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Multilateral Governance for the Digital Economy and Artificial Intelligence

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Multilateral Governance for the Digital Economy and Artificial Intelligence[1]

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Abstract

The digital economy and artificial intelligence (AI) play an increasingly pivotal role in global economic and societal value creation but lack multilateral rules. The current fragmented state of the global digital economy risks dampening digital and AI systems' productivity growth potential and exacerbating their emerging risks. This paper provides three building blocks for new approaches to multilateral governance that can more evenly distribute the benefits of digital and AI systems while collectively managing their risks. First, it analyzes the economic logic of value creation in the digital economy and the policy dilemmas that this logic implies. Second, it identifies major economic and political challenges that impede efforts to advance multilateral governance, including concentration of power, protectionism, and exclusion in digital and AI systems. Third, it evaluates the potential of Digital Public Infrastructure (DPI)—an increasingly globally-recognized framework for promoting publicly guaranteed digital ecosystems—to serve as a foundation for more equitable, interoperable and inclusive global digital and AI governance. The paper concludes by identifying near-term opportunities for policymakers to align on shared multilateral principles while respecting all countries' domestic policy space.

Keywords: Digital economy, artificial intelligence, multilateral governance
JEL classification: F02, F13, L5, O32, O36

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Introduction

The world has crossed a threshold where the digital economy is now the key driver of value in the global economy. The digital economy makes up more than 15% of global GDP and has grown two and a half times faster than world physical GDP over the last 10 years.[2] In that same time period, the Standard and Poor's 500 (S&P 500) stock market index tracking the performance of 500 of the largest listed companies on the US stock exchanges has almost doubled its exposure to digital technology from 23% in 2010 to 39.8% in January 2024, with the "Magnificent Seven" of Apple, Microsoft, Alphabet, Amazon, Nvidia, Meta Platforms and Tesla collectively accounting for over 28% of the index's total exposure.[3] The World Economic Forum estimates that 70% of new value created over the coming decade will be based on digitally-enabled platform business models.[4] Much of trade in physical goods and services is now dependent on data-driven insights produced from these physical flows.[5]

Systems of data, software, computation, and talent promises significant productivity growth and new opportunities for improving welfare. But it also presents new challenges to societies and policymakers globally. The digital divide between rich and poor countries and vulnerable populations within all countries is extreme. In 2022, only one in four people in low-income countries used the internet compared with more than 90% of people in high-income countries[6]. In 2023, one-third of the world's population, or 2.6 billion people remained offline, a disproportionate number of whom were women, indigenous people, and rural residents[7].

In a watershed moment for the global digital economy in 2023, large-scale generative AI systems demonstrated an impressive capacity to transform massive volumes of data into meaningful ideas and productive value across a range of industry-relevant contexts. A new wave of generative AI models is set to turbocharge the digital economy by serving as 'foundation models' for a new industrial layer[8]. Capturing the high-value components of the global digital value chain, emerging generative AI systems now represent the zenith of global digital economic activity.

Frontier digital and AI systems present new opportunities for societies to address challenges that were previously too costly or not possible, such as increasing worker productivity in sectors like healthcare and education, identifying tailored solutions in disability or social welfare support across heterogeneous societies, or global-scale biodiversity monitoring or pandemic preparedness systems.

At the same time, the speed and scale of growth in the digital economy and generative AI are exacerbating existing risks around personal privacy, cyber security, and IP protection, while also creating entirely new risks. Some are easily recognizable in the form of deepfakes and misinformation, while others are harder to identify, such as single point of failure vulnerabilities in computational infrastructure, algorithmic biases and discrimination, or the environmental impacts of massive-scale computational systems. Slowing the use of frontier digital and AI technologies in one jurisdiction—if it were even possible—would not mitigate

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[2] https://www.weforum.org/agenda/2022/08/digital-trust-how-to-unleash-the-trillion-dollar-opportunity-for-our-global-economy/

[3] https://www.reuters.com/markets/us/sp-500s-wild-ride-an-all-time-high-2024-01-19/

[4] https://www.weforum.org/agenda/2022/08/digital-trust-how-to-unleash-the-trillion-dollar-opportunity-for-our-global-economy/
https://intelligence.weforum.org/topics/a1Gb0000001SH21EAG

[5] https://www.mckinsey.com/mgi/overview/in-the-news/the-ascendancy-of-international-data-flows

[6] https://www.itu.int/itu-d/reports/statistics/2022/11/24/ff22-internet-use/

[7] https://www.itu.int/en/mediacentre/Pages/PR-2023-09-12-universal-and-meaningful-connectivity-by-2030.aspx

[8] https://arxiv.org/pdf/2108.07258.pdf

risks from other jurisdictions in a digital world where borders matter less.

Globally-inclusive, multilateral arrangements for digital and AI governance can help address many of these risks by helping align incentives and establish shared norms between all actors. But developing multilateral digital and AI governance is not easy in the current disruptive global environment. A range of interconnected, transnational challenges—including climate change, the collapse of biodiversity, conflict, inequality and indebtedness—are outpacing international institutions designed to manage such challenges. Great power rivalry between China and the United States and the Global Majority's mistrust and resentment of rich countries' increasingly inward-looking postures further stymy hopes of coordinating the global-scale cooperation and action required to match the speed and scope of these issues.

As a result, the global digital governance landscape remains highly fragmented. There has been considerable progress on digital economy and e-commerce rulemaking within plurilateral settings such as the World Trade Organization (WTO)'s Joint Statement Initiative (JSI) and evolution of the Japan-led concept of Data Free Flow with Trust (DFFT) within G20 and G7 groupings. However, the global digital economy nonetheless resembles what is colloquially referred to as a 'digital noodle bowl' of bilateral digital economy agreements (DEAs) and regional agreements that are at risk of coalescing around three blocs—the United States and its allies, China and the European Union[9]. This Balkanization of digital governance, including key gaps in membership and rules, threatens to further fuel geopolitical rivalry and adversely affect economic dynamism and interdependence in goods and services trade.

In this context, continued engagement in existing multilateral rule making and consensus building processes is important but not sufficient. There is a need for new approaches to multilateral governance of the digital economy and AI that more effectively distribute the benefits of digital and AI systems while collectively managing their risks.

In this paper, we argue for the need to (i) better understand how economic and societal value generated by digital and AI systems can be more equitably distributed, (ii) identify the major economic and political challenges that impede progress on multilateral arrangements for digital and AI systems, and (iii) embrace emerging technical and policy innovations capable of supporting new types of multilateral policy solutions.

Accordingly, in section 1 of this paper, we analyze how the underlying logic of digital and societal value creation of digital and AI systems implies unique dilemmas for policymakers. Since key components of digital economic activity have public good features, with data and software being able to be used by many simultaneously, barriers to free flow of data, software, and talent are particularly detrimental for economic growth and development within and between countries. Monopolistic hoarding of these components by technology firms and barriers to digital trade across borders and jurisdictions affect supply chains, productivity, peoples' livelihoods, and reduce the growth potential of economies, including those at the global technological frontier. There is a need for policy solutions that liberalize flows of data and software while incentivizing business innovation and protecting against risks.

In section 2, we argue that that it will be difficult to make progress on multilateral arrangements for digital and AI systems without first confronting key challenges in the global political economy of these systems, including:

1. **Concentration**: The concentration of power over key inputs to digital and AI systems (data, software, compute capacity, and talent) by a handful of companies globally, making it difficult for new entrants to compete, governments to avoid vendor lock-in and public actors to ensure

[9] https://www.tradeexperettes.org/blog/articles/untangling-the-digital-noodle-bowl-the-case-for-depa

accountability for the social and environmental impacts associated with these systems.

2. **Protection**: A related tendency of governments and firms alike toward protection of digital assets from international access and competition (also known as 'localization' in the digital economy) threatens potential economic dynamism and distribution from digital and AI systems.
3. **Exclusion:** the world's most vulnerable stakeholders in developing countries and specific populations within all countries (for example, women, rural, and indigenous communities) are systematically excluded from the benefits of digital and AI systems.

The challenge for policymakers will be finding ways to promote more globally-inclusive participation in the economic and societal value of digital and AI systems while preserving important emerging foundations of the digital economy, including individual privacy, cybersecurity, and civil society oversight.

In section 3, we consider the potential of Digital Public Infrastructure (DPI)—an increasingly globally-recognized framework for developing inclusive, interoperable, and publicly guaranteed digital ecosystems—to advance global digital and AI governance. By supporting a 'level playing field' for inclusive and competitive digital economic activity within (and potentially between) countries, DPI could help establish a stronger foundation for multilateral digital and AI governance in the years to come. A level playing field, or equal treatment, is a fundamental principle of the multilateral trading system enshrined in the most favored nation (MFN) clause that diffuses economic and political power (Armstrong, et al. 2021).

To conclude, we suggest that basic guiding principles—of liberalization, interoperability and inclusivity—can help enhance the opportunities and positive spillovers from the new technologies while managing risks and negative spillovers across borders. We point to practical opportunities to develop these shared principles within global and regional settings. Advancing inclusive, globally-agreed arrangements for the governance of digital and AI systems will ultimately require striking a balance between incentivizing and enforcing—through shared norms and rules-based arrangements for digital trade and cybersecurity—openness and interoperability between digital systems while preserving domestic policy space for countries to regulate and govern according to specific social, economic and political circumstances.

(1) The logic of value in the digital economy

Digital products and services are defined as such because they are primarily created, distributed, and consumed in a non-physical, intangible environment. They commonly rely on an assemblage of interrelated components: digitally-stored information (data), instructions for collecting, processing, and representing data (software), hardware (including personal computing interfaces and computational infrastructure or "compute") and human labor (talent).

Historically, economic value in the digital economy has correlated with the extent to which digital products or services can capture network effects and learning effects.

Network effects occur when the value of a product or service increases as more people use it. For example, each new user of a social media platform like Facebook adds value for all existing users (increasing the potential for connections and interactions) and for Facebook itself (increasing the marketability of its user base to potential advertisers). Learning effects arise from the ability of Facebook, for example, to learn from data (derived from its operations and user interactions on its platform) to continually improve these products and associated services (for example, sell advertising). In this way, learning effects can enhance network effects in a virtuous cycle.

Prior to 2023, most technology firms would have already been using (custom-built) machine learning and

AI systems to gain insights from large volumes of data, refine products and services and automate business processes. The productization and rapid adoption of large-scale, natural language-based generative AI models in 2023 (namely ChatGPT and other similar applications) signals that generative AI systems could serve as a new foundational layer of digital applications and services, akin to what the internal combustion engine is for cars or airplanes, or the Central Processing Unit (CPU) is for personal computers in the personal computing era.

AI systems represent a new zenith in the logic of digital value creation. However, it is yet to be seen how network and learning effects will be harnessed or abused to capture the value in this technological innovation.

Non-rival and rival goods in the digital economy

It is important to recognize that each of the core components underpinning digital systems have specific characteristics that determine their economic and societal value.

Data and software, for instance, are non-rival in their consumption, meaning that the same data or software can be used by many actors simultaneously. This gives data and software an important feature of a 'public' good. Public goods are non-rivalrous (their use does not diminish the use for others) and non-excludable (it is costly or impossible for one user to exclude others from using a good).

As Jones and Tonetti (2020) point out, the commonly cited analogy of data as "the new oil" is misleading in the context of digital value creation. Unlike oil, data are non-rival and inexhaustible in their consumption, allowing for increasing returns, or economies of scale, potentially compounding the benefits from mutually beneficial exchange across the global economy. Artificially excluding others from use of non-rivalrous data is therefore suboptimal and inefficient from an economic perspective. Fundamentally, hoarding data wastes its economic and societal value when it could be utilized by others.

Similar arguments can be made for software: once a piece of software is developed, it can be distributed and used by multiple users simultaneously without additional costs for each new user. This is evident in the widespread use of open-source software, digital applications, operating systems, where the marginal cost of serving an additional user is close to zero. But unlike data, whose acquisition costs are potentially low (can often be collected as a by-product of other activities such as user interactions with digital services), software typically requires significant upfront investment in terms of time, expertise, and resources.

Compute and talent are, by contrast, rival goods: computational hardware and human labour can only be allocated to one use at a time. Individuals or firms have rights over private goods because they are rivalrous and transacting rival goods means bearing transaction costs upfront to ensure they go to the highest value use (for example, writing contracts of sale). In the case that markets for compute or talent become highly concentrated, governments can intervene to ensure adequate access and competition for wealth creation and distribution.

Data commons tragedy

Despite this clear logic to the role of data flows in digital value creation, today's digital economy generally suffers from a unique form of the tragedy of the commons—typically understood as a situation in which individuals privately benefit (say, burning firewood to stay warm) at a cost to the community (creating carbon pollution or destroying forests that sustain communities). The tragedy with data in the digital economy is that the potential gains to the community associated with liberalizing data flows are immense (for example, curing cancers), and the cost to the individual of collecting and sharing data are low

(embodied in the inconvenience of having to 'accept' cookies, for example), yet the necessary incentives do not exist to capitalize on this opportunity for collective value creation.

The 'data commons tragedy' in today's digital economy can be traced to two key factors. First, quasi-monopolistic technology infrastructure firms who collect, own and control vast amounts of the world's data have no real economic incentive to share them, from fear of competition and creative destruction. Second, individuals are reluctant to share their data, in part from fear of personal privacy breaches (justified by a series of high-profile data breaches of firm and government databases in the past 20 years)[10] and in part due to a lack of data ownership rights that would otherwise economically incentivize trading data with data intermediaries.

With an increase in public awareness around the vulnerabilities of data to misuse, technology infrastructure firms that rely on the network effects from large user numbers are incentivized to protect individual privacy as a means of (re)establishing trust with users and preventing switching to competitors and alternate platforms. Recognizing that these business incentives to protect citizen privacy may not be enough (Jones & Tonetti, 2020), regulation is needed for baseline data privacy standards. Government regulations to increase individual privacy protections have also been introduced to placate user concerns around privacy, with for example, General Data Protection Regulation (GDPR) regulations that allow consumers to consent to online data collection). However, absent regulation designed to reduce data hoarding by monopolistic firms, personal privacy protections alone only exacerbate the data commons tragedy, by reducing the incentives for smaller market players to compete for economies of scale in industries of data aggregation and exchange.

Implications for policymakers

The differing characteristics of non-rival and rival goods in the digital economy reveals a need for differing governing principles and policies for these goods. In general, rules are required that reflect the underlying nature of the assets that technology is making available. Rules for data and software should aim to leverage the underlying public good characteristics of these assets to support societal value. Applying rules meant for private goods to public goods can impede—if not stop— the social benefits of these goods. Likewise, private goods such as compute and talent should be regulated as such, through the creation of competitive or contestable markets for those goods.

Specifically, we identify two dilemmas confronting policymakers when attempting to support economic and societal value of digital activity within and between countries:

1. ***The need to liberalize flows of non-rival goods (data and software), while incentivizing business innovation and protecting against risks***

Individuals, businesses, and governments all have different roles to play in the digital economy, implying different rules and incentives for different stakeholders to help maximize economic and societal value of non-rival goods while managing risks.

It makes sense that actors who bear the costs in transforming data and software into valuable information should be able to access returns from this investment. This logic should be applied not only to businesses but also to people and communities who bear the initial costs as original generators of data.

Some arguments frame data as labor and argue that individuals should be credited for their work in

[10] https://dl.acm.org/doi/10.1016/j.procs.2019.04.141

generating data (Arrieta-Ibarra et al. 2018). Another solution, as modeled by Jones and Tonetti (2020), would be to transfer ownership of data from monopolistic tech firms to their users, thus avoiding data hoarding. Under certain assumptions, individuals are more able than firms to optimally manage a tradeoff between incentives to share data for economic and societal value and incentives to protect privacy. The revealed preferences of consumers are largely to share data in exchange for digital services.

As will be discussed in more detail later, individual ownership or credit for data could be achieved by developing society-wide, publicly guaranteed infrastructure — or Digital Public Infrastructure (DPI) — for citizens and communities to own and share their data within a competitive market of data intermediaries such as data brokers, data trusts, data unions and data banks. Under this framework, governments should seek to share data openly, for dual purposes of transparency and accountability, and to facilitate value creation.

Data is an important input to competition because it can be disruptive. But data markets are also fragile. Even small upfront costs can eliminate competitors who may be collecting data incidentally and where future applications are uncertain. Therefore, individuals and new market entrants need the security that they can profit from collecting, sharing and applying data.

For example, applying transaction costs to data exchange *ex-ante* can eliminate incentives to collect, curate and use it. General Data Protection Regulation (GDPR) in Europe is a good example where many businesses preferred to stop transacting in data due to the upfront obligations around privacy, cyber security and intellectual property protection (Allen, et al. 2019). Rather than strict *ex-ante* controls on harms, misuse of data could instead draw significant *ex-post* penalties and (low cost) *ex-ante* norms for collecting and distributing data.

Many of the transaction costs needed to generate network and learning effects from data and software are large fixed costs which can easily be borne by established players, especially when these players have vertically integrated digital assets. Accordingly, special rules may be needed to require large incumbent firms to share data if they are hoarding data for private gain.

Developed originally to incentivize innovation, copyright is another example of a transaction cost on data that slows the potential economic social value from digital and AI systems. Artificial intelligence and machine learning is forcing a rethink on models of copyright and IP protection. Unlike humans, AI systems do not need the incentive of a property right to innovate (but may require even more stringent rules limiting and enforcing misrepresentation for markets to work more efficiently). Recognizing this issue, New Zealand removed copyright for software development and Australia's Productivity Commission has recently recommended introducing a 'fair use' exemption for data used in AI (Productivity Commission, 2024).

Jarvis (2023) has suggested a shift from copyright to "creditright" where a range of actors are credited for their role in the creation of an intellectual or artistic idea. This line of reasoning resembles efforts in the Open Science movement to credit a full range of actors for the creation of a scientific idea or product (Tay, 2024).

2. The need to honor private rights over compute and talent while supporting fair access, allocation, and distribution of these goods

As argued by Sastry et al (2024), compute is detectable, excludable, and quantifiable, making it a good candidate for regulation to ensure a contestable and competitive market of players. Getting the balance

right between protecting property rights over compute and broader access for social benefit is likely to be a deeply domestic matter for national governments, albeit one that can be guided by experiences in other countries and jurisdictions as technology evolves and regulatory solutions change. Agreed principles in international forums such as APEC can help set norms and standards and empower governments over powerful business interests.

The high returns for talent create a huge incentive for many to train in software engineering, big data and AI. The market response should be enough in this instance, albeit with shortages of high skilled workers from time to time that will only be resolved with a lag. Governments should seek to invest in digital and AI education and literacy and restrict barriers to talent mobility such as non-compete clauses.

(2) Major challenges in governing the global digital economy

The logic of value creation and associated policy dilemmas in the digital economy can help inform new approaches to the major challenges that impede progress on multilateral governance of digital and AI.

Concentration of power over key inputs to digital and AI systems

We now live in a world of over 6 billion smartphones[11], proving that access to digital technologies has become increasingly prevalent and democratized, despite enduring digital divides. Nonetheless, market concentration has become a feature of the global digital economy. Through a wave of market consolidation of the consumer internet between 2003 and 2017, a small club of big technology firms in the US and China control the highest value inputs to digital systems, including data, software, compute and talent. In 2023, for instance, Alphabet, Meta, Amazon, and Microsoft collectively accounted for 55% of global advertising revenue outside China, with the top 20 companies holding a 71% share.[12] In 2022, the "Magnificent Seven" alone (Apple, Microsoft, Alphabet, Amazon, Nvidia, Meta Platforms and Tesla) spent almost twice as much on research and development (R&D) than the combined research expenditure of all US universities ($98.8b)[13].

Market concentration is particularly acute in the case of large-scale frontier AI systems, which typically rely on computation- and data-intensive machine learning that only the most well-resourced technology companies are able to maintain (Bender, et al., 2021; Kak and Myers West, 2023). For example, the AI Now Institute estimates that OpenAI's frontier GPT4 model is over 100 times more expensive to develop and run than its immediate predecessor GPT3.5 (Kak and Myers West, 2023). Some estimate that OpenAI's total cost of operation is in the realm of US$640,000 per day[14]. In February 2024, social media platform Reddit struck a reported $60 million per year deal with Google[15] to make its content available for training the search engine giant's AI models. This follows deals between OpenAI and publishers Axel Springer and Associated Press[16]. Recent massive cross-investments and acquisitions by technology infrastructure firms into generative AI startups—the most recent and notable examples being Microsoft's US$10 billion investment in OpenAI and Amazon's US$4.2 billion investment in Anthropic—signal further consolidation of technology infrastructure firms' power over the 'full stack' of inputs needed to build AI.

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[11] https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

[12] https://madisonandwall.substack.com/p/media-industry-concentration-and

[13] https://ncses.nsf.gov/pubs/nsf24307

[14] https://www.nebuly.com/blog/understanding-the-total-cost-of-openai

[15] https://www.reuters.com/technology/reddit-ai-content-licensing-deal-with-google-sources-say-2024-02-22/

[16] https://www.axios.com/2023/07/13/ap-openai-news-sharing-tech-deal ；https://siliconangle.com/2023/12/13/openai-inks-content-licensing-deal-axel-springer/

This scenario signals a worrying 'winner takes most' environment for digital and AI globally (Vipra and Korinek, 2023). It is possible that high entry barriers to building and maintaining AI systems may reduce over time with technological progress and innovation (including through open source software and open AI systems), allowing new entrants to capture new forms of value. But early trends suggest that concentration of power over key AI inputs will compound as AI incumbents amass capital and learning effects from their leadership. Market concentration in AI threatens to limit economy-wide value creation (including distribution of productivity, income, and innovation gains; see Brynjolfsson and Unger, 2024), while making it difficult for governments—particularly in less developed countries—to avoid costly vendor lock-in to proprietary AI systems.

Market concentration in digital and frontier AI systems makes it difficult for public actors to ensure transparency and accountability around the potential biases, inequities, and environmental impacts of digital systems. For instance, in 2022 Microsoft reported a 34% Y.O.Y. increase[17] in water consumption due to a spike in data center activity following its cross-investment in OpenAI. Google reported a 20% Y.O.Y. increase in water usage over the same period[18]. The International Energy Agency (IEA) projects that data centers' electricity consumption in 2026 will be double that of 2022 — 1,000 terawatts, roughly equivalent to Japan's current total consumption[19].

Sound governance of digital and AI systems is required to promote liberalization of data and software flows to promote digital value creation. This can be achieved through policies that increase competition, heighten transparency, and increase equity in digital and AI systems. Governance promoting fair and healthy competition across key components of digital and AI systems, potentially including foreign actors, can offer several benefits:

- Increased supplier diversity: A wider pool of producers creates redundancy and lessens reliance on any single actor, reducing the risk of disruptions due to monopolies or geopolitical tensions.
- Enhanced innovation: Competition incentivizes companies to invest in research and development, leading to technological advancements and improved efficiency, potentially mitigating bottlenecks.
- Risk sharing: Expanding producer participation distributes some of the associated risks throughout the market, rather than concentrating them on specific entities.

Simply allowing unrestricted competition might not be sufficient. It's crucial to ensure a level playing field and prevent unfair practices like predatory pricing or intellectual property theft. Additionally, concerns regarding national security and sensitive technologies will necessitate careful balancing of competition with strategic control.

Protection of digital assets

With power over inputs to AI systems and their digital building blocks so heavily concentrated within a 'winner takes most' system, it is unsurprising that governments are seeking to protect and localize their digital assets. Between 2017 and 2021, the number of data localization controls in place around the world doubled, including key localization policies enacted by major digital players including China, the EU, India[20], Indonesia, and the United States (Cory and Dascoli, 2021). Smaller nations in the Asia Pacific

[17] https://fortune.com/2023/09/09/ai-chatgpt-usage-fuels-spike-in-microsoft-water-consumption/

[18] https://e360.yale.edu/features/artificial-intelligence-climate-energy-emissions

[19] https://iea.blob.core.windows.net/assets/6b2fd954-2017-408e-bf08-952fdd62118a/Electricity2024-Analysisandforecastto2026.pdf

[20] For details, see David and Rajeshwari (2022).

such as Vietnam and Malaysia have also adopted similar data localization policies.[21]

Localization results in rules and regulations that restrict the flow of data, hardware, investments and talent across national borders. These localization requirements are often introduced in the interests of citizen safety and national security, and other times as protectionist or industrial policy. Determining and agreeing on what are legitimate localization rules for security and privacy, and what are protectionist, beggar-thy-neighbor policies requires significant regional and global cooperation and negotiation.

Data localization is any regulation that restricts the use or transfer of data from domestic users to foreign jurisdictions. The least restrictive approach to data localization mandates that a copy of the targeted data is stored, usually for a period of time, on domestic servers or facilities. The data is usually stored for audit or to overcome lack of jurisdictional reach. Next are restrictions disallowing foreign storage, but not processing, so the data is returned home for storage. The most restrictive are local content requirements mandating that data be stored locally bundled with permissions to transfer or process the data overseas. This usually relates to industrial policy objectives, such as increasing employment or transferring know-how, by forcing foreign companies to establish data centers or servers as a condition to provide services or use local data. The rules are often made more complex because local content requirements are usually targeted at different sectors, like telecommunications, health or military technology.

From an economic perspective, localization of data and software (non-rival goods) restricts potential value creation through digital and AI systems. Data localization imposes costs on foreign firms trying to operate in another jurisdiction, since they need to establish a presence in that country or determine a system such that the domestic data is not routed internationally, which is expensive. In turn, data localization can impose higher business import costs on local firms seeking to access digital services such as cloud computing. Localization of data in whatever form can impact the quality of applications and services built on the agglomeration of data sources, including AI applications. It can also act as an indirect subsidy to domestic firms who are granted exclusive access to the data.

Localization measures have their own direct and indirect negative impacts on the development of AI systems for the region (Meltzer, 2018). Localization reduces access to training data and starves innovation ecosystems (Wu, 2021). It also risks fragmentation of safety and cybersecurity mechanisms and undermines the dynamism and efficiency of the digital economic activity that underpins AI systems (Cory and Dascoli, 2021; Swire and Kennedy-Mayo, 2023).

The industrial policy logic of localization might stack up for larger countries with mature ecosystems for the development and deployment of AI systems. But smaller and poorer countries across the region with the least access to data, computational capacity and talent will be left with fewer options to participate in the industry. The level of market concentration in emerging generative AI systems is such that smaller countries will have little choice but to pursue partnerships with US and Chinese technology firms to access advanced compute, foundation models, and other services required to participate at the frontier of AI innovation and value creation. But foreign firms may not find it worthwhile to establish a physical presence in the country, especially if the market is small or the infrastructure is lacking. Localization policies for smaller economies aimed at developing the local market and to encourage or help develop domestic capacity in digitally intensive sectors is akin to infant industry protectionism and industrial policy and risks reduced data flows and digital services.

[21] Those nations are members of the East Asian Regional Comprehensive Economic Partnership (RCEP), the world's largest regional trade agreement inked in 2020, with its chapter on e-commerce allowing data localization carve outs on national security grounds.

Despite remote management options, data storage mandates can hinder digital trade. Personal data protection regimes, though beneficial, impose costs on both government enforcers and complying businesses. Enforcing the US Health Insurance Portability and Accountability Act of 1996 (HIPAA), for instance, requires a $50 million annual budget for 150 employees, a cost and capability that is difficult for smaller countries. The EU GDPR incurs estimated costs of $250,000-$2 million per year for large firms (World Bank 2021, Chapter 7).

The United States has taken an assertive approach to protecting key assets needed to develop AI systems. Investments in onshore production of graphics processing units (GPUs) needed for AI and AI innovation ecosystems (through the CHIPS and Science Act) coupled with export controls targeting high-end GPUs sold to China indicates that United States intends to fully utilize industrial policy to maintain and extend the lead of its technology companies over frontier AI systems. Without robust regional or multilateral frameworks that build trust in national-level data protection and cross-border data flows, it will be difficult for potential AI competitors such as China, India and Indonesia not to respond in kind[22].

In this context, multilateral agreement on principles, definitions, rules and norms of cross-border data and technology flow is needed to address negative impacts of data localization on potential economic and societal value creation through digital and AI systems. Extensive cooperation will be needed to agree to data protection, cyber security and interoperability standards that mitigate legitimate security and privacy risks while building trust in more efficient data and technology sharing arrangements across borders.

Exclusion of populations from digital and AI systems

The combination of market concentration and related tendencies towards the protection of digital and AI assets by countries and firms alike poses risks for the world's less developed countries and excluded populations within all countries. Digital exclusion is most extreme in Least Developed Countries (LDCs), where lack of infrastructure, weak connectivity, unaffordability of the internet and devices, and poor digital literacy and adoption of digital technologies means that only 36% of the LDC population uses the Internet (the global average is 66 percent)[23,24]. Across all nations, Indigenous and rural populations in addition to women are most at risk of experiencing data-driven biases and exploitation of personal digital rights. The systematic exclusion of the world's least advantaged populations from digital infrastructure and applications has important implications for disparities in outcomes related to education, employment, governance, civic participation and health (Saed and Masters, 2021).

Meanwhile, disparity in AI readiness and resilience across the globe—between rich and poor nations and between advantaged and disadvantaged populations within nations—threatens to extend the world's already stark digital divides into 'algorithmic divides' (Lim, 2022; Hankins et al., 2023). With a young and digitally-literate population, Southeast Asia is often a source of optimism for digital economic development (Goyer, 2023). But Southeast Asia's AI readiness reveals several challenges[25]. For instance, while most Southeast Asian populations may be in a good position to be consumers of AI products and services, comparatively weak government and industry AI readiness across the region means that these same populations are less well-placed to participate in and benefit from AI systems[26]. Several countries

[22] https://www.eff.org/deeplinks/2017/08/rising-demands-data-localization-response-weak-data-protection-mechanisms; for China, see Roberts and Hine (2023).

[23] https://www.itu.int/itu-d/reports/statistics/2022/11/24/ff22-internet-use/

[24] https://www.undp.org/blog/committing-bridging-digital-divide-least-developed-countries

[25] https://www.salesforce.com/content/dam/web/en_au/www/documents/pdf/asia-pacific_ai-readiness-index-2021.pdf

[26] https://www.asiapathways-adbi.org/2022/02/artificial-intelligence-to-unlock-sustainable-development-potential-in-southeast-asia/

across the Asia-Pacific still lack adequate data protection laws and national AI strategies (Rogerson et al, 2022).

In this context, genuinely inclusive multilateral arrangements will be required to support the capacities of poorer countries and less advantaged populations within all countries to meaningfully address issues of representation and participation in digital and AI systems. Specifically, there is a need for greater inclusion of youth voices from LDCs who will drive digital transformations in generations to come (Signé, 2023).

(3) Innovations for multilateral governance

The state of global digital and AI governance

Challenges of concentration, protection, and exclusion define the major obstacles in existing attempts to establish multilateral arrangements for digital and AI systems globally.

Rulemaking and norm-setting in the digital economy is proceeding along multiple tracks. Up until recently, the two plurilateral initiatives driving discussions around global digital governance were the Japan-led Data Free Flow with Trust (DFFT) active within the G7 and the WTO's Joint Statement Initiative (JSI) on e-commerce. DFFT enshrines the free flow of data across borders on a foundation of interoperability between national digital systems as key principles. DFFT received (non-binding) sign-on from G20 members (except India) on the sidelines of the Osaka G20 summit in 2019.

2023 was an eventful year for global digital governance, as governments worldwide now became more aligned than ever on the need to govern national digital and AI systems in the public interest. This shift could have important implications for efforts to collectively address market concentration, protectionism, and exclusion.

Most notably, in September 2023, the G20 unanimously endorsed Digital Public Infrastructure (DPI) as a framework for developing publicly guaranteed, shared infrastructure for digital capabilities (for example digital ID, payments, and data exchanges) based on common principles of inclusivity, interoperability, accountability, and transparency[27]. Soon after, in October, the US announced withdrawal[28] of its longstanding demands around free flow of data and source code protections for US firms from the WTO's JSI,, citing[29] a need for more domestic policy room to "regulate in the public interest and the need to address anti-competitive behavior in the digital economy" (to the dismay of US technology firms big and small[30]).

The US move in the JSI is potentially a big blow for hopes of establishing multilateral agreements needed to fully deliver on the economic dynamism and global development potential of global digital trade, e-commerce, and emerging AI systems.[31] But progress within the JSI had already stalled around issues of cross-border data flows and source code protection, with most countries concerned that the US's demands around data flows and source code would disproportionately advantage US technology firms without sufficient assurances for non-US allies around citizen privacy protection and national security concerns.

What is more, the JSI—and, to a large extent, the DFFT—suffers from a representation problem. Despite being the world's foremost plurilateral forum for 'high-standard' rules for the global digital economy, of the JSI's 90 participating countries, seven are from Africa and only four are least developed countries.

Viewed in a more hopeful light, the combination of G20 support for DPI and the US's latest posture around

[27] http://www.g20.utoronto.ca/2023/G20-New-Delhi-Leaders-Declaration.pdf

[28] https://www.cigionline.org/articles/after-ustrs-move-global-governance-of-digital-trade-is-fraught-with-unknowns/

[29] https://www.reuters.com/world/us/us-drops-digital-trade-demands-wto-allow-room-stronger-tech-regulation-2023-10-25/

[30] https://www.csis.org/analysis/ustr-upends-us-negotiating-position-cross-border-data-flows

[31] https://www.csis.org/analysis/ustr-upends-us-negotiating-position-cross-border-data-flows

the digital economy could present a window of opportunity in 2024 for policymakers globally to take stock of digital governance priorities in light of unique issues associated with generative AI. Whether intended or not, the US implicitly honored most other countries' longstanding demands for greater agency in determining the digital foundations of their societies and economies. In this regard, most major international players in AI such China, India, and the US are now more structurally (if not ideologically) aligned on the need to manage the market concentration of big tech firms and what it means for economic and political power. It is just possible that willingness of the US government to make progress on this issue could unlock new and more globally inclusive multilateral conversations around the assurances needed to support interoperability of data and AI systems between firms and across national borders.

Digital Public Infrastructure as a potential pathway for progress

In 2023, DPI entered global digital governance discussions as a new approach to building the foundations of digital economies and societies. India's 2023 G20 presidency produced the first multilaterally-agreed DPI definition and principles[32] and a suite of policy tools[33] to support global scale-up while addressing known challenges with DPI including cybersecurity and government misuse.[34] Meanwhile, DPI's recognition has also grown within the U.N. and the global development sector, highlighted by initiatives like '50 in 5' to encourage DPI adoption in 50 countries by 2028, and the U.N. Secretary General's initiative targeting DPI adoption in 100 countries by 2030.[35][36]

DPI is now well positioned to inform debates on global digital governance including those on AI. DPI could complement emerging risk-based existing digital and e-commerce concepts such as the Japan-led DFFT.[37]

Embodying principles of inclusion, interoperability, and accountability (in addition to existing digital governance pillars of individual privacy protection, cyber security, and legal recourse to digital harms), DPI could be utilized to broker more inclusive and productive global conversations about the multilateral arrangements needed for global digital governance while helping set a firm foundation for global AI governance.

DPI layers including digital ID, payments, and data exchange are designed to function in the digital world the same way as roads, water, and electricity function in the physical world. By virtue of being publicly owned, publicly regulated, or open source, DPI aims to create a level playing field to support citizen inclusion and innovation of goods and services by competitive market players (Ingram et al., 2022). DPI is distinct from proprietary digital infrastructure, which is typically owned and operated by private entities, may have restrictive access, is not necessarily interoperable with other systems, and is accountable primarily to its owners or shareholders rather than the public.

Notable implementations of DPI include Aadhaar, India's digital ID enabling over 1 billion Indian citizens to access government services; Pix[38], Brazil's digital payments infrastructure that allowed uptake of 100 million users and over 1 billion monthly transactions within 12 months of deployment in 2021; and X-Road, Estonia's open and interoperable data sharing platform that allows citizens to access and exchange

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[32] http://www.g20.utoronto.ca/2023/G20-New-Delhi-Leaders-Declaration.pdf

[33] https://carnegieindia.org/2023/09/01/decoding-g20-consensus-on-digital-public-infrastructure-key-outcome-of-india-s-presidency-pub-90467

[34] https://blog-pfm.imf.org/en/pfmblog/2022/12/digitalization-of-public-finance-and-digital-public-infrastructure-opportunities-and-challenges

[35] https://50in5.net/

[36] https://hlpf.un.org/sites/default/files/2023-09/Digital%20Public%20Infrastructure%20Brochure.pdf

[37] https://carnegieindia.org/2023/09/01/decoding-g20-consensus-on-digital-public-infrastructure-key-outcome-of-india-s-presidency-pub-90467

[38] https://www.centralbanking.com/awards/7935556/payments-and-market-infrastructure-development-retail-central-bank-of-brazils-pix

their own data (for example, health records, financial data) and interact with a range of digital services.[39]

If combined with a comprehensive public policy framework (including robust data protection, cyber security, and IP laws), DPI can fairly incentivize a full range of market actors to leverage the 'non-rival' attributes of data and open-source software to drive productivity growth and societal value. At its best, DPI can incentivize (i) citizens to securely share data in exchange for products, services, or payment; (ii) governments to share data[40] for creation of societal value and public transparency; and (iii) businesses to innovate new products and services (Chakravorti, 2023).[41] In this way, principles of inclusivity, interoperability, and transparency lie at the heart of DPI's formula for promoting digital inclusion, economic productivity and societal value.

DPI's core technical layers of ID, payments, and data exchange provide important ingredients to support transitions from concentration, protection, and exclusion toward greater, equity, interoperability, and stewardship in digital and AI systems.

From concentration to equity

Proliferation of DPI globally helps set a level playing field for a range of players to participate in competitive digital markets. Digital IDs, payments, and data exchanges help counterbalance tech infrastructure platform dominance over data and compute by giving citizens a route to pursue agency and data ownership. The interoperability requirements of DPI help governments reduce inefficient vendor lock-in to proprietary digital systems. For instance, India's Unified Payments Interface demonstrates the potential for varied vendor participation by supporting over 25 payment apps, including GooglePay and WhatsApp Pay.[42]

DPI can empower governments to pursue public-private partnerships with technology firms that help increase rather than reduce the capacity of governments, small businesses, and citizens to participate in and design AI systems. Singapore's AI Verify Foundation[43], an initiative through which technology companies co-develop AI compliance mechanisms with government agencies, helps grow and democratize the technical and governance capacity of government agencies and SMEs.

From protection to interoperability

In a world in which the economic development arguments for free flow of data and technology across borders no longer stack up against the perceived risks to citizen privacy, national security, and industrial policy objectives, DPI provides new frameworks through which to consider issues of interoperability surrounding secure cross-border data and technology exchange. For example, the X-Road Federation, which enables protected data flows between Estonia and Finland, could serve as a model for international digital asset exchange, including data sharing and computational resources[44]. Establishing links between DPI's approach to interoperability and equivalent concepts within global e-commerce frameworks such as the Japan-led DFFT will be key to efforts to reduce global fragmentation in digital and AI ecosystems.

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[39] https://gds.blog.gov.uk/2013/10/31/government-as-a-data-model-what-i-learned-in-estonia/

[40] https://www.oecd.org/gov/digital-government/open-government-data.htm

[41] https://dial.global/good-dpi/

[42] https://www.sebi.gov.in/sebiweb/other/OtherAction.do?doRecognisedFpi=yes&intmId=43

[43] https://www.pdpc.gov.sg/news-and-events/announcements/2023/06/launch-of-ai-verify-foundation-to-shape-the-future-of-ai-standards-through-collaboration

[44] https://oecd-opsi.org/innovations/x-road-trust-federation-for-cross-border-data-exchange/

From exclusion to inclusion

DPI offers a framework to incentivize governments and their citizens, communities, and SMEs to be included as active stewards in the design and governance of AI systems. DPI can equip less developed countries with essential technical and governance tools for engaging in the global digital and AI economy without sacrificing digital sovereignty. Emerging DPI 'packaged solutions' aim to simplify DPI adoption for less developed countries and can be specified to account for rapid evolution of AI systems.[45]

For AI systems, DPI helps close the data gap, helping ensure representation in AI systems globally. Payments and data exchanges could also be key to ensuring that the benefits of participating in and governing AI systems are equitably distributed to the most vulnerable populations within all countries. For example, DPI has already proven critical as a foundation for AI-enabled cash transfers to alleviate extreme poverty (Chowdhury et al., 2022) and will be key to ensuring that AI-enabled systems for financing nature stewardship and climate adaptation practices operate in a way that fairly distributes value and decision making power to indigenous peoples and local communities[46].

Currently DPI is mostly a national approach to managing the digital economy and not one without risks, including vulnerability to government overreach and misuse for surveillance and oppression.[47] As with any global multilateral process, globally-agreed protocols and principles of DPI will need to be strong enough to shape behavior (thereby managing the risks of DPI), while preserving enough domestic policy space for all countries to determine locally appropriate implementations of DPI.

Towards multilateral governance

Countries exhibit diverse political, economic, and social systems, including varying approaches to data privacy, ownership, governance, and international trade. This diversity goes beyond the well-known differences between China and the United States. A multilateral digital governance regime, similar to the principles and purpose of the WTO trade-in-goods rules, can offer a framework for managing these differences while preserving national sovereignty (Armstrong, et al., 2021). Such a regime could discourage discriminatory practices, promote transparency and predictability, and prevent governments from enacting protectionist policies that ultimately harm everyone involved. Just like WTO trade-in-goods rules, a multilateral system for the digital economy can bind countries to avoid beggar-thy-neighbor policies or a broader regional or global race to the bottom whereby unilateral actions, driven by narrow individual interests, can lead to a collectively worse outcome for all.

While a global multilateral arrangement for regulating the digital economy and AI might be the ultimate ‘north star’ for progress, a more immediate question for policymakers in a rapidly evolving regulatory environment is how to navigate key issues of concentration, protection, and exclusion in a way that is supportive of economic and societal value creation while also being globally inclusive and preserving of important foundations of the digital economy, including individual privacy, cybersecurity, and legal redress.

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45 https://carnegieendowment.org/files/The_Future_of_Digital_Public_Infrastructure-_A_Thesis_for_Rapid_Global_Adoption.pdf

46 https://www.naturefinance.net/nature-markets-taskforce-sets-out-landmark-recommendations-at-amazon-summit-for-a-fairer-nature-economy/

47 https://blog-pfm.imf.org/en/pfmblog/2022/12/digitalization-of-public-finance-and-digital-public-infrastructure-opportunities-and-challenges

Guiding principles of multilateral governance of digital and AI

There is significant scope for mutually beneficial cooperation to share experience, skills and intelligence on how to protect personal information, reduce barriers to digital trade and govern the digital economy. Trust in platforms, service providers and technologies (such as autonomous vehicles), as well as trust in legal frameworks and regulation will be crucial to realizing the growth potential of the digital economy. Issues such as shifting ownership and control of data to consumers and competition policy for two-sided markets can be advanced through experience sharing and cooperation.

Domestic policy can be guided by best practice to introduce competition, avoid regulations that stifle innovation and narrow the digital divide. Areas such as immigration policy, attracting skilled workers and education systems have less scope for international cooperation but areas such as R&D and intellectual property policies that do not impede joint research would benefit from experience sharing and international dialogue.

At least three principles—of liberalization, interoperability, and inclusivity—can be a common guide to all players when attempting to design and advance multilateral arrangements for the global digital economy and emerging AI systems.

A starting point for governing the digital economy is the principle of prioritizing the free flow of data and software across borders. Similar to established regulations for physical goods, this approach envisions limitations justified only by pre-defined, transparent criteria. Exemptions for security, privacy, and other domestic concerns are envisioned as a space for cooperative dialogue and trust-building, potentially leading to agreed-upon carve-outs over time. Codifying security and privacy exceptions from the free flow of data and software will reduce uncertainty and fragmentation of outcomes across countries.

The security of all nations is enhanced when countries cooperate in setting rules where each sees benefit from being close to the technology frontier, rather than attempting to push some countries away from it. Citizen privacy concerns, national security considerations, and enduring winner-take-most network effects will likely continue to create strong incentives for some governments to support domestic champions. But these champions will require access to data internationally and economies of scale that can be helped within a more competitive international environment under an open and transparent international regime with agreed principles and rules.

Liberalized cross-border data flows will be difficult to achieve without more substantial and globally inclusive conversations for reaching interoperability within and between national systems. Interoperability refers to the ability of different systems, platforms, or components to work together, exchange data, and use the information effectively. It encompasses technology, data, human elements, and institutional aspects, aiming to create an environment where diverse digital frameworks can connect and operate together without barriers. Japan's approach to interoperability under DFFT involves embedding the concept into trade agreements and creating a roadmap for cooperation. This includes focusing on areas such as data localization, regulatory cooperation, government access to data, and data sharing for priority sectors.

Important progress has been made on the legal and trade dimensions of interoperability in global digital governance through DFFT, particularly within the G7, despite wide variation in digital governance regimes across countries. At the same time, many countries have clearly signaled an unwillingness to discuss interoperability if it is not combined with stronger assurances around citizen privacy and national security, or if it comes at the cost of autonomy in determining the design of national digital ecosystems. DPI’s approach to interoperability could provide a useful foundation for more globally inclusive debates on this issue.

The nature of impediments to discussions of data liberalization and interoperability drive home the importance of inclusivity when advancing multilateral governance. Considering the starkness of the global digital divide and how fundamental digital infrastructure has now become to the sustainable development of all countries (joining the ranks of other fundamental global sustainable development challenges such as climate change or inequality), it appears increasingly less viable to talk about multilateral arrangements for the digital economy or emerging arrangements for AI without meaningful representation or participation of all countries in these conversations.

Practical opportunities to advance multilateral governance

To avoid fragmentation of rules, standards and norms, negotiations in regional arrangements can be guided by forward-leaning multilateral principles like in DFFT and avoid a lowest common denominator approach, by building trust across different sovereign systems through technical and economic cooperation. Developing a common set of rules and standards will need to be guided by multilateral principles and to build on sectoral approaches. Different philosophies and values among countries can be bridged over time with technical and economic cooperation that builds trust and confidence.

The G20 has been important for agenda-setting and having the major economies agree to principles and work programs. Like APEC in the Asia Pacific, the G20 is a non-binding forum for cooperation where confidence and trust can be built over time with officials and leaders meeting regularly. Strategic competition between China and the United States hampers progress but these are consensus forming organizations that make progress in understanding the perspectives of other countries over time. Both APEC and the G20 have the ability for ministers and leaders to task officials and call in technical expertise from the business or think tank sectors, or the regional or multilateral institutions.

The G20's unanimous endorsement of DPI means it can now be operationalized internationally, as a basis for global digital and AI governance, complementing emerging risk-based AI safety frameworks and existing digital and e-commerce concepts such as the DFFT (Chaudhuri, 2023).

In 2024, there is an opportunity to build a bridge between several U.N. initiatives on digital development (including Global Digital Compact[48]) with UN-led discussions on AI governance within the High-level Advisory Body on AI[49]. This could be done by articulating how DPI principles can support the advisory body's stated functions, including cross-border useability regimes and (Function 4) and international collaboration on data, and computing capacity and talent for sustainable development outcomes (Function 5). Concepts central to digital governance such as openness[50] (for example, open data and open algorithms) need to be re-examined and updated with necessary digital privacy- and rights-preserving protocols to guard against data exploitation[51] associated with large-scale generative AI systems.

Regional groups have made progress in digital economy rulemaking and they are likely to be the main forum for rulemaking given the difficulties of top-down rulemaking in the WTO and elsewhere because of strategic competition between China and the United States. Such bottom-up rulemaking should be guided by multilateral principles and the existing DFFT, WTO e-commerce and G20 agreements to contribute to building a multilateral system and avoid further fragmentation.

[48] https://www.un.org/techenvoy/global-digital-compact
[49] https://www.un.org/en/ai-advisory-body
[50] https://blog.okfn.org/2023/03/16/updating-the-open-definition-to-meet-the-challenges-of-today/
[51] https://digitalpublicgoods.net/AI-CoP-Discussion-Paper.pdf

APEC in particular has a unique ability to mobilize governments, technical experts and business to promote economic cooperation on digital trade facilitation and progress multilateral rules. An economic cooperation process is likely to be more successful if it involves multiple stakeholders, including governments, big tech companies, small and medium sized companies, entrepreneurs, investors, workers, consumers and technological experts. These groups can be mobilized in existing cooperation frameworks. An economic cooperation agenda can be developed around shared and common interests in the digital economy and AI.

The Comprehensive and Progressive Agreement for Trans Pacific Partnership (CPTPP) and Regional Comprehensive Economic Partnership (RCEP), two 'mega regional' agreements have various rules to avoid restricting data flows, to facilitate digital trade, protect personal privacy, and keep open the process of upgrading those rules as the digital economy develops. Both agreements have national security exceptions that preserve domestic policy options but allow members to bypass all the agreed rules. Reducing the use of security and other exceptions over time will require a process of trust and confidence building and codifying of the exceptions.

The Digital Economy Partnership Agreement (DEPA) between Chile, New Zealand and Singapore takes a modular approach and does not require sign on to all aspects of the agreement. DEPA, RCEP and CPTPP are open to new members, albeit with different complexities. The ten member Southeast Asian group is developing an ASEAN Digital Community (ADC) 2045 that aims to build on the nine frameworks in digital economy corporation in ASEAN from 2016 to 2023 and balance political-security, economic, and socio-cultural interests in digital economy and AI governance (Ing, et al. 2023). Advantages of cooperation in ASEAN are that there is significant variation and diversity among its members, the grouping is multilateral in character (avoiding geopolitical alignment) and the mode of consensus building means cooperation is sustained.

Home to key players in DPI and AI, the Asia Pacific region is strategically important for near-term efforts to link DPI to AI. Establishing links between DPI and AI within multilateral settings like ASEAN, APEC and regional trade agreements like RCEP can help encourage dialogue between major powers like China, India, Indonesia, and the US with the help of influential middle powers like Australia, Japan, and Singapore. In this setting, it will be important to create incentives for the US, China, and their technology firms to participate in the development of DPI regionally, particularly in service of sustainable development outcomes in least developed countries in Southeast Asia and the Pacific Islands.

References

Allen DWE, Berg A, Berg C, Markey-Towler B and Potts J (2019) 'Some Economic Consequences of the GDPR', *Economics Bulletin*, vol. 39, no. 2, pp. 785-797.

Armstrong, S., R Sta Maria and T. Watanabe, 2021, 'Towards an Asia-Pacific Digital Economy Governance Regime', Research Institute of Economy, Trade and Industry.

Armstrong, S., G. de Brouwer, P. Drysdale and T. Westland, 2021. *Economic Tools for Statecraft and National Security*, Canberra: East Asian Bureau of Economic Research.

Arrieta-Ibarra, Imanol, Leonard Goff, Diego Jiménez-Hernández, Jaron Lanier, and E. Glen Weyl. 2018. "Should We Treat Data as Labor? Moving beyond "Free"." *AEA Papers and Proceedings*, 108: 38-42.

Bender E.M., T. Gebru, A. McMillan-Major, S. Shmitchell 2021. 'On the dangers of stochastic parrots: can language models Be too big?' Proceedings of the 2021 ACM Conference on Fairness, Accountability, and

Transparency, pp. 610-623.

Brynjolfsson, Erik, and Unger, Gabriel. 2024. "The Macroeconomics of Artificial Intelligence." *Finance & Development*. February 21. https://www.imf.org/en/Publications/fandd/issues/2023/12/Macroeconomics-of-artificial-intelligence-Brynjolfsson-Unger.

Chakravorti, Bhaskar, 2023. 'The Case for Investing in Digital Public Infrastructure', Harvard Business Review, 22 May. https://hbr.org/2023/05/the-case-for-investing-in-digital-public-infrastructure

Chowdhury, Anir, Cina Lawson, Elizabeth Kellison, Han Sheng Chia, Homi Kharas, Jacquelline Fuller, Michael Faye, Michal Rutkowski, Rodrigo Salvado, and Stefan Dercon, 2022. 'Accelerating digital cash transfers to the world's poorest'. Brookings Institution, February 17, https://www.brookings.edu/articles/accelerating-digital-cash-transfers-to-the-worlds-poorest/

Chaudhuri, Rudra, 2023. 'Decoding the G20 Consensus on Digital Public Infrastructure: A Key Outcome of India's Presidency', Carnegie India, 1 September https://carnegieindia.org/2023/09/01/decoding-g20-consensus-on-digital-public-infrastructure-key-outcome-of-india-s-presidency-pub-90467

Cory, Nigel and Luke Dascoli, 2021. 'How barriers to cross-border data flows are spreading globally, what they cost, and how to address them'. Information Technology & Innovation Foundation, July.

David, D. and B. Rajeshwari, 2022. 'India's data protection dilemma', *East Asia Forum*, 16 November https://eastasiaforum.org/2022/11/16/indias-data-protection-dilemma/

Datasphere Initiative (2022). *Sandboxes for data: creating spaces for agile solutions across borders.* https://www.thedatasphere.org/

Goyer, John, 2023. 'How Southeast Asia's Digital Potential Is Rising and What It Means for American Business', US Chamber of Commerce, 31 January https://www.uschamber.com/international/how-southeast-asias-digital-potential-is-rising-and-what-it-means-for-american-business

Hankins, Emma, Pablo Fuentes Nettel, Livia Martinescu, Gonzalo Grau and Sulamaan Rahim, 2023, *Government AI Readiness Index 2023*, Oxford Insights.

Ing, Lili Yan, Yessi Vadila, Ivana Markus, Livia Feliciani Nazara, 2023. 'ASEAN Digital Community 2045', ERIA Discussion Paper Series No. 487.

Ingram, George, John W. McArthur, and Priya Vora, 2022. 'Digital public technology can help drive sustainable development progress' Brookings Institution, 15 June https://www.brookings.edu/articles/digital-public-technology-can-help-drive-sustainable-development-progress/

Jarvis, Jeff, 2023. *The Gutenberg Parenthesis: The Age of Print and Its Lessons for the Age of the Internet*, Bloomsbury Publishing, June.

Jones, Charles I., and Christopher Tonetti. 2020. "Nonrivalry and the Economics of Data." *American Economic Review*, 110 (9): 2819-58.

Kak, Amba and Sarah Myers West, "AI Now 2023 Landscape: Confronting Tech Power", AI Now Institute, April11, 2023, https://ainowinstitute.org/2023-landscape

Lim, Jonathan, 2022. 'Bridging the Divide: AI Governance in ASEAN', *ASEAN-Australia Strategic Youth Partnership*, https://aasyp.org/2022/05/04/bridging-the-divide-ai-governance-in-asean/

Meltzer, Joshua, 2018. 'The impact of artificial intelligence on international trade', Brookings Institution, 13 December. https://www.brookings.edu/articles/the-impact-of-artificial-intelligence-on-international-trade/

Productivity Commission, 2024. *Making the most of the AI opportunity: productivity, regulation and data access*. 1 February. https://www.pc.gov.au/research/completed/making-the-most-of-the-ai-opportunity

Roberts, H and R. Hine (2023), 'The future of AI policy in China', *East Asia Forum*, 27 September https://eastasiaforum.org/2023/09/27/the-future-of-ai-policy-in-china/

Rochet, Jean-Charles, and Jean Tirole, 2006. 'Two-Sided Markets: A Progress Report', *The RAND Journal of Economics*, Vol. 37, No. 3 (Autumn), pp. 645-667.

Rogerson, Annys, Emma Hankins, Pablo Fuentes Nettel and Sulamaan Rahim, 2022. *Government AI Readiness Index 2022*, Oxford Insights.

Saeed SA, Masters RM. Disparities in Health Care and the Digital Divide. Curr Psychiatry Rep. 2021 Jul 23;23(9):61. doi: 10.1007/s11920-021-01274-4. PMID: 34297202; PMCID: PMC8300069.

Sastry, Girish, Lennart Heim, Haydn Belfield, Markus Anderljung, Miles Brundage, Julian Hazell, Cullen O'Keefe et al. "Computing Power and the Governance of Artificial Intelligence." arXiv preprint arXiv:2402.08797 (2024).

Signé, Landry, 2023. 'Fixing the global digital divide and digital access gap', Brookings Institution, 5 July. https://www.brookings.edu/articles/fixing-the-global-digital-divide-and-digital-access-gap/

Swire, Peter and Kennedy-Mayo, DeBrae, 2023. 'The Effects of Data Localization on Cybersecurity - Organizational Effects', June 15. Georgia Tech Scheller College of Business Research Paper No. 4030905, Available at SSRN: https://ssrn.com/abstract=4030905 or http://dx.doi.org/10.2139/ssrn.4030905

Tay, Andy, 2024. "The open-science movement for sharing laboratory materials gains momentum," *Nature*, vol. 625(7996), pages 841-843, January.

Taylor, Jacob. 2023. Concentration, localization and exclusion in Asian AI governance. EAFQ. https://press-files.anu.edu.au/downloads/press/n11874/pdf/book.pdf#page=16

Vipra, Jai and Anton Korinek, 2023. 'Market concentration implications of foundation models: the invisible hand of ChatGPT', Brookings Center on Regulation and Markets Working Paper #9, September.

World Bank, 2021, 'Creating value in the data economy: The role of competition, trade, and tax policy' (Chapter 7) in *World Development Report 2021*.

Wu, Emily, 2021. 'Sovereignty and Data Localization' The Cyber Project, Belfer Center for Science and International Affairs, July. https://www.belfercenter.org/sites/default/files/2021-07/SovereigntyLocalization.pdf