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The False Choice Between Digital Regulation and Innovation

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This Article challenges the common view that more stringent regulation of the digital economy inevitably compromises innovation and undermines technological progress. This view, vigorously advocated by the tech industry, has shaped the public discourse in the United States, where the country's thriving tech economy is often associated with a staunch commitment to free markets. US lawmakers have also traditionally embraced this perspective, which explains their hesitancy to regulate the tech industry to date. The European Union has chosen another path, regulating the digital economy with stringent data privacy, antitrust, content moderation, and other digital regulations designed to shape the evolution of the tech economy towards European values around digital rights and fairness. According to the EU's critics, this far-reaching tech regulation has come at the cost of innovation, explaining the EU's inability to nurture tech companies and compete with the US and China in the tech race. However, this Article argues that the association between digital regulation and technological progress is considerably more complex than what the public conversation, US lawmakers, tech companies, and several scholars have suggested to date. For this reason, the existing technological gap between the US and the EU should not be attributed to the laxity of American laws and the stringency of European digital regulation. Instead, this Article shows there are more foundational features of the American legal and technological ecosystem that have paved the way for US tech companies' rise to global prominence—features that the EU has not been able to replicate to date. By severing tech regulation from its allegedly adverse effect on innovation, this Article seeks to advance a more productive scholarly conversation on the costs and benefits of digital regulation. It also directs governments deliberating tech policy away from a false choice between regulation and innovation while drawing their attention to a broader set of legal and institutional reforms that are necessary for tech companies to innovate and for digital economies and societies to thrive.

INTRODUCTION

There is a widely held view that more stringent regulation of the digital economy compromises innovation and undermines technological progress. Regulation is commonly viewed as a burden that diverts resources away from firms' innovative activities.[1] Proponents of this view

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point to concrete examples that, presumably, prove this assertion correct. They highlight the astounding success of the leading American tech companies, which have transformed economies and societies while generating tremendous wealth to their founders and investors. These companies were able to grow and scale in a permissive regulatory environment in their home market, which directly and significantly contributed to these companies' commercial success, the argument goes.[2] Evidence from Europe is cited as a cautionary tale to further affirm this view: European tech regulations are extensive while globally successful European tech companies are hard to come by.[3] These observations are then used to draw a causal relationship between a country's digital regulations and the performance of its tech industry.[4]

Until recently, most governments have refrained from regulating the tech industry precisely because of the fear that any attempts to interfere in the operation of tech companies would undermine their innovative capacity. The United States ("US") has led this charge against regulation, insisting on the primacy of free markets, free speech, and the free internet as foundations of the digital economy.[5] The American regulatory approach reflects a view that the country's technology leadership derives from an unregulated marketplace. This techno-libertarian ethos is deeply embedded in the US regulatory regime, which consists of weakly enforced antitrust laws, the absence of a federal data privacy law, and permissive content moderation rules that shield tech companies from liability. In contrast, the European Union ("EU") has frequently leveraged its regulatory powers, including antitrust laws, data privacy regulation, and rules on content moderation, in an effort to rein in tech giants and protect the rights of European citizens.[6] These regulations have had a significant impact on the daily operation of tech companies, constraining the way they collect, process, or share data, design their products, and interact with internet users or other businesses in the marketplace.

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[1] *See, e.g.*, discussion in: Nicholas Crafts, *Regulation and Productivity Performance*, 22 OXFORD REV. ECON. POL'Y 186-202 (2006); Philippe Aghion, Antonin Bergeaud, & John Van Reenen, *The Impact of Regulation on Innovation* (Nat'l Bureau of Econ. Rsch., Working Paper No. 28381, 2021), https://www.nber.org/papers/w28381 (showing that companies are hesitant to invest in their operations when hiring more employees increases regulatory oversight); James Andrew Lewis, *Tech Regulation Can Harm National Security*, CTR. FOR STRATEGIC AND INT'L STUD. (Nov. 28, 2022), https://www.csis.org/analysis/tech-regulation-can-harm-national-security (noting how "Technological innovation does not flourish in an environment of risk-averse and burdensome regulation"); *see also* Shira Ovide, *The Hands-Off Tech Era Is Over*, N.Y. TIMES (June 16, 2023), https://www.nytimes.com/2022/06/15/technology/government-intervention-tech.html?searchResultPosition=3 (acknowledging that "[m]ore government intervention will slow tech down" and inviting normative conversation on the societal implications of digital regulation).

[2] *See, e.g.*, Anupam Chander, *How Law Made Silicon Valley*, 64 EMORY L.J. 677 (2015); *See generally*, Tal Zarsky, *The Privacy-Innovation Conundrum*, 19 LEWIS & CLARK L. REV. 115 (2015); Josh Withrow, *Don't Stifle U.S. Tech Innovation with Europe's Rules*, R STREET (Oct. 9, 2022), https://www.rstreet.org/commentary/withrow-dont-stifle-u-s-tech-innovation-with-europes-rules-opinion/.

[3] *Id.*

[4] Chander, *supra* note 2, at 677 (2015); Zarsky, *supra* note 2, at 115 (2015); *Shaking Up Europe: Andrew McAfee Argues for Less Regulation*, MIT INITIATIVE ON DIGIT. ECON. (Sept. 8, 2021), https://ide.mit.edu/insights/shaking-up-europe-andrew-mcafee-argues-for-less-regulation/; Mark Minevich, *Can Europe Dominate in Innovation Despite US Big Tech Lead?*, FORBES (Dec. 3, 2021), https://www.forbes.com/sites/markminevich/2021/12/03/can-europe-dominate-in-innovation-despite-us-big-tech-lead/?sh=6bfd6c1f1d75.

[5] ANU BRADFORD, DIGITAL EMPIRES: THE GLOBAL BATTLE TO REGULATE TECHNOLOGY ch. 1 (2023) [hereinafter Bradford, Digital Empires]

[6] ANU BRADFORD, THE BRUSSELS EFFECT: HOW THE EUROPEAN UNION RULES THE WORLD (2020) [hereinafter Bradford, The Brussels Effect]; Bradford, Digital Empires, *supra* note 5, ch. 3 (2023).

However, public sentiment is now shifting in the US, with American citizens increasingly recognizing the societal harms caused by tech companies.[7] US political leadership has also started to question the benefits of an unregulated tech economy,[8] and various bills aimed at curtailing the power of tech companies have been proposed in Congress.[9] Despite this growing public and political support for digital regulation, the US government has to date failed to institute any meaningful regulatory reforms. This reflects, in part, a persisting fear that an interventionist regulatory approach would undermine tech companies' innovative activities and thus halt the country's economic and technological progress.[10] This concern is heightened in today's era of the US-China tech war, which accentuates the importance of retaining—or, some would argue, reclaiming—American technological leadership.[11] Thus, a deep-rooted concern remains that a more regulated digital economy would force the US to relinquish its role as a technological leader, leaving the country without many beneficial innovations, while ceding to China's supremacy in the unfolding tech race.

At first sight, it seems understandable that the US is reluctant to follow the EU's path in digital regulation. It is tempting to observe causality between the EU's stringent regulatory regime and the dearth of leading tech companies emanating from Europe. After all, there is no European Amazon, Apple, Google, Meta, or Microsoft. European companies contribute less than 4% of the market capitalization of the world's 70 largest platforms, while the US's share is 73%.[12] Various other metrics all point to the same, unambiguous conclusion that the EU is currently lagging behind the US in technological prowess. European firms trail their US counterparts in profitability,

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[7] *See* Monica Anderson, *Most Americans Say Social Media Companies Have Too Much Power, Influence in Politics*, PEW RSCH. CTR. (July 22, 2020), https://www.pewresearch.org/fact-tank/2020/07/22/most-americans-say-social-media-companies-have-too-much-power-influence-in-politics/ [https://perma.cc/ZK6N-HBSC].

[8] *See* Eric Johnson, *Nancy Pelosi Says Trump's Tweets "Cheapened the Presidency" – and the Media Encourages Him*, VOX (Apr. 12, 2019), https://www.vox.com/2019/4/12/18307957/nancy-pelosi-donald-trump-twitter-tweet-cheap-freak-presidency-kara-swisher-decode-podcast-interview [https://perma.cc/S9UK-FU7K] (addressing Rep. Pelosi's perspective on Section 230*): FACT SHEET: Executive Order on Promoting Competition in the American Economy*, WHITE HOUSE (July 9, 2021), https://www.whitehouse.gov/briefing-room/statements-releases/2021/07/09/fact-sheet-executive-order-on-promoting-competition-in-the-american-economy/.

[9] *See, e.g.*, American Innovation and Choice Online Act, S. 2992, 117th Cong. (2021) (as reported by S. Comm. on the Judiciary, Mar. 2, 2022); Press Release, Rep. Ro Khanna, Release: Rep. Khanna Releases 'Internet Bill Of Rights' Principles, Endorsed By Sir Tim Berners-Lee (Oct. 4, 2018), https://khanna.house.gov/media/press-releases/release-rep-khanna-releases- internet-bill-rights-principles-endorsed-sir-tim#:~:text=Set%20of%20Principles%20for%20an,of%20personal%20data%20by%20companies%3B&text=(10)%20To%20have%20an%20entity,accountability%20to%20protect%20your%20privacy [https://perma.cc/RS54-PEZG]; CONSENT Act, H.R. 5815, 115th Cong. (2018); *see also* H.R. 3843, *infra* note 84; Kellen Browning, David McCabe, & Karen Weise, *Judge Rejects F.T.C. Delay of $70 Billion Microsoft-Activision Deal*, N.Y. TIMES (July 11, 2023), https://www.nytimes.com/2023/07/11/technology/microsoft-activision-deal-ftc.html; *however, see* Tonya Riley, *The FTC's Biggest AI Enforcement Tool? Forcing Companies to Delete Their Algorithms*, CYBERSCOOP (July 5, 2023), https://cyberscoop.com/ftc-algorithm-disgorgement-ai-regulation/; *Crypto Assets and Cyber Enforcement Actions*, SEC (June 15, 2023), https://www.sec.gov/spotlight/cybersecurity-enforcement-actions.

[10] See discussion *infra*.

[11] Nitasha Tiku, *Big Tech: Breaking Us Up Will Only Help China*, WIRED (May 23, 2019), https://www.wired.com/story/big-tech-breaking-will-only-help-china/.

[12] *The EU Wants to Set the Rules for the World of Technology*, ECONOMIST (Feb. 22, 2020), https://www.economist.com/business/2020/02/20/the-eu-wants-to-set-the-rules-for-the-world-of-technology [https://perma.cc/FB4D-VLEQ?view-mode=server-side].

growth, and innovation, contributing to a significant technology gap between the US and the EU.[13] At the same time, the EU has earned a reputation as the world's "regulatory superpower."[14] Consumers may not be able to name any leading European tech companies, but they all have heard about the "GDPR," the EU's data privacy regulation. Thus, while the EU may not be capable of generating the world's leading tech companies, it has shown itself more than capable in generating regulations seeking to govern those companies.

However, while the transatlantic technology gap is unquestionable, it is less clear that the EU's exacting tech regulations are the reason why today's tech giants were founded in the US and not in the EU. This prevailing view is overly simplistic in how it characterizes the relationship between digital regulation and innovation. It also reflects several misunderstandings about the strengths and weaknesses of the American and European regulatory regimes and their respective tech ecosystems. Instead, a closer examination of US-EU differences suggests that the EU's inability to cultivate an equally successful tech industry can be traced to various other factors, including (1) the fragmented digital single market that prevents the scaling of innovations within the EU, (2) under-developed capital markets that limit tech companies' ability to grow in the EU, (3) Europe's punitive bankruptcy laws that deter risk-taking, and (4) the absence of a proactive immigration policy that would allow the EU to harness foreign tech talent. At the same time, these same factors are inherent strengths of the US's legal regime and tech ecosystem, directly contributing to the success of US tech companies. Thus, there is much that Europe is not getting right in terms of nurturing innovation and cultivating leading tech companies. But choosing to regulate the tech industry in the name of safeguarding individual rights and societal freedoms is not where the problem lies.

In advancing our understanding of the relationship between regulation and innovation, this Article makes several contributions, three of which should be highlighted here. First, the Article shows that lenient tech regulation is not necessary for the development of a thriving tech sector or, conversely, that stringent tech regulation does not inherently prevent powerful tech companies from emerging. Second, the Article demonstrates how the country's broader legal, economic, political, and cultural attributes shape its digital economy and determine whether tech companies are likely to thrive or falter. Thus, any causal claims about the relationship between tech regulation and innovation must first account for a host of other variables that may, in the end, have a more substantial effect on the relative success of the country's tech industry. Third, the scholarly insights of this Article also have concrete policy implications for the US and the EU. In rejecting the view that Europe's tech regulations hinder Europe's tech industry, the Article lends normative support to the EU's ambitious digital regulatory agenda. This should embolden the EU to continue to pursue its aspirations around fundamental rights, democracy and fairness as hallmarks of the digital economy. At the same time, by identifying a set of other factors that adversely affect the European tech industry, the Article leaves the EU with a long and urgent list of policy reforms,

[13] MCKINSEY GLOBAL INSTITUTE, SECURING EUROPE'S COMPETITIVENESS vi (2022), https://www.mckinsey.com/~/media/mckinsey/business%20functions/strategy%20and%20corporate%20finance/our%20insights/securing%20europes%20competitiveness%20addressing%20its%20technology%20gap/securing-europes-competitiveness-addressing-its-technology-gap-september-2022.pdf [hereinafter Securing Europe's Competitiveness]

[14] Bradford, The Brussels Effect, *supra* note 6.

which European leaders ought to prioritize if they want the EU to not only generate tech regulations but also cultivate leading tech companies.

Similarly, the Article should offer solace to any American decision-maker—or any other foreign government—that is looking to regulate the tech industry but hesitates to do so for fear of compromising the country's economic and technological progress. Choosing to regulate the tech industry does not force the US to forgo the benefits of innovation or lose the race for technological leadership to China. Instead, it is possible for the US to have both ambitious tech regulation and impressive tech innovation—as long as the US continues to invest in the key strengths that have sustained its tech leadership to date.

This Article proceeds as follows. Part I describes the common view under which countries seeking to regulate their tech industry will face an inevitable trade-off in terms of innovation and technological and economic progress. Part II challenges this view and shows how the relationship between the level of tech regulation and the rate of innovation is more complex than the public conversation has often acknowledged. In doing so, it also rejects the argument that the US-EU technology gap can primarily be attributed to tech regulation. Part III offers an alternative explanation for the US tech companies' relative success compared to their European rivals. It argues that the US-EU differences in technological prowess can be predominantly traced to existing differences in market integration, capital markets, bankruptcy regimes and risk-taking, and talent acquisition. The Conclusion draws lessons for scholars and policymakers from the discussion, inviting a new way to think about the relationship between tech regulation and innovation.

I. EXISTING VIEW ON TECH REGULATION AND INNOVATION

Many of the world's leading tech companies today emanate from the United States or, increasingly, also from China. In stark contrast to the American tech behemoths—including Amazon, Apple, Google, Meta, Microsoft—or the Chinese tech giants—including Alibaba, Baidu, Huawei, JD.com, Tencent, and Xiaomi—European countries have nurtured few leading tech companies. With the exception of perhaps Spotify, few European companies are even known by global internet users. A look at almost any key tech indicator reveals the extent to which the EU is currently lagging behind the technological prowess of the US,[15] raising the question of why the EU has been unable to create a vibrant tech industry of its own.

For example, it is telling that the four most valuable brands in the world in 2023 were Apple, Microsoft, Amazon, and Google.[16] These brands are embraced by consumers and investors alike. Amazon, Apple, Google, Meta, and Microsoft collectively recorded over $1 trillion in revenue in 2020, while earning an income of $197 billion and having a market capitalization exceeding $10 trillion by February 2024.[17] In 2021, the combined market capitalization of Apple,

[15] *See* Frances G. Burwell & Kenneth Propp, *The European Union and the Search for Digital Sovereignty: Building "Fortress Europe" or Preparing for a New World?*, ATL. COUNCIL, June 2020, at 5.
[16] *Leading Brands Worldwide in 2023, by Brand Value*, STATISTA (Feb. 16, 2024), https://www.statista.com/statistics/264826/most-valuable-brands-worldwide-in-2009/.
[17] Alison Beard, *Can Big Tech Be Disrupted?*, HARV. BUS. REV., Jan.-Feb. 2022, at 54; *Mega-cap companies saw strong gains in 2023 amid tech optimism*, REUTERS (Jan. 2. 2024), https://www.reuters.com/markets/us/global-markets-marketcap-2024-01-02/.

Alphabet, Meta and Amazon exceeded the value of the over 2,000 companies listed on the Tokyo Stock Exchange; Apple and Meta together were worth more than the 100 companies with the highest market cap listed on the London Stock Exchange; and Amazon alone eclipsed the entire German DAX Index, which represents around 80% of the market cap of companies publicly listed in Germany.[18]

Other statistics unveil a very similar story. On *The Forbes* 2023 list of "The World's Largest Technology Companies," only three EU-based companies, ASML, SAP, and Accenture, made it into the top twenty. Meanwhile, there were eleven US companies on that list.[19] Other statistics portray an equally sobering picture. When focusing on the world's top 100 unicorns, only fourteen were European companies as of January 2024, with six of those hailing from the United Kingdom as opposed to the EU.[20] There is a well-documented transatlantic technology gap that permeates many cutting-edge technologies, including quantum computing and artificial intelligence ("AI").[21] The ten largest companies investing in quantum computing hail from the US and China, not Europe. Similarly, US companies' investment in AI is six times higher than that of European companies. The EU also trails the US and China in AI patent filings.[22] It was therefore no surprise to anyone that OpenAI and its much-hyped large language model chatbot ChatGPT emerged from the US and not Europe. These statistics paint a clear picture of the EU's relative weakness in the global tech race and raise the important question of why the EU lags behind the US in tech innovations.

Several critics attribute the dearth of tech companies hailing from Europe to the EU's stringent approach towards tech regulation, including the EU's exacting data privacy laws or its propensity to leverage its antitrust laws to challenge dominant online platforms.[23] Over the past decade, the EU has gained a reputation as the primary jurisdiction regulating tech companies.[24] It has promulgated a myriad of regulations that have a significant impact on the daily operation of tech companies, constraining the way they collect, process, or share data; design their products; or interact with internet users or other businesses on the marketplace. In stark contrast to the EU, the US has adopted a laissez-faire approach towards digital regulation, prioritizing free market, free speech, and free internet. The success of US tech companies is often attributed to the enabling regulatory environment, which allowed US tech companies to grow and innovate unconstrained by regulatory burdens. At the same time, the EU's failure to replicate the US's success in tech innovations has similarly been attributed to the regulatory burdens faced by EU companies.

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[18] Leo Lewis, *Tokyo Stock Market Eclipsed by the Four Tech Leviathans*, FIN. TIMES (Sept. 1, 2021), https://www.ft.com/content/460747da-a410-41aa-a8a4-0c991f264c06 (on file with author).
[19] Jonathan Ponciano, *The World's Largest Tech Companies in 2023: A New Leader Emerges*, FORBES (June 8, 2023), https://www.google.com/url?q=https://www.forbes.com/sites/jonathanponciano/2023/06/08/the-worlds-largest-technology-companies-in-2023-a-new-leader-emerges/?sh%3D4a97cc965d1d&sa=D&source=docs&ust=1690825996119248&usg=AOvVaw0nGe73zJXZxfxbHRPYmDl0.
[20] *The Complete List of Unicorn Companies*, CBINSIGHTS, https://www.cbinsights.com/research-unicorn-companies (last accessed Mar. 3, 2024).
[21] Securing Europe's Competitiveness, *supra* note 13.
[22] Shana Lynch, *The State of AI in 9 Charts*, STANFORD UNIV. HUMAN-CENTERED A.I. (Mar. 16, 2022), https://hai.stanford.edu/news/state-ai-9-charts.
[23] *See infra* Section I.C.
[24] Bradford, The Brussels Effect, *supra* note 6.

The discussion below first reviews the US's approach towards tech regulation before contrasting that with the EU's regulatory approach. The US has adopted a so-called "market-driven regulatory model," where protecting free speech, free internet, and incentives to innovate form central pillars of its regulatory regime.[25] In contrast, the EU has embraced what could be labeled as a "rights-driven regulatory model," where fundamental rights and the notion of a fair marketplace take center stage.[26] This comparison reveals significant differences in terms of regulations that tech companies face in Europe and the US. The discussion then shows how these differences are commonly thought to explain the EU's failure to match the US in the global tech race, with policymakers, tech companies, and some legal scholars drawing a causal link between the EU's stringent tech regulations and the relatively weaker performance of European tech companies.

A few notes on terminology and the scope of the analysis before proceeding. The terms "tech regulation" or "digital regulation" are here understood to refer to legislative, administrative, or enforcement actions targeting the tech sector or the digital economy specifically, or having a substantial effect on the way tech companies operate. For example, rules on content moderation, including the EU's newly adopted Digital Services Act, are a clear example of digital regulation. In contrast, data privacy regulation—such as the EU's GDPR—applies to a wide range of industries but can be viewed as digital regulation given its profound impact on tech companies whose business models rely on collecting and monetizing data. Similarly, antitrust law is not limited to the tech sector but has over the past decade become a key policy tool—especially in the EU—to shape the tech industry, with a flurry of enforcement actions targeting the largest online platforms. In addition, the EU has recently adopted a Digital Markets Act, which is a specific digital regulation designed to enhance competition in the digital economy. For the purpose of this Article, all these measures geared at constraining the operation of the tech companies and shaping the digital economy fall under the rubric of "tech regulation" or "digital regulation."

The below discussion focuses on EU-level regulation, even though there have been significant legislative developments on the individual EU Member State level, which have shaped the broader European approach towards the digital economy. The analysis also omits any discussion of tech regulation in China. However, China's regulatory posture has until very recently resembled that of the US in terms of maximizing the country's tech companies' ability to grow and innovate, largely unburdened by regulatory constraints.[27] China has also managed to nurture a powerful domestic tech industry, further contributing to the perception that lax regulation and technological progress, indeed, go hand in hand.

A. Tech Regulation in the US

The US's approach towards regulating the digital economy is shaped by the country's uncompromised faith in markets and skepticism towards government regulation.[28] This market-

[25] Bradford, Digital Empires, *supra* note 5, Ch. 1.
[26] *Id.* Ch. 3.
[27] Angela Huyue Zhang, *Agility Over Stability: China's Great Reversal in Regulating the Platform Economy*, 63 HARV. INT'L L. J. 457, 471–83 (2022).
[28] *See Read the Framework*, CLINTON WHITE HOUSE, https://clintonwhitehouse4.archives.gov/WH/New/Commerce/read.html [https://perma.cc/WV7G-RMJM] (last visited Nov. 16, 2022).

driven regulatory model reflects American deep-rooted techno-optimism, which places its trust in tech companies' ability to self-regulate. Regulation is viewed as an impediment to innovation as it increases costs and constrains innovative behavior. As a result, the government needs to step aside to maximize the private sector's unfettered innovative zeal and, with that, economic growth. According to this American techno-libertarian view, government intervention not only compromises the efficient operation of markets; it also undermines individual liberty and societal progress. Thus, while the US's commitment to innovation and growth provides the economic rationale against government intervention, its commitment to individual liberty and freedom is invoked as a political reason to limit the government's role.

These free-market ideas are deeply entrenched in the existing US legal regime. No other law better captures the techno-libertarian ethos of the American market-driven model than Section 230 of the Communications Decency Act ("CDA") of 1996.[29] This law provides immunity for online intermediaries, precluding these companies from being held legally liable for any third-party content that they host on their platforms. For example, YouTube cannot be held responsible when a user uploads a video that promotes violence, and Meta cannot be accused of defamation when a Facebook user posts a libelous comment about someone on that platform. At the same time, if YouTube chose to take the illegal video down or Meta chose to remove the defamatory post, these companies would be free to do so without a fear that they are violating the user's free speech rights. This immunity that protects platforms' action and inaction alike has been viewed as essential for online services to grow and flourish.[30]

The US's anti-regulation stand extends to other facets of tech regulation, including data privacy. Even as most countries in the world have recently adopted data privacy laws, no comprehensive federal privacy law has emerged from Congress. Congress has also not updated its dated antitrust statutes that, according to many, are ill-suited to address the problems of today's digital economy. Nor has Congress acted to regulate artificial intelligence, protect the rights of gig workers, or impose obligations on platforms to share revenue with creators of copyright protected content. This minimalist US legislative framework stands in stark contrast to the legislative activity of the EU, which has regulated extensively across these and many other domains of the digital economy, as discussed below. The US courts have also vigorously defended the unregulated tech economy, lending their legitimacy to the free-market ethos that underlies the US's regulatory approach towards the digital economy.[31]

This American commitment to free market ideas has remained unchanged across different administrations, with both Democrats and Republicans shunning tech regulation. For example, the Obama Administration's 2011 International Strategy for Cyberspace identified the promotion of

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[29] 47 U.S.C. § 230 (2018).

[30] Emily Bazelon, *How to Unmask the Internet's Vilest Characters*, N.Y. TIMES MAG. (Apr. 22, 2011), https://www.nytimes.com/2011/04/24/magazine/mag-24lede-t.html [https://perma.cc/8RBN-BDWD].

[31] *Zeran v. America Online, Inc.*, 129 F.3d 327, 330 (1997) (stressing the Congressional focus on freedom of speech); *see also*, Kate Klonick, *The New Governors: The People, Rules, and Processes Governing Online Speech*, 131 HARV. L. REV. 1598, 1606–09 (2018) (discussing the *Zeran* case and laying out the two objectives of Section 230); *Batzel v. Smith*, 333 F.3d 1018, 1027 (2018).

THE WHITE HOUSE, INTERNATIONAL STRATEGY FOR CYBERSPACE: PROSPERITY, SECURITY, AND OPENNESS IN A NETWORKED WORLD 17 (2011), https://obamawhitehouse.archives.gov/sites/default/files/rss_viewer/international_strategy_for_cyberspace.pdf.

open markets as a policy priority, explaining how the role of the government was to "sustain that free-trade environment, particularly in support of the high-tech sector, to ensure future innovation."[32] Only very recently have some members of Congress started to question the free-market orthodoxy as a foundation of the digital economy. Several bills calling for more governmental oversight over tech companies are pending in both the House of Representatives and the Senate.[33] However, the persistent partisan gridlock has ensured that Congress has not been able to harness the needed political consensus to pass any such proposed legislation to date. Thus, Congress—through its inaction—continues to sustain the market-driven regulatory model as the foundation of the US digital economy even today.

Close links between Silicon Valley and Washington DC have likely contributed to the US's laissez-faire approach towards tech regulation. Tech companies' outsized influence over the political process in the US is undeniable, and the lax regulatory environment, in part, reflects the tech industry's persistent lobbying efforts. These tech companies' significance to the US economic growth and innovation base is clear, making political leaders more susceptible to their views. For example, Apple, Amazon, Google, and Meta combined spent more than $55 million on lobbying the federal government in 2021, up from $34 million in 2020.[34] In 2021, Amazon alone spent a record-high $19 million on lobbying,[35] and Meta over $20 million.[36] These tech companies often cite innovation and competitiveness as reasons for the government to refrain from regulating them. For example, in 2022, these companies argued in congressional antitrust hearings that more robust antitrust legislation would "give a free pass" to foreign companies, hurting US competitiveness.[37]

Thus, the US's ideological commitment to free markets, together with the relentless corporate lobbying and congressional dysfunction, likely explain why the US has refrained from regulating its tech industry to date. While this regulatory approach has faced criticism, a common perception is that it has ensured that the American culture of innovation and commitment to technological progress has remained untouched, with economic growth and social progress ensuing as a direct result of that approach.

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[32] The White House, International Strategy for Cyberspace: Prosperity, Security, and Openness in a Networked World, 17 (2011).

[33] See e.g. American Innovation and Choice Online Act, S. 2992, 117th Cong. (2021) (as reported by S. Comm. on the Judiciary, Mar. 2, 2022); Press Release, Rep. Ro Khanna, Release: Rep. Khanna Releases 'Internet Bill Of Rights' Principles, Endorsed By Sir Tim Berners-Lee (Oct. 4, 2018), https://khanna.house.gov/media/press-releases/release-rep-khanna-releases- internet-bill-rights-principles-endorsed-sir-tim#:~:text=Set%20of%20Principles%20for%20an,of%20personal%20data%20by%20companies%3B&text=(10)%20To%20have%20an%20entity,accountability%20to%20protect%20your%20privacy [https://perma.cc/RS54-PEZG]; CONSENT Act, H.R. 5815, 115th Cong. (2018).

[34] Emily Birnbaum, *Tech Spent Big on Lobbying Last Year*, POLITICO (Jan. 24, 2022), https://www.politico.com/newsletters/morning-tech/2022/01/24/tech-spent-big-on-lobbying-last-year-00001144 [https://perma.cc/MB2J-2REN].

[35] Cat Zakrzewski, *Tech Companies Spent Almost $70 million Lobbying Washington in 2021 as Congress Sought to Rein in Their Power*, WASH. POST (Jan 21, 2022), https://www.washingtonpost.com/technology/2022/01/21/tech-lobbying-in-washington/ (on file with author).

[36] Lobbying Report: Lobbying Disclosure Act of 1995 (Section 5), https://www.politico.com/f/?id=0000017e-7dc2-d1fc-ad7f-ffc269ad0000 [https://perma.cc/2QL5-4W9A] (last visited on Oct. 26, 2022).

[37] Kent Walker, *The Harmful Consequences of Congress's Anti-Tech Bills*, GOOGLE: PUBLIC POL'Y (Jan. 18, 2022), https://blog.google/outreach-initiatives/public-policy/the-harmful-consequences-of-congresss-anti-tech-bills/ [https://perma.cc/N6F5-8JNU].

B. Tech Regulation in the EU

The EU acknowledges that tech companies' innovative products and services generate vast benefits for individuals and societies and that their development should therefore be encouraged. At the same time, the European approach towards the tech industry reflects its concern that the digital transformation has ushered in an exceedingly concentrated economy where a few powerful tech companies control vast economic wealth and exert political power. With this economic power, these companies can abuse their market dominance and restrict competition to the detriment of their rivals and consumers.[38] The EU also maintains that unmitigated free speech online does not always serve societies well. These companies have become platforms for disinformation, hate speech, and other repulsive content, often undermining the safety and dignity of individuals while dividing societies and destabilizing democracies.[39] They have also violated individuals' rights to data privacy by extracting vast data on their users' private lives and commercializing that information through targeted advertising.[40]

In light of these concerns, the EU has engaged in extensive regulatory activity, adopting a number of laws that restrict tech companies' business models over the past decade. The EU protects the fundamental right to data privacy through the 2016 General Data Protection Regulation ("GDPR").[41] It also seeks to curtail the market power of dominant tech companies through active enforcement of antitrust laws, complemented by the 2022 Digital Markets Act ("DMA").[42] The DMA is a major piece of digital regulation which aims to enhance market competition by restricting certain business practices by "digital gatekeepers" that are deemed anticompetitive.[43] The EU regulates online content through a host of regulatory instruments, including the 2019 Copyright Directive[44] and the 2021 Regulation on Terrorist Content.[45] It has also implemented codes of conduct targeting disinformation and hate speech,[46] which paved the way for an over-arching regulation of online intermediaries, the 2022 Digital Services Act

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[38] Beard, *supra* note 17, at 54.

[39] *See generally* TARLETON GILLESPIE, CUSTODIANS OF THE INTERNET: PLATFORMS, CONTENT MODERATION, AND THE HIDDEN DECISIONS THAT SHAPE SOCIAL MEDIA (2018).

[40] *See* SHOSHANA ZUBOFF, THE AGE OF SURVEILLANCE CAPITALISM: THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER 17 (2019) [check pincite]

[41] Regulation 2016/679, of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with regard to the Processing of Personal Data and on the Free Movement of Such Data, and Repealing Directive 95/46/EC, 2016 O.J. (L 119) 1.

[42] Regulation (EU) 2022/1925, of the European Parliament and of the Council of 14 September 2022 on Contestable and Fair Markets in the Digital Sector and Amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act), 2022 O.J. (L 265) 1.

[43] *Id.*

[44] Directive (EU) 2019/790, of the European Parliament and of the Council of 17 April 2019 on Copyright and Related Rights in the Digital Single Market and Amending Directives 96/9/EC and 2001/29/EC, 2019 O.J. (L 130) 92.

[45] Regulation (EU) 2021/784, of the European Parliament and of the Council of 29 April 2021 on Addressing the Dissemination of Terrorist Content Online, 2021 O.J. (L 172) 79.

[46] EUR. COMM'N, THE STRENGTHENED CODE OF PRACTICE ON DISINFORMATION 2022 (2022), https://ec.europa.eu/newsroom/dae/redirection/document/87585 (on file with the author); EUR. COMM'N, CODE OF CONDUCT ON COUNTERING ILLEGAL HATE SPEECH ONLINE (2016), https://ec.europa.eu/newsroom/just/document.cfm?doc_id=42985 (on file with the author).

("DSA").[47] The EU is also leading the way in regulating AI, with its ambitious and comprehensive AI Act expected to be finalized still this year.[48] The EU also seeks to enhance the labor rights of platform workers with a Directive that is likely to become law in 2024.[49] These are but some examples of the EU's multifaceted regulatory agenda through which it is actively shaping the digital economy.[50]

What these numerous digital regulations have in common is a focus on enhancing rights—be it the fundamental rights of internet users, the democratic rights of digital citizens, the social rights of platform workers, or various economic rights of smaller market actors. The EU's extensive digital agenda also reflects a deep-seated belief that markets will not, left to their own devices, yield optimal outcomes and that government intervention is needed to preserve and strengthen these rights. In contrast to the American market-driven model, which emphasizes how governments do not understand technology and should hence refrain from regulating it, the EU is more concerned that tech companies do not understand how technology implicates individuals' fundamental rights or democratic institutions, which their products and services are frequently undermining.[51] Thus, the digital economy needs to be regulated to ensure that it will be rights-preserving, democracy-enhancing, and, ultimately, capable of distributing the benefits of the digital transformation more widely and fairly.

The EU's pro-regulation stance is not limited to the technology sector but reflects a broader view of how markets operate and what the optimal role of government is. Compared to the US, the state enjoys greater public trust in the EU and can therefore assume a more prominent role in regulating markets.[52] In terms of the influential literature on "varieties of capitalism," most European countries exhibit features of a "coordinated market economy" as opposed to a "liberal market economy," meaning they reserve a greater role for government regulation and non-market institutions.[53] Andreas Schwab, a Member of the European Parliament and the Parliament's chief

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[47] Regulation (EU) 2022/2065, of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services and Amending Directive 2000/31/EC (Digital Services Act), 2022 O.J. (L 277) 1.

[48] *Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) And Amending Certain Union Legislative Acts*, COM (2021) 206 final, 2021/0106 (COD) (Apr. 21, 2021); Draft European Parliament Legislative Resolution on the Proposal for a Regulaton of the European Parliament and of the Council on Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts EUR. PARL. DOC. (COM 206) (2023). [update after expected April adoption]

[49] *Proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work*, COM (2021) 762 final, 2021/0414 (COD) (Dec. 9, 2021). [update after expected April adoption]

[50] For other examples, *see, e.g.*, *Proposal for a Regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act)*, COM (2022) 68 final, 2022/0047 (COD) (Feb. 23, 2022); Regulation (EU) 2022/868, of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), 2022 O.J. (L 152) 1; Foo Yun Chee, *EU's Planned Digital Levy to Cover Hundreds of Firms, Vestager Says*, REUTERS (July 2, 2021), https://www.reuters.com/business/exclusive-eus-planned-digital-levy-cover-hundreds-firms-vestager-says-2021-07-02/.

[51] Paul Nemitz, *Constitutional Democracy and Technology in the Age of Artificial Intelligence*, PHIL. TRANS. R. SOC. A., Oct. 15, 2018, at 1, 5.

[52] The EU's commitment to the social market economy is explicitly mentioned as a common objective for Europe, see Consolidated Version of the Treaty on European Union art. 3, 2012 O.J. (C 326) 13 [hereafter TEU].

[53] See PETER A. HALL & DAVID SOSKICE, VARIETIES OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE (2001).

negotiator for the DMA, captured this view when he recently commented on the passage of the DMA in Parliament. Schwab emphasized how the Community's "message is clear: the EU will enforce the rules of the social market economy also in the digital sphere, and this means that lawmakers dictate the rules of competition, not digital giants."[54]

The EU's rights-driven regulatory approach reflects an ideological commitment to a human-centric, rights-driven, and regulated digital economy. This regulatory approach also has strong backing from the European citizenry, revealed by several large public opinion surveys that show important support for more extensive digital regulation.[55] This public support has lent both democratic legitimacy and political momentum to the EU's regulatory agenda—momentum that even extensive lobbying by the tech industry has not been able to reverse.[56] The political environment in the EU has also been conducive to extensive rule-making. In contrast to their American counterparts, European political elites are ideologically less divided and consequently more responsive to public demand for more stringent regulations. Parties across the ideological spectrum in Europe may differ in the extent of their support for regulation, but they share a fundamental commitment to a regulated market economy.[57] The DMA illustrates this political consensus particularly well. The law was adopted in the European Parliament with 588 votes in favor, eleven against, and thirty-one abstentions, with parties across the political spectrum lending resounding support.[58] This degree of consensus is revealing of Europe's faith that governments, not tech companies, ought to be the guardians of the digital economy.

C. The Perceived Relationship between Tech Regulation and Tech Innovation

The above discussion reveals how the EU regulates the digital economy with a relatively heavy hand compared to the US. The EU's restrictive regulatory approach is often thought to increase the operating costs of companies and to deter innovation, casting a shadow over the EU's technology sector and leaving the EU behind the US and China in the unfolding tech race. Thus, a common criticism associated with the European regulatory approach is that it overdoes regulation—to the extent that it kills innovation and stifles economic progress. According to this view, the EU may be more successful in safeguarding the fundamental rights of individuals and

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[54] Press Release, Digital Markets Act: Parliament Ready to Start Negotiations with Council, EUR. PARL. (Dec. 15, 2021), https://www.europarl.europa.eu/news/en/press-room/20211210IPR19211/digital-markets-act-parliament-ready-to-start-negotiations-with-council [https://perma.cc/9FHM-UQY3?view-mode=server-side]

[55] See e.g., EUR. COMM'N, SPECIAL EUROBAROMETER 477 REPORT: DEMOCRACY AND ELECTIONS 5 (2018), https://europa.eu/eurobarometer/api/deliverable/download/file?deliverableId=67373 [https://perma.cc/3MY3-QB4K?view-mode=server-side]; EUR. COMM'N SPECIAL EUROBAROMETER 503 REPORT: ATTITUDES TOWARDS DIGITALISATION ON DAILY LIVES 49 (2020), https://europa.eu/eurobarometer/api/deliverable/download/file?deliverableId=72615 [https://perma.cc/8EPT-MV3M?view-mode=server-side].

[56] Adam Satariano & Matina Stevis-Gridneff, *Big Tech Turns Its Lobbyists Loose on Europe, Alarming Regulators*, N.Y. TIMES (2020), https://www.nytimes.com/2020/12/14/technology/big-tech-lobbying-europe.html; Javier Espinoza, *How Big Tech Lost the Antitrust Battle with Europe*, FIN. TIMES (Mar. 21, 2022), https://www.ft.com/content/cbb1fe40-860d-4013-bfcf-b75ee6e30206.

[57] Andreas Laudner, The Polarization of the European Party System – New Data, New Approach, New Results 7 (Sept. 5, 2014) (paper presented in panel P361- "The Methodological Challenges of Designing Cross-National Voting Advice Applications" at the ECPR General Conference). [check]

[58] *European Parliament's Plenary Adopts the Digital Services Act and Digital Markets Act*, ECOMMERCE EUR. (July 7, 2022), https://ecommerce-europe.eu/news-item/european-parliaments-plenary-adopts-the-digital-services-act-and-digital-markets-act/ [https://perma.cc/JHV9-9K38?view-mode=server-side].

the democratic structures of society, but its stringent regulatory approach deprives societies of economic opportunities. This concern stems from a widely held belief that there is an inevitable trade-off between regulation and innovation.

Several tech entrepreneurs and industry analysts explicitly trace EU tech companies' relative lack of success to the level of tech regulation they face. Andrew McAfee, co-founder of the MIT Initiative on the Digital Economy, argues that "more upstream governance translates to less downstream innovation" in the EU and predicts that the "expensive and time-consuming requirements" in the EU's proposed AI rules "will generate less tech innovation."[59] Jack Ma, the co-founder of Alibaba Group, has also suggested that the EU's "tighter regulation could hamper its ability to innovate," noting that China's "lack of regulation around the internet in the early days allowed China's mobile internet to flourish and for Alibaba to thrive."[60] Other major industry voices concur, arguing that the EU's proposed AI rules "will run up costs and stifle innovation," which "will have a negative impact on Europe's technology sector over the long term."[61] One tech industry association representative points out that Spotify is one of the few successful European tech companies and, to change that, the EU ought to "rethink its approach to regulation."[62] A 2020 study, conducted by Oxera but commissioned by Amazon, strikes a similar tone, warning that the EU's DMA "risk[s] reducing innovation overall."[63] These statements capture a common sentiment that assumes a direct link between the EU's stringent tech regulations and its lackluster technological progress.

Most leading tech companies themselves, unsurprisingly, frequently voice criticism that more tech regulation results in lesser innovation. In commenting on the EU's proposed DMA, Apple noted that mandated interoperability and data access obligations may hinder innovation, warning that the Commission's proposed measures on interoperability would "stifle the kind of consumer-focused innovation that Apple stands for."[64] Meta similarly warned that the DMA would suppress innovation while describing the existing market as "rapidly evolving, dynamic, and highly innovative."[65] Google cautioned the Commission that, with *ex ante* regulation such as the DMA, "there is a risk of chilling innovation to the detriment of consumers." For example, a blanket ban on self-preferencing—a practice for which the EU has previous fined Google—would,

[59] Andrew McAfee, *supra* note 59.
[60] Zen Soo, *Alibaba's Jack Ma Says He Is "Worried" Europe Will Stifle Innovation with Too Much Tech Regulation*, S. CHINA MORNING POST (May 17, 2019), https://www.scmp.com/tech/big-tech/article/3010606/alibabas-jack-ma-says-he-worried-europe-will-stifle-innovation-too [https://perma.cc/C5K6-SBXT?view-mode=server-side].
[61] Angus Loten, *Corporate Tech Leaders are Mixed on EU Artificial Intelligence Bill*, WALL ST. J. (Apr. 21, 2021), https://www.wsj.com/articles/corporate-tech-leaders-are-mixed-on-eu-artificial-intelligence-bill-11619049736 (on file with the author).
[62] Gary Shapiro, *How the EU's War on U.S. Innovation Stifles European Creativity*, INVESTOR'S BUS. DAILY (Sept. 12, 2016), https://www.investors.com/politics/commentary/how-the-eus-war-on-u-s-innovation-stifles-european-creativity/ [https://perma.cc/3MZQ-R6SX?view-mode=server-side].
[63] *The Impact of the Digital Markets Act on Innovation*, OXERA (commissioned by Amazon, Nov. 2020) at 1, https://www.oxera.com/wp-content/uploads/2020/11/The-impact-of-the-Digital-Markets-Act-on-innovation_FINAL-3.pdf [https://perma.cc/USE9-QWAS?view-mode=server-side].
[64] APPLE, APPLE RESPONSE TO DIGITAL SERVICES ACT CONSULTATION PROPOSAL FOR EX ANTE REGULATION OF GATEKEEPER PLATFORMS 11 (2020), available at https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12417-Digital-Services-Act-deepening-the-Internal-Market-and-clarifying-responsibilities-for-digital-services/public-consultation_en (on file with the author).
[65] FACEBOOK, FACEBOOK RESPONSE TO EC PUBLIC CONSULTATION ON THE DIGITAL SERVICES ACT (DSA) (2020), https://about.fb.com/de/wp-content/uploads/sites/10/2020/09/FINAL-FB-Response-to-DSA-Consultations.pdf.

according to Google, "deny users the benefits of innovation and product improvements."[66] Microsoft, which in general has been more amenable to regulation than its counterparts, also expressed reservations about the DMA, noting that lack of sufficiently clear guidance on gatekeepers "will create uncertainty" and "only hamper growth in digital markets and online platform innovation or otherwise reduce consumer welfare."[67]

The US government and industry associations have frequently expressed concern over the EU's approach towards tech regulation, criticizing EU regulation of data privacy, antitrust, and AI alike. In commenting on the GDPR in 2015, the American Chamber of Commerce to the European Union emphasized the importance of balancing data privacy with innovation. It welcomed harmonized EU rules while expressing concern that the "GDPR falls short of striking a balance between stimulating innovation and protecting personal information," costing the EU jobs and investment.[68] The US government also raised a number of concerns about the DMA in 2022, warning against "unintended adverse consequences, such as inadvertent cybersecurity risks or harms to technological innovation" and expressing concern that the DMA was discriminating against US companies. [69] Eric Schmidt, the Chair of the US National Security Commission on AI and a former CEO of Google, has criticized the EU's AI Act as being "a very big setback" for Europe.[70] According to Schmidt, the EU should be an "innovation partner to the U.S." so that the two allies can better compete with China. Instead, according to Schmidt, "the EU did regulation first and … that's a mistake."[71]

Tech companies have invoked similar concerns when opposing tech legislation in the US by stressing their critical role in sustaining the American innovation economy.[72] Congress' efforts to subject tech companies to greater antitrust scrutiny have faced particularly stark opposition from tech companies. According to Google, the proposed American Innovation and Choice Online Act—a bill drafted to rein in anticompetitive practices of the leading tech companies— "would be a dramatic reversal of the approach that has made the U.S. a global technology leader, and risks ceding America's technology leadership and threatening our national security." It would "[h]andicap[] America's technology leaders" while leaving foreign companies "free to

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[66] GOOGLE, QUESTIONNAIRE FOR THE PUBLIC CONSULTATION ON A NEW COMPETITION TOOL: GOOGLE'S SUBMISSION 44 (2020), https://blog.google/documents/88/Googles_submission_on_a_New_Competition_Tool.pdf/.
[67] MICROSOFT, MICROSOFT RESPONSE TO DIGITAL SERVICES ACT CONSULTATION PROPOSAL FOR EX ANTE REGULATION OF GATEKEEPER PLATFORMS (2020), https://blogs.microsoft.com/wp-content/uploads/prod/sites/73/2020/09/Microsoft-Position-Paper-re-Proposed-DSA-Ex-Ante-Regulation-FINAL.pdf.
[68] *GDPR Falls Short of Its Ambition*, AMCHAM EU (Dec. 16, 2015), https://www.amchameu.eu/media-centre/press-releases/gdpr-falls-short-its-ambition.
[69] Samuel Stolton, *US Pushes to Change EU's Digital Gatekeeper Rules*, POLITICO (Jan. 31, 2022) https://www.politico.eu/article/us-government-in-bid-to-change-eu-digital-markets-act/.
[70] Pieter Haeck, *Ex-Google Boss Slams Transparency Rules in Europe's AI Bill*, POLITICO (May 31, 2021), https://www.politico.eu/article/ex-google-boss-eu-risks-setback-by-demanding-transparent-ai/.
[71] *Id.*
[72] Letter from Apple to Senate Jud. Comm. (Jan. 18, 2022), https://9to5mac.com/wp-content/uploads/sites/6/2022/01/Apple-letter-full.pdf (See e.g., Apple warning against regulatory overreach when commenting on American Innovation and Choice Online Act, emphasizing how its "App Store has been an incredible engine for economic growth and innovation since its founding in 2008," and an "economic miracle for developers," who—thanks to Apple—have been able to reach users around the world. Interfering with the AppStore would undermine security and privacy, which have been hallmarks of Apple's product development).

innovate".[73] Leading tech companies have made similar arguments when seeking to debunk other types of tech regulation. In a congressional hearing focusing on social media privacy and abuse of data, Meta's Mark Zuckerberg emphasized the importance of "enabling innovation" when regulating sensitive technologies such as facial recognition, invoking the threat of Chinese companies gaining a competitive advantage over US tech companies if the US companies' ability to innovate is curtailed by extensive regulation.[74]

In addition to tech companies' direct lobbying efforts, many industry associations and think tanks have sought to persuade Congress to retain its hands-off approach, citing how tech regulation would hurt innovation and the US's international competitiveness. In 2022, the US Chamber of Commerce warned how proposed antitrust bills, if enacted, "would drag the United States down in an unfolding global technology competition," constraining companies that are "the strongest drivers of U.S. innovation" while causing "self-inflicted wounds to our competitiveness" by "turning antitrust into a weapon against dynamic and successful U.S. firms."[75] James Andrew Lewis from the Center for Strategic & International Studies has emphasized how "Technological innovation does not flourish in an environment of risk-averse and burdensome regulation."[76] The American Enterprise Institute and the National Security Institute have similarly stressed the costs on US tech companies' competitiveness, warning against "voluntarily ceding critical technological and economic advantage to countries like China at a time when leading in key technologies and tech markets is critical for [the] nation's long-term thriving."[77] Josh Withrow from the R Street Institute has urged the US not to "Stifle U.S. Tech Innovation with Europe's Rules," noting how "[the EU's] proclivity for precautionary regulation is one of the reasons that almost none of the large tech companies they aim to govern are actually from Europe," and describing the EU's approach as being "'[i]f you can't innovate, regulate."[78]

US lawmakers have often been receptive to these arguments, defending their regulatory inaction on the grounds that they are preserving tech companies' incentives to innovate. This has been the case since the early days when the internet was commercialized in the 1990s and regulation was first debated in Congress. As acknowledged earlier, Section 230 of the CDA reflected the view that tech companies should be protected from regulation in order to develop innovative internet services.[79] The regulation of data privacy has also been opposed on the grounds

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[73] Kent Walker, *The Harmful Consequences of Congress's Anti-tech Bills*, GOOGLE (Jan. 18, 2022), https://blog.google/outreach-initiatives/public-policy/the-harmful-consequences-of-congresss-anti-tech-bills/.
[74] Facebook, Social Media Privacy, And the Use And Abuse of Data: Joint Hearing Before the Comm. on Com., Sci & Transp. And Comm. on Jud., S.Hrg. 115-683, at 22 (2018), https://www.congress.gov/event/115th-congress/senate-event/LC64510/text?q=%7B%22search%22%3A%5B%22%5C%22CONSENT+act%5C%22%22%5D%7D&s=6&r=27.
[75] U.S. CHAMBER OF COM., U.S. ANTITRUST LEGISLATIVE PROPOSALS: A GLOBAL PERSPECTIVE (2022), https://www.uschamber.com/assets/documents/U.S.-ANTITRUST-LEGISLATIVE-PROPOSALS-A-GLOBAL-PERSPECTIVE-FINAL-LOCKED-2.16.22.pdf.
[76] James Andrew Lewis, *Tech Regulation Can Harm National Security*, CTR. FOR STRATEGIC AND INT'L STUD. (Nov. 28, 2022), https://www.csis.org/analysis/tech-regulation-can-harm-national-security.
[77] DON'T BREAK WHAT WORKS, SENATORS, EXPERTS: AMERICAN INNOVATION AND CHOICE ONLINE ACT HAS SERIOUS FLAWS (S. 2992 AND H.R. 3816) (2022), https://dontbreakwhatworks.ccianet.org/wp-content/uploads/2022/03/Big-WTAS-Updated-3.9.pdf.
[78] Josh Withrow, *supra* note 2.
[79] *See* discussion *supra*.

of innovation. During congressional hearings on privacy in 2012, then-Representative and current Senator Marsha Blackburn warned the US against following the "European privacy model," noting how that model "take[s] information out of the information economy" and causes "revenues [to] fall and innovation [to] stall."[80] Even though many US lawmakers have recently turned against the tech industry, no meaningful legislation has emerged from Congress in this new political environment. Tech companies have continued their relentless lobbying, ensuring that bills such as the American Innovation and Choice Online Act have failed.[81] In refusing to back more stringent antitrust oversight, members of Congress have invoked various concerns, including national security and privacy, but one consistent ground for opposition has been the weakening of American innovation and global competitiveness.[82]

In the 2020 antitrust hearings held by the US House of Representatives, which brought in all leading tech CEOs for extensive questioning, many representatives expressed concerns about tech companies' outsized market power and anticompetitive behavior.[83] Yet others remained concerned that the proposed antitrust bills would hamper tech innovation and economic growth. Representative Steve Chabot registered his opposition, noting his belief that the bills were "going to hurt innovation."[84] He warned against allowing "government bureaucrats" to "dismantle successful companies," while adding that "[w]riting legislation under the guise of antitrust law is not how we innovate if we want to compete with China." [85] Several other House members echoed these comments, with Representative Darrell Issa warning that the bills would "slow the rate of innovation," [86] Representative Eric Swalwell expressing concern that the bills would "slow innovation and make [the country] less competitive, particularly to China,"[87] and Representative Zoe Lofgren emphasizing how the bills would "undercu[t] [the US's] position relative to [its] international competitors." [88] These comments illustrate how the perception that tech regulation harms innovation is deep-seated among US lawmakers, contributing to the continuing regulatory stalemate in Congress.

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[80] *Balancing Privacy And Innovation: Does the President's Proposal Tip the Scale: Hearing Before the Subcomm. On Com., Mfr. & Trade of the Comm. on Energy & Commerce*, 112 Cong. 11 (2013) (statement of Marsha Blackburn), https://www.govinfo.gov/content/pkg/CHRG-112hhrg81441/pdf/CHRG-112hhrg81441.pdf.

[81] Emily Birnbaum, *Big Tech Divided and Conquered to Block Key Bipartisan Bills*, BLOOMBERG, https://www.bloomberg.com/news/articles/2022-12-20/big-tech-divided-and-conquered-to-block-key-bipartisan-bills#xj4y7vzkg (last updated Dec. 20, 2022).

[82] *See, e.g.*, comments by Senator Chris Coons (D-DE), opposing the bill because of its "potentially unintended negative consequences on the competitiveness globally" *in* DON'T BREAK WHAT WORKS, SENATORS, EXPERTS: AMERICAN INNOVATION AND CHOICE ONLINE ACT HAS SERIOUS FLAWS (S. 2992 AND H.R. 3816) (2022), https://dontbreakwhatworks.ccianet.org/wp-content/uploads/2022/03/Big-WTAS-Updated-3.9.pdf.

[83] *See, e.g., Cicilline Opening Statement at Big Tech Antitrust Hearing*, DAVID N. CICILLINE (July 29, 2020), https://cicilline.house.gov/press-release/cicilline-opening-statement-at-big-tech-antitrust-hearing.

[84] Markup of H.R. 3843, the "Merger Filing Fee Modernization Act of 2021"; H.R. 3460, the "State Antitrust Enforcement Venue Act of 2021"; H.R. 3849, the "Augmenting Compatibility and Competition by Enabling Service Switching Act of 2021" or the "ACCESS Act of 2021"; H.R. 3826, the "Platform Competition and Opportunity Act of 2021"; H.R. 3816, the "American Choice and Innovation Online Act"; and H.R. 3825, the "Ending Platform Monopolies Act": Hearing Before House Jud. Comm. 117 Cong. ll. 1463–65 (2021) (statement of Representative Steve Chabot), https://www.congress.gov/117/meeting/house/112818/documents/HMKP-117-JU00-Transcript-20210623.pdf.

[85] *Id.*

[86] *Id.* (statement of Representatives Darrell Issa).

[87] *Id.* (statement of Representative Eric Swalwell).

[88] *Id.* (statement of Representative Zoe Lofgren).

In addition to these views expressed by tech companies, industry associations, and many US lawmakers, a number of scholars have argued that tech regulation can compromise innovation—even if their argument is often more nuanced, qualified, or context-specific. For example, William Rogerson has warned that telecommunications regulation "may interfere with innovation both because it reduces incentives of firms to innovate, and because it reduces the diversity of the pool of innovators."[89] Richard Epstein has argued that while some regulation of the technology industry is necessary, "allowing technology to be free from regulation will make the system both more competitive and efficient."[90] Others have emphasized that tech regulation may be particularly ill-suited for guiding technological innovation given the fast pace of technological development and the slow pace of generating and implementing regulations,[91] whereas others have noted how "[r]egulation deters startup innovation and activity in areas where entrepreneurs can provide [] the greatest benefits."[92] Several scholars have criticized efforts to tighten antitrust regulation in particular, noting how those efforts—which they refer to "regulation by intimidation"—may "scare companies to inaction."[93] Carmelo Cennamo and Daniel Sokol describe the EU's recently adopted DMA as "too blunt, with the risk of constraining value creation" while producing "stifling unintended consequences."[94] According to them, the DMA fails to account for "innovation dynamics."[95]

Some legal scholars have specifically contrasted the US and the EU's approaches to regulation. Anupam Chander draws a connection between the success of the US tech companies and the permissive regulatory environment they have faced in their home market.[96] In contrast, extensive regulatory constraints in Europe have held back the EU's tech sector, contributing to the existing innovation gap. Illustrating his argument through examples from data privacy, content moderation, and intellectual property, Chander argues that "reduced liability concerns for Internet intermediaries, coupled with low privacy protections" created an enabling legal environment in the US, in which new tech companies could thrive and innovate.[97] While stringent data privacy rules "hobbled internet startups" in Europe,[98] the "absence of privacy constraints proved especially

[89] William P. Rogerson, *The Regulation of Broadband Telecommunications, The Principle of Regulating Narrowly Defined Input Bottlenecks, and Incentives for Investment and Innovation*, 2000 UCHILF 119 (2000).
[90] Richard A. Epstein, *Can Technological Innovation Survive Government Regulation*, 36 HARVARD J.L. & PUB. POL'Y 87, 97 (2013).
[91] *See, e.g.*, Gary E Marchant, *The Growing Gap Between Emerging Technologies and the Law*, *in* the GROWING GAP BETWEEN EMERGING TECHNOLOGIES AND LEGAL-ETHICAL OVERSIGHT: THE PACING PROBLEM 19–33 (2011); Wulf A. Kaal & Robert N. Farris, *Innovation and Legislation: The Changing Relationship—Evidence from 1984 to 2015*, JURIMETRICS, Spring 2018, at 303.
[92] Liya Palagashvili, *Exploring How Regulations Shape Technology* Startups, MERCATUS CTR. AT GEORGE MASON UNIV. (June 1, 2021), https://www.mercatus.org/research/research-papers/exploring-how-regulations-shape-technology-startups.
[93] Gus Hurwitz & Geoffrey Manne, *Antitrust Regulation by Intimidation*, WALL ST. J. (July 24, 2023), https://www.wsj.com/articles/antitrust-regulation-by-intimidation-khan-kanter-case-law-courts-merger-27f610d9.
[94] Carmelo Cennamo & D. Daniel Sokol, *Can the EU Regulate Platforms Without Stifling Innovation?*, HARVARD BUS. REV. (Mar. 1, 2021), https://hbr.org/2021/03/can-the-eu-regulate-platforms-without-stifling-innovation [https://perma.cc/F3FV-2U5M?view-mode=server-side].
[95] *Id.*
[96] Chander, *supra* note 2.
[97] *Id.*, at 642.
[98] *Id.*

conducive to Internet innovation" in Silicon Valley, Chander asserts.[99] He also describes European rules on intermediary liability as less welcoming to tech companies, hence contributing to the relatively greater success of US internet companies.[100]

Other scholars have similarly argued that exacting tech regulations compromise innovation. Tal Zarsky claims that there is a link between lenient US privacy laws and the success of US tech companies and asserts that the EU's stringent privacy laws have contributed to European tech industry's relative stagnation when compared to its American counterpart.[101] In citing the EU's weak performance as a tech leader, Zarsky notes how "an inescapable linkage between the strength of privacy laws and the level of ICT innovation is evident."[102] This, according to Zarsky, points towards a conclusion that the EU should consider easing its privacy laws while the US should refrain from adopting stringent laws,[103] adding that "[i]f the whole world had been strictly subjected to the EU Data Protection Directive, we might not have had Facebook, Gmail, or Amazon."[104]

Notwithstanding this perceived cost that tech regulation has on innovation, many commentators praise the EU's regulatory approach as necessary given the many manifested problems associated with today's tech economy. However, even proponents of the EU's approach often assume that it involves a trade-off and that the protection of digital rights takes place at the expense of supporting innovation—they are convinced that the trade-off exists and simply believe that it is beneficial for the society as a whole.[105] Similarly, the absence of comprehensive privacy protections in the US can be viewed as a "price to be paid" for innovations.[106] Under this view, the question becomes whether a society wants to pay the price. But the normative debate rests on an assumption that by pursuing stringent tech regulation, societies need to accept lower levels of innovation—an assumption that will be questioned below.

II. RETHINKING TECH REGULATION AND INNOVATION

The above discussion has shown how the perception that tech regulation impedes innovation often dominates public discourse. Some legal scholars have endorsed this view, but this question has not been extensively examined in the academic literature.[107] The scholarly discussion on the relationship between regulation and innovation has to date been more extensive in other

[99] *Id*. at 667.
[100] *Id*. at 670–73.
[101] *See generally* Zarsky, *supra* note 2.
[102] *Id*. at 154.
[103] *Id*. at 161–62 (2015)
[104] *Id*. at 165 (2015)
[105] Chander, *supra* note 2, at 645.
[106] *Id*. ("The limitations on Internet intermediary liability and the lack of omnibus privacy protections beyond those that are promised contractually by websites mean that there is a price to be paid for the amazing innovation of the past two decades.").
[107] Philippe Aghion, Antonin Bergeaud, & John Van Reenen, *The Impact of Regulation on Innovation* (Nat'l Bureau of Econ. Rsch., Working Paper No. 28381, 2021), https://www.nber.org/papers/w28381 (noting that "there is considerable literature on the economic impacts of regulations, but relatively few studies on their impact on technological innovation.").

areas of law, such as environmental regulation.[108] Academic analysis on the relationship between tech regulation and tech innovation is sparse in part because tech regulation is still a relatively recent phenomenon. Over the past few years, economists have begun to examine the effects of the GDPR on various market outcomes but, overall, both theoretical and empirical literature on tech regulation beyond that nascent literature on data privacy remains undeveloped. The below discussion first takes a closer look at various arguments on the relationship between regulation and innovation generally before examining how those arguments can be extended to digital regulation, focusing on data privacy, antitrust, and artificial intelligence.

A. Key Insights From the Scholarship on Regulation and Innovation

Few voices today would argue that markets, left to their own devices, produce optimal outcomes. Instead, there is a broad consensus that some degree of regulation is needed for the proper functioning of a market economy and society. Regulation helps correct market failures, minimize negative externalities, and ensure that public interest is protected. However, even though academics and policymakers agree that regulation can advance beneficial social objectives, they remain concerned that regulation may curtail private actors' incentives to innovate. Innovation is central to economic growth, which is a key for societies to thrive and provide public goods to their citizens. Thus, no government can afford to disregard the effects their regulations have on innovation, elevating innovation to the center of any debates on regulation.

Of course, "innovation" is a nebulous word and can be used to mean different things. Much of the critical assessment of the relationship between regulation and innovation—including the commentary discussed above—equates innovation with technological progress that results in economic growth. Perhaps the most common way regulation is thought to impede innovation is that it often increases compliance costs. It is well understood that regulations can be costly to implement. The public conversation often uses the term "regulatory burden," which assumes that regulatory compliance has a negative impact on economic activity. Regulation may adversely affect productivity, new investment, and innovation and hence slow down economic growth and technological progress. If firms need to spend extensive resources on regulatory compliance, those resources may be diverted away from various R&D activities that are designed to support new innovations. As a result, regulation may lead to a reduced rate of innovation and more limited technological progress.[109]

However, more regulation does not need to entail less innovation. Certain types of regulation are, by design, susceptible to promoting innovation. For example, intellectual property protection incentivizes investments in R&D by granting a temporary monopoly for firms and individuals to enjoy the rewards of their innovations. There are also numerous examples how the US government regulation has over the decades spurred innovation, or even created new industries. For example, in the 1970s, the US government regulated the telecommunications monopoly AT&T, culminating in the breakup of the company in 1984. This was widely seen as encouraging internet innovation. Similarly, common carrier rules, including rules on "net neutrality"—a term

[108] See Yafit Lev-Aretz & Katherine J. Strandburg, *Regulation and Innovation: Approaching the Market Failure from Both Sides*, 38 YALE J. ON REGUL. 5 (2020) (noting that "The academic literature on the interplay between regulation and innovation focuses primarily on a few contexts, most notably environmental regulation").
[109] Nicholas Crafts, *Regulation and Productivity Performance*, 22 OXFORD REV. ECON. POL'Y 186-202 (2006).

that refers to internet carriers needing to offer all content providers equal access to the network—are commonly seen as having contributed to a thriving internet industry in the US.[110]

In his seminal work, Michael E. Porter has shown how regulation can spur innovation. Specifically, Porter has argued that regulation can incentivize firms to transform their products and production processes in ways that generate not only environmental, health, safety or other social benefits but also lead to economic gains. This "Porter hypothesis" rests on an idea that regulation often spurs companies to upgrade or re-engineer their technologies. A company that successfully develops a new technology to meet the demands of a regulation can have a first-mover advantage, which can lead the firm to capture the market and hence reap notable economic rewards. This way, "innovation offsets" generated by a regulation can exceed the compliance costs associated with regulation, leading to a net benefit in terms of innovation.[111] Regulations may not only catalyze incumbent firms to re-tool their production; they may also encourage new entrants to enter the market with new and innovative products that were designed to meet the regulatory demands and that can displace existing, inferior technologies.[112] Thus, the net impact of regulation on innovation depends on whether the "incentive effect" outweighs the compliance costs associated with regulation.[113]

The Porter hypothesis focuses on the economic costs and benefits of regulation. However, a more comprehensive analysis also accounts for various social benefits—such as the mitigation of climate change—when analyzing the costs and benefits of regulations. Richard Stewart's work on the interplay between regulation and innovation has been particularly influential in conceptually distinguishing between "market innovation" and "social innovation."[114] Market innovation refers to the development of new products or processes that lead to productivity gains and thus create economic benefits that the firm can capture on the marketplace. Social innovation refers to social benefits such as cleaner air that the firm cannot directly monetize through sales. At times, regulations may adversely affect market innovations but still lead to social innovations as regulations incentivize firms to undertake investments that promote certain social objectives.[115] However, it is also possible that a given innovation generates both types of benefits, leading to social innovations and market innovations at the same time.[116]

These influential scholarly insights suggest that the relationship between regulation and innovation is not always straightforward. Instead, the innovation effects may depend on particular regulatory design.[117] For example, more stringent regulations have been found to incentivize more

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[110] Tim Wu, *Antitrust via Rulemaking: Competition Catalysts*, 16 COLO. TECH. L. J. 33 (2017).
[111] Michael E. Porter & Claas van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. ECON. PERSP. 97 (1995).
[112] Nicholas A. Ashford & Ralph P. Hall, *The Importance of Regulation-Induced Innovation for Sustainable Development*, 3 SUSTAINABILITY 270 (2011).
[113] Knut Blind, *The Impact of Regulation on Innovation* 6 (Nesta Working Paper No. 12/02, 2012).
[114] *See generally* Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CAL. L. REV. 1256 (1981).
[115] Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CAL. L. REV. 1256, 1279, 1281 (1981).
[116] *Id*. at 1279.
[117] Yafit Lev-Aretz & Katherine J. Strandburg, *Privacy Regulation and Innovation Policy*, 22 YALE J. L. & TECH. 256, 262—63 (2020) (noting that "[i]n general, well-designed regulation is likely to shift innovative activity into more socially desirable *directions*, rather than to reduce innovation overall" (emphasis in original)).

radical innovations whereas less stringent regulations tend to push firms towards more incremental innovations.[118] Stringent regulations may therefore be more effective in incentivizing more foundational or disruptive innovations compared to lenient regulations that can be satisfied with more incremental adjustments of firms' products and processes. Also, while regulations often have negative effects on innovation in the short term, those effects can be positive in the long term.[119] This suggest that tech regulation is also unlikely to have a one-directional relationship to innovation—a proposition that seems validated when examining the regulation of data privacy, antitrust, and artificial intelligence below.

B. How Data Privacy Regulation Affects Innovation

Tech companies often resist regulation on grounds that such regulation is costly. For example, Google noted that it had spent "hundreds of years of human time" to achieve GDPR compliance.[120] It was reported that US Fortune 500 companies collectively spent approximately $7.8 billion on GDPR compliance by May 2018, averaging $16 million per company.[121] While large tech companies often lament the costs of regulatory compliance, in relative terms these costs are even higher for small-and-medium-sized tech companies—including many EU companies, which are often smaller than their US counterparts—that have reduced capacity to engineer their products and services to meet the EU's exacting regulatory demands. As a result, small tech companies in particular may have fewer resources to dedicate to innovative activities after adjusting their products and services to meet the demands of the GDPR. When compliance costs are too high, these smaller tech companies may be forced to exit the market or, alternatively, they never enter the market in the first place.[122]

Recent empirical research offers support for the argument that the GDPR has imposed non-trivial costs on small tech companies in particular. According to a 2022 study, numerous apps exited the Google Play Store following the implementation of the GDPR, leading the researchers to conclude that "whatever the privacy benefits of GDPR, they come at substantial costs in foregone innovation."[123] The GDPR can thus reduce consumer choice and curtail innovation as smaller players no longer participate in the marketplace. The incumbent firms' incentives to innovate may also diminish in the face of less competition from smaller rivals or new entrants. Another research surveying small AI startups has similarly shown that the GDPR can adversely affect early-stage companies.[124] Small startups often have access to limited data from their own pool of customers and rely on third-party data to develop their algorithms. With restrictions imposed on such data gathering, the GDPR increases the costs incurred by these firms to collect

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[118] Knut Blind, *supra* note 113.
[119] *Id*. at 25.
[120] Ashley Rodriguez, *Google Says it Spent "Hundreds of Years of Human Time" Complying with Europe's Privacy Rules*, QUARTZ (Sept. 26, 2018), https://qz.com/1403080/google-spent-hundreds-of-years-of-human-time-complying-with-gdpr/ [https://perma.cc/SP4H-BKTK].
[121] *Id*.
[122] Rebecca Janßen et al., *GDPR and the Lost Generation of Innovative Apps* (Nat'l Bureau of Econ. Rsch. Working Paper 30028, 2022), https://www.nber.org/system/files/working_papers/w30028/w30028.pdf. However, one may criticize this study's assumption that more apps always means more innovation as some apps are likely only copycat apps as opposed new apps that reflect genuine new innovation.
[123] *Id*.
[124] James Bessen et al., *GDPR and the Importance of Data to AI Startups* (NYU Stern School of Bus. Research Paper Series, Sep. 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3576714.

and analyze the data they need to develop AI applications.[125] Additionally, these companies may face greater difficulties in fundraising if investors price in the increased data acquisition costs and other compliance challenges associated with the GDPR.[126] This research therefore suggests that one of the unintended consequences of the GDPR is that it may protect, or even further entrench, the relative power of the largest tech companies that are better placed to comply with demanding regulations such as the GDPR.[127]

Any costs imposed by a regulation such as the GDPR are easier to justify if the regulation generated benefits that outweighed those costs. On this score, some may question the net benefit of the GDPR given the well-known deficiencies in the GDPR's implementation. With limited resources, European privacy regulators have been criticized for having brought a small number of cases under the GDPR, which to date have often resulted in modest fines.[128] This suggests that, at worst, the GDPR has imposed compliance costs without generating the promised social innovation benefits in the form of protection of privacy rights. This exposes the EU regulation to criticism that, without effective implementation, the compliance costs it imposes are not offset by the intended benefits.[129] However, there are signs that the EU is now moving towards more robust enforcement of the GDPR, as evidenced by a high-profile $1.3 billion fine that the Irish Data Protection Agency imposed on Meta in May 2023.[130]

Data privacy rules have the potential to alter innovation pathways. After the GDPR entered into force, tech companies faced limits on collecting, combining, storing, and processing user data. This can present a hurdle for tech companies, including AI firms, which need access to extensive data to create more accurate AI applications. In such instances, there is a potential trade-off between more data protection and less product innovation.[131] Another example relates to the way tech companies gather data for targeted advertising. In its 2022 decision, the European Data Protection Board ("EDPB") found that Meta can no longer use data generated on its own platform to create personalized ads unless it obtains specific user consent for such targeted advertising[132]—a consent that may be difficult to obtain from users.[133] This ruling may fundamentally change

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[125] *Id*.

[126] Jian Jia et al., *The Short-Run Effects of GDPR on Technology Venture Investment*, 40 MKTG. SCI. 661 (2021), https://pubsonline.informs.org/doi/epdf/10.1287/mksc.2020.1271.

[127] Bradford, The Brussels Effect, *supra* note 6, at 238; Garrett Johnson et al., *Privacy & Market Concentration: Intended & Unintended Consequences of the GDPR*, MGMT. SCI. (2023), https://pubsonline.informs.org/doi/10.1287/mnsc.2023.4709.

[128] Madhumita Murgia & Javier Espinoza, *Ireland Fails to Enforce EU Law Against Big Tech*, FIN. TIMES (Sept. 13, 2021), https://www.ft.com/content/5b986586-0f85-47d5-8edb-3b49398e2b08 (on file with the author).

[129] Andrew McAffee, EU Proposals to Regulate AI Are Only Going to Hinder Innovation, FIN. TIMES (July 25, 2021), https://www.ft.com/content/a5970b6c-e731-45a7-b75b-721e90e32e1c (criticizing the GDPR as restricting innovation and reducing VC funding in Europe, while adding that "the benefits to the EU of all the extra governance are not obvious" given the suboptimal enforcement efforts).

[130] *1.2 Billion Euro Fine for Facebook as a result of EDPB Binding Decision*, EDPB (May 22, 2023), https://edpb.europa.eu/news/news/2023/12-billion-euro-fine-facebook-result-edpb-binding-decision_en.

[131] Bessen et al., *supra* note 124, at 18.

[132] Eur. Data Prot. Bd., Binding Decision 3/2022 on the Dispute Submitted by the Irish SA on Meta Platforms Ireland Limited and Its Facebook service (Art. 65 GDPR) (Dec. 5, 2022), https://edpb.europa.eu/our-work-tools/our-documents/binding-decision-board-art-65/binding-decision-32022-dispute-submitted_en.

[133] For a comparison, when Apple introduced its tracking tool and asked users specifically if they wanted to be tracked, a large majority chose not to be tracked. *See* Samuel Axon, *96% of US Users Opt Out of App Tracking in iOS 14.5, Analytics Find*, ARS TECHNICA (May 7, 2021), https://arstechnica.com/gadgets/2021/05/96-of-us-users-

Meta's business model, forcing the company to retool its entire digital advertising business. For anyone who considers targeted advertising to be valuable—for instance by allowing users to forgo a subscription fee and receive, in return, more relevant advertising based on users' personal data—the privacy ruling can be viewed as costly or detrimental to innovation.

However, even if the GDPR entailed various compliance costs, it may encourage social innovations. Protection of data privacy can be seen as creating a social benefit by enhancing fundamental rights of individuals whose data would otherwise be vulnerable to exploitation by tech companies. The social benefit associated with the GDPR is therefore enhanced privacy, self-determination, and personal autonomy that individuals can enjoy.[134] Julie Cohen has further connected these attributes directly to innovation by arguing that the right to privacy is foundational for individuals' capacity to innovate. Innovations require individuals to be free from surveillance so that they can exercise critical independence of mind.[135] Seen this way, data privacy regulation enhances innovation through greater personal autonomy and freedom of thought.

This social benefit may reduce market benefits for tech companies whose business model relies on monetizing users' personal data through advertising. However, there is also an argument that the GDPR confers both social and market benefits, in particular in the long term. For a company like Apple, privacy-enhancing innovations have generated significant economic benefits. Apple's privacy practices can be viewed as the company's conscious business strategy and not only a response to EU regulation.[136] In April 2021, Apple rolled out an update on its iPhone that asks users whether they want apps, such as Facebook, to track them.[137] This change is seen as a tremendous boon for user privacy but a devastating blow to companies like Meta, which rely on retaining access to user data in Apple devices.[138] Meta's stock price plunged 26% in February 2022, following Meta's disclosure that Apple's privacy change will cost the company billions of dollars annually.[139] At the same time, Apple itself has seen its advertising revenue soar as the company can still access the data generated on its own devices.[140] This shows how Apple has been able to monetize its pro-privacy innovations, enhancing users' privacy—thus generating social innovations—while at the same time reaping significant economic rewards by innovating product enhancements that were welcomed by users and that also tilted the marketplace in Apple's favor.

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opt-out-of-app-tracking-in-ios-14-5-analytics-find/ [https://perma.cc/23U7-DAFJ]; Jared Newman, *Most People Are Embracing iOS 14.5's New Anti-Tracking Features*, FAST COMPANY (May 7, 2021), https://www.fastcompany.com/90633965/ios-14-5-tracking-opt-out-rate [https://perma.cc/77AS-U98N].

[134] Cf. James Whitman, *The Two Western Cultures of Privacy: Dignity Versus Liberty*, 113 YALE L.J. 1151 (2004); *see generally* Charles Fried, *Privacy*, 77 YALE L.J. 475, 477 (1968); See Zuboff, *supra* note 40.

[135] Julie Cohen, *What Privacy Is For?*, 126 HARV. L. REV. 1904, 1920, 1927 (2013).

[136] Kif Leswing, *Apple is Turning Privacy Into a Business Advantage, Not Just a Marketing Slogan*, CNBC (June 8, 2021), https://www.cnbc.com/2021/06/07/apple-is-turning-privacy-into-a-business-advantage.html.

[137] See Data Privacy Day at Apple: Improving Transparency and Empowering Users, APPLE (Jan. 27, 2021), https://www.apple.com/newsroom/2021/01/data-privacy-day-at-apple-improving-transparency-and-empowering-users/ [https://perma.cc/QQ8M-5RDB].

[138] See Patrick McGee, *Snap, Facebook, Twitter and YouTube Lose Nearly $10bn After iPhone Privacy Changes*, FIN. TIMES (Oct. 31, 2021), https://www.ft.com/content/4c19e387-ee1a-41d8-8dd2-bc6c302ee58e (on file with the author).

[139] See Kate Conger & Brian X. Chen, *A Change by Apple is Tormenting Internet Companies, Especially Meta*, N.Y. TIMES (Feb. 3, 2022), https://www.nytimes.com/2022/02/03/technology/apple-privacy-changes-meta.html (on file with the author).

[140] *Apple Ad Revenues Skyrocket Amid Its Privacy Changes*, INSIDER INTEL. (Jan. 31, 2022), https://www.insiderintelligence.com/content/apple-ad-revenues-skyrocket-amid-its-privacy-changes.

In the same vein, if Meta now responds to the adverse EDPB ruling by creating a new advertising model that is more responsive to users' privacy expectations, social innovation may occur. Initially, such innovation would likely reduce Meta's advertising revenue and hence be costly to the company. However, the Porter hypothesis suggests that the exacting regulatory demands may incentivize Meta to engage in more drastic innovation around digital advertising. This may lead the company to develop a new business model that will, in the long run, generate commercial benefits for the company. Alternatively, the constraints imposed on Meta may invite entry from other tech companies whose business models are more responsive to users' privacy expectations, increasing these companies' incentives to innovate in ways that disrupt the existing digital advertising market.

The EU has consistently maintained that the GDPR and other European tech regulations increase social innovation. There are pressing social needs that call for regulations even if such regulations were to impose compliance costs or deter certain types of innovation. However, according to the EU, its regulations also often contribute to market innovations and further technological progress. The GDPR has elevated consumers, tech companies, and governments' consciousness about data privacy, contributing to a shift in marketplace expectations. As internet users become more conscious of privacy, they start viewing privacy as an element of product quality and increasingly turn to privacy-conscious products. This way, firms developing privacy-enhancing technologies can reap economic gains as the market will reward them for innovations that reflect changing consumer preferences. Tech companies are already adjusting their business practices to EU rules, indicating that technological development is now moving in a more privacy-conscious direction. Most tech companies' privacy policies today are aligned with the GDPR and companies such as Apple, Google, Meta, and Microsoft offer GDPR protections to their global users.[141] This reveals that the EU's data privacy regulation is already changing the direction of tech companies' innovation activities.

According to the European Commission, the EU's stringent data privacy rules also contribute to market innovation. Firms adhering to higher privacy standards can gain a competitive advantage because consumers and users are likely to place more trust in their products and services.[142] Some tech companies, including Microsoft, have also endorsed this view.[143] According to Microsoft, in the absence of strong privacy rules, "it will likely become harder for U.S. companies to keep the trust of consumers worldwide." This will place US providers at a competitive disadvantage as foreign customers are increasingly likely to turn to non-US companies who they trust to keep their data safe. As a result, Microsoft asserted that "strong data protection practices are not the antithesis of innovative data usage" and that "privacy and big data can and

[141] *See e.g.g*, Preparing for a New Era in Privacy Regulation, Microsoft (Apr. 16, 2018), https:// www.micros oft.com/ en- us/ micros oft- 365/ blog/ 2018/ 04/ 16/ prepar ing-for- a- new- era- in- priv acy- reg ulat ion- with- the-micros oft- cloud/; *See Requests to Delist Content Under European Privacy Law*, GOOGLE (May 29, 2014), https://transparencyreport.google.com/eu-privacy/overview (on file with the author) (these numbers are accurate of Aug. 15, 2022. Google updates the figures periodically).

[142] Viviane Reding, *The European Data Protection Framework for the Twenty-First Century.* 2 INT'L DATA PRIVACY L. 119, 129 (2012). [update]

[143] Julie Brill, *Microsoft's Commitment to GDPR , Privacy, and Putting Customers in Control of Their Own Data*, POLITICO (May 25, 2018), https://www.politico.eu/sponsored-content/microsofts-commitment-to-gdpr-privacy-and-putting-customers-in-control-of-their-own-data/.

must go hand-in-hand."[144] Consistent with this view, Microsoft was an early supporter of the EU's GDPR,[145] and has called for Congress to enact "strong, comprehensive privacy legislation" in the US.[146] Of course, it is less costly for Microsoft to take a strong pro-privacy stand as its business model does not rely on targeted advertising. It will therefore be interesting to see if Microsoft's views on data privacy shift after its significant investment in OpenAI. Generative AI relies on extensive data gathering to train large language models, which risk conflicting with data privacy rules. As a result, Microsoft is now more exposed to regulatory constraints, testing its stand as a staunch advocate of data privacy rules.

The above discussion suggests that data privacy regulation generates both costs and benefits to tech companies by limiting certain types of innovation while encouraging other forms of innovation. While a regulation such as the GDPR can legitimately be criticized—including for its adverse distributional effect on small companies or its ineffective implementation—data privacy regulation does not have a one-directional effect on innovation that presents governments with a clear choice between regulation and innovation. Instead, data privacy regulation has spurred new innovations in product development, many of which enhance social innovations and, arguably, also market innovations.

C. How Antitrust Regulation Affects Innovation

Antitrust law, correctly implemented, should contribute to greater innovation by reducing market concentration and fostering competition. However, some scholars have argued that a more concentrated market structure can sometimes have a positive effect on innovation. Prominent economists have debated this question, disagreeing on how much market power is optimal for creating or preserving firms' incentives for innovation. Joseph Schumpeter famously argued that the prospect of market power and ensuing monopoly rents spur innovation.[147] Kenneth Arrow challenged this view, arguing instead that monopolists have less to gain from innovating and an interest in preserving the status quo.[148] According to Arrow, more competition increases firms' incentives to innovate. Jean Tirole has similarly suggested that the monopolist is likely to hold back innovation because of the "replacement effect"—the idea that innovation would only replace a monopolist's existing rents.[149] Several commentators describe this longstanding debate as "unresolved," but if there is a prevailing view today, it seems to be that neither an oligopolistic market structure nor highly competitive markets provide the most fertile environment for

[144] Microsoft's Response to National Telecommunications and Information Administration's Requst for Comment on Big Data and Consumer Privacy in the Internet Economy (Aug. 5, 2014), https://www.ntia.doc.gov/files/ntia/microsoft.pdf.
[145] *Id*.
[146] Microsoft's Response to National Telecommunications and Information Administration's Requst for Comment on Big Data and Consumer Privacy in the Internet Economy (Aug. 5, 2014), https://www.ntia.doc.gov/files/ntia/microsoft.pdf.
[147] *See generally* JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY (1942)
[148] *See generally* KENNETH ARROW, ECONOMIC WELFARE AND THE ALLOCATION OF RESOURCES FOR INVENTION (1962). However, even Arrow acknowledged the benefit that large firms have in acting as their own insurance company, allowing them to pursue multiple projects at the same time—the benefit he still called "an imperfect solution."
[149] JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION (1997).

innovation, but that, on balance, competitive market structures foster innovation more than monopolistic markets.[150]

While the debate on the relationship between *competition* and innovation is long-standing, there is limited empirical literature on the relationship between competition *regulation* and innovation. Some scholars have suggested that antitrust laws contribute to innovation whereas others have argued that they deter innovation.[151] There are several reasons to expect that antitrust laws and their enforcement positively affect tech companies' incentives to innovate.[152] Antitrust laws encourage entry and rivalry, which creates incentives for firms to reduce costs, improve product quality, or develop new products to increase their profits and stay ahead of their rivals. Empirical evidence also suggests that companies that are shielded from international competition fall behind and lose their ability to compete due to a lack of rivalry that would have driven them to innovate.[153] John Baker has taken a firm stand in arguing that antitrust enforcement today promotes innovation, urging scholars to "move beyond the "Schumpeter vs. Arrow" debate and to embrace antitrust as essential for fostering innovation."[154]

Economist and technologist James Bessen has argued that today's concentrated digital markets are not optimal for innovation. He notes how the information revolution initially contributed to greater dynamism and innovation across industries.[155] By the late 1990s, several industries experienced rapid cycles of disruption where new players were challenging the incumbents, allowing startups and smaller firms to thrive.[156] However, the rate of disruption has declined over the past two decades as a handful of "superstar firms" have entrenched their control over the key technologies.[157] This has impeded the growth prospects of smaller firms and slowed productivity growth.[158] Thus, while small firms are still created, they face impediments to growth, which has reduced overall productivity growth for the economy. This has an adverse effect on innovation because the level of innovation is, according to Bessen, greatest when knowledge diffuses and a diverse set of individuals and companies engage in an innovative process.[159]

Others have advanced a different view. For example, Nicolas Petit and David J. Teece have called into question the relevance of market size and market concentration for assessing

[150] MASSIMO MOTTA, COMPETITION POLICY: THEORY AND PRACTICE (2004).
[151] Dora Marinova, Michael McAleer & Daniel Slottje, Antitrust Environment and Innovation, 64 SCIENTOMETRICS 301-311 (2005); Geoffrey A. Manne & Joshua D. Wright, *Innovation and the Limits of Antitrust*, 6 J. COMPETITION L. & ECON. 153 (2010); Andrew Thomas Young & William F. Shughart II, *The Consequences of the U.S. DoJ's Antitrust Activities: A Macroeconomic Perspective*, 142 PUBLIC CHOICE 409 (2010).
[152] Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L. J. 575 (2007); Carl Shapiro, *Competition and Innovation: Did Arrow Hit the Bull's Eye? in* THE RATE & DIRECTION OF ECONOMIC ACTIVITY REVISITED (Josh Lerner & Scott Stern eds., 2012); George Priest, *Advancing Antitrust Law to Promote Innovation and Economic Growth*, *in* RULES FOR GROWTH: PROMOTING INNOVATION AND GROWTH THROUGH LEGAL REFORM 209 (Lacey Graverson, Sarah Gowen, and Matt Rees eds.) (2011).
[153] Michael E. Porter, *Competition and Antitrust: A Productivity-Based Approach to Evaluating Mergers and Joint Ventures*, 46 ANTITRUST BULL. 919 (2001) (Revised May 30, 2002).
[154] Jonathan Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L. J. (2007).
[155] JAMES BESSEN, NEW GOLIATHS (2022).
[156] *Id.* at 9.
[157] *Id.* at 16.
[158] *Id.* at 17.
[159] *Id.* at 190.

competition and innovation.[160] According to them, this traditional debate focuses on static as opposed to dynamic models of monopoly and is hence ill-suited to analyze dynamic competition that characterizes the tech industry. The authors characterize today's digital economy as dynamic, featuring "unprecedented productivity growth," "rapid innovation," and "new entry." They describe digital firms as diversified companies that compete across different markets, challenging each other's dominance. This makes existing monopolists vulnerable to competition, which should alleviate concerns from antitrust regulators. This description of a "vigorous" oligopolistic competition among the leading tech firms departs from the common narrative that focuses on tech companies' uncontested monopoly power. This understanding of the market dynamics leads Petit and Teece to caution against strict rules designed to ban practices such as monopoly leveraging, which, according to them, would likely lead to reduced innovation.[161]

While disagreements over the optimal antitrust policy persist, a growing number of voices are calling for aggressive antitrust action, including breaking up monopolies such as Meta.[162] While some argue that Meta should not be punished for its success and innovations, others assert that breaking up Meta would incentivize rivals to enter the market and innovate[163] Excessive market concentration has also increased support to restrict mergers and acquisitions ("M&A") in the tech industry. Currently, many small tech companies can never challenge the incumbents, such as Meta, because these incumbents often acquire their rivals to fend off an emerging competitive threat—a phenomenon referred to as "killer acquisitions." These concerns motivate the US Federal Trade Commission's ("FTC") ongoing suit against Meta.[164] The FTC is seeking to unwind the company's past acquisitions of Instagram and WhatsApp, which the FTC sees as having been motivated by Facebook's attempt to kill a nascent competitive threat to its business, thus diminishing rivalry-driven innovation in the market for social media. However, others caution that aggressive merger control may reduce innovation. In particular, this could happen if startups fear that their chances of a successful exit through a future acquisition are diminished.[165]

The scholarly conversation on how antitrust regulation affects digital markets is intensifying in the wake of the EU's adoption of the DMA. While it will be years until the DMA's effect on competition and innovation can be empirically measured, its merits are debated—

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[160] Nicolas Petit & David J Teece, *Innovating Big Tech Firms and Competition Policy: Favoring Dynamic Over Static Competition*, 30 INDUS. & CORP. CHANGE 1168, 1168 (2021).
[161] *Id.* at 1170.
[162] Chris Hughes, It's Time to Break Up Facebook, N.Y. TIMES (May 9, 2019), https://www.nytimes.com/2019/05/09/opinion/sunday/chris-hughes-facebook-zuckerberg.html; Jack Kelly, *Senator Elizabeth Warren Says "It's Time To Break Up Amazon, Google And Facebook"— And Facebook CEO Mark Zuckerberg Fights Back*, FORBES (Oct. 2, 2019), https://www.forbes.com/sites/jackkelly/2019/10/02/senator-elizabeth-warren-says-its-time-to-break-up-amazon-google-and-facebook-and-facebook-ceo-mark-zuckerberg-fights-back/?sh=f1c26cd67916.
[163] Nilay Patel, *It's Time to Break Up Facebook: 'Start by breaking off WhatsApp and Instagram'*, THE VERGE (Sept. 4, 2018), https://www.theverge.com/2018/9/4/17816572/tim-wu-facebook-regulation-interview-curse-of-bigness-antitrust.
[164] Press Release, Fed. Trade Comm'n, FTC Sues Facebook For Illegal Monopolization (Dec. 9, 2020), https://www.ftc.gov/news-events/press-releases/2020/12/ftc-sues-facebook-illegal-monopolization [https://perma.cc/74EJ-UB7J].
[165] Tom Relihan, *Will Regulating Big Tech Stifle Innovation?*, MIT SLOAN SCHOOL MGMT. (Sept. 27, 2018), https://mitsloan.mit.edu/ideas-made-to-matter/will-regulating-big-tech-stifle-innovation; Andrew Edgecliffe-Johnson & Kiran Stacey, *Top US Business Lobbyist Lambasts Joe Biden's Antitrust "Over-Reach"*, FIN. TIMES (Jan. 11, 2022), https://www.ft.com/content/6fd7d5c3-00b2-43fc-9308-7d96614c53bb.

including its predicted effect on innovation. The assumption behind the DMA is the belief that digital markets today are too concentrated and hence anticompetitive. The goal of the DMA is to enhance the contestability of the marketplace so that new firms can enter and compete in the marketplace. This, according to the European Commission, will augment rivals' and new entrants' incentives to innovate and challenge the incumbents.[166] Thus, we expect to see greater innovation by rivals and—through their entry into the marketplace—greater incentive by tech giants to innovate as their position would now be challenged. Arguably, while the DMA will introduce some trade-offs, including whether to prioritize innovation by incumbents or challengers, it has the potential to enhance the "diversity" of innovation that takes place.[167]

The EU's critics have questioned whether the DMA will lead to greater innovation. An Amazon-commissioned study by Oxera Consulting argues that the DMA will reduce aggregate innovation.[168] The study argues that any increase in rivals' incentives to innovate would not offset the decrease in large platforms' incentives to innovate under the new regulation. Many innovations depend on the market size, allowing large firms with a global scale to better recoup the fixed costs of their R&D expenditures. New entrants also know that their potential ability to gain success in the marketplace will lead to greater regulation, which dampens their incentives to innovate and pursue such success.[169] As a result, the aggregate level of innovation will likely deteriorate following the DMA's entry into force. The authors of the study acknowledge that potential entrants often pursue disruptive innovations whereas incumbents have the incentive to pursue more incremental innovations. However, they conclude that both variants of innovations are beneficial and question the EU's choice of prioritizing only potentially disruptive innovations by rivals.[170]

This discussion suggests that antitrust law, too, may have a more nuanced relationship to innovation than often presumed. There are well-reasoned arguments that show how overly constraining antitrust laws may have an adverse effect on innovation or that the existing tech giants challenge each other and thus sustain the culture of innovation. At the same time, there are strong arguments that more competition leads to greater innovation and that the excessive concentration that characterizes today's tech industry has had a limiting effect on innovation. In particular, that reduction in innovation is manifested in how difficult—if not impossible—it is to challenge the incumbents and provide consumers with diversity of innovations from multiple sources. It is therefore difficult to see how the EU's antitrust laws and enforcement actions—or regulations such as the DMA—would categorically suppress innovation and explain why the EU has not developed a thriving tech industry.

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[166] Impact Assessment Report Accompanying the Document Proposal for a Regulation of the European Parliament and of the Council on Contestable and Fair Markets in the Digital Sector (Digital Markets Act), SWD(2020) 363 final, para 279 (Dec. 15, 2021).
[167] Pierre Larouche & Alexandre de Streel, *The European Digital Markets Act: A Revolution Grounded on Traditions*, 12 J. EUR. COMPETITION L. & PRAC. 542, 552 (2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3911361.
[168] OXERA, THE IMPACT OF DIGITAL MARKETS ACT ON INNOVATION (2020) (Commissioned by Amazon), https://www.oxera.com/wp-content/uploads/2020/11/The-impact-of-the-Digital-Markets-Act-on-innovation_FINAL-3.pdf.
[169] *Id.* at 2.
[170] *Id.* at 3.

D. How AI Regulation Affects Innovation

Given the nascent stage of AI regulation, it is too early to draw any definitive conclusions about the actual impact of those regulations on innovation. Much of the discussion on the relationship between AI regulation and technological development is still speculative and focused on predicting various outcomes based on still-evolving regulatory proposals. Despite this uncertainty, the relationship between AI regulation and innovation is already subject to debate, with some commentators suggesting that AI regulation will harm technological progress while others argue that the effect is likely to be positive.

Critical voices assert that government efforts to regulate AI with binding rules will likely adversely affect the development of AI applications. This prediction relies on a familiar assumption that any tech regulation, by its very nature, entails compliance costs, which can adversely affect innovation.[171] However, others suggest that these costs can be mitigated if regulators help, in particular, small companies with their compliance efforts. For example, the EU's AI Act envisions the establishment of so-called "regulatory sandboxes," which are specifically created, controlled environments within which businesses can test their innovations under regulators' supervision.[172] This practice is designed to alleviate regulatory risks before a new technology is introduced to the market, thus encouraging innovation.[173]

Even if compliance costs could be mitigated in some instances, AI regulation may still adversely affect technological development in other ways. One common criticism emphasizes regulators' inadequate understanding of particularly complex and fast-evolving AI systems. This information asymmetry between regulators and market actors might slow down innovation as a result of poorly-conceived or hard-to-follow regulations, and is often cited as an argument favoring industry-led standards.[174] Another concern is that the EU's stringent regulatory requirements may oblige tech companies to retrain their AI systems—initially developed for the global market—for the European market if those AI systems are viewed as inconsistent with EU regulations.[175] This may lower the quality of the AI applications made available in Europe, in particular if those applications are trained on smaller datasets after all non-compliant data is removed.[176] However, it is not clear how AI developers will respond to the EU's AI Act. Some—while likely not all—developers, may choose to tailor their global products to the EU standard to ensure that the same AI system can be sold across the global market, eliminating the concern regarding systems tailored specifically for the EU.[177]

While these arguments are plausible, there are also several reasons why increased regulation may, in fact, be helpful to accelerate the development and usefulness of AI applications. One such argument emphasizes the ability of AI regulation to contribute to greater social

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[171] Alessio Tartaro, Adam Leon Smith and Patricia Shaw, *Assessing the impact of regulations and standards on innovation in the field of AI* ARXIV 2302.04110 (2023); *see also* Chris Reed, *How should we regulate artificial intelligence*? PHILOS TRANS A MATH PHYS ENG SCI (2018).
[172] European Parliament Research Service, ARTIFICIAL INTELLIGENCE ACT AND REGULATORY SANDBOXES (2022).
[173] *Id*.
[174] Alessio Tartaro et al. *supra* note 171.
[175] Andrea Renda, *Study supporting the impact assessment of the AI regulation*, EUR. COMM'N (2021).
[176] *Id*.
[177] Bradford, Digital Empires, *supra* note 5.

innovation, by directing AI development towards more ethical, accurate, and safe AI systems. Such systems would be welfare-enhancing in that they would mitigate concerns such as large-scale discrimination that occurs when AI is trained based on biased datasets.[178] While regulation may initially hinder the development and adoption of AI, such regulation is ultimately welfare-enhancing in that it encourages firms to invest in more ethical and less error-prone AI applications, steering the industry towards more robust AI systems.[179] This can create a positive market response if more consumers adopt AI as a consequence of trusting novel technologies that meet regulatory standards.[180] This argument is consistent with the Porter hypothesis and illustrates how AI regulation may redirect technological innovation in ways that can contribute to both social and market innovation.

The EU itself has defended its proposed AI Act as enhancing, rather than undermining, AI development. According to the Commission, its AI Act can enhance innovation in two primary ways. First, common European rules reduce complexity and enhance legal certainty, which decreases regulatory risk and paves the way for greater investment in AI innovations.[181] In its impact assessment, the Commission notes that the alternative to the EU's AI Act is not the wholesale absence of regulation but rather fragmented AI regulation promulgated by individual EU Member States.[182] Such a balkanized regulatory landscape would compound greater uncertainty, complexity, and compliance costs—which would be particularly harmful in the case of AI applications, which require large pools of data to be effective.[183] At worst, different national rules would require tailored AI systems to be developed for various Member States within the EU.[184]

Second, the Commission has described how the proposed AI Act is designed to steer AI innovation towards ethical and safe applications, which are valued by consumers. The Act limits certain invasive AI technologies, such as mass surveillance or manipulative algorithms designed to exploit individuals' vulnerabilities. These particular tech regulations advance a set of social goals that European lawmakers have identified as beneficial for individuals and societies. In the short run, however, these regulations may well force tech companies to forgo some commercial opportunities and hence forgo revenue—even while contributing towards social innovation.

Yet it is possible that market benefits may ensue as well. For example, the EU has argued that its AI regulation will give a commercial advantage to tech companies whose AI applications adhere to high regulatory standards.[185] According to this view, compliance with stringent EU regulation can help firms obtain reputational gains and win over consumers, contributing to market

[178] Mariano-Florentino Cuéllar, Benjamin Cedric Larsen, Yong Suk Lee, and Michael Webb, Brookings, *How does information about AI regulation affect managers' choices?* BROOKINGS (2022).
[179] Kathryn Mueller, *Regulation can foster innovation*, AI MYTHS (2020).
[180] Cuéllar et al. *supra* note 178.
[181] European Commission, IMPACT ASSESSMENT FOR THE ARTIFICIAL INTELLIGENCE ACT (2021) at 68.
[182] *Id.* at 26.
[183] *Id.*
[184] *Id*. (discussing the fragmentation concern and citing the German Data Ethics Commission calling for a five-level risk-based system of regulation on AI that would go from no regulation for the most innocuous AI systems to a complete ban for the most dangerous ones).
[185] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Fostering a European approach to Artificial Intelligence* (2021).

innovations alongside social innovations. While there is today genuine excitement about the possibilities around generative AI, there is also a very public conversation about severe risks that AI presents, with OpenAI's Sam Altman and other prominent AI technologists even comparing AI to nuclear war and warning about AI's potential to pose existential risks to humanity.[186] According to the Commission, these risks and the existing "[m]istrust in AI would slow down AI development" […] "If citizens observe that AI repeatedly endangers the safety of individuals or infringes their fundamental rights, they are unlikely to be willing to accept the use of AI technologies for themselves or by other users."[187] Some scholars have endorsed this view, noting how AI regulation enhances consumer confidence "through clear rules, legal certainty, higher trust, and greater social acceptance."[188]

Several tech companies have acknowledged that AI regulation can serve their business interests, lending support to the notion that social innovation can also translate into market innovation. In particular, they recognize that tech regulation can enhance consumer confidence in new products, thus generating useful market innovations.[189] Among these industry voices, the chief technology officer of OpenAI recently called for the regulation of AI, warning that "AI can be misused."[190] According to her, tech companies should not be left alone to ensure that the technology will be aligned with human values. The rapid advances in AI-driven large-language models have unsettled even tech entrepreneurs and AI engineers, who recently called for a temporary moratorium on training such models,[191] lending force to the argument that regulatory oversight is both necessary and desirable.

III. ALTERNATIVE DRIVERS FOR INNOVATION AND TECHNOLOGICAL PROGRESS

The above section suggests that the relationship between tech regulation and innovation is likely to be more intricate than what the public conversation and some scholars have suggested to date. As a result, any claims suggesting that there is a causality between a country's digital regulation and the strength of its tech sector call for additional analysis. The below discussion addresses this issue by asking whether the claims of Europe's overregulation reflect, at least partially, a misattribution of the European tech sector's failings to Europe's digital regulation, and examines whether the reasons for the EU's inability to match the US's tech prowess may, in the end, be found elsewhere. Thus, the perceived causal relationship between tech regulation and innovation may be illusory and explained by other variables that have little to do with tech regulation.

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[186] Cade Metz, *How Could A.I. Destroy Humanity?*, tN.Y. TIMES (Jun. 10, 2023), https://www.nytimes.com/2023/06/10/technology/ai-humanity.html; Tristan Bove, *Sam Altman and Other Technologists Warn That A.I. Poses a 'Risk of Extinction' on Par With Pandemics and Nuclear Warfare*, FORTUNE (May 30, 2023), https://fortune.com/2023/05/30/sam-altman-ai-risk-of-extinction-pandemics-nuclear-warfare/.
[187] European Commission, IMPACT ASSESSMENT FOR THE ARTIFICIAL INTELLIGENCE ACT (2021) at 27.
[188] Alessio Tartaro et al. *supra* note 171.
[189] Brad Smith, *Facial Recognition Technology: The Need for Public Regulation and Corporate Responsibility*, MICROSOFT (July 13, 2018); *See e.g.* Stephanie Hare, *We Must Face Up to the Threat Posed by Biometrics*, FIN. TIMES (Aug. 8, 2018).
[190] *The Creator of ChatGPT Thinks AI Should Be Regulated,* TIME (2023), https://time.com/6252404/mira-murati-chatgpt-openai-interview/.
[191] Chris Vallance, *Elon Musk among experts urging a halt to AI training,* BBC (March 30, 2023).

There are a few obvious reasons to question the claim that tech regulation is the primary culprit explaining the absence of large European tech companies. Looking back, the digital economy was not heavily regulated in Europe before 2010, when the Commission opened its first antitrust investigation into Google. The EU's 2000 e-Commerce Directive—the predecessor to the 2022 DSA—closely resembles Section 230 of the CDA, shielding platforms from any general monitoring obligation.[192] The only other notable EU tech regulation in force before 2010 was the 1995 Data Protection Directive, which was less protective of fundamental rights than the EU's 2016 GDPR.[193] During the years when companies such as Google and Facebook were founded—1998 and 2004 respectively—comparable companies did not emerge in Europe even while the EU's regulatory framework was more permissive back then.

The EU's digital regulations are also hardly as draconian as some of their critics seem to suggest, which calls into question whether they are even able to dampen innovation in a meaningful way. All EU regulations emanate from a contested legislative process that calls for a compromise across twenty-seven individual Member States. This process serves to moderate any extreme versions of proposed regulations. What further balances EU tech regulations is that they always serve two goals, with European integration being one of them. For example, the GDPR is geared at both protecting the fundamental right to data privacy and also to facilitate the transfer of personal data across the EU. The EU's digital regulations are hence not only geared at protecting some stated social objective but also aimed at fostering trade among EU Member States, and hence advancing European integration. This neo-liberal foundation makes EU regulations inherently less stringent and more market-driven. The EU's proposed new AI regulation illustrates this well, garnering criticism both from those who believe it goes too far, and from those who do not think it goes far enough in protecting fundamental rights.[194]

Furthermore, the main target of the EU's digital regulation to date has been large US tech companies but few critics would suggest that the stringent EU regulations have discouraged those companies from innovating. The EU has issued adverse antitrust decisions against Microsoft (2004), Intel (2009), and Google (2017, 2018, and 2019), extracted a settlement from Amazon

[192] Directive 2000/31/EU of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market, 2000 O.J. (L 178) 1, 1–16.
[193] However, even before the GDPR was adopted, the European Court of Justice was moving towards a more rights-protective interpretation of the Data Protection Directive, in particular after the Lisbon Treaty made the Charter of Fundamental Rights binding. *See* Case C-131/12, Google Spain SL v. Agencia Española de Protección de Datos, ECLI:EU:C:2014:317; Case C-362/14, Maximillian Schrems v. Data Prot. Comm'r, 2015 E.C.R; *See also discussion in:* Thomas Streinz, *The Evolution of European Data Law*, *IN* THE EVOLUTION OF EU LAW (3d ed. 2021), https://academic.oup.com/book/39246/chapter-abstract/338797238?redirectedFrom=fulltext.
[194] For contrasting positions, see e.g., *Innovative And Trustworthy AI: Two Sides Of The Same Coin,* Position paper on behalf of Denmark, Belgium, the Czech Republic, Finland, France, Estonia, Ireland, Latvia, Luxembourg, the Netherlands, Poland, Portugal, Spain and Sweden (Oct. 8, 2020), available at https://em.dk/media/13914/non-paper-innovative-and-trustworthy-ai-two-side-of-the-same-coin.pdf; Samuel Stolton, *EU nations call for 'soft law solutions' in future Artificial Intelligence regulation*, EURACTIV (Oct. 8, 2020), https://www.euractiv.com/section/digital/news/germany-calls-for-tightened-ai-regulation-at-eu-level/.

(2022),[195] and is now challenging anticompetitive practices by Apple, Google, and Meta.[196] Other European regulations, ranging from data protection to content moderation, and from online copyright rules to digital taxation, have also mostly affected US tech companies. While some have criticized these regulations as burdensome, it is difficult to see how these regulations would have held back the technological progress and innovative potential of these companies. Of course, it is possible that these companies would have innovated even more in the absence of regulatory constraints they faced in the EU. But that does not seem to be a common concern. If anything, the prevailing perception is that the EU has fallen short in effectively reining in the US tech giants.[197]

If the EU's tech regulation cannot be blamed for the dearth of globally successful tech companies hailing from Europe, the obvious question is what, then, explains the EU's inability to nurture companies such as Google or Apple. This Section offers four reasons that, taken together, likely explain the existing innovation gap between the US and the EU—or at least significantly contribute to the emergence and persistence of that gap. These four reasons relate to the following features of the EU's tech ecosystem: (1) the absence of a digital single market; (2) the lack of deep and integrated European capital markets; (3) punitive bankruptcy laws that deter risk-taking; and (4) the absence of a proactive immigration policy that would allow Europe to harness global talent. These same factors can be identified as inherent strengths of the US's tech ecosystem. Of course, these four factors are likely not the only reasons that explain the differences in the EU and US's tech ecosystems, nor is their relative contribution to tech sector performance easy to measure. However, they should illustrate how any argument equating the US's tech success to the US's lax digital regulation—or equating the EU's struggles to generate tech champions to its stringent regulations—remains either too simplistic or plainly inaccurate.

A. Digital Single Market and the Scaling of Innovations

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[195] Commission Decision of 24 May 2004 relating to a proceeding pursuant to Article 82 of the EC Treaty and Article 54 of the EEA Agreement against Microsoft Corporation, 2007 O.J. (L 32); James Kanter, *Europe Fines Intel $1.45 Billion in Antitrust* Case, N.Y. TIMES (May 13, 2009), https://www.nytimes.com/2009/05/14/business/global/14compete.html; European Commission Press Release IP/17/1784, Antitrust: Commission Fines Google €2.42 Billion for Abusing Dominance as Search Engine by Giving Illegal Advantage to Own Comparison Shopping Service (June 27, 2017); European Commission Press Release IP/18/4581, Antitrust: Commission Fines Google €4.34 Billion for Illegal Practices Regarding Android Mobile Devices to Strengthen Dominance of Google's Search Engine (July 18, 2018); European Commission Press Release IP/19/1770, Antitrust: Commission Fines Google €1.49 Billion for Abusive Practices in Online Advertising (Mar. 20, 2019); European Commission Press Release IP/22/7777, Antitrust: Commission Accepts Commitments by Amazon Barring It From Using Marketplace Seller Data, and Ensuring Equal Access to Buy Box and Prime (Dec. 20, 2022).

[196] As available on the European Comm'n's website at https://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=1.

[197] See See Conor Dougherty, *Inside Yelp's Six-Year Grudge Against Google*, N.Y. TIMES (July 1, 2017), https://www.nytimes.com/2017/07/01/technology/yelp-google-european-union-antitrust.html (on file with the author); Nitasha Tiku, *Don't Expect Big Changes From Europe's Record Google Fine*, WIRED (July 18, 2018), https://www.wired.com/story/dont-expect-big-changes-from-europes-record-google-fine/; Madhumita Murgia & Javier Espinoza, *Ireland Fails to Enforce EU Law Against Big Tech*, FIN. TIMES (Sept. 13, 2021), https://www.ft.com/content/5b986586-0f85-47d5-8edb-3b49398e2b08; See Special Report on the Commission's EU Merger Control and Antitrust Proceedings: A Need to Scale Up Market Oversight, ECA (2020) 24/2020.

One significant impediment faced by European tech companies is that they do not benefit from a fully integrated digital single market ("DSM") that would allow them to seamlessly operate across the EU. Scaling is key to growth and competitiveness, yet such a growth strategy is harder to pursue when companies are operating across numerous national markets with different languages, cultures, and government regulations. A 2019 study conducted by the McKinsey Global Institute highlighted this challenge, noting that "[f]ragmentation seems to put Europe at a structural disadvantage" when considering the innovation deficit between Europe on one hand and the US and China on the other.[198] In contrast, American and Chinese companies benefit from more homogenous home markets, which makes it relatively easier for their companies to scale domestically. That domestic scaling also paves way for these companies' subsequent global expansion. The fragmented DSM is a particular challenge for small and medium size enterprises, which presents a challenge for the EU's tech sector. Around 96% of the over 10,000 potentially high-growth platforms established in the EU are SMEs.[199] For them, the costs of fragmentation are often prohibitively high as they cannot draw on economies of scale to grow beyond a certain size.

Several reasons contribute to the fragmentation of the European single market for digital services. The EU is a heterogeneous consumer market that comprises twenty-four official languages. There are notable political and cultural differences across the EU Member States, in addition to differences in per capita GDP and levels of technological maturity. All these factors shape consumer demand and create barriers for intra-EU trade. For example, it was naturally easier for Amazon to start as an online bookseller in the US where the demand for English-language books was high across the country. In Europe, the publishing market is more fragmented because of linguistic diversity, creating obstacles for scaling across the continent. Video-on-demand ("VOD") services have also been difficult to scale in Europe because audience demand varies across Member States.[200] Spanish viewers are interested in different content than Belgian viewers whereas the demand for various titles is likely to vary less between audiences in Michigan and Virginia.[201] As a result, providers of VOD services in Europe often have to offer wholly different content in different Member States, which hinders their ability to market their services at scale.[202]

There is little that can be done to remove existing linguistic and cultural barriers through EU policy-making. However, there are also legal barriers that undermine digital trade within the EU, and those are the function of policy choices. Today, tech companies must often navigate a diverse set of national laws across Europe, which adds costs, complexity, and uncertainty to their business operations.[203] For example, France recently adopted onerous requirements on software

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[198] *See* Jacques Bughin, Eckart Windhagen, Sven Smit, Jan Mischke, Pal Erik Sjatil & Bernhard Gürich, *Innovation in Europe*, MCKINSEY GLOBAL INSTITUTE 14 (Oct. 2019), https://www.mckinsey.com/~/media/mckinsey/featured%20insights/innovation/reviving%20innovation%20in%20europe/mgi-innovation-in-europe-discussion-paper-oct2019-vf.ashx [https://perma.cc/7K3N-576K].

[199] European Commission, IMPACT ASSESSMENT ACCOMPANYING THE DOCUMENT PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL ON A SINGLE MARKET FOR DIGITAL SERVICES (DIGITAL SERVICES ACT) AND AMENDING DIRECTIVE 2000/31/EC (2020).

[200] iMinds, FRAGMENTATION OF THE SINGLE MARKET FOR ONLINE VIDEO ON DEMAND SERVICES: POINT OF VIEW OF CONTENT PROVIDERS (European Commission 2014), at 33.

[201] *Id.*

[202] *Id.*

[203] *See e,g.* France's onerous requirements around software and warranties, which undermine the EU's deregulatory efforts and risk fragmenting the single market. Digital Europe, *Single Market Barriers*, DIGITAL EUROPE (March 3

updates and warranties, adding costs and complexity for any software provider willing to offer products to customers in France.[204] When faced with such country-specific legal requirements, tech companies may need to offer different product varieties in different parts of Europe, which adds to their operating costs. Various other laws, including differences in national value-added tax ("VAT") systems, add to tech companies' compliance burdens. According to a 2019 survey of European entrepreneurs, over 60% of European businesses find VAT procedures to be a "significant" or "very significant" obstacle to doing business in the single market.[205] While the EU has sought to simplify VAT-compliance for companies operating across the EU Member States,[206] companies still face separate VAT registration requirements in all EU countries where they store inventory.[207]

Even when regulations are harmonized at the EU level, implementation can differ across the twenty-seven jurisdictions. Such differences in implementation increase operational burdens for companies and lead to the fragmentation of the single market. The Audiovisual Media Services Directive ("AVMSD") is a good illustration of this issue. The Directive was designed to harmonize national legislation on audiovisual media, including television broadcasting and VOD services.[208] One of its policy goals is to facilitate the sale of audiovisual goods and services across the EU by subjecting the provider only to the laws of the EU Member State where the provider is established.[209] However, in practice, several Member States have undermined this principle, creating additional regulatory requirements that add costs and can even require tailored products for different markets.[210] Member States have also introduced high investment obligations, levies, and different reporting obligations for VOD services, further hindering the cross-border expansion of those services.[211] These and other differences have led the European Audiovisual Observatory—a public service organization established under the Council of Europe—to conclude that the current regulatory environment in this industry "provides a labyrinth of obstacles to cross-border scaling" in Europe.[212]

The AVMSD is hardly a lone example of legal fragmentation that persists despite the EU-level efforts to pursue harmonization. The EU's 2019 Directive on Copyright in the Digital Single

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2022), https://www.digitaleurope.org/resources/single-market-barriers-continue-limiting-the-eus-potential-for-the-twin-transition/.

[204] Louise Bégué, *France: New Requirements Concerning the Sale of Digital Goods*, JDSUPRA, (2022)

[205] EuroChambres, BUSINESS SURVEY - THE STATE OF THE SINGLE MARKET: BARRIERS AND SOLUTIONS, (2019).

[206] European Commission, *VAT: New e-commerce rules in the EU will simplify life for traders and introduce more transparency for consumers'* (June 28 2021), https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3098.

[207] Digital Europe, *Single Market Barriers*, DIGITAL EUROPE (March 3 2022), https://www.digitaleurope.org/resources/single-market-barriers-continue-limiting-the-eus-potential-for-the-twin-transition/ at 5.

[208] Directive 2010/13/EU.

[209] *Id.* art. 2.

[210] *See e.g.* measures taken by Germany and France, discussed in Digital Europe, *Single Market Barriers*, DIGITAL EUROPE (March 3 2022), https://www.digitaleurope.org/resources/single-market-barriers-continue-limiting-the-eus-potential-for-the-twin-transition/.

[211] Digital Europe, *Single Market Barriers*, DIGITAL EUROPE (March 3 2022), https://www.digitaleurope.org/resources/single-market-barriers-continue-limiting-the-eus-potential-for-the-twin-transition/.

[212] European Audiovisual Observatory, INVESTING IN EUROPEAN WORKS: THE OBLIGATIONS ON VOD PROVIDERS (2022) at 5.

Market[213] has also fallen short of its goal to foster a single market for online copyright.[214] Member States have been slow and inconsistent in transposing the Directive into national law, deepening regulatory divergence and undermining the cohesion of the DSM.[215] In response to these threats to the unity of European standards and the risks to the DSM, the European Commission recently referred eleven EU Member States to the Court of Justice of the European Union for their failure to fully transpose EU copyright rules into national law,[216] illustrating the hurdles that persist in the EU's efforts to complete the DSM.

These examples illustrate how tech companies' ability to grow in Europe is compromised when the EU market is effectively balkanized along Member State lines. Whereas American tech companies have benefited from being able to scale much more rapidly across a fully integrated domestic market, European tech founders are constrained by the small size of their local market and the difficulty of expanding to other parts of Europe. Patrick Borre, a co-founder of ticketing platform Billetto, noted how "[I]f you're based in Denmark, for example, your entire local market is only half the size of London, so you quickly hit a ceiling.[217] He noted how "achieving initial scale [in Europe] is much more difficult than in the US,"[218] because "every European country has its own distinct environment you must learn about and navigate."[219] This fragmented home for European startups has forced them to internationalize earlier than their American counterparts, which were able to build scale domestically at first. According to a 2020 study, "about 70 percent of European unicorns had to establish a global or partly global geographical footprint," whereas only "50 percent of US unicorns" had to do the same.[220]

European lawmakers acknowledge that the fragmented DSM hampers the European technology sector's growth. In many other sectors of the economy, European companies benefit from a single European market as EU laws have harmonized national regulations and thereby facilitated intra-EU trade. However, the efforts to create a digital single market remain incomplete as legislation in this sector has not kept up with other EU-wide harmonization efforts. Back in 2010, the Commission recognized that, as a result of this fragmentation, "[t]oo few of our innovative SMEs grow into large, globally successful companies."[221] However, most barriers to growth and innovation have remained in place since 2010, despite the EU's persistent efforts to pursue greater digital integration. In 2015, only 4% of all digital services consumed in the EU were

[213] Directive 2019/790/EU.
[214] Mathilde Adjutor, *Copyright Rules: Contradictory National Implementation Threatens the Single Market*, DISRUPTIVE COMPETITION PROJECT (October 28 2022).
[215] *Id.*
[216] European Commission, *Press Release: The European Commission referred 11 Member States to the Court of Justice of the European Union for failing to fully transpose EU copyright rules into national law* (February 15 2022).
[217] Kjartan Rist, *Europe Is Building World-Class Tech Companies – But Can It Close The Gap With The US?*, FORBES (May 27 2022).
[218] *Id.*
[219] *Id.*
[220] Kim Baroudy, Jonatan Janmark, Abhi Satyavarapu, Tobias Strålin & Zeno Ziemke, *Europe's Start-Up Ecosystem: Heating Up, But Still Facing Challenges*, MCKINSEY & CO. (Oct. 11, 2020), https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/europes-start-up-ecosystem-heating-up-but-still-facing-challenges).
[221] European Commission Press Release, Turning Europe Into a True Innovation Union (Oct. 6, 2010).

sold cross-border.[222] In 2020, European Commission Executive Vice President Margrethe Vestager acknowledged that "one of the reasons why [the EU does not] have a Facebook and … a Tencent is that [the EU] never gave European businesses a full single market where they could scale up."[223] This suggests that EU leadership is aware of the challenge but has, to date, struggled to address it effectively.

The absence of a DSM holds back European tech companies in many industries, few of which have received particular attention in recent years. One 2021 study documents difficulties in deploying AI in the healthcare industry, in part because there are no harmonized standards on data quality, health-related cybersecurity protocols, standardized electronic health records, or infrastructures for exchanging health data across Europe.[224] Health industries also differ across Europe due to varying cultural approaches and risk appetites for new technology, adding to the balkanization. These factors complicate tech companies' ability to scale AI applications across Europe's health care sectors. Another example is the cloud computing and storage industry. In 2016, a study commissioned by the European Parliament estimated the cost of the incomplete DSM for cloud computing at "between €31.5 and €63 billion per year."[225] According to the European Cloud Partnership, one of the reasons that Europe is lagging behind is the lack of regulatory consistency, which adversely affects both cloud providers and cloud users.[226]

The above discussion has shown how the fragmented DSM poses a major impediment for European tech companies' growth as they face multiple barriers for scaling beyond a certain size. But the discussion also casts European-level tech regulations in a new light. The problem for tech companies is not often regulatory *stringency* in Europe as much it is regulatory *complexity* owing to the absence of common European rules. An alternative to a GDPR, AI Act, DMA, DSA, and other major European-level digital regulations is not a Europe without digital regulation; the alternative is a Europe with twenty-seven different digital regulations, adding to the complexity that is already hampering tech companies' growth strategies in Europe. As a result, laws such as the GDPR are more likely to facilitate than undermine innovation, by mitigating uncertainty and complexity. After all, an EU with twenty-seven disparate approaches towards data protection would, no doubt, present even greater barriers for data transfers across Europe.

B. Shallow and Fragmented Capital Markets Impede the Funding of Innovations

The DSM is not the only domain where European integration is falling short and hindering the growth potential of the EU's tech sector. Another major impediment is the absence of deep and integrated capital markets that would allow European companies to fund their innovations in Europe. In contrast to their American counterparts, startups in Europe have historically relied on

[222] *See* European Commission, *Why We Need a Digital Single Market* (2015), https://ec.europa.eu/info/sites/default/files/dsm-factsheet_en.pdf; *see also* Paul-Jasper Dittrich, *Balancing Ambition and Pragmatism for the Digital Single Market* 4 JACQUES DELORS INST. POL'Y PAPER 204 (2017).
[223] Melissa Heikkila, *Vestager touts AI-powered vision for Europe's tech future*, POLITICO (February 17 2020).
[224] European Commission, STUDY ON EHEALTH, INTEROPERABILITY OF HEALTH DATA AND ARTIFICIAL INTELLIGENCE FOR HEALTH AND CARE IN THE EUROPEAN UNION (2021) at 25.
[225] Study for the IMCO Committee, REDUCING COSTS AND BARRIERS FOR BUSINESSES IN THE SINGLE MARKET (European Parliament 2016).
[226] European Cloud Partnership, TRUSTED CLOUD EUROPE (2014) at 8.

banks in lieu of venture capital ("VC") financing from institutional investors.[227] This is a direct result of underdeveloped and fragmented capital markets in Europe. But banks are known for being more risk-averse than VC investors, calling into question their suitability to invest in high-risk, high-reward startups in the technology space.[228]

According to a study by the McKinsey Global Institute, the underdevelopment of equity finance in Europe poses a major challenge for startups seeking funding.[229] Analyzing European AI startups, this study concludes that financing has a "significantly higher impact" on the density of AI startup networks than other factors such as the ability to build innovative business models. While European companies can often secure seed funding and succeed in early fundraising rounds, they struggle to raise capital in later rounds. The comparison to the US here is stark: When companies enter the later stage D and E funding rounds, the percentage of total European VC funding as a proportion of US VC funding falls by approximately 50%.[230] In the absence of large European VC funds that have the capital to support late-stage rounds, similar US companies in comparable industries tend to raise significantly higher sums than their European rivals.[231] The financial analytics firm S&P Global has similarly highlighted how "the lack of finance for equity growth is among the biggest reasons for the dearth of big new innovators in the EU, especially in the digital and technological sectors."[232]

Many of today's leading tech giants, including Apple, Google, and Meta, hail from Silicon Valley, where entrepreneurial talent meets deep pockets of risk capital. Risk-seeking VC investors—pursuing rare but, when successful, astronomical awards—have, no doubt, fueled these and other US tech companies' innovations.[233] These investors have channeled both capital and talented employees into countless tech startups, incubating a fertile tech industry and establishing California's—and in particular Silicon Valley's—preeminence in the global digital economy.[234] The thriving VC market offers a powerful explanation for the success of American tech startups, revealing the benefits that ensue when three key inputs—capital, entrepreneurs, and financial

[227] Craig S. Smith, Europe's Venture Capital Scene is Narrowing the Gap With the US Despite Global Investment Slowdown, FORBES (Feb. 14, 2023), https://www.forbes.com/sites/craigsmith/2023/02/14/europes-venture-capital-scene-is-narrowing-the-gap-with-the-us-despite-global-investment-slowdown/?sh=712f12a4993b. The European version of financing "chok[es] capital supply and expos[es] the investment process to a host of frictions." Will Gornall & Ilya A. Strebulaev, The Economic Impact of Venture Capital: Evidence from Public Companies 21 (2021) (unpublished working paper) (on file with the author); Laura Bottazzi, Marco Da Rin, Jan C. van Ours & Erik Berglöf, Venture Capital in Europe and the Financing of Innovative Companies, 17 Econ. Pol'y 229, 240 & tbl.2 (2002) (discussing how, in the period from 1991 to 2000, institutional investors provided between 56% and 76% of all venture capital in the US, compared to only 13% to 34% in Europe. Meanwhile, banks provided between 32% and 48% of financing in Europe, while only making up 3% to 23% in the US, over the same period.).

[228] Craig S. Smith, Europe's Venture Capital Scene is Narrowing the Gap With the US Despite Global Investment Slowdown, FORBES (Feb. 14, 2023), https://www.forbes.com/sites/craigsmith/2023/02/14/europes-venture-capital-scene-is-narrowing-the-gap-with-the-us-despite-global-investment-slowdown/?sh=712f12a4993b.

[229] See Bughin et al., supra note 198, at 8.

[230] Baroudy at al., *supra* note 220.

[231] *See id.*

[232] Sylvain Broyer & David Henry Doyle, The EU Capital Markets Union: Turning the Tide, S&P GLOBAL (June 1, 2020), https://www.spglobal.com/en/research-insights/featured/special-editorial/the-eu-capital-markets-union-turning-the-tide.

[233] *See generally* Sebastian Mallaby, THE POWER LAW: VENTURE CAPITAL AND THE MAKING OF THE NEW FUTURE (2022).

[234] *Id.*, ch. 1 (2022).

intermediaries—come together in a single region such as Silicon Valley.[235] In this private ordering that benefits from "agglomeration economics," the government has played a trivial role. Instead, VC firms are in the driver's seat as financial intermediaries, contributing not only capital but invaluable expertise to startups.[236]

What sets the US apart from the EU is not only the prominent role of VCs as financial intermediaries funding tech companies but also the type of investors that provide the capital that VC firms deploy. The American VC market has benefited from substantial capital provided by institutional investors such as universities and pension funds that—unlike their European counterparts—have been free to invest their plentiful coffers in risky startups. In particular, the massive endowments of American universities have facilitated the continued growth of venture capital and startups in the US. It is telling, for instance, that universities contributed about half of the capital raised by VC firm Greylock Partners in each of its partnership from the 1970s onwards. VC firms have eagerly welcomed university endowments as universities typically have longer investment horizons and greater ability to endure illiquidity.[237] As a result, they are less prone to withdraw funds even when stocks are underperforming.[238] European universities simply do not have the capital to invest on the same scale as their American counterparts. Most of them do not have any significant endowments—much less ones capable of being deployed to invest heavily in VC.[239]

Pension funds have similarly fueled VC growth in the US. According to a 2017 survey of leading VC firms worldwide, public pension funds make up the biggest class of limited partners in VC funds, contributing 27% of committed capital.[240] VC market has been open to pension funds since regulatory reforms in the late 1970s. Those reforms expanded pension funds' ability to allocate capital to stocks as opposed to only "safe" investments such as government bonds.[241] By some estimates, these rule changes increased the money entrusted to VC funds by tenfold in the early 1980s as institutional investors—in particular, large pension funds—parked their money in VC.[242] However, this development has been largely confined to the US. In Europe, pension funds are largely restricted from investing in private and illiquid assets.[243] Even in the UK, which has the most developed capital markets in Europe, pension funds are still grappling with regulatory barriers when it comes to investing in tech startups.[244] Therefore, the absence (or near-absence) of

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[235] Ronald J. Gilson, Engineering a Venture Capital Market: Lessons from the American Experience, 55 STAN. L. REV. 1067, 1069.
[236] *Id. at* 1071, 1088.
[237] Tom Nicholas, VC: AN AMERICAN HISTORY 311 (2019).
[238] *Id.*
[239] See Alex Usher, University Endowments in a Global Context, HIGHER EDUC. STRATEGY ASSOCS. (June 4, 2015), https://higheredstrategy.com/university-endowments-in-a-global-context/.
[240] Preqin Special Report: The Venture Capital Top 100 (May 2017), https://docs.preqin.com/reports/Preqin-Special-Report-Venture-Capital-Top-100-Report.pdf. When private sector pension funds are added to that statistic, pension funds, in general, represent 42% of the surveyed VC firms' committed capital.
[241] Gornall & Strebulaev, *supra* note 235; Max M. Schanzenbach & Robert H. Sitkoff, Did Reform of Prudent Trust Investment Laws Change Trust Portfolio Allocation?, 50 J. L. Econ. 681, 681—82.
[242] Gornall & Strebulaev, *supra* note 235, at 20.
[243] *Id.*
[244] See Tal Feingold, It's Time to Open Up UK Pension Funds to Venture Capital, VAUBAN (Oct. 7, 2021), https://vauban.io/post/its-time-to-open-up-uk-pension-funds-to-venture-capital; Shubhu Patil, Positive News for UK

a similarly robust and active base of institutional investors in Europe has contributed to the vast difference between the European and American capital markets in general, and the VC markets in particular.

Of course, in principle EU startups could also grow with the help of foreign capital. Capital is mobile, after all, and investors should not care if their portfolios grow with foreign or domestic innovations. However, VC investment often favors local companies. Many American VC firms, based in or near Silicon Valley, feel more comfortable making risky bets on companies whose funders they know and whose business operations they can closely monitor after making the investment.[245] After all, VC investment is inherently risky and the potential of any given startup is difficult to assess. Startups based in Silicon Valley benefit from closely-knit professional and social networks where top researchers, entrepreneurs, and investors frequently interact and rely on established relationships. American VCs cannot similarly draw on their local network and informational advantage if they invest in a start-up in Berlin, Helsinki or Lisbon. This local bias explains why the US-based VC capital has disproportionately benefited tech startups based in Silicon Valley.[246]

However, there are signs that American VC firms view Europe as an increasingly attractive investment destination, and their capital is now flowing into European startups at a greater rate than before. As evidence of this trend, investments made by American VC firms in European ventures tripled between 2020 and 2021, reaching $83 billion.[247] Several prominent US-based investment firms have also opened European offices, which may indicate the arrival of more American capital in the future. For instance, the storied Sequoia Capital—which had $85 billion in assets under management in 2022[248]—opened an office in London in early 2021.[249] These developments reflect an increasing conviction among some of Silicon Valley's most successful venture capitalists that the European tech ecosystem is on the cusp of exponential growth.[250] They also give hope that even if European sources of capital remain limited for the continent's startups, American and other foreign capital may be able to offset some of those deficiencies.

Tech Startups: Pension Funds Will Be Able to Invest in UK Tech, HARPER JAMES (Aug. 17, 2022), https://harperjames.co.uk/news/pension-funds-will-be-able-to-invest-in-tech/.

[245] See discussion in Sarath Balachandran & Exequiel Hernandez, *Mi Casa Es Tu Casa: Immigrant Entrepreneurs As Pathways to Foreign Venture Capital Investments*, 42 STRATEGIC MGMT. J. 2047 (2021) (The authors discuss the local bias in VC investment but note that that might be changing by relying on immigrant networks.).

[246] Douglas Cumming & Na Dai, *Local Bias in Venture Capital Investments*, 17.3 J. OF EMPIRICAL FIN. 362 (2010).

[247] See How Sturdy Are Europe's Tech Unicorns?, THE ECONOMIST (July 4, 2022), https://www.economist.com/business/2022/07/04/how-sturdy-are-europes-tech-unicorns (on file with the author).

[248] See Natalie Sachmechi, Sequoia Capital Opening Its First New York Office, CRAINS N.Y. BUS. (July 28, 2022), https://www.crainsnewyork.com/real-estate/sequoia-capital-opening-its-first-new-york-office (on file with the author).

[249] See Sam Shead, U.S. VC Heavyweight Sequoia is Shunning London's Mayfair to Open a New Office in Marylebone, CNBC (Feb. 16, 2021), https://www.cnbc.com/2021/02/16/sequoia-shuns-londons-mayfair-for-marylebone.html [https://perma.cc/DX9E-6EZF]; Sam Shead, Prestigious Silicon Valley VC Firm Looks to Europe for Start-up Success Stories, CNBC (Nov. 26, 2020), https://www.cnbc.com/2020/11/26/sequoia-capital-vc-firm-looks-to-europe-for-start-up-success-stories.html [https://perma.cc/2GPG-Q4VZ].

[250] See Sebastian Mallaby, Venture Capital's New Race for Europe, FIN. TIMES (Feb. 4, 2022), https://www.ft.com/content/6fc9455a-75fc-4952-a4ff-203e5579aefa (on file with the author).

Despite this greater availability of US-based VC funding for promising European startups in recent years, few question the benefits that would ensue from more integrated and robust European capital markets. Historical differences in securities laws, investor protection, enforcement mechanisms, market structures, and, more broadly, stages of market development have resulted in a fragmented capital market across the EU that "has hampered market attractiveness, depth, and liquidity, which is driving up funding costs."[251] EU institutions have recognized the problem and have undertaken several initiatives aimed at improving the funding available for European startups and scale-ups. One landmark initiative is the Capital Markets Union ("CMU"), established in 2015. The CMU's goal is to reduce fragmentation in financial markets by creating a single market for capital in the EU. Deep and integrated European capital markets would help diversify financing sources, facilitate cross-border capital flows, and improve businesses' access to finance. The Commission has stated that the completion of the CMU is needed to strengthen the EU's global competitiveness.[252] Key leadership from the European Central Bank has similarly called for deeply integrated European capital markets. According to these individuals, progress towards the CMU would "support growth and innovation" as capital markets are "better at financing innovation and new sources of growth."[253] However, the implementation of the CMU has been slow. In practice, European capital markets remain far from integrated, hampering European tech companies' ability to access the kind of funding available to their American counterparts.

The EU is not just lagging behind the US in terms of private funding. The US government has also played a more productive role in funding US tech innovations compared to what European governments have done. While the private VC market provides the foundation for funding tech companies, governments can also contribute to a country's tech ecosystem by providing critical seed capital or otherwise facilitating technological innovations. The US government has taken on a pivotal role in fostering many of the most foundational innovations that underpin today's digital economy.[254] The state-backed innovation strategy is often tied to national security-related tech development, which the US government has had a strong incentive to support. Some of this investment can be traced back to the Cold War when the US government invested heavily in its arms race and space race against the Soviets. It also has roots in the US's efforts to prevail in the economic competition against Japan in the 1980s. These battles called for massive state investments in technology, leading the US to disburse large research grants to universities and offer lucrative military contracts to private tech companies.

Several path-breaking technologies have their origins in a US government agency called Defense Advanced Research Project Agency ("DARPA"), which operates under the US

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[251] Apostolos Thomadakis, Karel Lannoo & Niamh Moloney, Time to Reenergize the EU's Capital Markets, at 3 (https://www.ecmi.eu/sites/default/files/for_publication_time_to_re-energise_the_eus_capital_markets.pdf).

[252] See What Is the Capital Markets Union?, EUR. COMM'N, https://ec.europa.eu/info/business-economy-euro/growth-and-investment/capital-markets-union/what-capital-markets-union_en#overview [https://perma.cc/VG6C-YPAS] (last visited Mar. 28, 2022).

[253] See Luis de Guindos, Fabio Panetta & Isabel Schnabel, Europe Needs a Fully Fledged Capital Markets Union – Now More Than Ever, ECB BLOG (Sept. 2, 2020), https://www.ecb.europa.eu/press/blog/date/2020/html/ecb.blog200902~c168038cbc.en.html [https://perma.cc/LE68-NQD5].

[254] Margaret O'Mara, THE CODE: SILICON VALLEY AND THE REMAKING OF AMERICA (2019); Mariana Mazzucato, THE ENTREPRENEURIAL STATE: DEBUNKING PUBLIC VS. PRIVATE SECTOR MYTHS (2013).

Department of Defense. For example, DARPA financed the ARPANET, which was the predecessor of the internet. Email was similarly developed as a result of DARPA-funded research projects at the Massachusetts Institute of Technology and Stanford University.[255] Even the Apple iPhone is not a poster child of pure private entrepreneurship but rather a beneficiary of DARPA funding.[256] The iPhone's personal assistant "Siri," which relies on voice-recognition technology, was developed as a spinoff from a DARPA-backed artificial intelligence project.[257] In contrast, the EU does not have any joint defense fund that would be able to back European innovations at the scale that has been done by DARPA, adding to the existing innovation gap. Now that EU Member States are bolstering their defense capabilities in the wake of Russia's invasion of Ukraine, there is an opening for a renewed conversation about common European defense capabilities, including joint investment in military technologies. As the US example shows, a European equivalent of the American DARPA could yield substantial benefits for the broader innovation ecosystem. But comparing the American and European tech ecosystems as they stand right now, the relative dearth of both public and private funding in the EU offers a powerful reason for why today's tech companies emanate from the US and not from the EU.

C. Punitive Bankruptcy Laws Deter Risk-Taking and Discourages Entrepreneurship

Another potential reason for the absence of European tech giants is Europe's legal and cultural barriers to risk-taking and entrepreneurship. Punitive bankruptcy laws across the EU have made failure so costly that European entrepreneurs often shy away from the kind of risk-taking required for ambitious technological ventures. In a report studying insolvency regimes across countries, the Organisation for Economic Co-operation and Development ("OECD") described how "insolvency regimes that do not unduly penalise entrepreneurial failure can spur firm creation, draw more talented individuals into entrepreneurship and incentivize radical innovation over conservative business strategies."[258] Several studies suggest that lenient bankruptcy laws—often seen as those that protect the rights of debtors at the expense of creditors—have a positive effect on entrepreneurship and innovation, [259] even though other studies have identified instances in which debtor-friendly bankruptcy regimes may also have a negative effect on entrepreneurship. [260]

The US and Europe differ in their approach to business failure, which has sustained differences in their respective bankruptcy laws. Across several dimensions, US personal insolvency regimes are less punitive for the entrepreneur in case of failure, lowering barriers to

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[255] Amy Lynne Bomse, *The Dependence of Cyberspace*, 50 DUKE L.J. 1717, 1721 (2001).
[256] Mariana Mazzucato, *Taxpayers Helped Apple, But Apple Won't Help Them*, HARVARD BUS. REV. (Mar. 8, 2013), https://hbr.org/2013/03/taxpayers-helped-apple-but-app [https://perma.cc/XF87-CKPH].
[257] *Id.*
[258] Müge Adalet McGowen & Dan Andrews, Design of Insolvency Regimes Across Countries, Economics Department, OECD (2018), https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ECO/WKP(2018)52&docLanguage=En
[259] Viral V. Acharya & Krishnamurthy V. Subramanian, *Bankruptcy Codes and Innovation*, 22 REV. OF FIN. STUD. 4949, 4950, 4951, 4953 (2009); *See generally*, Seung-Hyun Lee et al., *How Do Bankruptcy Laws Affect Entrepreneurship Around the World?* 26 J. OF BUS. VENTURING 505 (2011); *See generally*, Blażej Prusak et al., *The Impact of Bankruptcy Regimes on Entrepreneurship and Innovation. Is There Any Relationship?*, 18 INT'L ENTREPRENEURSHIP & MGMT. 473 (2022).
[260] *See* Geraldo Cerqueiro & María Fabiana Penas, *How Does Personal Bankruptcy Law Affect Startups?*, 30 REV. OF FIN. STUD. 2523, 2538--52. (2017); *See generally*, David M. Primo & Wm Scott Green, *Expanding Our Perspectives on Entrepreneurship Research*, 1 ENTREPRENEURSHIP RSCH J. 5 (2011).

entrepreneurship and risk taking.[261] In its report, the OECD found that the personal costs of entrepreneurship, which were primarily measured by the time to discharge—that is, the number of years until bankrupt entrepreneurs are discharged from their debts—and the number of exemptions given to entrepreneurs—that is, the debtors' assets that are carved out from insolvency—were the lowest in the US, Canada, and Turkey, and the highest in the Czech Republic, Sweden, Portugal, and several other European countries.[262]

Personal insolvency law is relevant in that it impacts individuals' incentives to engage in entrepreneurship in the first place, while also affecting their ability to return to the marketplace after a business failure. Entrepreneurs are typically only able to turn to VC at the stage when their innovation is at a more advanced stage. Until then, the entrepreneur often needs to rely on her own funds, personal credit, or investment from family and friends, potentially overextending her personal finances. If fund raising efforts subsequently fail, the entrepreneur may face personal insolvency.[263] John Armour has shown that a harsher personal bankruptcy regime has both an *ex ante* and *ex post* adverse effect on entrepreneurship and, consequently, dampens the aggregate demand for VC finance.[264] His cross-national study involving the US and ten European jurisdictions shows that personal insolvency laws are generally more severe in Europe and that those punitive insolvency regimes discourage individuals from engaging in risky entrepreneurship in the first place. In addition, such laws make it more difficult for failed entrepreneurs to return to the marketplace after insolvency.[265] More recent studies confirm these findings, suggesting that lenient personal bankruptcy laws, indeed, foster entrepreneurship.[266]

Like personal insolvency law, corporate insolvency law can also influence incentives for entrepreneurship. One way to measure if the corporate bankruptcy regime is creditor- or debtor-friendly is whether it facilitates restructuring of the firm in case of a bankruptcy. On this score, the US bankruptcy laws are generally considered more debtor-friendly in that they are designed to facilitate reorganization, which can salvage the failed company and allow the business to operate while it seeks to restructure its debts.[267] These features of the US regime encourage entrepreneurship and risk-taking at the outset.[268] In contrast, the reorganization of a failed business is generally more difficult in Europe, even though differences exist across member states.[269]

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[261] *See* Müge Adalet McGowen & Dan Andrews, Design of Insolvency Regimes Across Countries, Economics Department, OECD (2018).
[262] *Id*.
[263] John Armour, *Personal Insolvency Law and the Demand for Venture Capital*, 5 EUROPEAN BUS. ORG. L. REV. – 87 (2015).
[264] *Id*.
[265] *See:* John Armour & Douglas J. Cumming, *The Legislative Road to Silicon Valley*, 58 OXF. ECON. PAP. 596-635 (2006).
[266] Błażej Prusak, Sylwia Morawska, Michał Łukowski & Przemysław Banasik, *The impact of bankruptcy regimes on entrepreneurship and innovation. Is there any relationship?*, 18 IEMJ 473-498 (2022). However, some within-countries studies have found no relationship. *See* Ali Sadeghi & Ewald Kibler, *Do bankruptcy laws matter for entrepreneurship? A Synthetic Control Method analysis of a bankruptcy reform in Finland*, 18 J. BUS. VENTUR. INSIGHTS (2022).
[267] 11 U.S.C. § 362.
[268] *Id.* at 6.
[269] Francesco Guarascio, *EU Proposes U.S.-Style Rules to Give Failing Firms Second Chance*, REUTERS (Nov. 22, 2016), https://www.reuters.com/article/uk-eu-business-bankruptcy-idUKKBN13H1SW; José Garrido, et al., *Restructuring and Insolvency in Europe: Policy Options in the Implementation of the EU Directive* (Int'l Monetary Fund Working Paper No. 2021/152, 2021),

Without an agreed upon reorganization plan, the debtor is doomed to liquidation, adding to the risks faced by European tech startups and other entrepreneurs. This explains, in part, why the various European insolvency regimes contribute to lower entrepreneurial activity in the EU as compared to the US.

There are several reasons why the US has chosen a more lenient bankruptcy regime, some of which stem from historical developments. The growth of the US railroad industry in the 19th century, when American society spread westward across the continent, required immense amounts of credit. In case of a bankruptcy of a railroad company, it would have been inefficient for creditors to force the railroad owner to strip up its steel tracks and sell them to repay debts. As such, bankruptcy law was forced to become debtor-friendly to ensure that the train lines—the arteries of American industry at the time—remained in place.[270] Even today, the US insolvency laws reflect the view that debtor-friendly bankruptcy laws are positively correlated with greater rates of innovation and economic growth.[271] Without the opportunity to receive a "fresh start," entrepreneurs would not innovate.[272]

Europeans do not share the American view on credit, risk-taking, and business failure.[273] However, EU leaders are increasingly conscious that their approach towards insolvency can deter risk-taking and thereby entrepreneurship. Without a possibility for a fresh start, Europeans cannot afford to take the risk of default and are hence less likely to start a business in the first place. To alleviate the problem, EU institutions have sought to pursue greater harmonization of national insolvency laws across Member States, stressing that insolvency from "entrepreneurship does not necessarily have to turn into a 'life sentence.'"[274] In 2016, the European Commission proposed a Directive aimed at reducing the costs of failure for entrepreneurs, endorsing the "principle of second chance."[275] The Directive, which bears similarities to Chapter 11 of the US Bankruptcy Code, was formally adopted in 2019.[276] This and other legislative efforts to date have, nevertheless,

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https://www.imf.org/en/Publications/WP/Issues/2021/05/27/Restructuring-and-Insolvency-in-Europe-Policy-Options-in-the-Implementation-of-the-EU-50235.

[270] Todd J. Zywicki, *The Past, Present, and Future of Bankruptcy Law in America*, 101 MICH. L. REV. 2016, 2017--20 (2003) Blażej Prusak et al., *The Impact of Bankruptcy Regimes on Entrepreneurship and Innovation. Is There Any Relationship?*, 18 INT'L ENTREPRENEURSHIP & MGMT. 493 (2022)..

[271] Pollman, *supra* note 284, at 164 (2015); Armour, *supra* note 262, at 10 (2011) (noting how the US is the hallmark of VC entrepreneurship, not only because of debtor-friendly laws, but due to regulatory competition in the US).

[272]Florian Ederer & Gustavo Manso, *Incentives for Innovation: Bankruptcy, Corportate Governance, and Compensation Systems*, HANDBOOK OF L., INNOVATION & GROWTH 6 (2011).

[273] Thomas Fuller, *The Workplace: Risk-takers Are a Rare Breed in EU*, NYTIMES (Jan. 19, 2005), https://www.nytimes.com/2005/01/19/business/worldbusiness/the-workplace-risktakers-are-a-rare-breed-in-eu.html; Isabel Grilo & Jesus-Maria Irigoyen, *Entrepreneurship in the EU: To Wish and Not to Be*, 26 SMALL BUS. ECON. 305, 310 (2006); Katrina Bishop, *EU Needs Risk-Takers to Compete With US: EU's Kroes*, CNBC (Oct. 20, 2014), https://www.cnbc.com/2014/10/20/eu-needs-risk-takers-to-compete-with-us-eus-kroes.html.

[274] See European Parliamentary Research Service Briefing, New EU Insolvency Rules Give Troubled Businesses a Chance to Start Anew, EPRS_BRI (2018), https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/623548/EPRS_BRI(2018)623548_EN.pdf [https://perma.cc/PY4N-JD5U] [hereinafter New EU Insolvency Rules].

[275] See Press Release, Council of the EU, Giving Entrepreneurs a Second Chance: New Rules on Business Insolvency Adopted (June 6, 2019), https://www.consilium.europa.eu/en/press/press-releases/2019/06/06/giving-entrepreneurs-a-second-chance-new-rules-on-business-insolvency-adopted/ [https://perma.cc/WP2N-YT9H].

[276] *See id*.; New EU Insolvency Rules, *supra* note 278.

been slow to harmonize and modernize EU bankruptcy laws across Member States, prolonging the problem faced by European tech entrepreneurs.[277]

Yet, unforgiving bankruptcy laws are only part of the story behind European entrepreneurs' risk-aversion. Cultural factors also play a role. Business failure carries a greater stigma in Europe, hampering risk-taking and consequently holding back innovation.[278] In Europe, "failure is regarded as a personal tragedy," whereas in Silicon Valley failure is seen as a badge of honor or rite of passage, leading to the mantra of "[f]ail fast, fail often."[279] This more forgiving American approach towards failure includes giving a second chance to individuals whose prior ventures have failed. In part, this reflects a simple realization that failure is common and as such baked into the VC business model. According to some estimates, 70% of venture-backed startups fail,[280] but many of the failed entrepreneurs try again.[281] Investors realize that a failure may reflect bad luck or other external circumstances rather than a lack of skill and are therefore prepared to back the unsuccessful founder again. [282] This mentality thus recognizes that failure and success are often intertwined in the innovative startup ecosystem.[283]

Some stories of spectacular business failures in the US, followed by even more spectacular successes have contributed to the mindset that a failure is not fatal and can offer lessons and even breed new success. It is remarkable that one of the most successful US tech entrepreneurs, Steve Jobs, was fired from Apple in 1985—the company he had founded in 1976. In retrospect, Jobs described his firing from Apple as "the best thing that could have ever happened to me," explaining how "[t]he heaviness of being successful was replaced by the lightness of being a beginner again, less sure about everything. It freed me to enter one of the most creative periods of my life." [284] After being let go by the Apple Board, Jobs went on to create two new companies, Pixar and NeXT, before returning to Apple in 1997—this time to save the company from the verge of bankruptcy and to lead Apple to tremendous success.[285]

In contrast, Europeans do not share the American approach towards failure. They tend to be more risk-averse, dampening the continent's entrepreneurial spirit and holding back European

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[277] *See* Emilie Ghio et al., *Harmonizing Insolvency Law in the EU: New Thoughts on Old Ideas in the Wake of the COVID-19 Pandemic*, 30 INT'L INSOLVENCY REV. 427, 431--33 (2021); Regulation 2015/848 of the European Parliament and of the Council of 20 May 2015 on Insolvency Proceedings, 2015 O.J. (L 141); *Commission Proposal for a Directive of the European Parliament and of the Council Harmonising Certain Aspects of Insolvency Law*, COM (2022) 702 final (July 12, 2022).

[278] Armour, *supra* note 262, at 19.

[279] *See* Baroudy at al., *supra* note 220; James B. Stewart, A Fearless Culture Fuels U.S. Tech Giants, N.Y. TIMES (June 18, 2015), https://www.nytimes.com/2015/06/19/business/the-american-way-of-tech-and-europes.html (on file with the author) (internal quotation marks omitted).

[280] Elizabeth Pollman, *Startup Governance*, 168 U. PENN. L. REV. 155, 159, 161 (2015).

[281] *Id.* at 189 (2015) (citing a survey study finding that 48% of first-time entrepreneurs start another venture within five years of their initial failure).

[282] *Id.*

[283] *Id.* at. 159, 161.

[284] *Steve Jobs: Apple Founder's Moving Speech on Why Being Fired From Tech Giant was the Best Thing to Happen*, THE INDEP. (Feb. 24, 2016), https://www.independent.co.uk/news/people/steve-jobs-apple-founder-s-moving-speech-on-why-being-fired-from-tech-giant-was-the-best-thing-to-happen-a6893196.html.

[285] Matt Weinberger & Avery Hartmans, *Steve Jobs Would Have Been 65 on Monday: Here's How the Late Apple CEO Saved the Company from Disaster and Set it On a Path to a $1 Trillion Valuation*, BUS. INSIDER (Feb. 24, 2020), https://www.businessinsider.com/steve-jobs-apple-photos-2017-1

companies' innovativeness.[286] Instead of celebrating—or even merely accepting—failure, Europeans value stability, which cultivates a mentality that is antithetical to disruptive innovation.[287] Several studies point to this conclusion. For example, one study by EOS Gallup Europe shows that fifty percent of Europeans believe that the greatest risk of starting a business is insolvency. In America, only thirty percent do.[288] Europeans are also less drawn to entrepreneurship more broadly. An analysis of media coverage of entrepreneurship shows that only 17% of press coverage in Germany portrays entrepreneurship in a positive light, while 39% of media coverage in the US presents entrepreneurship positively.[289]

Europeans' risk aversion is similarly evident in their investment patterns. One study measuring attitudes towards financial risk across fifteen countries found that people living in Austria, Germany, and the Netherlands are the most risk-averse, while those living in the US are the least risk-averse.[290] This leads to differential investment patterns, with most European retail investors believing that investments in shares, mutual funds, and bonds are very risky, while comparable investors in the US perceived significantly less risk in the same investments. Similarly, a study sponsored by the European Central Bank found that the ownership and relative magnitude of risky assets in the US is far higher than in Europe.[291] This European culture of risk-aversion may also explain the more limited availability of later stage VC funding for European startups.[292] Europeans are often too risk-averse to start a tech company—but possibly also too risk-averse to fund that tech company.

D. Inability to Harness Global Talent Contributes to Skills Deficit

Finally, the innovation deficit in Europe can be partly attributed to the EU's inability to attract the world's best innovative talent through a proactive migration policy. In comparison, the US technology sector relies heavily on its ability to attract immigrants. Looking at the founders of the most successful US tech companies reveals a powerful story of the role of immigration behind these tech companies. Steve Jobs of Apple was the son of a Syrian immigrant; Jeff Bezos of Amazon is a second-generation Cuban immigrant; Eduardo Saverin, the co-founder of Facebook, is Brazilian; Sergey Brin, the co-founder of Google, was born in Russia; and Elon Musk of Tesla was born in South Africa. These individuals are also not rare exceptions: A 2018 study by the National Foundation for American Policy reveals that 55% of America's billion-dollar companies

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[286] *See* Peter Ester, *What Can Europe Learn From Silicon Valley Accelerators?*, ACCELERATORS IN SILICON VALLEY 137, 142 (2017).
[287] *Id.*; Stewart, *supra* note x.
[288] *Europeans More Reluctant than Americans to Take Risks in Business Creation, Says Report*, EUR. COMM'N (July 12, 2002), https://cordis.europa.eu/article/id/18673-europeans-more-reluctant-than-americans-to-take-risks-in-business-creation-says-report.
[289] Baroudy at al., *supra* note 220.
[290] Maria Ferreira, *Cross-country Differences in Risk Attitudes towards Financial Investment*, VOXEU (Sept. 21, 2018), https://voxeu.org/article/cross-country-differences-risk-attitudes-towards-financial-investment.
[291] Karim Bekhtiar, Pirmin Fessler & Peter Lindner, *Risky Assets in Europe and the US: Risk Vulnerability, Risk Aversion and Economic Environment*, Eur. Cent. Bank Working Paper Series No. 2270 (2019).
[292] Baroudy at al., *supra* note 220.

have an immigrant founder and, if the children of immigrants are included, the statistic rises to 64%.[293]

Overall, studies have documented that immigrants are more entrepreneurial than the general US population. A recent study focusing on immigration and entrepreneurship across industries found that immigrants are 80% more likely to found a firm compared to U.S.-born citizens.[294] Another study by the Center for American Entrepreneurship reveals that 43% of the 2017 Fortune 500 companies were founded by an immigrant or the child of an immigrant.[295] Among the top 35 firms, that share rises to 57%.[296] These are high numbers considering that immigrants made up only 14% of the U.S. population as of December 2022.[297] The impact of foreign talent has also been strong in the technology sector, in particularly among companies that trace their roots to Silicon Valley. One study found that 25% of engineering and technology companies established between 1995 and 2005 nationwide had at least one immigrant founder.[298] In comparison, during the same period, 52% of startups founded in Silicon Valley had at least one immigrant founder.[299] Immigrant talent is also disproportionately fueling many tech companies focusing on emerging technologies, including AI. For example, The *Forbes*' annual list of the 50 most promising North American AI startups features a large number of AI companies founded by immigrants. The inaugural list of leading AI startups in 2019 reveals that 66% of those companies have at least one first generation immigrant founder.[300]

These statistics would be difficult to replicate in Europe, given both its current immigration policies and a culture in which diversity and immigration have not been interwoven into the fabric of society. There are, of course, some examples of immigrant founders of prominent European tech startups—including Nikolay Storonsky and Vlad Yatsenko of the fintech company Revolut[301] and Adrian Durham of another fintech company FNZ.[302] At the same time, it is hard to obtain

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[293] See Stuart Anderson, Nat'l Found. for Am. Pol'y, Immigrants and Billion Dollar Companies, NFAP POL'Y BRIEF 1 (Oct. 2018), https://nfap.com/wp-content/uploads/2019/01/2018-BILLION-DOLLAR-STARTUPS.NFAP-Policy-Brief.2018-1.pdf [https://perma.cc/J6QJ-5C7P].

[294] Pierre Azoulay, Benjamin F. Jones, Daniel Kim & Javier Miranda, Immigration and Entrepreneurship in the United States, 4 Am. Econ. Rev. 71, 81 (2022).

[295] Immigrant Founders of the 2017 Fortune 500, STARTUPS USA, https://startupsusa.org/fortune500/ (last accessed Apr. 24, 2023).

[296] *Id*.

[297] Miriam Jordan & Robert Gebeloff, Amid Slowdown, Immigration Is Driving U.S. Population Growth, N.Y. TIMES (Feb. 5, 2022), https://www.nytimes.com/2022/02/05/us/immigration-census-population.html.

[298] Vivek Wadhwa, AnnaLee Saxenian, Ben Rissing & Gary Gereffi, America's New Immigrant Entrepreneurs 4 (2007). This particular study classified various industries under the umbrella of "engineering and technology": bioscience, computers/communications, defense/aerospace, environmental, innovation/manufacturing-related services, semiconductors, and software.

[299] *Id*.

[300] Tina Huang, Zachary Arnold & Remco Zwetslott, Most of America's 'Most Promising' AI Startups Have Immigrant Founders 4 (2020).

[301] John Hyatt, Russian-Born Billionaire Behind Revolut Fintech App Publishes Anti-War Letter, FORBES (Mar. 1, 2022), https://www.forbes.com/sites/johnhyatt/2022/03/01/revoluts-russian-anti-war-billionaire-founder-promises-to-match-donations-to-red-cross-ukraine/?sh=2b3eae4078e4; Forbes Profile: Vlad Yatsenko, FORBES (last updated Apr. 4, 2022), https://www.forbes.com/profile/vlad-yatsenko/?sh=70c448235b86.

[302] Rob Stock, FNZ Was Founded by Kiwi Adrian Durham in 2003. Now It's Worth $3.35 Billion, STUFF (Oct. 10, 2018), https://www.stuff.co.nz/business/money/107727511/fnz-was-founded-by-kiwi-adrian-durham-in-2003-now-its-worth-335-billion.

directly comparable data on the prevalence of immigrant founders in European tech companies. Some studies contain information on ethnic background among tech entrepreneurs. While ethnicity is an imperfect proxy for identity as an immigrant, these studies directionally suggest that the EU is faring considerably worse than the US in leveraging immigrant talent to fuel tech innovation. For example, one study found that fewer than 13% of European unicorns have at least one founder who is from a minority ethnic background.[303]

In the absence of extensive data on the immigration status of European tech founders, another way to measure foreign talent and innovation is to focus on inventors and patents, with the caveat that studies typically focus on a few EU Member States and not the entire EU. One study suggests that around 12% of inventors aged 25—64 filing patent applications in Sweden were foreign-born.[304] In Germany, 11% of total patents from 1994—2018 could be traced to inventors with a migrant background.[305] In comparison, another study found that almost 30% of leading inventors in the US are foreign-born.[306] The US also boasts a far higher share of "resident inventors" compared to the EU. A study by the World Intellectual Policy Organization found that while 7% of resident inventors from 1991—2010 in the US were foreign nationals, less than 2.5% of resident inventors were foreign nationals in the twelve European countries that were assessed.[307] This same study concluded that the US is successful in attracting highly productive inventors from countries and that skilled immigrants have a preference for the US.[308]

Immigration contributes to a country's innovation base in various ways. For one, it adds greater diversity to the talent pool, which is widely accepted to be a powerful driver of innovation.[309] Europe tends to be less diverse than the US, a limitation which remains true among corporations, including tech startups.[310] Immigration also supplies skilled workers to the local economy. These highly skilled workers serve as major catalysts for expanding knowledge, business ventures, and other innovative initiatives.[311] European companies draw on a smaller of

[303] State of DEI (2022), STATE OF EUROPEAN TECH, https://stateofeuropeantech.com/reading-tracks/state-of-dei.
[304] Yannu Zheng & Olaf Ejermo, *How Do Foreign Born Perform in Inventive Activity? Evidence from Sweden*, 28 J. Population Econ. 659, 670 (2015).
[305] Oliver Koppel & Enno Kohlisch, *Migration and Innovation*, SOC. EUR. (Jun. 1, 2021), https://socialeurope.eu/migration-and-innovation.
[306] Yeonji No & John P. Walsh, *The importance of foreign-born talent for U.S. innovation*, 28 NATURE BIOTECHNOLOGY 289 (2010).
[307] Sefano Breschi, Francesco Lissoni & Gianluca Tarasconi, *Inventor Data for Research on Migration & Innovation: A Survey and a Pilot* 23 (WIPO Econ. Rsch. Working Paper No. 17, 2014), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_econstat_wp_17.pdf.
[308] *Id*. at 26.
[309] *See, e.g.*, Sylvia Ann Hewlett, Melinda Marshall & Laura Sherbin, *How Diversity Can Drive Innovation*, HARV. BUS. REV. (Dec. 2020), https://hbr.org/2013/12/how-diversity-can-drive-innovation; Stuart R. Levine, *Diversity Confirmed to Boost Innovation and Financial Results*, FORBES (Jan. 15, 2020), https://www.forbes.com/sites/forbesinsights/2020/01/15/diversity-confirmed-to-boost-innovation-and-financial-results/?sh=24477ec9c4a6; Beth Stackpole, *Location Matters as Companies Get Their Innovation Mojo Back*, MIT SLOAN SCHOOL OF MANAGEMENT (Sept. 14, 2021), https://mitsloan.mit.edu/ideas-made-to-matter/location-matters-companies-get-their-innovation-mojo-back.
[310] *See* ATOMICO & SLUSH, THE STATE OF EUROPEAN TECH 2021, at 152 (2021).
[311] MARTIN KAHANCE & KLAUS F. ZIMMERMAN, EUROPEAN COMMISSION, MIGRATION IN AN ENLARGED EU: A CHALLENGING SOLUTION? (2009), https://ec.europa.eu/economy_finance/publications/pages/publication14287_en.pdf, citing Etienne Wasmer et al.,

skilled-labor workforce, in part because of the presence of fewer skilled immigrants in Europe. According to a 2019 study, only 25% of immigrants to Europe are highly educated, compared to 36% of immigrants who migrate to other OECD countries.[312] These numbers track closely to the difference between the entry of new immigrants into strongly growing occupations in the US and the EU, including in the STEM field.[313]

The EU is not only struggling to attract migrants to its tech sector, but is also losing European talent to the US. There are numerous examples of European tech entrepreneurs relocating to the US to start a business or to grow it there, contributing to a significant brain drain that deepens the US-EU technology gap. Some examples of talent migration away from the EU to the US include payment platform Stripe (valued at $95 billion) whose founders John and Patrick Collison grew up in Ireland but left their home country to attend college in the US before founding Stripe in San Francisco in 2010.[314] Daniel Dines and Marius Tîrcă, the founders of business automation platform UiPath ($7.6 billion market cap), founded their company in Bucharest, Romania, in 2005 before moving its headquarters to New York in 2017.[315] The cofounder and CEO Ali Ghodsi of Databricks—a data analytics and AI platform (valued at $28 billion)—left Sweden in 2009 to attend UC Berkeley as a visiting scholar. Ghodsi's plan was to stay in the US for a year,[316] but he ended up cofounding Databricks in San Francisco in 2013 and "never went back to Sweden."[317]

There are various ways to measure the extent of the brain drain from the EU to the US beyond these individual anecdotes. One study focusing on the distribution of top AI talent around the world shows that while top AI researchers overwhelmingly work in US institutions—60% of the talent pool is US-based, as opposed to 11% in Europe—this US-based talent is only partially homegrown. Over half of the top-tier AI researchers in the US are immigrants or foreign nationals, with 29% of them having received their undergraduate degree in China, followed by 20% in the US and 18% in Europe.[318] This suggests that the world's top AI researchers, including top-European AI researchers, are migrating to the US and rarely the other way around.

The Macroeconomics of Education, *in* EDUCATION AND TRAINING IN EUROPE, (Giorgio Brunello, Pietro Garibaldi & Etienne Wasmer eds., 2007).

[312] See Bughin et al., *supra* note 198.

[313] OECD, *Is Migration Good for the Economy?*, OECD MIGRATION POL'Y DEBATES (May 2014), https://www.oecd.org/migration/OECD%20Migration%20Policy%20Debates%20Numero%202.pdf.

[314] Alex Konrad, *The Collison Brothers Built Stripe Into a $95 Billion Unicorn With Eye-Popping Financials. Inside Their Plan to Stay on Top*, FORBES (May 26, 2022), https://www.forbes.com/sites/alexkonrad/2022/05/26/stripe-exclusive-interview-collison-brothers-95-billion-plan-to-stay-on-top/?sh=7909f9d95a1b.

[315] *Id*.

[316] *Getting Around "Moore's Wall": Databricks CEO Ali Ghodsi Strives to Make AI More Accessible to the Fortune 2000*, DATABRICKS (Aug. 22, 2017), https://www.databricks.com/blog/2017/08/22/getting-around-moores-wall-databricks-ceo-ali-ghodsi-strives-to-make-ai-more-accessible-to-the-fortune-2000.html; Kenrick Cai, *Accidental Billionaires: How Seven Academics Who Didn't Want To Make A Cent Are Now Worth Billions*, FORBES (May 27, 2021), https://www.forbes.com/sites/kenrickcai/2021/05/26/accidental-billionaires-databricks-ceo-ali-ghodsi-seven-berkeley-academics/?sh=7677be377008.

[317] Getting Around "Moore's Wall, *supra* note 319.

[318] See The Global AI Talent Tracker, MACRO POLO, https://macropolo.org/digital-projects/the-global-ai-talent-tracker/ [https://perma.cc/VH9H-6EAL] (last visited Mar. 29, 2022).

These and other studies confirm that the EU is losing talent to the US, limiting the pool from which tech companies can hire in the EU while further increasing the talent pool available for US tech companies.[319] There are several reasons for why researchers and tech entrepreneurs often prefer the US to the EU. One reason is the attractiveness of US universities that can act as a gateway to the US labor market.[320] The US's world-class universities are a major draw for foreign talent. According to the 2021 Times Higher Education World University Rankings, only six universities in the EU are listed among the top fifty universities in the world, with the highest ranked number thirty-two. In contrast, the same list features twenty-two US universities.[321] Rather strikingly, in the 2016—2017 school year, 54% of master's degrees and 44% of doctorate degrees in STEM fields issued by U.S. universities were earned by foreign students.[322] Many foreign students stay in the US after graduating, subsequently contributing to the US talent base in the labor market. A 2018 report by the National Science Foundation revealed that 70% of foreign-born, non-citizen science and engineering doctoral students in the US remain in the US after graduating.[323] The *Forbes* list of the 50 most promising North American AI startups similarly points to the US universities as an important entryway for highly-skilled immigrants to the US. Of those highly successful first-generation immigrant AI startup founders, 72% came to the U.S. to pursue higher education.[324]

European universities also have weaker links to startup ecosystems compared to the US, making them less attractive destinations for aspiring tech entrepreneurs. Academic entrepreneurship is culturally discouraged in Europe.[325] It is also financially less rewarding to launch a business on a European university campus. European universities frequently demand an equity share of 25% upon founding of a company—some institutions ask for as much as 50%. In comparison, the technology transfer offices at American institutions like MIT or Stanford rarely demand more than 10%. The technology transfer offices of European universities also often engage in highly bureaucratic negotiations over intellectual property rights with founders.[326] These reasons, in part, explain the scarcity of tech companies emanating from university campuses in the EU. According to one study, only four of the 116 venture capital-backed European unicorns are

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[319] Jawaria Khan, European Academic Brain Drain: A Meta Analysis (2021).
[320] See A Quick Look at Global Mobility Trends, INST. INT'L EDUC. (2020), https://iie.widen.net/s/g2bqxwkwqv/project-atlas-infographics-2020 [https://perma.cc/C54X-9483].
[321] See World University Rankings 2022, TIMES HIGHER EDUC., https://www.timeshighereducation.com/world-university-rankings/2022/world-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats [https://perma.cc/7H6K-GH7V] (last visited Mar. 29, 2022).
[322] Foreign STEM Students in the United States (2019), https://crsreports.congress.gov/product/pdf/IF/IF11347 (last accessed Apr. 24, 2023).
[323] See Michael G. Finn & Leigh Ann Pennington, Stay Rates of Foreign Doctorate Recipients from U.S Universities, 2013, NAT'L CTR. FOR SCI. & ENG'G STAT. OF THE NAT'L SCI. FOUND. BY OAK RIDGE INST. FOR SCI. & EDUC. 3—4 (Jan. 2018), https://orise.orau.gov/stem/reports/stay-rates-foreign-doctorate-recipients-2013.pdf [https://perma.cc/7S45-R4X5].
[324] Tina Huang, Zachary Arnold & Remco Zwetslott, Most of America's 'Most Promising' AI Startups Have Immigrant Founders 4 (2020).
[325] Nathan Benaich, *Universities in the UK and Europe Have a Start-Up Problem*, FIN. TIMES (May 10, 2021), https://www.ft.com/content/fd038300-f09a-4afc-9f7d-c0e3d6965243. However, some suggest that this attitude may be changing. See Tech Investors Can't Get Enough of Europe's Fizzing Startup Scene, THE ECONOMIST (Nov. 22, 2021), https://www.economist.com/business/tech-investors-cant-get-enough-of-europes-fizzing-startup-scene/21806435.
[326] Benaich, *supra* note 328.

university spinouts.[327] This closer collaboration between universities and the private sector in the US explains, in part, why the US has excelled in translating scientific research into commercial applications,[328] but it also acts as an incentive for foreign talent to migrate to the US, as opposed to the EU, by first studying at American universities.

In addition to the US's renowned and entrepreneurship-friendly universities, foreign talent prefers the US because of the financial rewards available in the US for tech entrepreneurs and employees. A 2017 study by European VC firm Index Ventures found that more than 75% of EU countries' stock-option rules lagged those in the US.[329] The same study reveals that startup employees in the US receive up to 20% of stock options available at a firm, which is double the amount of employee stock options available at EU startups.[330] There are several reasons for the US-EU compensation gap, one being fragmented tax legislation governing stock options across EU Member States. Many EU countries have laws that discourage the awarding and holding of stock options. These include German tax laws that impose a tax liability from the moment that the stock options are granted.[331] European tech startups are aware of this limitation. In 2019, 500 chief executives from European startups, joined by European VC investors, signed an open letter to European policymakers, urging them to overhaul regulations governing employee stock options so that EU tech firms can more effectively attract talent and thereby better compete with Silicon Valley.[332] There is also some evidence that European companies are now moving towards adopting more generous stock options policies to attract and retain talent, but it is unclear how much any such shift will contribute towards closing the US-EU innovation gap.[333]

European leaders are also conscious that the EU lags behind the US and some other countries, such as Australia and Canada, in its ability to attract foreign talent. Those countries have put in place immigration policies that are "consciously tailored to attract and retain international talent."[334] At the same time, many EU countries have strict immigration laws that make difficult to attract talent to Europe.[335] These laws reflect, in part, the political influence of populist movements that maintain hostile attitudes towards migrants in general.[336] Despite these headwinds, the EU has sought to create a path for highly skilled migrants to enter the European labor market. However, there is no unified visa scheme for non-EU nationals that allows an individual to enter the EU and move freely across the twenty-seven Member States. The EU has its rival to the

[327] *Id*.
[328] See O'Mara, *supra* note 254.
[329] See Dominic Jacquesson, Index Ventures, Rewarding Talent: A Guide to Stock Options for European Entrepreneurs (2017), https://www.indexventures.com/rewardingtalent/handbook [https://perma.cc/T98D-KNU4].
[330] Katia Moskvitch, *Europe's Stock Options Muddle is Handing America a Big Advantage*, WIRED (Nov. 28, 2018), https://www.wired.co.uk/article/europe-startups-open-letter-governments.
[331] Iain Martin, *European Startups Start to Close the Gap With Silicon Valley on Staff Equity*, FORBES (Dec. 2, 2021), https://www.forbes.com/sites/iainmartin/2021/12/02/european-startups-start-to-close-the-gap-with-silicon-valley-on-staff-equity/?sh=1755994c14d3.
[332] See Not Optional—Europe Must Attract More Talent to Startups, https://www.notoptional.eu/ [https://perma.cc/6NEA-KRTK] (last visited Mar. 29, 2022).
[333] Martin, *supra* note 334. According to a recent study, European startups are now handing 15-17% of equity to employees, up from roughly 10% around 2017.
[334] Khan, *supra* note 322, at 274—75.
[335] *Id*.
[336] Joanna Plucinska & Saim Saeed, *Europe Struggles to Attract Tech Talent Even as US Closes Doors*, POLITICO (July 14, 2017), https://www.politico.eu/article/why-europe-still-lacks-silicon-valleys-sex-appeal/.

American H-1B visa—known as Blue Card—designed to bring high-skilled workers to Europe and vest them with the right to move freely in the Schengen area. However, the Blue Card system has suffered from high salary thresholds and fragmentation across Member States in interpreting the rules underlying the system. [337] In 2021, the EU sought to revamp the Blue Card program to better attract highly skilled workers by adjusting salary thresholds, qualification requirements, and offering more generous family reunification policies.[338] However, there is much more the EU needs to do to attract and retain the best minds to ensure that its tech sector has access to the human capital that, in the end, is at the foundation for every successful tech company.

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The above discussion has identified variables other than tech regulation that go a long way in explaining why today's tech giants hail from the US and not from the EU. The US tech companies have benefited from a large and integrated home market that has allowed them to scale better than their European counterparts. They have had access to a deeper pool of risk capital that has funded their innovations. US firms have also been more willing to take risk and pursue more disruptive innovations without the burdens imposed by punitive bankruptcy laws and a culture that does not tolerate business failure. Finally, US tech firms have unparalleled access to global talent, which has allowed them to draw on a diverse and large pool of human capital that contributes to greater dynamism and innovation.

It also seems that, contrary to tech regulations such as antitrust and data privacy, the four variables outlined above all have a more straightforward relationship to innovation. It is hard to argue that a fragmented single market is anything but an impediment to the scaling of tech companies. In the same way, access to deep pools of capital tends to support innovation, as does entrepreneurship-friendly bankruptcy laws that encourage risk-taking and give tech entrepreneurs a second chance if they fail. Diversity and access to talent from around the world is also difficult to see as anything but a boon to tech companies that depend on human capital. Of course, some arguments can be advanced to the contrary. For example, some studies have suggested that the more constraining fundraising environment in Europe results in the EU's startups having a lower "burn rate," which may serve them well during periods when funding is less readily available.[339] Similarly, American bankruptcy laws can, of course, be criticized as encouraging reckless risk-taking, which—coupled with a risk-seeking VC industry—can lead to spectacular failures as shown by the sudden fall from grace of companies such as the healthcare company Theranos or the cryptocurrency exchange FTX Trading. However, in general, the factors identified above generally do not cut both ways; rather, they can clearly be seen as hindering innovation in Europe due to their absence and nurturing innovation in the US thanks to their presence.

These factors are not presented as a comprehensive explanation of the US-EU technology gap, and there are likely to be other reasons as well. These include more flexible labor markets in the US compared to the EU, which helps reallocate and reskill labor in the face of economic

[337] *Id.*
[338] EU Blue Card: Commission Welcomes Political Agreement on New Rules for Highly Skilled Migrant Workers, EUR. COMM'N (May 17, 2021), https://ec.europa.eu/commission/presscorner/detail/es/ip_21_2522.
[339] Are EU Startups Built to Last?, INT'L FIN. (Apr. 20, 2023), https://internationalfinance.com/are-eu-startups-built-to-last/.

downturn or technological disruption.[340] For example, in the wake of the advances in generative AI, US tech firms moved quickly to reallocate resources towards AI development, abandoning existing projects and laying off thousands of workers in the process.[341] Inflexible labor laws in Europe make it more difficult for tech companies to reduce employee costs and pursue necessary restructuring, making them less agile compared to their American counterparts. The hurdles in terminating employment contracts are likely to make EU startups more cautious in offering their employees generous salaries and stock options, which accentuates existing talent acquisition problems.[342] Talent also moves without restrictions in Silicon Valley as California does not enforce non-compete clauses,[343] which facilitates knowledge spillovers across tech firms and sustains the culture of dynamic innovation.[344] In contrast, several EU member states recognize non-compete clauses, which hinders labor mobility in Europe.[345] Compared to their European counterparts, US startups also typically grow as part of a more established tech ecosystem—such as Silicon Valley—where the clustering of research, talent, and capital leads to knowledge spillovers and other benefits.[346] However, all of these other variables point to the same conclusion: that the perceived causal relationship between stringent tech regulation and the weak performance of a tech industry is just that—a perception, and not a reality.

Of course, identifying these alternative explanations does not support an argument that *all* European tech regulation would be welfare enhancing and that digital regulations could never adversely affect innovation and slow down technological progress, as was shown in Part II. But it does challenge any simplistic and categorical argument that lays the blame of the EU's relative struggles in the global tech race on tech regulation alone. It similarly cautions against a blunt narrative that suggests that any tech regulation, enacted by the US or another jurisdiction, would inevitably entail a compromise in terms of technological and economic progress. This realization should clear the way for a more productive discussion of what optimal tech regulation looks like and what kinds of innovation such regulation ought to promote.

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[340] Sven Smit, Magnus Tyreman, Jan Mischke, Philipp Ernst, Eric Hazan, Jurica Novak, Solveigh Hieronimus & Guillaume Dagorret, Securing Europe's Competitiveness: Addressing Its Technology Gap 97, MCKINSEY (September 2022), https://www.mckinsey.com/~/media/mckinsey/business%20functions/strategy%20and%20corporate%20finance/our%20insights/securing%20europes%20competitiveness%20addressing%20its%20technology%20gap/securing-europes-competitiveness-addressing-its-technology-gap-september-2022.pdf.

[341] Yann Coatanlem, *Why Europe is a laggard in tech*, FIN. TIMES (Feb. 26, 2024), https://www.ft.com/content/d4fda2ec-91cd-4a13-a058-e6718ec38dd1?shareType=nongift.

[342] Mark Minevich, *Can Europe Dominate in Innovation Despite US Big Tech Lead?*, FORBES (Dec. 3, 2021), https://www.forbes.com/sites/markminevich/2021/12/03/can-europe-dominate-in-innovation-despite-us-big-tech-lead/?sh=7db749211d75.

[343] California Business and Professions Code §16600 explicitly bans "every contract by which anyone is restrained from engaging in a lawful profession, trade, or business of any kind is to that extent void."

[344] Ronald J. Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not to Compete*, 74 N.Y.U. L. REV. 575, 602-613 (1999).

[345] Nuna Zekić, *Non-Compete Clauses and Worker Mobility in the EU*, GLOB. WORKPLACE L. AND POL'Y (NOV. 30, 2022), https://global-workplace-law-and-policy.kluwerlawonline.com/2022/11/30/non-compete-clauses-and-worker-mobility-in-the-eu/#:~:text=Non%2Dcompete%20clauses%20prohibit%20the,employment%20relationship%20by%20the%20employer.

[346] William R. Kerr & Frederic Robert-Nicoud, Tech Clusters 2—4 (Harv. Bus. Sch., Working Paper No. 20-063, November 2019), https://www.hbs.edu/ris/Publication%20Files/20-063_97e5ef89-c027-4e95-a462-21238104e0c8.pdf.

CONCLUSION

This Article has sought to dispel the common view that tech regulation is inherently detrimental to innovation and technological progress. It has argued that governments do not face an inevitable trade-off between protecting digital rights and pursuing economic growth. In doing so, the Article has challenged the simplistic argument that the American tech companies are successful because they do not face burdensome digital regulations at home, whereas European tech companies are unsuccessful because they are burdened by costly European digital regulations. Instead, the discussion has shown that tech regulations affect tech companies' incentives to innovate in intricate ways, creating both costs and benefits for these companies.

Any conversation about technological innovations must correctly attribute the reasons that cultivate or impede those innovations. Digital regulation is not immaterial but, ultimately, technological innovation is a product of fundamental forces such as long-term investments in education, carefully designed industrial policy, and incentives for investment and entrepreneurship. That Google was founded in the US as opposed to Europe owes only so much to the fact that the US has not extensively regulated data privacy or that it has maintained a liability shield on content moderation. Today's tech giants emerged in the US predominantly because of factors such as thriving American capital markets and an entrepreneurial culture that is amenable to risk-taking. They have also benefited from access to diverse talent, which sustains the American culture of disruptive innovation, and taken advantage of a large home market, which is not characterized by different laws, languages, cultures, consumer preferences, or different channels for marketing and distribution.[347] It is therefore one-dimensional to argue that digital regulation—or the absence thereof—determines the fortunes of a country's tech industry. The US tech success owes more to a combination of factors that would remain untouched and unharmed even if the government adopted a federal privacy law or set limitations on online hate speech.

The primary objective of this Article has been to redirect the scholarly inquiry towards a broad set of economic, legal, and cultural attributes that make up the digital economy. But the discussion also provides important lessons for governments, including for the EU and the US. In dispelling the notion that tech regulation inevitably curtails technological and economic progress, the Article offers an implicit defense of the EU's ambitious digital agenda. At the same time, it urges the EU to rethink a variety of other laws and policies that have, to date, thwarted European technological progress. To close the technology gap between the EU and the US, the EU does not necessarily need to repeal the GDPR or refrain from implementing the recently enacted AI regulation. Instead, the EU should channel its policy ambition towards completing the digital single market, creating a genuine capital markets union, harmonizing the Member States' bankruptcy regimes, and viewing immigration as an opportunity for Europe's technological progress and economic growth. There is no doubt that the EU has much ground to cover in catching up to the US's technology sectors, but abandoning digital regulation is not what will get the EU there.

[347] Securing Europe's Competitiveness, *supra* note 13.

Of course, all digital regulation is not beneficial. But neither is all innovation. While many techno-optimists herald the revolutionary nature of digital technologies, others question whether today's leading tech companies are producing truly welfare-enhancing innovations that are leading to meaningful technological progress and economic growth, or enhancing the human experience.[348] A growing number of technologists, investors, journalists, and politicians are criticizing tech companies' business models that rely on the exploitation of internet users' data, asking whether those digital services ought to be considered "innovations" that are worth shielding from regulation.[349] In reassessing tech regulation, the EU should therefore also think more carefully about innovation, including what kind of innovation its tech regulation ought to advance. This includes the EU asking whether it even wants to nurture a "European Google" if that entails embracing a business model that is based on extracting user data in ways that contradict the EU's steadfast commitment to protect European citizens from such exploitation.

The discussion also offers lessons for the US or any other government considering greater government oversight of its tech industry. If the policymakers and various stakeholders in the US understand that the country's technological progress and culture of innovation are not tied to its lax regulatory approach, they are likely to feel more comfortable pursuing regulatory reforms that the American people have increasingly come to support. This Article has argued that any adjustment in the US towards the European regulatory regime—or the widespread emulation of that regime across the world more generally—would not, as a rule, set the US back in terms of innovation. Protecting internet users' data privacy, regulating tech giants' anticompetitive behavior, calling for more platform accountability over harmful online content, or insisting on ethical AI development would not dismantle the dynamic capital markets in the US, repeal its entrepreneurship-friendly bankruptcy laws, or discourage global tech talent from migrating to the country.

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[348] *See generally* ROBERT J. GORDON: THE RISE AND FALL OF AMERICAN GROWTH (2017); Greg Ip, *As Big Tech's Growth and Innovation Slow, Its Market Dominance Endures*, WALL ST. J. (Feb. 8, 2023), https://www.wsj.com/articles/as-big-techs-growth-and-innovation-slow-its-market-dominance-endures-11675871487.; Lee Vinsel & Andrew L. Russell, THE INNOVATION DELUSION: HOW OUR OBSESSION WITH THEN NEW HAS DISRUPTED THE WORK THAT MATTERS MOST (2020).

[349] Pascal-Emmanuel Gobry, *Facebook Investor Wants Flying Cars, Not 140 Characters*, INSIDER (July 30, 2011), https://www.businessinsider.com/founders-fund-the-future-2011-7); (""[w]e wanted flying cars, instead we got 140 characters."); *2022 Letter*, DAN WANG (Mar. 4, 2023), https://danwang.co/ ("I've never stopped lamenting the marketing trick that California pulled off to situate consumer internet as the highest form of technology, as if Tencent and Facebook are the surest signs that we live a technologically-accelerating civilization."); Josh Hawley, *Big Tech's 'Innovations' That Aren't*, WSJ OPINION (Aug. 28, 2019), https://www.wsj.com/articles/big-techs-innovations-that-arent-11567033288 (pointing out the distance between the American innovations of the past era—such as sending a man to the moon 50 years ago—and today's innovations, which, according to Hawley, consist of exploitation of people rather than innovating new and better products); *Warren Delivers Remarks at Freedom From Facebook and Google: Break Up Big Tech*, ELIZABETH WARREN (May 27, 2021), https://www.warren.senate.gov/newsroom/press-releases/warren-delivers-remarks-at-freedom-from-facebook-and-google-break-up-big-tech (asserting that "[t]oday's Big Tech companies have grown so giant and so powerful that they threaten our economy, our society, and our very democracy. They have bulldozed competition, used private information for profit, and tilted the playing field against everyone else.") Greg Ip, *As Big Tech's Growth and Innovation Slow, Its Market Dominance Endures*, WALL ST. J. (Feb. 8, 2023), https://www.wsj.com/articles/as-big-techs-growth-and-innovation-slow-its-market-dominance-endures-11675871487 (describing how US tech companies used to be "big, fast-growing, and ferociously innovative" but how today, "they are mostly just big).

In addition to seeking to guide the regulatory choices in the EU and the US, this Article provides a roadmap for other governments that frequently emulate leading economies in designing their regulatory regimes. A closer examination of the American and European legal regimes and tech ecosystems suggests that when it comes to the regulation of the digital economy, these countries may be well served by adopting some of the rights-protective regulatory policies promoted by the EU. However, when it comes to capital markets, insolvency laws, the entrepreneurial culture of risk-taking, and attracting global innovative talent, these countries should rather turn to the US. These two regulatory regimes should not be viewed as alternatives, but instead as complementary digital ecosystems whose best features foreign governments can emulate and pursue in tandem. There is no need for governments to set up a false choice between tech regulation and tech innovation when it is possible for them to have both.