



## UvA-DARE (Digital Academic Repository)

### Regulatory interdependence in AI

Mügge, D.

**DOI**

[10.4337/9781803922171.00027](https://doi.org/10.4337/9781803922171.00027)

**Publication date**

2024

**Document Version**

Author accepted manuscript

**Published in**

Handbook on Public Policy and Artificial Intelligence

[Link to publication](#)

**Citation for published version (APA):**

Mügge, D. (2024). Regulatory interdependence in AI. In R. Paul, E. Carmel, & J. Cobbe (Eds.), *Handbook on Public Policy and Artificial Intelligence* (pp. 249-260). (Handbooks of research on public policy). Edward Elgar Publishing.  
<https://doi.org/10.4337/9781803922171.00027>

**General rights**

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

**Disclaimer/Complaints regulations**

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

# Regulatory Interdependence in AI

DANIEL MÜGGE

University of Amsterdam  
[d.k.muegge@uva.nl](mailto:d.k.muegge@uva.nl)

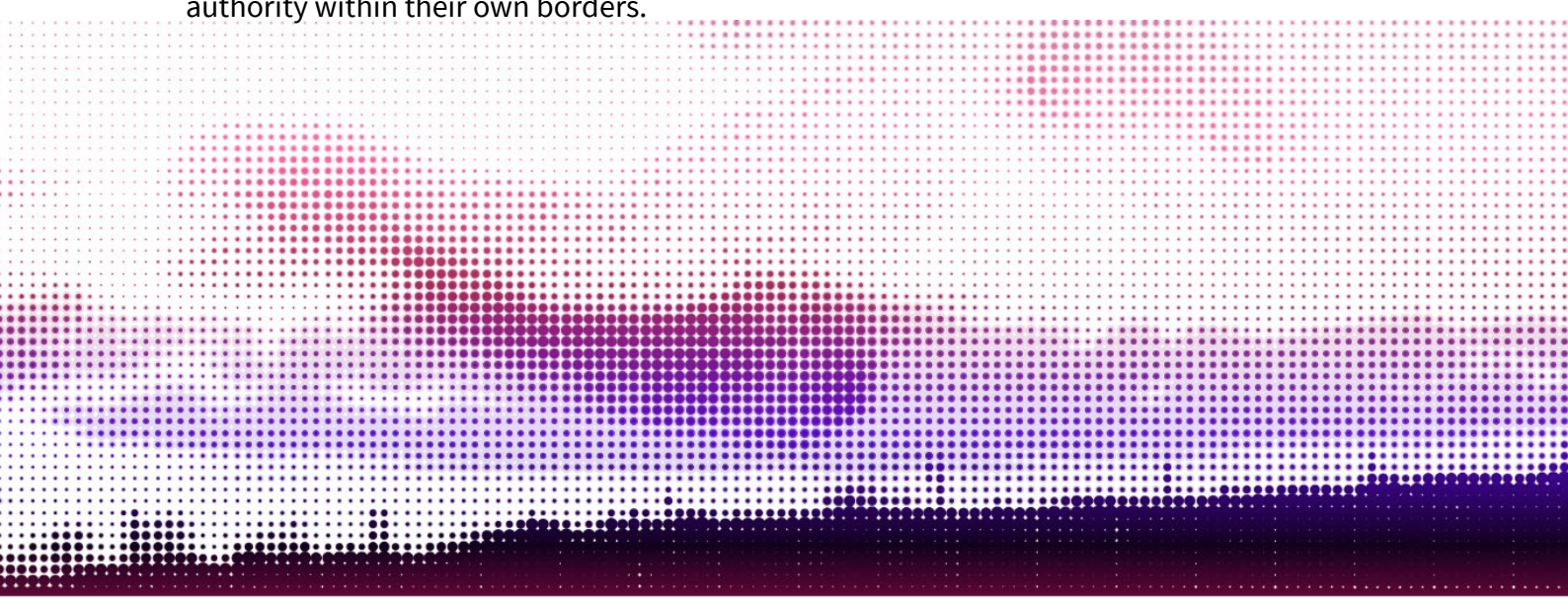
Principal investigator of the [RegulAite project](#)

Pre-print of chapter in

Regine Paul, Emma Carmel, and Jennifer Cobbe (eds) *Handbook on Public Policy and Artificial Intelligence*, (in print/2024) Cheltenham Spa: Edward Elgar Publishing.

## Abstract

Artificial intelligence (AI) creates manifold challenges for public policy, and authorities try to counter them through regulation of AI's development and application. Such regulation does not evolve in a vacuum, however. Geopolitical and economic power, as well as technological prowess, are distributed highly unevenly across the globe. Governments therefore confront regulatory interdependence: their own scope for effective regulatory intervention is heavily shaped by what powerful jurisdictions such as the USA, China or the EU do. This chapter analyses the different forms of regulatory interdependence countries confront, lays out how economic imperatives can undermine regulatory aims, and how most jurisdictions end up being rule takers in AI regulation, never mind their formal legal authority within their own borders.



## Introduction

Much debate about the governance of artificial intelligence technologies (AITs) concentrates on the interplay between technological developments, their societal implications, and the legal guard rails necessary to manage those.<sup>1</sup> But both the shape and the effectiveness of domestic rules hinge on how other jurisdictions govern AITs—whether rules elsewhere are compatible with national ones, and whether they are more or less stringent. This regulatory interdependence is poorly reflected in most regulatory debates, which tend to discuss regulatory desiderata without heeding the global regulatory force field in which it plays out. Appreciating such interdependence thus helps us understand the real-world options jurisdictions have and the choices they make in AIT governance.

This chapter examines the different facets of this regulatory interdependence in AI, how they influence policy and its effectiveness, and in particular how regulatory interdependence is asymmetrical. Some jurisdictions feel its consequences much more than others, meaning that sovereignty in AIT regulation is distributed unevenly. Because of regulatory interdependence, many jurisdictions are *de facto* rule takers, rather than sitting in the regulatory driving seat themselves. Most obviously, this applies to many countries in the so-called Global South, or what Amrute *et al.* (2022) call the majority world (to which the minority world in the Global North rarely gives much thought). But also the EU, for example, faces constraints. OpenAI's CEO Sam Altman openly mused about his company quitting the Continent if impending rules would prove too difficult to implement (Waters *et al.* 2023). Even though the threat was later retracted, it demonstrated the limits to EU leverage over an American tech behemoth before the latter just quits.

Where digital products can be freely traded across borders, relatively stringent national rules can put domestic firms at a disadvantage and trigger regulatory competition and a potential downward spiral in standards (Smuha 2021). Regulatory interdependence often pits economic rationales against regulatory aspirations (Lazer 2001; Simmons 2001; Singer 2004).

---

<sup>1</sup> Artificial intelligence (AI) is a contested concept, also in regulatory debates (Schuett 2023). To do justice to the blurry edges of AI as a policy object, this chapter follows Paul, Carmel and Cobbe's suggestion (Introduction, this volume) and talks of artificial intelligence technologies, in the plural, instead.

Additional dynamics enter the picture for AITs: because many digital products can be supplied remotely, local regulation may fail to curtail its undesirable effects. And where indirect spillovers worry legislators, national rules may struggle to stop them—think for example of a global diffusion of oppressive technologies.

AITs develop quickly, and estimates of their future capabilities vary widely (Ford 2018). That adds a speculative element to the regulatory politics that try to address those (Nordström 2022). For example, it is simply unclear how AI will transform geopolitical security dynamics. Some see a fundamental game changer; others a transient hype. In consequence, whether governments embrace security logics in regulatory cooperation depends as much on successful AIT framings as on objective technological developments (Mügge 2023).

This chapter first introduces regulatory interdependence and competition as a lens on regulatory politics, before spelling out how these concepts apply to AITs and how they affect countries around the globe in very uneven ways.

### **Regulatory interdependence and competition**

Regulatory interdependence arises when one jurisdiction's regulation affects that in another (Lazer 2001, 2006; Newman and Posner 2011). In an open global economy, countries may confront a trade-off between competitiveness of domestic firms and the stringency of domestic rules. In many cases, tight rules make *production* more expensive: think of domestic banks having to hold big capital buffers to offset potential losses (Singer 2007) or companies having to adhere to tight safety standards in their factories.

Mismatches in regulation about *products* unleash a different dynamic. Here, all products sold in a jurisdiction have to fulfil specific requirements, no matter their provenance. Examples might include limits on chemicals used in foodstuff or obligatory car safety features. Ex ante, domestic and foreign firms would be affected equally, and companies from abroad may simply forgo market entry in the high-standards jurisdiction.

Finally, national rules on the permissible *use* of products may differ, too, for example through speed limits on highways. Ceteris paribus, use restrictions dent the demand for affected products, but beyond that, they have no competitiveness impact. Problems only surface when products whose use is banned outright are readily available for illegal import from abroad. Bans on citizen ownership of weapons or drugs, for example, are difficult to

enforce with porous borders. A hard-to-control global digital space may pose similar challenges.

Jurisdictions have alternative strategies to tackle regulatory interdependence (cf. Müller et al. 2014). When the cross-border impact is low, one option is benign neglect. Once stringent standards do affect firms' competitiveness, a jurisdiction may embrace regulatory competition (Stigler 1971) and dilute its rules to benefit local firms. Or it may accept mismatched standards and sacrifice trade openness to safeguard regulatory goals or protect domestic producers (Sykes 1999).

Dynamics shift when a large jurisdiction can leverage access to its market (Vogel 1995). It can then arm-twist others to tighten regulations to avoid competitive disadvantage (e.g. Simmons 2001). The EU has often exercised such "market power" (Damro 2012, 2015), and it has externalized its policies both consciously and unintentionally (Bradford 2012; Lavenex and Schimmelpfennig 2009).

Jurisdictions can also cooperate to sidestep regulatory competition and solve coordination problems (Mattli and Woods 2009). Formats vary from international trade agreements, via trans-governmental networks (Eberlein and Grande 2005; Verdier 2009), to the implicit endorsement or embrace of privately set standards (Büthe and Mattli 2011), each with their own advantages and drawbacks.

Where harmonized standards are beyond reach, mutual recognition of local rules can facilitate cross-border market access. This strategy has been a cornerstone of the single European market (Egan 2001; Griffin 2001; Schmidt 2002), but also been used to manage transatlantic regulatory interdependence (Farrell and Newman 2019; Shaffer 2002), including in technically complex fields such as finance (Mügge 2014; Posner 2009).

Finally, when standard development is highly technical and the costs of standard creation loom large, it becomes attractive to outsource it to technical experts in transnational non-governmental organizations, or to delegate it to intergovernmental forums with few active participants (cf. Lorenz 2021). The same is true for standards that require frequent updating because of technologies' dynamism (Mandel 2007; Moses 2007), which is difficult for detailed international agreements (cf. Mügge and Linsi 2020).

## The character of regulatory interdependence for AITs

How do these dynamics play out for AITs? As a policy object, “AI” eludes unambiguous definition (Martinez 2019; Schuett 2023), and in debates around the EU AI Act for example, these ambiguities have themselves generated political discord. After all, more or less expansive AI definitions extend the regulatory net to more or fewer firms, pitting politicians eager to clamp down on AI against more permissive ones.

Nevertheless, many countries and international organizations have initiated regulatory programs under the AI heading (Cath et al. 2018; Radu 2021), and the blurriness of AITs has not hampered international initiatives, at least at the level of general principles (von Ingersleben-Seip 2023). This chapter thus concentrates on those actors and technologies that commonly feature in AI policy debates.

AITs have five properties that shape regulatory interdependence: first, because of their digital character, the application of AITs is, *ex ante*, hardly territorially bound. Large language models (LLMs) for example run on high performance computers, and the training of AI systems with many parameters—their production, as it were—requires enormous, and by now jealously guarded, quantities of hardware. With appropriate infrastructure, however, their *services* can be accessed from anywhere. For example, unless governments restrict access, OpenAI’s ChatGPT can be used through a simple website from around the world through no more than a smartphone. AI *production* is territorially bound; AI *application* much less so.

Second, once systems have been trained (at considerable cost) and the required infrastructure is in place, they allow rapid scaling and at least temporary market domination unless legal restrictions come in the way.<sup>2</sup> Based on the speed with which ChatGPT could be rolled out globally, it became synonymous with large language models within weeks. These oligopolistic tendencies remain particularly pronounced for generative AI, as extensive deployment by users itself improves the algorithm, locking in first-mover advantages. They also thrive off the platform and marketing power of companies like Microsoft or Google, who

---

<sup>2</sup> Just training GPT3, ChatGPT’s precursor, reportedly cost \$5 million, and answering the millions of queries ChatGPT now receives was estimated to consume \$700,000 per day, mostly due to high server costs (Mok 2023). Maintaining and expanding ChatGPT’s services—initially without charge to private users—requires deep pockets, and Microsoft’s \$10 billion investment in OpenAI is indicative of the resources required to create an early market leader (Bass 2023).

dominate subsegments of the market for digital products into which generative AI can profitably be integrated (Staab 2019). To be sure, the strength of centripetal dynamics depends on specific use cases and the model complexity required to make an algorithm successful. Using locally generated data—say, weather observations—to train predictive models for agriculture may also be commercially viable for niche companies. Patterns from other technology- and capital-intensive sectors point to possible future consolidation: large digital firms that identify synergies between AI and its existing products have incentives to acquire AIT start-ups. It is unclear how long niche companies would survive market consolidation unless competition policy gets in the way.

Third, AITs are broadly applicable, inviting comparisons to electricity or the steam engine (Brynjolfsson and McAfee 2014). AIT governance with an eye to one use case may thus have unintended consequences for others. The collateral damage that both excessively loose and tight regulation may do is disproportionately big, making targeted regulation difficult even when we ignore the global context—a tension that has fueled heated debates about “general purpose AI” in the EU parliament. It is amplified by the dual-use (joint civilian and military) applications that many AITs have (cf. Mügge 2023).

Fourth, AIT development is quick. Generative AI performance has improved enormously year on year; capabilities a decade from now are anybody’s guess (Nordström 2022). AITs therefore require particularly adaptable regulatory frameworks, able to evolve with technology and our understanding of it (Mandel 2007; Moses 2007). Such adaptability, however, may be difficult to square with rigid international agreements that might otherwise help solve collective action problems.

Finally, AIT development is unpredictable, also regarding successful real world application (Marcus and Davis 2019). Autonomous driving was long heralded as imminent whereas generative AI hopes were much lower. In the event, the former faltered while the latter thrived. The regulatory interdependence that shapes real-world policy therefore includes speculation about future technologies and developments (cf. Berten and Kranke 2022), creating openings for authoritative actors in AI to frame debates, problems and solutions in self-interested ways.

## **The AI competitiveness discourse**

One key facet of regulatory interdependence is a potential tension between regulatory stringency and economic competitiveness. Such arguments animate AI debates, as well. The EU *Coordinated Plan on Artificial Intelligence* (European Commission 2018) or its updated version, *Fostering a European Approach* (European Commission 2021), ceaselessly underline that homegrown AITs are crucial for EU economic success. Debates in the European Parliament frequently pitted a pro-economic innovation camp, fearful of excessively tight rules, against lawmakers eager to weave a tight regulatory net.

The anticipated commercial dynamics surrounding AITs are thus one side of the regulatory interdependence-coin, as stringent regulation might hand companies from laxer jurisdictions a competitive advantage. In a global market for digital products, including AITs, the economic price tag of regulation depends on what other jurisdictions do.

While these economic dynamics are crucial to regulatory politics, they are also highly speculative, because just what there is to be won or lost economically remains disputed: Brynjolfsson and McAfee (2014) had famously presaged a *Second Machine Age*; other observers suspect that the transformative impact of digital technologies has been overhyped, an intuition buttressed by the dismal performance of the digital tech sector in 2022 after several prodigious years. (AI companies have largely bucked that trend.) Similar disagreement characterizes debates about AITs' economic downsides, in particular job losses and rising inequality: some predict massive job destruction and hence crumbling bargaining power for workers (Dyer-Witthford et al. 2019; Frey 2019; Frey and Osborne 2017); others see those fears as large exaggerations (Autor 2015; cf. Campbell-Verduyn and Hütten 2022), pointing to continuing labor market shortages across many sectors and countries.

While the extent of economic transformations is unclear, AITs concentrate the ability to extract surplus among the companies in control them and enable the monetization of personal information, creating incentives for large-scale commercial data collection and analysis (Beer 2019; Zuboff 2019). And they offer profit opportunities by commodifying hitherto untapped societal and personal domains (Couldry and Mejias 2019). Taken together, profit-concentration, labor market disruption, and personal data commodification creates both winners and losers.



Widespread AIT application may thus have contradictory effects: they may simply shift profits from the non-AI sector to the most advanced digital companies occupying strategic links in a particular production chain—akin to rent extraction by the financial and real estate sector (Krippner 2005, 2011; Staab 2019; Stockhammer 2007). As capital’s share in national income would increase as the expense of wages, aggregate demand would suffer, too (cf. Gordon 2016). A boon for individual firms might be a bane for the macroeconomy. AI-powered productivity increases may only generate sustainable economic growth if accompanied by redistributive policies that counteract the wealth-concentrating dynamics digitization entails.

The unpredictable *specific* economic impact of AITs, however, creates discursive flexibility: the weight attached to different economic aspects in policy discourse thrives on extrapolation of short-term trends far into the future. Economic AI-discourse—including the potential costs of losing out in global regulatory competition (Bryson and Malikova 2021; Smuha 2021)—is prone to hyperbole (Ulnicane 2022). The impact of AI regulatory interdependence on actual policies is therefore not direct; instead, it is mediated by whatever discourses about it dominate policy debates (Bareis and Katzenbach 2022).

Two implications for regulatory interdependence follow: first, it is variegated across different actors in national economies. For companies eager to access foreign markets, misaligned regulatory regime can be an obstacle, because they impede market access. For uncompetitive local incumbents and their workers, in contrast, such misalignment can be a blessing as it shelters their business from foreign market intruders. The economic dimension of the regulatory interdependence equation varies with the economic actor in question. Countries do not either win or lose as a whole, but rather find within them winners and losers of any policy options.

Second, as policymakers confront the uncertainty surrounding AITs and their economic impact (Wirtz et al. 2020), they are heavily dependent on those actors closest to its application for information—the companies that develop it. Uncertainty opens the door to lobbying from the corporate sector, disguised—whether consciously or not—as expertise. In that discursive environment, the argument that “missing out now on AI will lock in economic disadvantage indefinitely” can develop substantial force (Bareis and Katzenbach 2022; Lee 2018), and in consequence temper regulatory ambitions. The uncertain AIT future hand an

advantage to tech companies, also on international regulatory policy, with potentially adverse consequences for other stakeholders.

### **Dimensions of regulatory interdependence in AITs**

The economic dimension of regulatory interdependence in AITs is the backdrop against which countries evaluate and develop their policies, also relative to others. As I will argue further below, the high concentration of leading AIT firms—particularly in the USA and China—creates a steep hierarchy among the world’s nations in international AI policy: some occupy a position of strength; many others are weak, to different degrees. Their economic strategies and policies bear the imprint of that position.

That said, many policymakers do recognize specific public policy concerns that AITs create and debate useful regulatory interventions to curtail those. Prominent examples include privacy breaches, poor machine safety, automated discrimination, manipulation of the spreading of fake digital content, and so on (Smith and Browne 2019; West and Allen 2020). As jurisdictions regulate AITs with an eye to these harms, how does regulatory interdependence enter the picture? How, in other words, does it matter for local rules what the others do? These effects can be ordered along four kinds of effects: market fragmentation, loss of regulatory effectiveness, remote provision of undesirable AI-powered services, and AITs’ indirect effects.

Equivalent but incompatible product standards mean that products made for one market cannot be sold in another—an example would be an AI system certified as bias-free following a domestic testing regime that is not recognized abroad. The effect of such mismatches is limited as long as, compared to the commercial opportunities a market offers, it is not too costly for AIT developers to tailor systems to local requirements (cf. Siegmann and Anderljung 2022). If it is costly, however, private companies may simply shun that market. Governments could then acquiesce or embrace a more widely accepted foreign standard. A jurisdiction’s ability to use market access as a lever to impose onerous rules on foreign companies unilaterally is largely a function of domestic market size and the adaptation cost companies would face to bridge the gap between companies’ home country rules and those envisaged in the host market. Large jurisdictions such as the EU clearly have an advantage here (Damro 2015).

The importance of market size—rather than population size—hands a regulatory advantage to rich countries. Governments can leverage their citizens' purchasing power to secure compliance with exacting domestic rules. Countries whose citizens or companies are less attractive as direct or indirect customers are at the mercy of regulatory deals struck elsewhere and face incentives to embrace a regulatory regime to whose specifications companies already tailor their products. Colonial legacies are thus reproduced in global regulatory dynamics for AITs (cf. Carmel and Paul 2022).

That said, only time will tell to what degree even the EU can force a company such as OpenAI to tweak its algorithms to produce different outputs for a European audience than for those elsewhere in the world. As motioned earlier, the company's CEO has openly mused about quitting the EU altogether should regulatory demands be too high (Waters et al. 2023).

AI-powered services that can be supplied at a distance generate additional challenges. Whenever AITs are built into physical products, the latter can be taken off a market in case of non-compliance with domestic rules. Examples would be semi-autonomous vehicles or devices with AI-powered voice assistants that fail domestic safety tests.

Restrictions are much harder to enforce on digital products sold through a fiber optic cable. As an example, consider the general prohibition on real-time biometric identification in the European Union, as envisaged at the time of writing. Somebody eager to identify individuals as they are being filmed—say, at a political demonstration—could still share a live-feed with a company abroad, if necessary through a VPN connection, and have individuals identified in real time. Even the Chinese government frequently struggles to enforce digital censorship, despite significant infrastructure to that end. Circumventing local regulations by accessing AI-powered digital services abroad will remain attractive especially for malevolent users, who do not mind breaching host country laws if that enables them to use a banned service. This problem therefore concerns only a subset of AIT uses, but an important and potentially crucial one.

The final category of regulatory interdependence concerns second-order effects of AIT diffusion, for example the export of oppressive surveillance or automated weapons systems around the world (Polyakova and Meserole 2019). Jurisdiction A cannot directly block the sale of harmful AITs from jurisdiction B to jurisdiction C, however much it may oppose it.

This dynamic transcends what is normally considered regulatory interdependence, but it is a key channel through which one country's rules have effects on others. It incentivizes countries to seek global accords, akin to non-proliferation or environmental agreements, which equally seek to limit externalities (Głowacka et al. 2021).

However, cooperation is more difficult for AITs than for environmental collective action problems, in which everyone could benefit from cooperation. China may have little to lose from surveillance tech exports to third countries; indeed, if they would solidify other governments' grip on political power, China could create technological dependencies and political alliances through them. (Feldstein 2019). Considered in isolation, the incentives to join comprehensive export bans would remain meagre.

### **Global asymmetries**

Regulatory interdependencies are rarely balanced: they constrain some countries much more than others. How do they play out for countries at different levels of the global AI hierarchy? Five factors matter in particular (cf. Bradford 2012; Damro 2015; Siegmann and Anderljung 2022): first, countries with a large homegrown AIT sector have much more immediate regulatory leverage over the companies in question, and they depend less on foreign firms to supply AI-powered services domestically. Second, domestic market size shapes the regulatory concessions a jurisdiction can extract from foreign market entrants in exchange for access. Third, its regulatory capacity (Bach and Newman 2007) determines to what degree a jurisdiction could use on its own enforcement mechanisms rather than having to rely on those of home countries. For many countries, a comprehensive domestic auditing regime the products of global AI firms is implausible. Fourth, jurisdictions be able to leverage other political or economic resources to counter regulatory disadvantage. And finally, it matters whether countries favor relatively lower or higher levels of stringency than others. When regulatory ambitions are low, a lack of political leverage may matter little; it does, however, when aspirations are high.

How do these criteria map onto the current global AIT landscape? By most measures, the USA and China are the clear global frontrunners (Lee 2018). AIT investment is most extensive there, and they host the largest AIT companies. Indeed, given the transatlantic economic integration in digital products, the predominance of large American companies also in

Europe perpetuates itself; potential competitors confront hard-to-beat winner-takes-all dynamics. American strength, in other words, is a source of European weakness.

For the USA and China, the effects of regulatory interdependence are relatively limited, because they can simply exclude each other's AIT firms from their domestic markets. China tries, with varying success, to control cross-border digital traffic, so that remote provision is a lesser challenge.

At the same time, both countries seek to diffuse domestic AIT projects abroad, for both commercial and geopolitical reasons, and are therefore invested in regulatory cross-border harmonization that would facilitate such access. China, for example, is strongly represented in transnational expert forums for AIT standard setting such as the International Standardization Organization and the International Electrotechnical Commission; the USA leverages the transatlantic Trade and Technology Council (TTC) for US-EU alignment of AIT policy. Both forms of engagement seek to shape cross-border regulatory spaces to the advantage of domestic firms and technologies.

The EU occupies a very different position. Its regulatory capacity is high and access to its large market prized by foreign companies (Siegmann and Anderljung 2022). At the same time, most companies dominating the European AIT market are foreign (largely American), and its regulatory ambitions are higher than those of most other jurisdictions. That generates a complex challenge: relatively strict domestic rules, for example about data gathering and use, may hamper the development of a European AI sector that could rival US firms. At the same time, the subsequent dominance of those American firms reinforces EU dependence on regulatory policies abroad. Current intra-European negotiations about appropriate regulation reflect these opposing forces. At the time of writing, in June 2023, this dynamic is mirrored two parallel policy processes: negotiations within the European Parliament about a political common position on AI regulation on the one hand, and the EU Commission's TTC negotiations with the US government about shared AI standards on the other. It is unclear for far how these two processes can be reconciled without subordinating one to the other.

Smaller jurisdictions with similar levels of regulatory aspirations have much fewer levers to impose their preferences and may therefore opt to copy whatever regime the EU adopts (Siegmann and Anderljung 2022). In the AI version of Bradford's Brussels Effect, they could

free-ride on the EU's unique capacity to impose high standards on foreign firms who may enjoy laxer rules in their home jurisdictions. That said, the EU itself is not an autonomous agent in AI regulation, heeding as it must its regulatory and technological dependence on the USA. The Brussels Effect plays out, in other words, in the shadow of US and Chinese dominance of the sector.

Economically relatively small countries that are de facto niche developers of AI-powered products are a different category again—for example Israel, Canada, or Russia. For commercial success, they depend on market access abroad, creating strong incentives for regulatory alignment with the main envisaged export markets and for a permissive regime at home.

Akin to financial secrecy jurisdictions (Palan 2002; Shaxson 2012), regulatory havens for AIT use and development may become sorts of black holes in the global web of rules. Depending on just how tight major jurisdictions' rules and enforcement capacities are, companies could circumvent regulatory intentions by selectively outsourcing or relocating specific parts of their AI development to jurisdictions that offer little more than data storage, computing capacity, or even only legal residence for subsidiaries or contractors (Scasserra and Foronda 2022). Examples would include outsourcing of human data labelling, content moderation or other inputs to train or police algorithms—work that is frequently draining and harmful, while poorly paid under bad working conditions (Gray and Suri 2019). To what degree these jurisdictions will undermine regulatory restrictions imposed elsewhere is still hard to say, as that depends not only on corporate business models and scope for regulatory arbitrage, but also the technological possibilities future AIT development may itself afford. Nevertheless, just as has been true for financial regulation and taxation, the availability of regulatory escape hatches to circumvent limits on data storage and analysis may seriously damage the effectiveness of rules elsewhere.

Countries that fall into neither of the categories above will rely on overseas providers for their digital technologies, including AI-powered applications, but have limited leverage themselves to enforce significantly higher regulatory standards have been set in one of the other major jurisdictions. With potentially limited monitoring and enforcement capacities,

their best bet may be piggy-backing on other major regimes including, as potentially the most stringent one emerging, the European one.

In practice, this means that much of what Amrute *et al.* (2022) have called the majority world—what others have called the Global South—may de facto become rule takers in AITs, with limited scope to shape the development and application of technologies beyond standards devised and agreed elsewhere. For most countries outside the circle of technologically or economically privileged countries, digital sovereignty—and by implication at least a modicum of AIT sovereignty—is likely to remain beyond reach.

## **Conclusion**

Current regulatory debates about AITs rarely heed the interdependencies that characterize the field—even though both the shape and the effectiveness of national rules will depend heavily on what other jurisdictions do. When they are considered, they typically feature as economic or geopolitical competitors to be beaten through ingenious policies and regulatory interventions. That, beyond such narratives, the global economic political force field in which countries find themselves simply limits what government policy can achieve, is rarely acknowledged—even though it is essential both for understanding current policies and their effects, and for maximizing the effectiveness of public interventions in AI.

This interdependence generates strong incentives for cooperation, not least to evade regulatory competition that might otherwise generate undesirably low regulatory standards. On the other hand, the asymmetry in interdependence means that some countries can largely afford to ignore what others do, and use regulatory alliance building as a geopolitical tool. The USA in particular has led attempts to forge an anti-China coalition in AI regulation, using both the Trade and Technology Council to consolidate an integrated transatlantic regulatory space and multilateral organizations such as the Organization of Economic Cooperation and Development for broader standard design that excludes Beijing. Regulatory interdependence therefore curtails the potential for digital sovereignty that different countries enjoy. Most of them will be at the receiving end of the economic and geopolitical competition that unfolds between and within a handful of leading global AIT powers. To the degree that AITs will be a defining feature of future societies, asymmetrical

regulatory interdependence is therefore likely to cement the economic and technological imbalances we see around the globe today.



## References

- Amrute, S., R. Singh and R. L. Guzmán (2022), *A Primer on AI in/from the Majority World: An Empirical Site and a Standpoint*, accessed at <http://dx.doi.org/10.2139/ssrn.4199467>.
- Autor, D. H. (2015), 'Why Are There Still So Many Jobs? The History and Future of Workplace Automation', *Journal of Economic Perspectives*, **29** (3), 3–30.
- Bach, D. and A. Newman (2007), 'The European regulatory state and global public policy: micro-institutions, macro-influence', *Journal of European Public Policy*, **14** (6), 827–46.
- Bareis, J. and C. Katzenbach (2022), 'Talking AI into Being: The Narratives and Imaginaries of National AI Strategies and Their Performative Politics', *Science, Technology, & Human Values*, **47** (5), 855–81.
- Bass, D. (2023), 'Microsoft Invests \$10 Billion in ChatGPT Maker OpenAI', accessed 10 June 2023 at <https://www.bloomberg.com/news/articles/2023-01-23/microsoft-makes-multibillion-dollar-investment-in-openai>.
- Beer, D. (2019), *The Data Gaze. Capitalism, Power and Perception*, London: Sage.
- Berten, J. and M. Kranke (2022), 'Anticipatory Global Governance: International Organisations and the Politics of the Future', *Global Society*, **36** (2), 155–69.
- Bradford, A. (2012), 'The Brussels Effect', *Northwestern University Law Review*, **107** (1), 1–67.
- Brynjolfsson, E. and A. McAfee (2014), *The Second Machine Age*, New York: W.W. Norton.
- Bryson, J. J. and H. Malikova (2021), 'Is There an AI Cold War?', *Global Perspectives*, **2** (1), accessed at <https://doi.org/10.1525/gp.2021.24803>.
- Büthe, T. and W. Mattli (2011), *The New Global Rulers. The Privatization of Regulation in the World Economy*, Princeton: Princeton University Press.
- Campbell-Verduyn, M. and M. Hütten (2022), 'Governing Techno-Futures: OECD Anticipation of Automation and the Multiplication of Managerialism', *Global Society*, **36** (2), 240–60.
- Carmel, E. and R. Paul (2022), 'Peace and Prosperity for the Digital Age? The Colonial Political Economy of European AI Governance', *IEEE Technology and Society Magazine*, **41** (2), 94–104.
- Cath, C., S. Wachter, B. Mittelstadt, M. Taddeo and L. Floridi (2018), 'Artificial Intelligence and the "Good Society": the US, EU, and UK approach', *Science and Engineering Ethics*, **24**, 505–28.

- Couldry, N. and U. Mejiias (2019), *The Costs of Connection. How Data Is Colonizing Human Life and Appropriating It for Capitalism*, Stanford: Stanford University Press.
- Damro, C. (2012), 'Market power Europe', *Journal of European Public Policy*, **19** (5), 682–99.
- Damro, C. (2015), 'Market power Europe: exploring a dynamic conceptual framework', *Journal of European Public Policy*, **22** (9), 1336–54.
- Dyer-Witheford, N., A. M. Kjoson and J. Steinhoff (2019), *Inhuman Power. Artificial Intelligence and the Future of Capitalism*, London: Pluto Press.
- Eberlein, B. and E. Grande (2005), 'Beyond delegation: transnational regulatory regimes and the EU regulatory state', *Journal of European Public Policy*, **12** (1), 89–112.
- Egan, M. (2001), *Constructing a European Market: Standards, Regulation and Governance*, Oxford: Oxford University Press.
- European Commission (2018), *Coordinated Plan on Artificial Intelligence [COM(2018) 795 Final]*, Brussels.
- European Commission (2021), *Fostering a European Approach to Artificial Intelligence*, Brussels.
- Farrell, H. and A. Newman (2019), *Of Privacy and Power. The Transatlantic Struggle over Freedom and Security*, Princeton: Princeton University Press.
- Feldstein, S. (2019), 'The Road to Digital Unfreedom: How Artificial Intelligence is Reshaping Repression', *Journal of Democracy*, **30** (1), 40–52.
- Ford, M. (2018), *Architects of Intelligence. The Truth about AI from the People Building It*, Birmingham: Packt Publishers.
- Frey, C. B. (2019), *The Technology Trap: Capital, Labor, and Power in the Age of Automation*, Princeton: Princeton University Press.
- Frey, C. B. and M. A. Osborne (2017), 'The future of employment: How susceptible are jobs to computerisation?', *Technological Forecasting and Social Change*, **114**, 254–80.
- Głowacka, D., R. Youngs, A. Pintea and E. Wołosik (2021), *Digital Technologies as a Means of Repression and Social Control*, Brussels.
- Gordon, R. (2016), *The Rise and Fall of American Growth. The U.S. Standard of Living Since the Civil War*, Princeton: Princeton University Press.
- Gray, M. and S. Suri (2019), *Ghost Work. How to Stop Silicon Valley from Building a New Global*

- Underclass*, New York: Harper Business.
- Griffin, P. B. (2001), 'The Delaware Effect: Keeping the Tiger in Its Cage - The European Experience on Mutual Recognition in Financial Services', *Columbia Journal of European Law*, **7** (3), 337–54.
- Krippner, G. (2005), 'The financialization of the American economy', *Socio-Economic Review*, **3** (2), 173–208.
- Krippner, G. (2011), *Capitalizing on Crisis. The Political Origins of the Rise of Finance*, Cambridge MA: Harvard University Press.
- Lavenex, S. and F. Schimmelpfennig (2009), 'EU rules beyond EU borders: theorizing external governance in European politics', *Journal of European Public Policy*, **16** (6), 791–812.
- Lazer, D. (2001), 'Regulatory interdependence and international governance', *Journal of European Public Policy*, **8** (3), 474–92.
- Lazer, D. (2006), 'Global and Domestic Governance: Modes of Interdependence in Regulatory Policymaking', *European Law Journal*, **12** (4), 455–68.
- Lee, K.-F. (2018), *AI Superpowers. China, Silicon Valley, and the New World Order*, Boston: Houghton Mifflin.
- Lorenz, P. (2021), *AI Standardization and Foreign Policy. How European Foreign Policy Makers Can Engage with Technical Standardization*, Berlin.
- Mandel, G. (2007), 'History Lessons for a General Theory of Law and Technology', *Minnesota Journal of Law, Science & Technology*, **8** (2), 551–70.
- Marcus, G. and E. Davis (2019), *Rebooting AI. Building Artificial Intelligence We Can Trust*, New York: Pantheon.
- Martinez, R. (2019), 'Artificial Intelligence: Distinguishing between Types & Definitions', *Nevada Law Journal*, **19** (3), 1015–41.
- Mattli, W. and N. Woods (2009), *The Politics of Global Regulation*, Princeton: Princeton University Press.
- Mok, A. (2023), 'ChatGPT could cost over \$700,000 per day to operate. Microsoft is reportedly trying to make it cheaper.', accessed 11 June 2023 at <https://www.businessinsider.com/how-much-chatgpt-costs-openai-to-run-estimate-report-2023-4>.

- Moses, L. B. (2007), 'Recurring Dilemmas: The Law's Race to Keep up with Technological Change', *University of Illinois Journal of Law, Technology & Policy*, **2** (Fall 2007), 239–86.
- Mügge, D. (2014), *Europe and the Governance of Global Finance*, Oxford: Oxford University Press.
- Mügge, D. (2023), 'The securitization of the EU's digital tech regulation', *Journal of European Public Policy*, 1–16.
- Mügge, D. and L. Linsi (2020), 'The national accounting paradox: how statistical norms corrode international economic data', *European Journal of International Relations*, accessed at <https://doi.org/10.1177/1354066120936339>.
- Müller, P., Z. Kudrna and G. Falkner (2014), 'EU–global interactions: policy export, import, promotion and protection', *Journal of European Public Policy*, **21** (8), 1102–19.
- Newman, A. L. and E. Posner (2011), 'International interdependence and regulatory power: Authority, mobility, and markets', *European Journal of International Relations*, **17** (4), 589–610.
- Nordström, M. (2022), 'AI under great uncertainty: implications and decision strategies for public policy', *AI & SOCIETY*, **37** (4), 1703–14.
- Palan, R. (2002), 'Tax Havens and the Commercialization of State Sovereignty', *International Organization*, **56** (1), 151–76.
- Polyakova, A. and C. Meserole (2019), *Exporting Digital Authoritarianism. The Russian and Chinese Models*, Washington DC.
- Posner, E. (2009), 'Making Rules for Global Finance: Transatlantic Regulatory Cooperation at the Turn of the Millennium', *International Organization*, **63** (4), 665–99.
- Radu, R. (2021), 'Steering the governance of artificial intelligence: national strategies in perspective', *Policy and Society*, **40** (2), 178–93.
- Scasserra, S. and A. Foronda (2022), *Banking on Data. How the World's Tax Havens Became the Data Centres for the Digital Economy*, Amsterdam: Transnational Institute.
- Schmidt, S. (2002), 'The impact of mutual recognition - inbuilt limits and domestic responses to the single market', *Journal of European Public Policy*, **9** (6), 935–53.
- Schuett, J. (2023), 'Defining the scope of AI regulations', *Law, Innovation and Technology*, 1–23.

- Shaffer, G. (2002), 'Reconciling Trade and Regulatory Goals: The Prospects and Limits of New Approaches to Transatlantic Governance Through Mutual Recognition and Safe Harbor Agreements', *Columbia Journal of European Law*, **9** (1), 29–77.
- Shaxson, N. (2012), *Treasure Islands: Uncovering the Damage of Offshore Banking and Tax Havens*, New York: Palgrave Macmillan.
- Siegmann, C. and M. Anderljung (2022), *The Brussels Effect and Artificial Intelligence: How EU Regulation Will Impact the Global AI Market*, London.
- Simmons, B. (2001), 'The International Politics of Harmonization: The Case of Capital Market Regulation', *International Organization*, **55** (3), 589–620.
- Singer, D. (2004), 'Capital Rules: The Domestic Politics of International Regulatory Harmonization', *International Organization*, **58** (3), 531–65.
- Singer, D. (2007), *Regulating Capital. Setting Standards for the International Financial System*, Ithaca: Cornell University Press.
- Smith, B. and C. A. Browne (2019), *Tools and Weapons. The Promise and Peril of the Digital Age*, London: Penguin.
- Smuha, N. A. (2021), 'From a "race to AI" to a "race to AI regulation": regulatory competition for artificial intelligence', *Law, Innovation and Technology*, **13** (1), 57–84.
- Staab, P. (2019), *Digitaler Kapitalismus. Markt Und Herrschaft in Der Ökonomie Der Unknappheit*, Frankfurt am Main: Suhrkamp.
- Stigler, G. (1971), 'The Theory of Economic Regulation', *Bell Journal of Economics*, **2** (1), 113–21.
- Stockhammer, E. (2007), *Some Stylized Facts on the Finance-Dominated Accumulation Regime*, Amherst, MA: Political Economy Research Institute WP 142, University of Massachusetts Amherst.
- Sykes, A. (1999), 'Regulatory Protectionism and the Law of International Trade', *University of Chicago Law Review*, **66** (1), 1–46.
- Ulnicane, I. (2022), 'Emerging technology for economic competitiveness or societal challenges? Framing purpose in Artificial Intelligence policy', *Global Public Policy and Governance*, **2** (3), 326–45.
- Verdier, P.-H. (2009), 'Transnational Regulatory Networks and Their Limits', *Yale Journal of*

*International Law*, **34** (1), 113–72.

Vogel, D. (1995), *Trading Up. Consumer and Environmental Regulation in a Global Economy*, Cambridge: Harvard University Press.

von Ingersleben-Seip, N. (2023), 'Competition and cooperation in artificial intelligence standard setting: Explaining emergent patterns', *Review of Policy Research*, **n/a** (n/a), accessed at <https://doi.org/https://doi.org/10.1111/ropr.12538>.

Waters, R., M. Murgia and J. Espinoza (2023), 'OpenAI warns over split with Europe as regulation advances', *Financial Times*, accessed at <https://www.ft.com/content/5814b408-8111-49a9-8885-8a8434022352>.

West, D. and J. Allen (2020), *Turning Point. Policymaking in the Era of Artificial Intelligence*, Washington DC: Brookings Institution Press.

Wirtz, B. W., J. C. Weyerer and B. J. Sturm (2020), 'The Dark Sides of Artificial Intelligence: An Integrated AI Governance Framework for Public Administration', *International Journal of Public Administration*, **43** (9), 818–29.

Zuboff, S. (2019), *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, New York: Public Affairs.