needs two or three high-quality models on par with that of OpenAI to drive China's AI development.[354]

Industry diffusion poses significant challenges for software governance at the local level within China's fragmentary government system. For example, AI firms in technology hubs in Shenzhen and Beijing often operate under vastly different regulatory standards and local priorities due to regional disparities. In Shenzhen, local government initiatives emphasize the rapid commercialization of AI applications to attract international investment, a strategy that affords greater autonomy to the private sector but risks looser regulatory oversight.[355] In contrast, Beijing, as the nation's political center, aligns more closely with national industrial policy, prioritizing public services, social stability, and national security objectives in its AI action plans.[356]

---

[353] *See* Kelly Le, *'Too Many' AI Models in China: Baidu CEO Warns of Wasted Resources, Lack of Applications*, S. CHINA MORNING POST (Jul. 5, 2024), https://www.scmp.com/tech/tech-trends/article/3269338/too-many-ai-models-china-baidu-ceo-warns-wasted-resources-lack-applications [https://perma.cc/23G9-R75R].

[354] *See* Triolo & Schaefer, *supra* note 350.

[355] For example, the Shenzhen Municipal Bureau of Industry and Innovation Technology unveiled an action plan in March 2025 to accelerate the commercialization of AI for the purpose of enhancing the city's status as an international hub for AI innovation. The plan explicitly lists AI applications in consumer goods sectors such as smart phones, AR/VR, computers, and home appliances as priorities for government subsidization. Around the same time, the Guangdong Provincial Government established a CNY 10-billion investment fund to support AI and robotics enterprises. *See* 深工信 [SHENZHEN MUN. BUR. OF INDUS. & INFO. TECH MUNICIPAL BUREAU OF INDUS. AND INNOVATION], 深圳市加快推进人工智能终端产业发展行动计划 (2025-2026 年) [SHENZHEN ACTION PLAN FOR ACCELERATING THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE (2025-2026)] (March 3, 2025), https://www.sz.gov.cn/cn/xxgk/zfxxgj/zcfg/content/post_12052747.html [https://perma.cc/UF2B-5J9Q]; *see also* 深圳将设 100 亿元 AI 和机器人产业基金 [Shenzhen to Establish 10 Billion Yuan AI and Robotics Industry Fund], 南方日报网络版 [SOUTHERN DAILY ONLINE EDITION] (Feb. 24, 2025), http://www.gd.gov.cn/gdywdt/dsdt/content/post_4671682.html [https://perma.cc/QVL3-EDWM].

[356] Unlike Shenzhen, the Beijing Municipal Government's 2024 AI action plan emphasized less on the commercialization of AI and more on its application to public services and the maintenance of social stability and public security. *See* 京发改 [BEIJING MUN. DEV. AND REFORM COMM'N ET AL.], 北京市发展和改革委员会等关于印发《北京市推动"人工智能+"行动计划（2024-2025 年)》[NOTICE OF THE BEIJING MUNICIPAL DEVELOPMENT AND REFORM COMMISSION ET AL. ON ISSUING THE BEIJING "AI+" ACTION PLAN (2024-2025)] (Jul. 18, 2024), https://www.beijing.gov.cn/zhengce/zhengcefagui/202503/t20250325_4043893.html

These governance challenges are further compounded by China's weak intellectual property (IP) protection regime, which has resulted in an uneven legal landscape. Although China leads the world in patent filings by volume and has established specialized IP and internet courts, its IP regime remains weak due to susceptibility to political influence. [357] Two main factors contribute to this uneven legal landscape for software governance:

(i) *Overambitious Central Planning*: Regulatory fragmentation undercuts the central government's plan to surpass the United States in AI development. Although the central government sets ambitious targets for AI development, implementation varies at the local level.[358] Local bureaucrats are incentivized to quickly commercialize AI at the expense of certain developers' IP rights.[359] Local courts also exhibit significant home bias against developers from other localities. [360] This undermines legal predictability across jurisdictions.

[https://perma.cc/JJ8G-EZM7]; *see also* 京经信发 [BEIJING MUN. BUR. OF ECONOMY AND INFO.], 北京市经济和信息化局关于印发《北京市人工智能赋能新型工业化行动方案（2025 年）》[NOTICE OF THE BEIJING MUNICIPAL BUREAU OF ECONOMY AND INFORMATIZATION ON ISSUING THE BEIJING ACTION PLAN FOR AI EMPOWERMENT OF NEW-TYPE INDUSTRIALIZATION (2025)] (May 26, 2025), https://www.beijing.gov.cn/zhengce/zhengcefagui/202506/t20250605_4107006.html [https://perma.cc/5F3G-MD8U].

[357] Since 2011, China has led the world in the number of patent applications filed. In particular, China is far ahead of the United States and other countries in the quantity of generative AI patent applications. But the overall quality of those applications remains relatively low, and China continues to lack a robust IP enforcement regime. *See* Alex He, *China Leads on Generative AI Patents, But What Does That Mean?*, CIGI (Dec. 19, 2024), https://www.cigionline.org/articles/china-leads-on-generative-ai-patents-but-what-does-that-mean/ [https://perma.cc/FG7G-F9YR].

[358] *See* Karman Lucero, *Artificial Intelligence Regulation and China's Future*, 33 COLUM. J. ASIAN L. 94, 94 (2019) (describing China's AI policies as overambitious, "serv[ing] more immediate rhetorical and political goals rather than substantive ones").

[359] *See* Kyle Chan et al., *Full Stack: China's Evolving Industrial Policy for AI*, RAND CORP. (Jan. 26, 2025), https://www.rand.org/pubs/perspectives/PEA4012-1.html? [https://perma.cc/M4AY-FRAR] ("Local governments from Shanghai to Shenzhen have set up state-backed AI labs and AI pilot zones to accelerate AI research and talent development … Local governments often provide funding for start-ups through public investment funds and 'computing vouchers' that offer subsidized access to computing resources."); *see also* Li You & Han Luo, *Copyright Implications and Legal Responses to AI Training: A Chinese Perspective*, 14 LAWS 43 (2025) (explaining that, despite the absence of a nationwide consensus on the copyright implications of AI training, some Chinese local courts have held that AI training does not infringe copyright while granting copyright protections for certain AI-generated materials).

[360] *See generally* Aimin Li, *Judicial Local Protection and Corporate Litigation Outcomes: A Study Based on Legal Big Data*, 66 FIN. RSCH. LETTERS 105696 (2004) ("Our findings reveal that judicial local protection remains prevalent in China. Further analyses indicate that the characteristics of the involved company, the trial court, and the specific case significantly affect the degree of judicial local protection.").

(ii) *Conflicting Governance Priorities*: Tech firms, local authorities, and central regulators do not share the same interests in AI software development. The central government's focus on national security and global technological leadership often clashes with the local authorities' protectionist economic agenda. Meanwhile, the tech industry prioritizes legal predictability—a core precondition for fair competition and scaling—which frequently conflicts with local protectionism and the central government's shifting policies. This misalignment creates room for opportunistic IP enforcement, where IP protections may be applied selectively to favor local interests.

Both factors have caused significant legal unpredictability in software-related AI intellectual property cases. In January 2020, the Shenzhen Nanshan District People's Court held in *Shenzhen Tencent Computer System Co., Ltd. v. Shanghai Yingmou Technology Co., Ltd.* that an article authored by Tencent's AI proprietary text bot was eligible for copyright protection.[361] Ruling in favor of Shenzhen's superstar tech firm, Tencent, the Shenzhen court established Tencent's copyright over the AI-generated article under the doctrine of accession.[362] In November 2023, however, the Beijing Internet Court's reached a different conclusion in *Li v. Liu*.[363] There, the Beijing court held that an AI-generated image created using a third party open-source AI model, Stable Diffusion, is copyrightable by the user, not the AI developer.[364] Notably, while both cases held that AI-generated content is copyrightable, their underlying logic is incompatible. To date, neither the Beijing court, the Shenzhen court, nor the Supreme People's Court has clarified the legal standards for copyright in AI-generated works, creating a gap in legal consistency that complicates IP protection for developers and users alike.[365]

---

[361] *See* Aaron Wininger, *Shenzhen Court Rules AI-Generated Articles are Entitled to Copyright Protection*, CHINA IP L. UPDATE (Jan. 3, 2020), https://www.chinaiplawupdate.com/2020/01/shenzhen-court-rules-ai-generated-articles-are-entitled-to-copyright-protection/ [https://perma.cc/3ZH5-9XE4].

[362] *See* 周波 [Zhou Bo]，人工智能与著作权保护：中国法院的司法实践 [Artificial Intelligence and Copyright Protection: Judicial Practice of China's Courts], WORLD INTELL. PROP. ORG. (May 21, 2020), https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/conversation_ip_ai/pdf/ms_china_1_zh.pdf [https://perma.cc/E97D-WYLX].

[363] *See* Yuqian Wang & Jessie Zhang, *Beijing Internet Court Grants Copyright to AI-Generated Image for the First Time*, WOLTERS KLUWER COPYRIGHT BLOG (Feb. 2, 2024), https://copyrightblog.kluweriplaw.com/2024/02/02/beijing-internet-court-grants-copyright-to-ai-generated-image-for-the-first-time/ [https://perma.cc/XV82-26KW].

[364] *See id*.

[365] Chinese court decisions recognizing the copyrightability of purely AI-generated works stand in contrast to recent U.S. court decisions. In *Thaler v. Perlmutter*, the U.S. District Court for the District of Columbia held that works generated entirely by AI are ineligible for copyright protection because the Copyright Act requires human authorship, a decision the D.C. Circuit subsequently affirmed. *See* Thaler v. Perlmutter, 687 F.Supp.3d 140 (D.D.C. 2023), *aff'd*, 130 F.4th 1039 (D.C. Cir. 2025). The D.C. Circuit reasoned that the Copyright Act's statutory text, structure, and history presuppose a human author: a machine cannot own property (§ 201), have lifespans (§ 302), have heirs (§ 203), sign transfers (§ 204), hold

Consequently, the lack of clarity in China's copyright jurisprudence on AI-generated content undercuts its ambition to create a "world-leading" AI software industry.[366] Angela Zhang notes that these emerging copyright cases are motivated by China's goal to foster a business-friendly environment conducive to the swift commercialization of AI software.[367] However, what is often overlooked is how this ambition fuels local disparities and weakens legal predictability. As illustrated by the conflicting rulings in *Tencent* and *Li*, AI-related copyright determinations remain vulnerable to local protectionism. In the absence of judicial independence from the party-state, Chinese courts must navigate a complex terrain of competing objectives—balancing commercial interests, local allegiances, and national geo-strategic goals. This ambiguity incentivizes private sector actors to pursue extralegal strategies to protect their economic interests, such as forging alliances with local governments and exploiting legal inconsistencies through regulatory arbitrage.

2.   Hardware Governance

Unlike AI software, China's hardware development faces substantial external limitations. The Chinese semiconductor market is heavily influenced by a small group of politically connected "national champion" firms and their government stakeholders.[368] Given hardware's centrality to national security, the central government plays a far more interventionist role in this sector than

---

nationality or domicile (§ 104), or possess intent for joint works (§ 101). The U.S. Copyright Office has likewise emphasized that the human authorship is a bedrock, irreplaceable requirement for copyright protection. *See* U.S. Copyright Office, *Copyright and Artificial Intelligence, Part 2: Copyrightability* 1, 3–4 (Jan. 2025), https://www.copyright.gov/ai/Copyright-and-Artificial-Intelligence-Part-2-Copyrightability-Report.pdf [https://perma.cc/4DHQ-YVP2].

[366] *See* Graham Webster, Rogier Creemers, Elsa Kania & Paul Triolo, C*hina's Plan to 'Lead' in AI: Purpose, Prospects, and Problems*, DIGICHINA, STAN. CYBER POL'Y CTR. (Aug. 1, 2017) ("China declares its intentions to pursue a 'first-mover advantage' to become 'the world's primary AI innovation center'") (citing The New Generation Artificial Intelligence Development Plan promulgated by the State Council of the People's Republic of China in 2017), https://digichina.stanford.edu/work/chinas-plan-to-lead-in-ai-purpose-prospects-and-problems/ [https://perma.cc/Q6E9-FXMZ].

[367] *See* Angela Huyue Zhang, *China's Short-Sighted AI Regulation*, PROJECT SYNDICATE (Dec. 8, 2023), https://www.project-syndicate.org/commentary/risks-of-beijing-internet-court-ruling-allowing-copyright-of-ai-generated-content-by-angela-huyue-zhang-2023-12 [https://perma.cc/4ELP-MEXJ].

[368] China's "national champion" companies refer to large, privately owned enterprises tasked with advancing strategic objectives of the central government in key sectors of the economy. Although not formally state-owned, these companies—typically industry leaders in sectors deemed vital to national development—operate under the supervision of the CCP and often benefit from state-backed policies, direct subsidies, and regulatory preferences. *See* Jeffrey Melnik, *China's "National Champions": Alibaba, Tencent, and Huawei*, 24 EDUC. ABOUT ASIA 28, 28 (2019) (defining national champion firms); *see also* Li-Wen Lin & Curtis J. Milhaupt, *We Are the (National) Champions: Understanding the Mechanisms of State Capitalism in China*, 65 STAN. L. REV. 697, 699 (2013) (examining the institutional and legal foundations of China's national champion system within its broader state-capitalist economy).

in software. The CCP Central Committee has outlined ambitious plans for reaching self-sufficiency in critical semiconductor technologies.[369]

Yet, China's semiconductor sector is far from self-sufficient. Despite possessing the world's largest reserves of rare earth minerals—the raw materials for semiconductors[370]—China lacks the technological prowess to fully utilize them.[371] Leading Chinese microchip manufacturers, such as Semiconductor Manufacturing International Corporation (SMIC), have made strides in 5 nm semiconductor design.[372] However, mass production remains out of reach due to China's inability to domestically produce extreme ultraviolet (EUV) lithography machines, which are critical for advanced chip manufacturing.[373] As a result, China's AI hardware industry remains heavily reliant on imports, particularly from the United States and Taiwan. Under the *Made in China 2025* plan,[374] the CCP Central Committee set goals for 40% of

---

[369] For example, China's 14th Five Year Plan explicitly identifies achieving supply-chain self-sufficiency in integrated circuits and semiconductors as "critical national security priorities *See* 中国发展改革报社 [NAT'L DEV. & REFORM COMM'N], 中华人民共和国国民经济和社会发展第十四个五年计划和 2035 年远景目标纲要 [OUTLINE OF THE PEOPLE'S REPUBLIC OF CHINA'S 14TH FIVE-YEAR PLAN FOR NATIONAL ECONOMIC AND SOCIAL DEVELOPMENT AND LONG-RANGE OBJECTIVES THROUGH THE YEAR 2035] (March 13, 2021), https://www.gov.cn/xinwen/2021-03/13/content_5592681.htm [https://perma.cc/Q8ZF-WBHL]. China's 15th Five Year Plan, which will cover the years 2026 to 2030, will likely continue this strategic vision of promoting supply-chain self-sufficiency in critical AI infrastructure. *See* 中国发展改革报社 [NAT'L DEV. & REFORM COMM'N], 承上启下的关键五年，"十五五"如何谋划？重点在哪？ [THE PIVOTAL FIVE YEARS LINKING THE PAST AND FUTURE: HOW WILL THE 15TH FIVE YEAR PLAN BE FORMULATED AND WHERE ARE ITS KEY PRIORITIES?] (Mar. 3, 2025),
https://www.ndrc.gov.cn/wsdwhfz/202503/t20250303_1396402.html
[https://perma.cc/GUV9-QMNR] (stating that China must continue fostering technological self-sufficiency by integrating industry with new and experimental technologies, particularly as AI becomes fully integrated into social and economic governance).

[370] *See Reserves of Rare Earths Worldwide as of 2023, by Country*, STATISTA (last visited on Dec. 7, 2024), https://www.statista.com/statistics/277268/rare-earth-reserves-by-country/ [https://perma.cc/9RYM-84HX].

[371] *See* Qianer Liu, *China on the Cusp of Next-Generation Chip Production Despite US Curbs*, FIN. TIMES (Feb. 5, 2024), https://www.ft.com/content/b5e0dba3-689f-4d0e-88f6-673ff4452977 [https://perma.cc/6YME-EEF4].

[372] *See* Jeff Pao, *SMIC to Sell Huawei Costly, Inefficient 5 nm Chips*, ASIA TIMES (Feb. 8, 2024), https://asiatimes.com/2024/02/smic-to-sell-huawei-costly-inefficient-5nm-chips/ [https://perma.cc/E37X-AEVJ].

[373] ASML, a Dutch company, is the primary manufacturer of EUV lithography machines. The U.S. government has exerted pressure on ASML to limit the sale of EUV to China. Complying with this request, the Dutch government imposed export bans on China. *See* Dan Robinson, *US-China Chip Wars 'Mainly Ideological' Says Ex-ASML Boss*, THE REGISTER (Jul. 8, 2024), https://www.theregister.com/2024/07/08/us_china_chip_wars_ideological/ [https://perma.cc/HY7X-BE2D].

[374] For further details on the *Made in China 2025* Initiative, see, e.g., Jost Wübbeke et al., *Made in China 2025: The Making of a High-Tech Superpower and Consequences for Industrial Countries*, MERICS (Aug. 12, 2016), https://merics.org/en/report/made-china-2025 [https://perma.cc/VN5W-V3R8]; KAREN SUTTER, CONG. RSCH. SERV., IF10964, MADE IN CHINA 2025 AND INDUSTRIAL POLICIES: ISSUES FOR CONGRESS (2023), https://crsreports.congress.gov/product/pdf/IF/IF10964/6 [https://perma.cc/N5QB-TZCN].

semiconductor microchips to be produced domestically by 2020 and 70% by 2025.[375] Yet, as of 2023, China produced less than 20% of its own chips.[376] By one estimate, a single Taiwanese company, TSMC, makes more than 70% of all chips used in China.[377]

The U.S. CHIPS Act has severely hindered China's access to essential AI hardware, limiting the scalability of its AI technologies.[378] The Biden administration's 2023 export controls prohibited leading U.S. microchip manufacturers like Nvidia from selling high-end GPUs—vital for AI model training and inference—to Chinese companies.[379] Additionally, CHIPS Act subsidies were extended to microchip suppliers in Taiwan and South Korea, contingent on their complete exclusion of China from their supply chains.[380] Although the Trump administration has scaled back certain Biden-era export restrictions on microchips to foreign countries in line with its broader deregulatory agenda, restrictions targeting China have largely remained intact.[381]

Beyond general export controls, the U.S. supply chain strategy also targets individual Chinese firms. Companies such as Yangtze Memory Technologies Co. (YMTC) and Huawei's HiSilicon were added to the U.S. Entity List, cutting off access to critical U.S. hardware technologies.[382] In October 2022, the Department of Commerce (DOC) introduced export controls barring U.S. companies from exporting semiconductor manufacturing

---

[375] *See* Eve Register, *Can China Leapfrog ASML in Its Quest for Semiconductor Self-Reliance?* THE DIPLOMAT (Oct. 12, 2023), https://thediplomat.com/2023/10/can-china-leapfrog-asml-in-its-quest-for-semiconductor-self-reliance/ [https://perma.cc/KR3P-KYVE].
[376] *See id.*
[377] *See* Richard Cronin, *Semiconductors and Taiwan's "Silicon Shield": A Wild Card in U.S.-China Technological and Geopolitical Competition*, HENRY L. STIMSON CENTER (Aug. 16, 2022), https://www.stimson.org/2022/semiconductors-and-taiwans-silicon-shield/ [https://perma.cc/ACC4-WLP2].
[378] *See* Catherine Pan-Giordano & Ting Zhou, *The CHIPS and Sciences Act of 2022: The Impact on China*, DORSEY & WHITNEY (Sep. 19, 2022), https://www.dorsey.com/newsresources/publications/client-alerts/2022/09/the-chips-and-sciences-act-of-2022 [https://perma.cc/9LWE-HH4S].
[379] *See* Alexandra Alper, Karen Freifeld & Stephen Nellis, *Biden Cuts China Off from More Nvidia Chips, Expands Curbs to Other Countries*, REUTERS (Oct. 17, 2023), https://www.reuters.com/technology/biden-cut-china-off-more-nvidia-chips-expand-curbs-more-countries-2023-10-17/ [https://perma.cc/6QWW-J26G].
[380] *See* Emilia David, *Where the CHIPS Act Money Has Gone*, THE VERGE (Jun. 7, 2024), https://www.theverge.com/24166234/chips-act-funding-semiconductor-companies [https://perma.cc/254G-CYUF].
[381] *See* Press Release, Bureau of Indus. & Sec., Department of Commerce Announces Recission of Biden-Era Artificial Intelligence Diffusion Rule, Strengthens Chip-Related Export Controls (May 13, 2025), https://www.bis.gov/press-release/department-commerce-announces-rescission-biden-era-artificial-intelligence-diffusion-rule-strengthens [https://perma.cc/2TMN-GK72].
[382] *See* Alexandra Alper, *Biden Blacklists China's YMTC, Crackdowns on AI Chip Sector*, REUTERS (Dec. 15, 2022), https://www.reuters.com/technology/biden-blacklist-chinas-ymtc-crackdown-ai-chip-sector-2022-12-15/ [https://perma.cc/V3JD-8P75].

equipment capable of producing microchips below the 14 nm threshold.[383] Those restrictions extend to natural persons as well: all U.S. citizens and green card holders were banned from contributing to development of advanced semiconductor technologies in China without obtaining a special federal license.[384] Violators face civil fines and criminal liability.[385] This policy has effectively curtailed the transfer of technical expertise from U.S. universities and research institutions to China. While the Trump administration has temporarily paused the enforcement of some of those restrictions to leverage trade negotiations with Beijing, many Chinese entities remain blacklisted—and such restrictions are likely to be reinstated should geopolitical conditions shift.[386]

To overcome these challenges, the PRC State Council introduced policies aimed at countering what it calls the "technological throat-choking effect" of U.S. restrictions on China's semiconductor industry.[387] However, these efforts are stymied by the lack of domestic expertise, inadequate technical infrastructure, and unequal access to critical technological components. While there has been some progress, such as SMIC's limited production of 7 nm and 5 nm microchips, these chips suffer from quality issues and cost inefficiencies, impeding their scalability.[388] The combined effects of U.S. restrictions on equipment, expertise, and partnerships have forced China's AI hardware development to rely on foreign technology through stopgap measures.

To mitigate the impact of U.S. export restrictions, Chinese hardware companies are investing in advanced packaging techniques with central

---

[383] *See* Press Release, Bureau of Indus. and Sec., Commerce Implements New Export Controls on Advanced Computing and Semiconductor Manufacturing Items to the People's Republic of China (PRC) (Oct. 7, 2022), https://www.bis.doc.gov/index.php/documents/about-bis/newsroom/press-releases/3158-2022-10-07-bis-press-release-advanced-computing-and-semiconductor-manufacturing-controls-final/file [https://perma.cc/E5ZY-KBCS].

[384] *See id.* at 3.

[385] *See id.*

[386] *See Trump Pauses Export Controls to Bolster China Trade Deal, FT Says*, REUTERS (Jul. 28, 2025), https://www.reuters.com/world/china/trump-pauses-export-controls-bolster-china-trade-deal-ft-says-2025-07-28/ [https://perma.cc/JB2Y-TMMP].

[387] The phrase "technological throat-choking," also known as "*jishu kabozi*" ("技术卡脖子") in Chinese, refers to bottlenecks in the development of critical technologies ["*guanjian jishu*"] ("关键技术") that hinder China's ability to achieve technological self-sufficiency. *See generally* 李云舒 [Li Yunshu], 美国不断泛化国家安全概念滥用出口管制措施：深度关注"科技霸凌"注定失败 [The U.S. Continues to Broaden National Security Concepts to Abuse Export Restrictions: A Deep Dive: "Technological Bullying" Is Destined to Fail], 中国纪检监察报 [CHINA DISCIPLINE AND INSPECTION NEWS] (Oct. 31, 2023), https://www.moj.gov.cn/pub/sfbgw/jgsz/gjjwzsfbjjz/zyzsfbjjztszs/202310/t20231031_488652.html [https://perma.cc/S99N-XTUK].

[388] *See* Pao, *supra* note 372.

government backing. Techniques such as System-in-Package (SiP), [389] Through-Silicon Via (TSV), [390] and Fan-Out Wafer-Level Packaging (FO-WLP) [391] reduce China's dependence on EUV lithography processes restricted by U.S. export controls. Huatian Technology, a leading Chinese integrated circuit manufacturer, is at the forefront of these efforts. However, advanced packaging is not a comprehensive solution. Mastery of these technologies requires substantial technical expertise and infrastructure, which China is still lacks. Advanced packaging cannot replace the production of state-of-the-art microchips at scale, as China remains constrained by its inability to access EUV lithography machines.

Chinese companies are also employing proxy entities to acquire restricted technologies, often using intermediaries in third-party jurisdictions to obscure end-users and circumvent export controls. [392] Although this strategy has enabled companies to evade U.S. restrictions, it exposes companies to heightened operational risks, including supply chain disruptions, enforcement detection, and heightened international scrutiny. The operational costs of maintaining proxy networks has further limited their effectiveness, particularly for acquiring high-value, tightly controlled equipment.

In sum, despite the central government's ambitious plans for full technological self-sufficiency, China's AI hardware development continues to face significant challenges, including technical bottlenecks, high costs, and a shortage of expertise. These issues are compounded by the hardware sector's deep reliance on global supply chains—hardships that will likely persist in the long term. Yet, paradoxically, these challenges have deepened the Chinese government's dependance on the private sector. Although the central government actively shapes industrial policy and planning, it relies heavily on

---

[389] A System-in-Package (SiP) is a method of combining two or more integrated circuits (IC) within a single package, allowing multiple functions to coexist in one unit. *See System in Package (SiP)*, SEMICONDUCTOR ENGINEERING (last visited Oct. 6, 2025), https://semiengineering.com/knowledge_centers/packaging/advanced-packaging/system-in-package/ [https://perma.cc/7LRX-2VSY].

[390] Through-Silicon Vias (TSVs) are vertical wires that enable connections between stacked chips. They are created by etching trenches into silicon and filling them with insulating liners and metal wires. *See Through-Silicon Vias (TSV)*, APPLIED MATERIALS (last visited Oct. 6, 2025), https://www.appliedmaterials.com/in/en/semiconductor/markets-and-inflections/heterogeneous-integration/tsv.html [https://perma.cc/5WXQ-QGPT].

[391] Fan-Out Wafer-Level Packaging (FO-WLP) is an advanced packaging method that reduces the package size, improves thermal and electrical performance, and increases the number of connections on a single chip. *See Fan-Out*, APPLIED MATERIALS (last visited Oct. 6, 2025), https://www.appliedmaterials.com/in/en/semiconductor/markets-and-inflections/heterogeneous-integration/fan-out.html [https://perma.cc/QHK5-RLZM].

[392] *See* Anton Shilov, *TSMC Reportedly Uncovers Huawei's Plot to Circumvent US Export Controls—Chinese Tech Giant May be Using a Proxy to Produce Chips at TSMC*, TOM'S HARDWARE (Oct. 22, 2024), https://www.tomshardware.com/tech-industry/tsmc-reportedly-uncovers-huaweis-plot-to-circumvent-us-export-controls-chinese-tech-giant-may-be-using-a-proxy-to-produce-chips-at-tsmc [https://perma.cc/C5BN-254K].

the private sector to fulfill its strategic goals and bypass U.S. export restrictions. Industry self-governance has thus become a defining feature of the semiconductor sector.

3. Infrastructure Governance

In the realm of AI infrastructure, China holds a scalability advantage over the United States[393] due to the government's unhindered access to vast datasets amassed through digital surveillance programs, including social credit systems[394] and social engineering databases.[395] Unlike the United States, where private real estate firms drive data center development, most data centers in China are either owned by local governments, developed by state-owned telecommunications giants like China Telecom and China Mobile, or managed by "national champion" platform companies like Tencent and Alibaba.[396]

China's scalability advantage is further fueled by its weak data privacy regime, allowing state authorities to trade citizens' data collected through surveillance.[397] Many local governments have created state-sponsored data exchanges, where individuals sell their biographical and facial recognition data to local governments and their business affiliates managing the data centers, often for minimal compensation.[398] Companies use this data to train advanced AI models, which are frequently supplied back to local governments to support mass digital surveillance programs for law enforcement and public services.[399] For example, Baidu, one of China's leading platform giants, jointly built the

---

[393] *See generally* YASHENG HUANG, THE RISE AND FALL OF THE EAST: HOW EXAMS, AUTOCRACY, STABILITY, AND TECHNOLOGY BROUGHT CHINA SUCCESS, AND WHY THEY MIGHT LEAD TO ITS DECLINE (2023) (arguing that China's governance model, which integrates meritocracy, technocracy, and autocracy, confers short-term advantages in scaling economic growth and maintaining social stability, but undermines long-term prosperity and the regime's capacity for self-correction).

[394] *See* Paul F. Langer, *Lessons from China—The Formation of a Social Credit System: Profiling, Reputation Scoring, Social Engineering*, PROCEEDINGS OF 21ST ANN. INT'L CONF. ON DIGIT. GOV'T RSCH. 164–74 (June 16, 2020), https://dl.acm.org/doi/10.1145/3396956.3396962 [https://perma.cc/M2XD-DGZW].

[395] *See* Jessica Lyons, *How Chinese Insiders are Stealing Data Scooped up by President Xi's National Surveillance System*, THE REGISTER (Dec. 8, 2024), https://www.theregister.com/2024/12/08/chinese_insiders_stealing_data/ [https://perma.cc/V5PV-26NW].

[396] *See* Giulia Interesse, *China's Data Center Sector: Industry and Regulatory Insights*, CHINA BRIEFING (Aug. 31, 2023), https://www.china-briefing.com/news/chinas-data-center-sector-industry-and-regulatory-insights/ [https://perma.cc/Q6EN-9FW2].

[397] *See* Andy Greenberg, C*hina's Surveillance State Is Selling Citizen Data as a Side Hustle*, WIRED (Nov. 21, 2024), https://www.wired.com/story/chineses-surveillance-state-is-selling-citizens-data-as-a-side-hustle/ [https://perma.cc/CKX9-F2DW].

[398] *See* Alex He & Rebecca Arcesati, *Data Marketplaces and Governance: Lessons from China*, CTR. FOR INT'L GOVERNANCE INNOVATION (Nov. 12, 2024), https://www.cigionline.org/articles/data-marketplaces-and-governance-lessons-from-china/ [https://perma.cc/5ULU-DTWT].

[399] *See id.*

Shanxi Data Exchange Program with the Shanxi Provincial Government.[400] As of mid-2023, data exchanges emerged in cities like Shenzhen, Guiyang, and Guangzhou, each reaching trading volumes exceeding CNY 1 billion.[401]

Local governments' significant role in data center governance stems from the private sector's limited capacity to fund such capital-intensive projects.[402] Compared to the United States, China's private credit and securities markets are underdeveloped. This makes sophisticated project financing options, like project bond issuances and syndicated loans in the United States, largely unavailable.[403] Due to volatile capital markets, Chinese banks prefer lending to local governments or state-owned enterprises, as these entities present lower default risks compared to smaller private sector businesses.[404] As a result, there are fewer private data center intermediaries at play in China's AI infrastructure markets.

This heavy local government involvement in data center governance has also spurred policy experiments that, at first glance, appear to conflict with the

---

[400] *See id.*

[401] *See id. See also* 方亚丽 [Fang Yali], 贵阳大数据交易所完成首笔个人数据合规流转场内交易 [Guiyang Big Data Exchange Completes First Transaction of Compliant Personal Data Circulation], 贵州日报 [GUIZHOU DAILY] (May 11, 2023), https://finance.sina.cn/2023-05-11/detail-imytitxi0087843.d.html?from=wap [https://perma.cc/KRY3-9WDS] (describing Guiyang's first government-supervised transaction of personal data on a local data exchange); 郭玟君 [Guo Wenjun],先行先试！深圳又一交易所诞生，如何打造？ [Go and Try First! Shenzhen Established Another Exchange. How Should It Develop?], 中国基金报 [CHINAFUND] (Dec. 3, 2022), https://finance.sina.com.cn/china/gncj/2022-12-03/doc-imqmmthc6944653.shtml?cre=tianyi&mod=pcfinf&loc=4&r=0&rfunc=18&tj=cxvertical_pc_finf&tr=12 [https://perma.cc/84XN-G8WC] (reporting the launch of the Shenzhen Data Exchange and transaction volumes exceeding CNY 1 billion).

[402] China's provincial governments have issued policies mandating the creation of state-owned database networks across municipalities and subsidizing the construction of municipal data centers. For example, in June 2024, the Guangdong Provincial Government issued a series of policy directives mandating the creation of regional database networks connecting cities in the Pearl River Delta region. *See* 中共广东省委办公厅、省政府办公厅印发《关于构建数据基础制度推进数据要素市场高质量发展的实施意见》 [IMPLEMENTATION OPINIONS ON BUILDING A DATA INFRASTRUCTURE SYSTEM AND PROMOTING THE HIGH-QUALITY DEVELOPMENT OF THE DATA MARKET], 广东省人民政府门户网站 [GUANGDONG PROVINCIAL PEOPLE'S GOVERNMENT PORTAL] (June 24, 2024), https://zfsg.gd.gov.cn/zwgk/wjk/content/post_4444073.html [https://perma.cc/JQ9N-4EKY] . However, many local governments have invested in data centers based on political or social governance priorities that often conflict with market supply and demand. This has resulted in a surplus of computing capacity and many data centers remaining underutilized. *See* Efosa Udinmwen, *Billions Wasted as China's Data Centres Sit Empty—So Now They Want to Sell You the Leftovers*, YAHOO FIN. (Jul. 29, 2025), https://finance.yahoo.com/news/billions-wasted-china-data-centres-212800807.html [https://perma.cc/JQN2-HX5K].

[403] *See* discussion *supra* Section III(D)(3).

[404] *See* Alex Zhou & Annisa Lee, *Local Government Financing Vehicles: A Growing Risk for China's Economy?* PIMCO (Sep. 1, 2023), https://www.pimco.com/mea/en/insights/local-government-financing-vehicles-a-growing-risk-for-chinas-economy [https://perma.cc/8FRZ-TEER].

central government's national security priorities. Due to limited domestic capital for financing data center projects, local governments have turned to foreign investment through joint ventures. [405] However, Chinese foreign investment restrictions limit foreign ownership to no more than 50%. [406] Despite these constraints, foreign-invested data centers have become key components of special economic zones like Shanghai's Lin-Gang Special Area, which have experimented with "smart city" policies since 2013. [407] These local innovations eventually gained national attention, leading to formal adoption by the central government. [408] In April 2024, the Ministry of Industry and Information Technology (MIIT) launched a pilot program relaxing the 50% foreign investment cap in four cities: Beijing, Shanghai, Hainan, and Shenzhen. [409] To align local initiatives with national security objectives, the MIIT introduced a compulsory licensing system to vet foreign investors. [410] Today, approximately 2,200 foreign-invested companies hold licenses to operate data centers in China. [411] The MIIT's pilot program exemplifies the policy experimentation model of local trial and national rollout, integrating foreign investment while addressing national security concerns.

The legal framework for data center governance in China contrasts with that of the United States, even though both systems allow for industry self-governance. In the United States, data centers operate within a web of state commercial laws shaped by complex business transactions that exploit jurisdictional differences. In China, data centers are typically governed by the regulations of a single province given the nature of local government control and ownership. This makes data center governance susceptible to local protectionism, since international cloud service providers seeking to lease data storage space in China must comply with varying data localization rules and cybersecurity standards imposed by the local authorities.

---

[405] *See* John Tanner, *China Allows Foreign Players to Own Data Centers in New Pilot Scheme*, DEVELOPING TELECOMS (Oct. 25, 2024), https://developingtelecoms.com/telecom-business/telecom-regulation/17521-china-allows-foreign-players-to-own-data-centres-in-new-pilot-scheme.html [https://perma.cc/6CTE-LEEV].

[406] *See* Giulia Interesse, *China New Pilot Program Removes Foreign Ownership Caps on Telecom and Data Centers*, CHINA BRIEFING (Oct. 30, 2024), https://www.china-briefing.com/news/china-new-pilot-program-removes-foreign-ownership-caps-on-telecom-and-data-centers/ [https://perma.cc/ZP5Z-3GMS].

[407] *See id.*; *see also* CHINA (SHANGHAI) PILOT FREE TRADE ZONE: LIN-GANG SPECIAL AREA (last visited Dec. 8, 2024), https://en.lingang.gov.cn/ [https://perma.cc/5B2F-ZE23] (highlighting Lin-Gang's role as a smart city pilot area hosting foreign-invested cloud and data-center projects since 2013); *see also* Ben Wodecki, *China Opens the Door to Foreign-Owned Data Centres Under New Pilot Scheme*, CAPACITY (Oct. 24, 2024), https://capacityglobal.com/news/article-china-opens-the-door-to-foreign-owned-data-centres/ [https://perma.cc/L7AZ-JLEB]

[408] *See* Wodecki, *supra* note 407.

[409] *See id.*

[410] *See id.*

[411] *See id.*

V. POLICY IMPLICATIONS

As explored earlier, the United States and China are converging in their approaches to AI governance. Despite opposing value systems, both countries are adopting a fragmentary governance model that allows the tech industry to fill existing policy vacuums through regulatory arbitrage, norm-building, and corporate lobbying. This shared feature, which I term "techno-federalism," serves as the enabling framework for industry self-governance.

Techno-federalism has upended the status quo in both countries. Today, the United States is shifting from decades of neoliberal free-market politics to one that blends national security with commercial objectives.[412] Likewise, China is moving away from a state-corporatist regime, enabling the private sector to take a more active role in carrying out national security goals.[413] Both have converged from opposite ends of the ideological spectrum.

What does this mean for the future of U.S. AI governance, especially in its geopolitical engagement with China? How can the United States address domestic challenges posed by emerging disruptive AI technologies while aligning them with broader geopolitical objectives? To answer these questions, this section is organized as follows. Section V(A) discusses the uniqueness of the current moment in AI competition by comparing techno-federalism to the Cold War "triple helix" model of government-coordinated technological development. Section V(B) explores potential legal and policy solutions that U.S. federal and state governments can undertake to compete with China in AI governance.

A.   *Return of the Triple Helix Under Techno-Federalism?*

Thus far, this article has used techno-federalism to describe the tripartite interplay between central, local, and market power that enables industry self-governance in the United States and China. At first glance, this dynamic bears resemblance to the Cold War triple helix—a tripartite collaboration among government, academia, and industry aimed at aligning technological

---

[412] *See* Maria Shagina, *America's Quiet Turn Towards State Capitalism*, INT'L INST. FOR STRATEGIC STUD. (Sept. 15, 2025), https://www.iiss.org/online-analysis/online-analysis/2025/09/americas-quiet-turn-towards-state-capitalism/ [https://perma.cc/W2WQ-EQRE] (arguing that the Trump administration "has taken extraordinary steps to embed itself within the private sector" in order to advance the federal government's geopolitical goals).

[413] China's central government has explicitly emphasized the importance of maintaining Party control over fostering Party leadership in the private sector in order to steer privately owned corporations—particularly those in high-tech R&D—toward advancing national strategic objectives. *See* 中共中央办公厅印发《关于加强新时代民营经济统战工作的意见》 [THE GENERAL OFFICE OF THE CPC CENTRAL COMMITTEE ISSUED THE "OPINIONS ON STRENGTHENING THE UNITED FRONT WORK FOR THE PRIVATE ECONOMY IN THE NEW ERA"], 新华社 [XINHUA NEWS AGENCY] (Sept. 15, 2020), https://www.gov.cn/zhengce/2020-09/15/content_5543685.htm [https://perma.cc/RQ56-QU3M].

advancements with national security goals. [414] Naturally, this raises the question: Is the current AI race merely an extension of a tech Cold War?

The answer is no. While national security remains central to this AI race, the private sector now plays an indispensable role in shaping and executing national security strategies. Despite escalating U.S.-China decoupling, both countries struggle to fully sever their supply chain interdependence as they navigate the competing demands of local protectionism, market efficiency, and national security. This dynamic is unprecedented. However, the triple helix remains relevant today, albeit in a transformed state. This section explores: (1) how the contemporary triple helix differs from its Cold War predecessor, and (2) how its resurgence offers insights into the future trajectory of the U.S.-China AI race.

1.   Reconceptualizing the Triple Helix

At the core of the triple-helix model are three key players: government, academia, and industry. [415] Governments provide regulatory guardrails, funding, and oversight. Academia bridges public interest with private innovation, contributing to foundational research, ethical considerations, and technical advancements in AI. Industry, now a main innovator, drives AI development, deployment, and commercialization, while setting market norms via open-source initiatives and public-private partnerships.

What distinguishes the modern triple helix is the increasingly fluid boundaries among these actors. Industry and academia frequently blur lines by entering policy-making arenas, while governments must now contend with private-sector dominance in shaping AI development and deployment. Unlike the centralized government leadership of the Cold War era—exemplified by Defense Department-led initiatives like the DARPA projects, where academia and industry operated as mere extensions of the military industrial complex[416]—today's triple helix thrives in regulatory fragmentation, enabling states and industry leaders to participate as co-regulators.

This decentralization stems from the late 20th-century neoliberal shift, which prioritized market-driven solutions over federal intervention. Although the federal government is now moving away from neoliberal free-market principles towards national security-focused policies, the legacies of past neoliberal tech policy endure. Over the past four decades of U.S. tech policy, the federal government has taken on a supervisory role, leaving state

---

[414] *See* discussion *supra* Section III(A).

[415] *See* Henry Etzkowitz & Loet Leydesdorff, *The Triple Helix: University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development*, 14 EASST REV. 14, 16–19 (1995).

[416] *See* discussion *supra* Section III(A).

governments to lead in coordinating academic and industry collaboration for technological development.

Today, states coordinate innovation across key AI governance domains. California leads in software oversight, enacting laws that regulate frontier model training and data aggregation.[417] Arizona has taken the lead in hardware, advancing semiconductor development through targeted manufacturing subsidies.[418] Meanwhile, New York and Delaware dominate infrastructure financing by leveraging their national influence over commercial and corporate law.[419] In each arena, private firms have embedded themselves in state law-making processes. Firms with nationwide influence such as OpenAI, Workday, and Intel have emerged as the primary rule-makers for AI, often dictating norms and pacing innovation without direct federal oversight.

The evolving roles of major players in the modern triple helix also reflect a broader shift in power dynamics. Historically, governments dominated innovation systems by directly funding and managing projects.[420] However, the rise of globalized markets and the privatization of AI R&D has tilted the balance toward industry. Private tech firms now lead AI development, often operating across borders and shaping national—and in some cases, global—norms. This influence is evident in how Meta's open-source Llama platform has shaped AI development standards in China.[421]

This globalized landscape has enabled private sector actors to bypass traditional regulatory constraints through cross-border operations and open-source initiatives.[422] Public-private partnerships have become more complex, involving multiple layers of governance. For example, the U.S. federal government increasingly relies on companies like Palantir to provide national

---

[417] *See* discussion *supra* Section III(D)(1). *See also* Joshua Turner & Nicol Turner Lee, *Can California Fill the Federal Void on Frontier AI Regulation?* BROOKINGS INST. (Jun. 4, 2024), https://www.brookings.edu/articles/can-california-fill-the-federal-void-on-frontier-ai-regulation/ [https://perma.cc/G2AG-CSXT].

[418] *See* discussion *supra* Section III(D)(2). *See also How Arizona is Competing for the CHIPS Act: State Leads Unprecedented Effort to Maximize Semiconductor Opportunities*, ARIZ. COM. AUTHORITY (Mar. 11, 2024), https://www.azcommerce.com/news-events/news/2024/3/how-arizona-is-competing-for-the-chips-act/ [https://perma.cc/R7PV-DCP7].

[419] *See* discussion *supra* Section III(D)(3). *See also* Allan Marks, *Chambers Global Practice Guide: Project Finance*, MILBANK 1, 8 (2019), https://www.milbank.com/a/web/109308/Chambers-Project-Finance-2019-Guide.pdf [https://perma.cc/7DJX-Z563].

[420] *See* Erica R.H. Fuchs, *Rethinking the Role of the State in Technology Development: DARPA and the Case for Embedded Network Governance*, 39 RSCH. POL'Y 1113, 1113 (2010).

[421] *See* Paul Triolo & Kendra Schaefer, *China's Generative AI Ecosystem in 2024: Rising Investment and Expectations*, NAT'L BUREAU OF ASIAN RSCH. (Jun. 27, 2024), https://www.nbr.org/publication/chinas-generative-ai-ecosystem-in-2024-rising-investment-and-expectations/ [https://perma.cc/629M-84JM].

[422] *See* discussion *supra* Sections III(D) and IV(C).

security-related AI solutions, illustrating the growing reliance on industry expertise and infrastructure.[423] Meanwhile, academia's role has shifted toward bridging ethical and practical considerations. Universities host debates over AI fairness, transparency, and existential risks, often shaping policy discussions without direct governmental mandates. This shift is evident in collaborative initiatives like the National AI Research Institute in the United States, which integrate academic expertise with industry goals.[424]

2. Future Trajectories of the U.S.-China AI Race

China's application of the triple helix reveals a more complex picture. While lacking the formal structure of federalism, China enforces informal federalism through institutional dynamics. This creates a paradox. On the one hand, China's top-down governance integrates government, academia, and industry under a corporatist model. Initiatives like *Made in China 2025* reflect Beijing's emphasis on aligning corporate actions with national strategic priorities. On the other hand, China's private sector has become more autonomous, acting as both suppliers and co-regulators alongside local governments.[425] As long as their actions align with central directives, private companies and local governments retain discretion in policy implementation. Although China's central government retains overall control, this has not stifled autonomous policy experimentation.

While the United States and China share certain converging features in their approaches to AI governance, their trajectories remain shaped by fundamentally distinct political climates. Both governments hold firm to their ideological commitments—at least in official rhetoric. Despite the Trump administration's growing emphasis on AI governance as a geostrategic contest rather than a clash of values, Washington continues to portray China's AI regime as an existential threat to U.S. liberal democracy.[426] Beijing, conversely, views its AI regime as a geostrategic countermeasure against U.S. technological containment and a means to bolster public trust in non-

---

[423] *See, e.g.*, Edward Graham, *Pentagon's AI Office Awards Palantir a Contract to Create a Data-Sharing Ecosystem*, NEXTGOV FCW (Jun. 4, 2024),
https://www.nextgov.com/defense/2024/06/pentagons-ai-office-awards-palantir-contract-create-data-sharing-ecosystem/397104/ [https://perma.cc/5CWR-3TNW]; *Palantir Announces Expansion of Federal Cloud Service with DoD IL6 Accreditation*, PALANTIR (Oct. 10, 2022), https://www.palantir.com/newsroom/press-releases/palantir-announces-expansion-of-federal-cloud-service-with-dod-il6/ [https://perma.cc/L2J3-PKSY].
[424] *See Democratizing the Future of AI R&D: NSF to Launch National AI Research Resource Pilot*, U.S. NAT'L SCI. FOUND. (Jan. 24, 2024), https://new.nsf.gov/news/democratizing-future-ai-rd-nsf-launch-national-ai [https://perma.cc/G7HB-BQGP].
[425] *See* discussion *supra* Sections III(D) and IV(C).
[426] *See* Sorelle Friedler et al., *What to Make of the Trump Administration's AI Action Plan*, BROOKINGS INST. (Jul. 31, 2025), https://www.brookings.edu/articles/what-to-make-of-the-trump-administrations-ai-action-plan/ [https://perma.cc/6HSB-MXLT] (noting the 2025 AI Action Plan's emphasis on market-led AI innovation to secure U.S. geostrategic advantage over China, while giving insufficient attention to risks for democratic governance).

democratic modes of governance.[427] As the AI race accelerates, these political narratives are unlikely to shift. However, in practice, the two countries' fates are increasingly intertwined. This will continue as their tech industries, reliant on global supply chains, are tasked with implementing national security objectives.

Whether the United States and China will converge further remains uncertain. But one thing is clear: the tech industry's importance as a disciplinary force will continue to grow as AI technologies mature. AI already transcends regulatory boundaries. And neither China nor the United States intends to let AI grow in unregulated markets without new legal guardrails.

As national security takes center stage, the tech industry is poised to play an ever-larger role in shaping this competition. But it will also likely become more integrated with government functions at both central and local levels—acting as a third power that provides checks and balances to local and central governments.[428] Thus, the critical question is how to harness the innovative capacity of industry self-governance while maintaining a delicate balance between national security and commercial interests.

B.   What Techno-Federalism Means for U.S. AI Policy

To compete with China for AI leadership, the United States should prioritize restoring market conditions that enable effective bottom-up industry self-governance. Given ongoing legislative gridlock in Congress and the Trump administration's deregulatory agenda, sustained federal inaction appears likely. [429] Consequently, traditional solutions centering on "federalizing" legal domains with negative interstate externalities remain impractical. [430] In this context, state-to-state collaboration offers a more promising avenue for effective AI governance. Below are three policy areas where states can take action.

---

[427] *See* Daniel Sprick, *Aligning AI With China's Authoritarian Value System*, THE DIPLOMAT (Feb. 3, 2025), https://thediplomat.com/2025/02/aligning-ai-with-chinas-authoritarian-value-system/ [perma.cc/QVS4-TSHR] (noting China's plan to use AI to build social consensus by requiring outputs to reflect "socialist core values"); *see also* Laura Podda, *China's Drive to Dominate the AI Race*, ATLAS INST. FOR INT'L AFF. (Apr. 14, 2025), https://atlasinstitute.org/chinas-drive-to-dominate-the-ai-race/ [https://perma.cc/PK9X-VWGY] (describing China's aims to counter U.S. technological "containment" by expanding domestic semiconductor capacity and AI infrastructure).

[428] *See* discussion *supra* Sections III(D).

[429] *See* discussion *supra* Sections III(C)(1).

[430] The term "federalization" refers to the federal government's creation of a comprehensive statutory scheme that preempts state regulation in the same area. *See, e.g.*, Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341, 2344–2353 (1996); Benjamin T. Seymour, *The New Fintech Federalism*, 24 YALE J. L. & TECH. 1, 53 (2022).

1. Potential Actions for State Governments

(i) *Software Governance*: The *AI Action Plan* explicitly frames "winning the AI race" as a national objective.[431] But winning this race will require more than deregulation—it hinges on developing safer, more reliable AI systems capable of performing diverse tasks across varied socio-technical settings. Left unregulated, private entities often pursue short-term gains at the expense of long-term resilience and public safety, thereby compromising broader geostrategic goals such as national security and public trust. As the federal government retreats from regulatory responsibility, states must step in to fill the vacuum.

Ensuring safe AI requires prophylactic risk mitigation measures embedding AI accountability into the development process itself. Yet, most state-level AI regulations focus narrowly on *ex post* remedies, such as tort-based litigation, fines, or state enforcement actions—imposing liability after the harm has already occurred.[432] Those measures, while necessary, are reactive rather than preventative. Worse still, monetary penalties are often treated as mere costs of doing business, weaking their deterrence effect.[433]

Effective AI governance therefore demands new guardrails: *ex ante* harm prevention must supplement traditional *ex post* liability.[434] To achieve that goal, states should adopt AI licensure regimes requiring AI developers to comply with ethical, transparent, and auditable development practices. Under traditional federalism principles, states already have the authority to regulate professional standards through licensure.[435] State licensing agencies could mandate that AI systems meet verifiable standards for safety, adaptability, correctability, and non-discrimination before deployment.[436] This *ex ante* model would place the burden of proof on developers to show that their AI systems are not manipulative or prone to hallucinations in their lawful business uses.[437] Such a framework would directly target systemic risks—like opaque training processes and untraceable input data—before they materialize, embedding accountability into the pipeline of innovation itself.

(ii) *Hardware Governance*: In addition to promoting accountability in software development, states can bolster the resilience of AI hardware systems by harnessing public-private partnerships for R&D and manufacturing. While support for industry leaders should continue, particular attention should be placed on supporting small AI startups, especially in connection with state or

---

[431] *See* AMERICA'S AI ACTION PLAN, *supra* note 142.

[432] *See* Gianclaudio Malgieri & Frank Pasquale, *Licensing High-Risk Artificial Intelligence: Toward Ex Ante Justification for a Disruptive Technology*, 52 COMPUT. L. & SCI. REV. 105899 (2024).

[433] *See id.*

[434] *See id.*

[435] *See* discussion *supra* Section III(C)(2).

[436] *See* Malgieri & Pasquale, *supra* note 432.

[437] *See id.*

municipal AI projects. This would not only stimulate innovation but also ensure that smaller players have opportunities to compete in the AI hardware ecosystem. Public-private partnerships also bypass the legal constraints that hamper federal and state action in AI hardware governance. Given the globalized nature of semiconductor supply chains, public-private partnerships will be essential for advancing national security objectives without stifling industry-led market innovation.

The success of these partnerships depends on well-structured contracts between states, federal government, and private entities. These contracts should establish clear performance metrics, including timelines, specific deliverables, and measurable public benefits, such as increased AI capacity or access to research for public institutions. They should also define risk and liability for project delays or failures, ensuring that private partners bear responsibility for underperformance while safeguarding public resources. Additionally, incorporating clear revenue-sharing models can attract private investment by guaranteeing shared financial rewards for both public and private stakeholders in critical AI hardware manufacturing projects. Encouraging state governments to actively engage in market functions through public contracts enables them to participate in the norm-building process alongside industry leaders. This mitigates regulatory arbitrage and addresses the "race-to-the-bottom" problem preventing interstate cooperation.

(iii) *Infrastructure Governance*: Data infrastructure—including both its digital architecture and physical components—serves as the backbone of AI ecosystems.[438] It operates vertically by supplying the raw inputs necessary for downstream AI applications and horizontally by linking those systems together in scalable, interconnected networks.[439] In the absence of comprehensive federal oversight, states can take the lead by establishing public data trusts to govern the collection, storage, and use of consumer data.[440]

This model draws inspiration from policy experiments in the UK and Canada, where data trusts have been proposed as governance mechanisms to ensure that personal data are managed ethically and in the public interest.[441]

---

[438] *See* Elettra Bietti, *Data Is Infrastructure*, 26 THEORETICAL INQUIRIES L. 55, 57, 63–65 (2025).

[439] *See id.* at 64–65.

[440] *See* Wu, *Beyond Free Markets and Consumer Autonomy*, *supra* note 68, at 130.

[441] *See, e.g.*, *Ontario Launches Consultations to Strengthen Privacy Protections of Personal Data*, ONTARIO (Aug. 13, 2020), https://news.ontario.ca/en/release/57985/ontario-launches-consultations-to-strengthen-privacy-protections-of-personal-data [https://perma.cc/2K2D-D9YH]; *Data Trusts: Lessons from Three Pilots*, OPEN DATA INST. (Apr. 15, 2019), https://theodi.org/news-and-events/blog/odi-data-trusts-report/ [https://perma.cc/Q6KG-7GM7]; Dame Wendy Hall & Jérôme Pesenti, *Growing the Artificial Intelligence Industry in the UK*, GOV.UK (Oct. 15, 2017), https://assets.publishing.service.gov.uk/media/5a824465e5274a2e87dc2079/Growing_the_artificial_intelligence_industry_in_the_UK.pdf [https://perma.cc/3FD4-4YZV].

Rather than adopting China's government-controlled data exchange model, U.S. states should instead create open-access data centers—commercially licensable but publicly managed by a fiduciary authority.[442] To ensure accountability and prevent over-commercialization, these data trusts should be governed under public trust doctrine and public utility law.[443] This would legally bind data trustees to prioritize public benefit over profit-maximization, curbing excessive data extraction and mitigating monopolistic control by a handful of dominant corporations. Dispersing control in this way not only protects individual privacy rights, but also ensures that the AI economy remains open, competitive, and aligned with democratic values.

State legislatures should also enact laws specifically tailored to data centers to address the current legal vacuum—where outdated real estate and commercial laws govern relationships between data centers and their tenants. This regulatory gap has enabled industry players to engage in regulatory arbitrage, exploiting jurisdictional differences by strategically mixing and matching state laws through complex business transactions.[444] To close this gap, states should define data tenancy rights and obligations explicitly. Clear legislative standards would help curb exploitative practices, foster cooperative innovation, and provide a more stable legal framework for the evolving AI economy. Although no state has yet passed legislation in this direction, the concept of treating data as a distinct category of property—and, by extension, classifying data centers and cloud storages as bailments of data—have gained traction among legal scholars.[445] Developing this area of law is increasingly urgent in a fast-moving digital economy, where physical infrastructure and intangible informational assets are deeply intertwined.

2.   Potential Actions for the Federal Government

At the national level, the federal government can strengthen its position in the AI race by leveraging its techno-federalist system without diluting its commitment to liberal-democratic values. The failure of neoliberal free-market politics does not necessitate a wholesale shift towards centralized control. Instead, the federal government should balance industry self-governance with appropriate federal supervision.

A practical way forward is to limit federal regulatory intervention to national security grounds. National security provides an alternative rationale for federal regulation that is not based on the neoliberal pursuit for market efficiency. Instead of confining the federal government's role to "internalizing" negative externalities that spill across states, national security allows the

---

[442] *See* Wu, *Beyond Free Markets and Consumer Autonomy*, *supra* note 68, at 130–31.

[443] *See* K. Sabeel Rahman, *Regulating Informational Infrastructure: Internet Platform as the New Public Utilities*, 2 GEO. L. TECH. REV. 234, 236 (2018).

[444] *See* discussion *supra* Section III(D)(3).

[445] *See* James Grimmelmann & Christina Mulligan, *Data Property*, 72 AM. U. L. REV. 829, 870–874 (2023).

federal government to justify intervention on public safety, social protection, or other normative grounds. This allows the federal government to intervene strategically without overstepping into state and market domains.

However, national security is a double-edged sword. Historically, it has often been misused. Legal scholars have rightly warned against regimes that enable broad national security exceptions, which risk eroding the rule of law and enabling the abuse of executive power.[446] Political theorists like Carl Schmitt and Giorgio Agamben have highlighted how national security imperatives can threaten democratic norms and human dignity under the guise of protecting the public good.[447]

To prevent such outcomes, the United States must establish clear national security guardrails for AI-related rulemaking within federal agencies. Currently, the concept of national security remains poorly defined by both Congress and the courts, with its boundaries largely shaped by executive discretion.[448] The Trump administration frequently invoked national security to justify protectionist economic measures—such as trade barriers and export controls—without articulating clear legal or strategic criteria.[449] The Biden administration also leaned on vague national security objectives, at times framing risks to democratic values as threats without identifying any concrete harm.[450] That should not be.

The federal executive should therefore adopt formal guidelines that clearly define the scope of national security emergencies and the specific powers they trigger. These guidelines should specify the statutory basis, policy objectives, and temporal limits of any measures taken—subject to judicial review and legislative oversight. For example, a proposed executive guideline aimed at addressing AI supply chain risks in microchip manufacturing should narrowly define national security risks as known, verifiable threats to entities or industries that perform essential functions in the national defense production pipeline. Such guidelines should also include expiration timelines, internal review mechanisms, and metrics for assessing the magnitude of the risk at issue.

---

[446] *See, e.g.*, L. Rush Atkinson, *The Fourth Amendment's National Security Exceptions: Its History and Limits*, 66 VAND. L. REV. 1343 (2013); James Bacchus, *The Black Hole of National Security*, CATO INST. POL'Y ANALYSIS NO. 936 (Nov. 9, 2022), https://www.cato.org/policy-analysis/black-hole-national-security [https://perma.cc/CQJ4-7XMH].

[447] *See* Rachel MagShamhrain, *The State of Exception Between Schmitt and Agamben: On Topographies of Exceptionalism and the Constitutionality of COVID Quarantine Measures*, 60 SOC'Y 93, 105 (2022).

[448] *See* Haochen Sun & Peter Wat, *Tech Wars and the Conflict of Public Interests*, 5 GEO. L. TECH. REV. 61, 70 (2021).

[449] *See id.*

[450] *See* THE WHITE HOUSE, BIDEN-HARRIS ADMINISTRATION'S NATIONAL SECURITY STRATEGY 6–7 (Oct. 12, 2022), https://bidenwhitehouse.archives.gov/wp-content/uploads/2022/10/Biden-Harris-Administrations-National-Security-Strategy-10.2022.pdf [https://perma.cc/S4VW-74DS].

While it may seem counterintuitive for the executive branch to voluntarily limit its own discretion, such self-restraint would ultimately enhance institutional credibility, strengthen interbranch cooperation, and improve the legitimacy and effectiveness of national security measures over the long term.

The federal government already possesses the legal tools to pursue this strategy. The International Emergency Economic Powers Act (IEEPA),[451] which grants the President significant power to regulate economic transactions in a national emergency, has been pivotal in the U.S. supply chain strategy against China.[452] For example, the first Trump administration has invoked IEEPA powers twice to restructure the U.S. supply chain—first in 2019 to impose a nationwide Huawei ban and again in 2020 to restrict investments in Chinese military-linked companies.[453] However, those measures suffered from vague national security justifications, undermining U.S. credibility in export controls. They were also ineffective in protecting U.S. critical tech industries, since they did not address systemic supply chain vulnerabilities. Future measures should focus on integrating IEEPA powers with long-term supply chain resilience strategies, ensuring that national security imperatives are both legitimate and effective.

National security also offers a framework for addressing domestic AI supply chain challenges. Federal agency subdivisions, such as the U.S. Artificial Intelligence Safety Institute,[454] can develop national security guidelines to govern AI software, hardware, and infrastructure projects— particularly for defense-critical sectors such as military intelligence. These guidelines can establish compliance mechanisms that provide legal clarity for industry players as they navigate the fragmentary regulatory landscape.

Outbound investment review is another vital tool for policing global AI supply chains. It prevents U.S. subsidies recipients from indirectly financing or supporting critical AI infrastructure or technologies in China and mitigates cross-border regulatory arbitrage. The Committee on Foreign Investment in the United States (CFIUS) can establish protocols for more targeted screening of foreign investments in AI development, especially in projects with potential military applications.

Beyond national security concerns, the federal government can encourage state-led AI initiatives that align with national priorities through financial incentives, such as matching funds or grant programs akin to the U.S.

---

[451] *See* 50 U.S.C. §§ 1701, *et seq.*

[452] *See* CHRISTOPHER A. CASEY, JENNIFER K. ELSEA, LIANA W. ROSEN, CONG. RSCH SERV., R45825, THE INTERNATIONAL EMERGENCY ECONOMIC POWERS ACT: ORIGINS, EVOLUTION, AND USE (2025), https://crsreports.congress.gov/product/pdf/R/R45618/1 [https://perma.cc/Y8SD-QCS5].

[453] *See id.* at 60–61.

[454] *See U.S. Artificial Intelligence Safety Institute*, NAT'L INST. OF STANDARDS AND TECH. (last visited Oct. 6, 2025), https://www.nist.gov/aisi [https://perma.cc/9GLW-H5GW].

CHIPS Act. For instance, federal support could target state projects in AI applications for public health, critical infrastructure, or cybersecurity—areas traditionally within state jurisdiction under federalism principles. [455] By fostering co-regulation between state and federal authorities, such funding would ensure that state-level innovation contributes to a unified national strategy for AI.

VI. CONCLUSION

This article highlights an emerging dynamic in the U.S.-China AI race: both countries are converging towards regulatory fragmentation in their quest for global technological leadership. This challenges the prevailing narrative of regulatory divergence, which frames the AI race as a "battle of values" between liberal democracy and techno-autocracy. However, beyond this dominant framing, a closer examination of AI governance in practice reveals striking similarities in how both countries navigate its complexities.

This convergence stems from the growing influence of the tech industry as a new regulatory force. Increasingly, tech firms operate as co-regulators of AI alongside traditional central and local authorities. Simultaneously, these firms act as the gatekeepers, suppliers, and primary beneficiaries of AI innovation. As both countries strive to align national security priorities with commercial objectives in coordinated AI development, these firms assume quasi-regulatory roles despite their private status. Operating primarily within state and local legal frameworks, tech firms exploit jurisdictional differences and leverage local protectionism to counterbalance federal authority while advancing central industrial policies. This dynamic has created a tripartite equilibrium among federal, state, and market power—a paradigm I term "techno-federalism."

The implications of techno-federalism are twofold. First, it shows that decentralized innovation is not exclusive to the U.S. system of liberal democracy. This dispels the notion of American exceptionalism and invites us to reframe regulatory fragmentation as a consequence of complex market and institutional dynamics, rather than purely ideological values. Second, techno-federalism sheds light on potential future trajectories in the U.S.-China AI race. As both countries navigate the competing demands of national security, local protectionism, and market efficiency within a globalized AI supply chain, the tech industry will increasingly influence the direction of this AI race. Regulatory fragmentation, far from being incidental, will remain a defining feature of this new tripartite equilibrium.

---

[455] *See* discussion *supra* Section II(B).