Centre for International
Governance Innovation

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The Age of AI Nationalism and Its Effects

Susan Ariel Aaronson

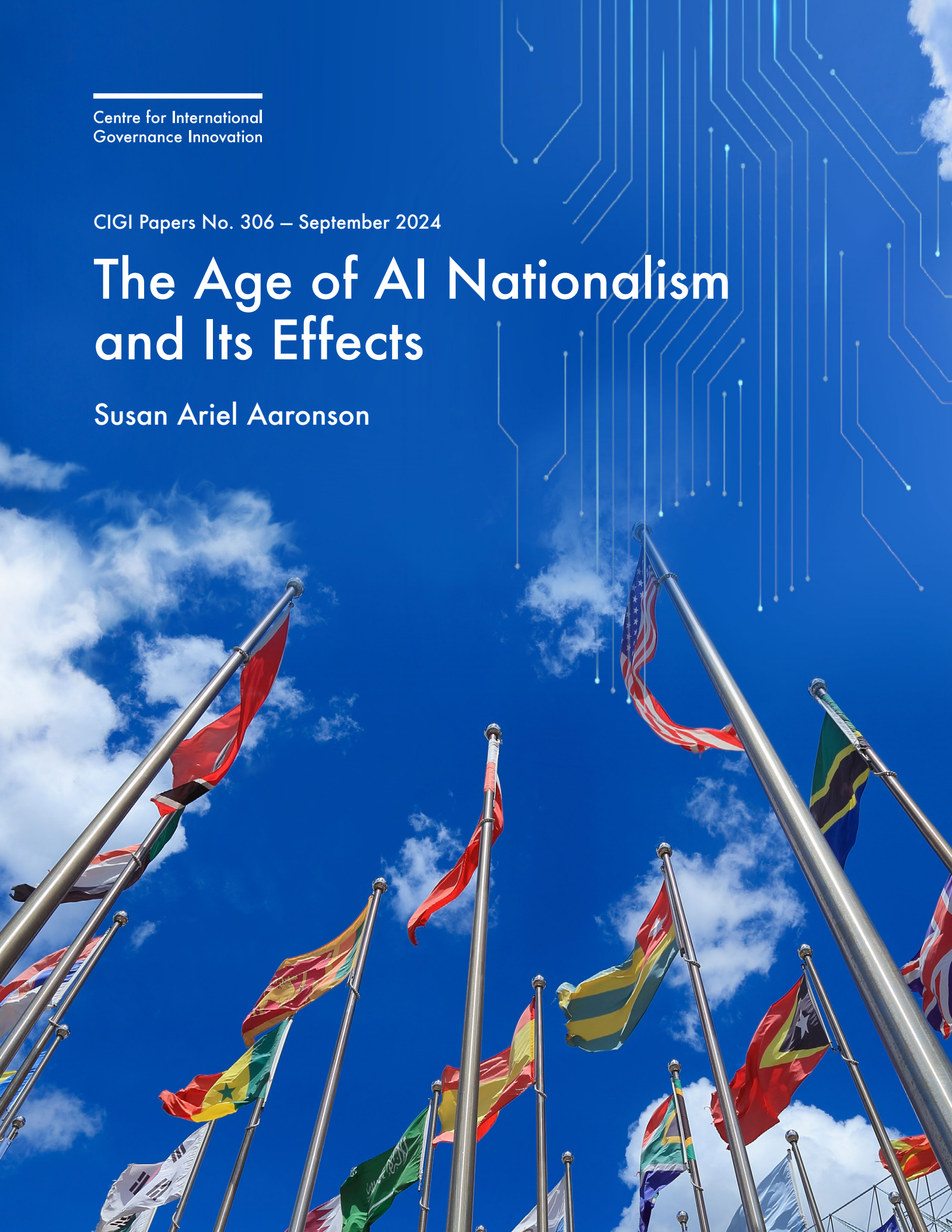

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Table of Contents

vi About the Author

vi Acronyms and Abbreviations

1 Executive Summary

1 Introduction

2 Methodology

3 Some Definitions and Context

7 How AI Sovereignty Efforts May Distort Trade in AI

13 Why Is AI Nationalism Problematic?

17 Conclusion

19 Works Cited

About the Author

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Susan directs the Digital Trade and Data Governance Hub at GWU. The Hub was founded in 2019 and educates policy makers, the press and the public about data governance and data-driven change through conferences, webinars, study groups, primers and scholarly papers. It is the only organization in the world that maps the governance of public, proprietary and personal data at the domestic and international levels. The Hub's research has been funded by foundations such as Ford and Minderoo.

Susan directs projects on defining AI protectionism; how governments may incentivize more accurate, complete and representative data sets; and how open-source AI builds trust. She regularly writes op-eds for *Barron's* and has been a commentor on economics for NPR's *Marketplace*, *All Things Considered* and *Morning Edition*, and for NBC, CNN, the BBC and PBS.

Previously, Susan was a guest scholar in economics at the Brookings Institution (1995–1999) and a research fellow at the World Trade Institute (2008–2012). Susan was also the Carvalho Fellow at the Government Accountability Project and held the Minerva Chair at the National War College. She has served on the business and human rights advisory board at Amnesty International and the advisory board of Human Rights under Pressure, a joint German and Israeli initiative on human rights.

In her spare time, Susan enjoys triathlons and ballet.

Acronyms and Abbreviations

AI	artificial intelligence
DoJ	Department of Justice
DPDPA	Digital Personal Data Protection Act
G7	Group of Seven
GDPR	General Data Protection Regulation
IP	intellectual property
LLMs	large language models
NAIRR	National Artificial Intelligence Research Resource
NSF	National Science Foundation
OECD	Organization for Economic Co-operation and Development
PPDSA	privacy-preserving data sharing and analytics
R&D	research and development
UAE	United Arab Emirates
UNCTAD	United Nations Conference on Trade and Development
USTR	United States Trade Representative
WTO	World Trade Organization
XR	extended reality

Executive Summary

We live in a time when many nations have deemed artificial intelligence (AI) an economic and national security imperative. Instead of working collaboratively to develop AI, many countries have adopted AI industrial policies. Policy makers are working to nurture sovereign AI. However, some nations are acting in ways that — with or without direct intent — discriminate among foreign market actors. For example, many countries forbid the sale of the latest high-speed chips to China. The United States has banned venture capital investments in China. Chile and Canada, among other nations, provide significant incentives for skilled immigrants to move to, work in and/or invest in their AI sectors. Some countries, such as China and Russia, require foreign suppliers of data-driven technologies to reveal their source code, which is often proprietary information.

Herein, the author makes a distinction between policies designed to advance domestic AI and policies that, with or without direct intent, hamper the production or trade of foreign-produced AI (known as "AI nationalism"). AI nationalist policies in one country can make it harder for firms in another country to develop AI. If officials can limit access to key components of the AI supply chain, such as data, capital, expertise or computing power, they may be able to limit the AI prowess of competitors in country *Y* and/or Z. Moreover, if policy makers can shape regulations in ways that benefit local AI competitors, they may also impede the competitiveness of other nations' AI developers.

AI nationalism may seem appropriate given the import of AI, but this paper[1] aims to illuminate how AI nationalistic policies may backfire. It proceeds as follows. First, the author describes key terms. Next, the author provides background into the roots of AI nationalism. The paper then follows with examples of national policies designed to promote AI in the AI supply chain that appear to have trade-distorting effects. The author first discusses what scholarly literature teaches us about the potential spillovers of such policies, and then moves toward what the findings may tell readers about these spillovers. Finally, the author makes some conclusions.

Introduction

In 2017, Russian President Vladimir Putin told the Russian people that "artificial intelligence is the future…for all humankind….Whoever becomes the leader in this sphere will become the ruler of the world" (RT.com 2017). One year later, Google CEO Sundar Pichai put forward a different vision of AI, asserting that it was more important than fire or electricity (Clifford 2018).

While this author cannot read the future, both men appear prescient today. We live in a time when more than one-third of the world's nations have a strategy and established funding and/or incentives to encourage AI development (Struett, Aaronson and Zable 2023). Moreover, government officials are enacting a wide range of policies that allow them to nurture AI while protecting their constituents from harm.[2] Given the importance of AI to the economy and national security, national government efforts to promote AI capability are understandable.[3] Taxpayers want to fund AI that redounds to the nation, its firms and its people. Government officials want to be sovereign over how their nation designs, deploys and governs AI.

However, as they attempt to nurture and govern AI, some nations are acting in ways that — with or without direct intent — discriminate among foreign market actors. For example, some governments are excluding foreign firms from access to incentives for high-speed computing, or requiring local content in the AI supply chain, or adopting export controls for the advanced chips that power many types of AI. If policy makers in country *X* can limit access to the building blocks of AI — whether funds, data or high-speed computing power — it might slow down or limit the AI prowess of its competitors in country *Y* and/or Z. At the same time, however, such policies could violate international trade norms of non-discrimination. Moreover, if policy makers can shape regulations in ways that benefit local AI competitors, they

1 This paper is based on work supported, in part, by the National Science Foundation (NSF)-National Institute of Standards and Technology Institute for Trustworthy AI in Law and Society, which is supported by the NSF under grant no. 2229885. Any opinions, findings, conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the NSF.

2 See www.oecd.ai.

3 As example, see Benson (2023); Hötte et al. (2022); Crafts (2021).

may also impede the competitiveness of other nations' AI developers. Such regulatory policies could be discriminatory and breach international trade rules as well as long-standing rules about how nations and firms compete — which, over time, could reduce trust among nations.

Officials from many governments are eager to nurture AI, despite the risks it poses to democracy, human rights and employment, among other areas (Leyden 2024). Moreover, they understand that AI can be a public good when it is used to mitigate complex problems affecting society (Gopinath 2023; Okolo 2023). However, when policy makers take steps to advance AI within their borders, they may — perhaps without intending to do so — make it harder for policy makers from other countries with less capital, expertise, infrastructure and data prowess to develop AI systems that could meet the needs of their constituents. In so doing, these officials could undermine the potential of AI to enhance human welfare and impede the development of more trustworthy AI around the world (Slavkovik 2024; Aaronson 2023; Brynjolfsson and Unger 2023; Agrawal et al. 2017; AI Safety Institute and UK Department for Science, Innovation & Technology 2023).[4]

Governments have many means of nurturing AI within their borders that do not necessarily discriminate between foreign and domestic producers of AI. Nevertheless, officials may be under pressure from local firms to limit the market power of foreign competitors. Officials may also want to use trade (for example, export controls) as a lever to prod other governments to change their behaviour (Buchanan 2020). Additionally, these officials may be acting in what they believe is the nation's national security interests, which may necessitate that officials rely solely on local suppliers and local control (US Government Accountability Office 2022).

Herein, the author attempts to illuminate AI nationalism and its consequences by answering three questions:

- What are nations doing to nurture AI capacity within their borders?
- Are some of these actions trade distorting?
- What are the implications of such trade-distorting actions?

Methodology

To answer the first question, the author uses process tracing and qualitative evidence to describe how some nations nurture AI. Process tracing is an in-depth within-case-study method used in the social sciences for tracing causal mechanisms and how they play out within an actual case (Beach and Brun Pederson 2019).

To answer the second question, the author focuses on government policies related to two elements of the AI supply chain: data and infrastructure. To create AI, developers need several assets such as capital, data, human expertise, algorithms[5] and infrastructure — including high-speed computers and the chips that power them (Belli 2023; Halopé and Narayan 2022). Herein, the author focuses on two of these components: data and infrastructure. The author will broaden the analysis in a future paper.[6] By focusing on these components, the author can illuminate how some of the actions taken by governments are without discriminatory intent, while others are clearly meant to hinder a competitor nation. The author examines these policies to see if they are designed to impede foreign competitors or to potentially benefit local competitors. The examples discussed are based on primary-source documents on government websites and/or provided to the Organisation for Economic Co-operation and Development (OECD) (OECD 2023, 29).

Finally, to answer the third question, the author examines the potential unintended consequences of AI nationalism by reviewing the economic and governance literature. Then the author further elaborates on how the findings from the first two questions bolster the argument.

The cases described below are selective, descriptive and incomplete. The analysis does not cover AI nationalism in any one country

4 AI can create other risks, including through misuse, societal harms, disinformation and threats to democracy, loss of human control and unpredictable progress.

5 Source-code disclosure has recently become a trade issue; see Dorobantu, Ostmann and Hitrova (2021).

6 As example, the analysis does not cover source code/algorithms or lack of protections for intellectual property (IP).

or in most countries. The countries that are adopting AI nationalist policies tend to be wealthy nations with already strong AI capacity, such as the United States, the United Kingdom, China and the European Union (Maslej et al. 2023; Chavez 2023). However, the author also discusses how wealthy countries, such as Saudi Arabia and the United Arab Emirates (UAE), are trying to attract AI expertise and capital.

Some Definitions and Context

What Do We Mean by "AI"?

Almost everyone who is online has interacted with some variant of AI, whether by using spellchecking software, online maps or social media.[7] Since 2023, many people have now experimented with generative AI chatbots, such as OpenAI's ChatGPT or Anthropic's Claude. These chatbots can create new content, such as text, images, videos, music and more.[8] Today, when many people think of AI, they think of interacting with generative AI (OECD 2023, 3).

Because there are so many different types of AI, there is no internationally accepted definition of AI.[9] The author uses the definition put forth by the OECD, in part, because more than 60 nations adhere to the OECD's principles regarding AI governance. The OECD defines an AI system as "a machine-based system that...infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment" (Russell, Perset and Grobelnik 2023).

What Do We Mean by "AI Nationalism"?

Policy makers in many countries want to be sovereign over AI to ensure that their nation reaps the benefits of AI while minimizing many of its potential costs — to jobs, social stability, equity and so forth.[10] It is important to note that national policies to promote AI may also help citizens in other countries. Nonetheless, in making a case for these policies, policy makers generally want to show voters that their ideas will improve voters' quality of life.

Other scholars use the term "AI sovereignty" to describe government support for AI. For example, Luca Belli defines AI sovereignty as "the capacity of a given country to understand, develop, and regulate AI systems" (Belli 2023, 27). Such capacity gives a nation the ability to retain control, agency and self-determination over AI systems (ibid.). In contrast, Pablo Chavez focuses on outcomes: "Sovereign AI involves national governments' strategic development and deployment of AI technologies to protect national sovereignty, security, economic competitiveness and societal well-being" (Chavez 2024).

However, the author believes "AI nationalism" is a better term. In 2018, Ian Hogarth, a UK tech entrepreneur, described his vision of the future of AI policy. He noted, "The transformation of both the economy and the military by machine learning will create instability at the national and international level forcing governments to act. AI policy will become the single most important area of government policy. An accelerated arms race will emerge between key countries" (Hogarth 2018). In the five years that followed, a growing number of nations have adopted a neo-mercantilist approach to nurturing AI. They are willing to adopt policies that may impede foreign competitors or benefit domestic competitors (Larsen 2022). These countries include China, France, India, the UAE, the United Kingdom and the United States, among others (Chavez 2023).

7 See www.statista.com/statistics/1410523/top-20-ai-countries-by-research-capacity/.

8 See https://oecd.ai/en/genai/issues/overview.

9 As an example of a different definition, the US government defines AI as a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments. See US, Executive Office of the President, "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence," Executive Order 14110 of October 30, 2023, 88 Fed Reg 210. "AI model" means "a component of an information system that implements AI technology and uses computational, statistical, or machine-learning techniques to produce outputs from a given set of inputs" (ibid., 75193).

10 The OECD (2023, 14) lists the top concerns among Group of Seven (G7) officials.

What Do We Mean by "Trade-Distorting Practices" or "Protectionism"?

Protectionism is hard to describe because it is an ideology, an economic theory and a government act. Protectionists generally believe that the government should intervene to ensure that domestic producers dominate the domestic market. When government officials use protectionist tools, such as tariffs, quotas, subsidies or performance requirements, they are changing market conditions, which could have implications for productivity and economic efficiency (Aaronson 2001, 7–8; Irwin 1996, 6).

To limit the use of protectionism at home and abroad, policy makers often turn to trade agreements. These agreements set rules to limit how and when nations may apply protectionist tools, but they also have exceptions to those rules. Nations negotiate trade agreements to ensure predictability and legal certainty for market actors and clarify or remove unjustified barriers.[11] At the same time, policies that may distort trade and appear protectionist may not have been designed to favour domestic producers over foreign producers. For this reason, trade agreements include exceptions that allow governments to breach trade agreement rules to achieve other important domestic policy goals, such as protecting public health, privacy or national security (Aaronson 2019; National Board of Trade Sweden 2016, 5).

There is no widely accepted definition of trade-distorting policies. Protectionism is both, at times, in the eye of the beholder and, at other times, recognized by most when seen but still difficult to define. In its most recent report on trade barriers, the United States Trade Representative (USTR) notes: "Trade barriers elude fixed definitions, but may be broadly defined as government laws and regulations…that restrict, prevent, or impede the international exchange of goods and services" (Office of the USTR 2023, 1). To the European Union, these barriers may include tariffs, administrative requirements, standards and insufficient IP protection, among others.[12] To the United States, these barriers could include tariffs, technical barriers to trade, procurement rules, insufficient IP protections, subsidies and even corruption (ibid., 2–3).

In its most recent report on trade barriers, the USTR expressed particular concern about barriers to cross-border data flows: "Data localization policies can be use[d] by government to surveil their populations, interfere with labor rights, and otherwise compromise civil and political liberties" (Office of the USTR 2024a). The USTR also noted that "data policies lack clarity and pose compliance challenges" (ibid.). The USTR has identified problematic data policies across a range of countries, including China and Russia. Such barriers could impede exports of AI, yet neither Canada[13] nor the European Union — both significant exporters of AI — reported any barriers to AI as of December 2023.[14] In contrast, in 2023, the USTR cited AI regulation as a possible trade barrier: "The United States also seeks to ensure that there is clarity across various pieces of legislation, particularly in areas such as artificial intelligence" (Office of the USTR 2023, 153). However, in the USTR's 2024 report, America's position on AI regulation as a potential barrier to trade became muddier. The USTR mentioned that drafts of the EU AI Act aimed to develop a risk-based approach to regulating the development, deployment and use of AI-driven products, services and systems. However, these drafts "neglect to provide strong, consistent, and transparent protection schemes for innovative and proprietary information embedded in the source code when the source code is required to be disclosed to the authorities" (Office of the USTR 2024b, 148).

A Brief History of Data, Digital and AI Sovereignty

Policy makers in several countries have argued that just as they are sovereign over their people and natural resources, they are also sovereign over data produced by or attributed

11 See https://trade.ec.europa.eu/access-to-markets/en/content/digital-trade-0.

12 See https://trade.ec.europa.eu/access-to-markets/en/content/trade-barriers.

13 For Canada, one witness mentioned AI. See House of Commons, *Non-tariff Barriers to Trade: Some Canadian Perspectives* (December 2023) (Chair: Judy A. Sgro). For witness statements, see House of Commons, Standing Committee on International Trade, *Evidence*, 44-1, No 060 (27 April 2023), online: <www.ourcommons.ca/DocumentViewer/en/44-1/CIIT/meeting-60/evidence#Int-12168373>.

14 EC, *Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Implementation and Enforcement of EU Trade Policy*, COM(2023)740 (15 November 2023), online: <https://ec.europa.eu/transparency/documents-register/detail?ref=COM(2023)740&lang=en>.

to their constituents. India, as example, has stressed that data is a sovereign asset and Indian control of its data is "non-negotiable" (ET Bureau 2019; Agrawal 2019; Ranganathan 2019). EU Internal Market Commissioner Thierry Breton has stated that "European data will be used for European companies in priority, for us to create value in Europe" (Delcker 2020). Some called this trend "digital sovereignty" — while others used the term "data sovereignty" (Chander and Le 2015; Chander and Sun 2021).

Countries tend to use broad rationales to justify their digital or data sovereignty. India used social stability as well as human rights arguments. Canada, the European Union and the United States tend to use national security rationales. China uses national security and social stability arguments (Aaronson 2021; Bradford 2023; Chavez 2022). India's Minister of State for Electronics and Information Technology Rajeev Chandrasekhar says India is dedicated to crafting AI applications that can significantly improve the lives of its citizens and mitigate potential harm to users (Dixit 2023).

But not all nations can achieve digital sovereignty. The World Bank argues that lower-income countries lack the infrastructure and skills to capture data and turn that data into value. Moreover, these nations also often "lack the institutional and regulatory frameworks to create trust in data systems, and the scale and agency to participate equitably in global data markets and their governance" (World Bank 2020, 2). Yet the United Nations Conference on Trade and Development (UNCTAD) notes that these same countries will need to import data analytics to ensure that their other goods and services remain competitive (UNCTAD 2017). Put differently, developing countries will have to export data and other goods to pay for data-driven services to facilitate exports.

Hence, the world is increasingly dividing into digital haves — countries with expertise in data and data-driven services — and digital have nots (Banga 2019; UNCTAD 2019). Many of these countries do not want to negotiate internationally binding provisions regarding data until they have addressed how to regulate data and data-driven sectors domestically (Parsheera 2022; Aaronson and Struett 2020). At the World Trade Organization (WTO), countries as diverse as Colombia and Côte d'Ivoire argued that trade negotiators should put the same emphasis on trade facilitation and capacity building as they do on negotiating shared rules (Aaronson and Struett 2020). But that is not the only problem. The "digital haves" are taking a wide range of steps to nurture and govern AI.

The governments that have been the most vocal about data/digital sovereignty, such as the European Union, India and South Africa, are not quite the same as those attempting to advance AI sovereignty and AI nationalism (China, the European Union and the United States, among others), although there is some overlap. The author argues that AI nationalism took hold in the United States and gradually spread among many of its close allies and trading partners, after China announced that AI development would be a top national priority (Larsen 2022).

In 2015, the Chinese government issued a 10-year plan, which it called "Made in China 2025." China regularly issued such 10-year plans, but this one was different because the country announced that it aimed to both catch up with and surpass world technological leaders in 10 priority sectors, including what it called "advanced information technology" (Office of the USTR 2024b, 51; Wübbeke et al. 2016; McBride and Chatzky 2019).

Soon thereafter, in 2017, the Chinese government released the "New Generation Artificial Intelligence (AI) Development Plan" with the goal to build up indigenous capacity at home and encourage its technology companies to pursue an export strategy, namely, to invest and expand abroad. China began to use subsidies, research and development (R&D) investment, venture funds and forced technology transfer to stimulate domestic AI (Luong, Lee and Konaev 2023). Analysts describe China's efforts as a great success. Meanwhile, policy makers in the United States and other developed countries, such as Australia, Canada, Japan, the Netherlands, South Korea and the United Kingdom, began to see China's efforts to become a dominant player in advanced technology as a national security problem (McBride and Chatzky 2019; Kennedy 2015). US and Canadian policy makers became concerned after multiple hacks of government-held personal data sets such as the Office of Personnel Management hack, as well as Canada-, Japan- and US-based firms (for example, the hacks of Anthem, Sony and Ashley Madison, among others) (Aaronson 2020).

The movement toward AI sovereignty is particularly strong in Europe. After the 2008 global financial crisis, European officials also began to focus less on exporting to the global economy and more on achieving "strategic autonomy," ensuring that

the European Union would not be dependent on any other country or groups of countries. The European Union now describes this policy as "open strategic autonomy" or "strategic sovereignty" (Damen 2022). However, some scholars argue that this approach, coupled with the European Union's regulations on data, platform business practices and AI, are, in fact, undermining its competitiveness (Bauer and Pandya 2024).

There is no one path toward achieving sovereign AI. France, the UAE and the United Kingdom provide an interesting comparison of strategies and approaches. In 2023, the French government created a Generative AI Committee to suggest ways to develop more AI talent in France, promote French innovation around the world and regulate in ways that do not weaken French innovation (Government of France 2023). To achieve those goals, the committee encouraged the French government to "create the conditions for collective appropriation of AI…by launching a plan to raise awareness and train the nation; make France and Europe a major hub for computing power; transform our approach to personal data to continue to protect while facilitating innovation to serve our needs; ensure the influence of French culture by enabling access to cultural content while respecting intellectual property rights; [and work to build] a global AI governance."[15]

France's emphasis on these two national objectives — collective ownership (so it is not just American and Chinese companies reaping the benefits of AI) coupled with its goal of ensuring that AI respects French culture — is consistent with long-standing French economic, trade and cultural policy (Ancenys, Mazilier and Laraki 2023).[16]

In 2017, the UAE published its AI strategy, which aims to help the country "build a reputation as an AI destination…develop a fertile ecosystem for AI…attract and train talent…provide the data and supporting infrastructure essential to become a test bed for AI…[and] ensure strong governance" (UAE 2017, 8). According to His Highness Sheik Mohammed bin Rashid Al Maktoum, UAE vice president and ruler of Dubai, "We want the UAE to become the world's most prepared country for artificial intelligence" (ibid., 6). Since then, the government appears to have made real progress by attracting students and companies to the UAE to study;[17] building a widely acclaimed open-source large language model (LLM), Falcon;[18] and creating a foundation to fund an open-source ecosystem (Technology Innovation Institute 2024).

In contrast, the British government is already a science and technology power, and its AI efforts are designed to enhance that capacity. In 2022, the UK government published a strategy document with objectives over a three-month, six-month and year(s)-long period. These objectives included developing a framework for ensuring data availability in the wider economy; organizing consultations on data governance and copyright; determining how defence agencies could use AI; and putting forward an all-of-government approach to international AI activity. British officials promised that they would maintain strong AI capacity for national security reasons, and to distribute AI expertise and development throughout the United Kingdom while protecting and furthering UK values (Gov.UK 2021, 2024a).

How Do Nations Nurture AI?

Governments that want to nurture sovereign AI usually begin with a strategy and then take steps to realize that strategy. AI strategies are innovation policies designed to signal that the government views a particular technology as a priority.[19] The Digital Trade and Data Governance Hub examined a sample of 68 countries and the European Union, varied by region, income and digital prowess, and found 43 nations had such an AI strategy (Struett, Aaronson and Zable 2023). As of April 2024, the OECD reports 106 strategies, but its reportage includes strategies for the digital economy, data strategies and other related strategic documents.[20]

15 See www.dataia.eu/en/news/report-ai-commission-our-ambition-france.

16 See www.diplomatie.gouv.fr/en/french-foreign-policy/cultural-diplomacy/cultural-and-creative-industries-key-to-our-foreign-policy/.

17 See https://ai.gov.ae/digital-economy/.

18 See https://falconllm.tii.ae/index.html.

19 The OECD (2010) noted that innovation strategies include five policy priorities: empowering people to innovate; unleashing innovation in firms; creating and applying knowledge; applying innovation to address global and social challenges; and improving the governance of innovative systems such as AI. In contrast, when a government uses sovereign AI policies to weaken or disadvantage foreign competitors, it is acting in a nationalist and often protectionist manner.

20 See https://oecd.ai/en/dashboards/policy-initiatives?conceptUris=http:%2F%2Fai.oecd.org%2Ftaxonomy%2FpolicyAreas%23PA15%7C%7Chttp:%2F%2Fai.oecd.org%2Fmodel%23National_strategies_agendas_and_plans.

Next, policy makers work to direct public and private funds toward enhancing research and capacity building within the nation. These investments in AI R&D are difficult to track over time and across countries, agencies and approaches (for example, public-private partnerships) (Clark, Zhang and Sellitto; Galindo-Rueda and Cairns 2021). However, the OECD examined eight countries from 2001 to 2019 and found that the total volume of AI-related government R&D funding identified through this exercise grew from $207 million in 2001 to almost $3.6 billion in 2019, a 17-fold increase (Yamashita et al. 2021).[21] Below are some additional investment data points that give a sense of governments' investment in AI.

- US government investment in AI R&D grew from $2.45 billion in 2021 to an estimated $3.1 billion in 2024, about what the eight countries studied by the OECD spent in 2019.[22]
- In February 2024, the UK government announced it would invest £100 million in UK AI R&D (UK Research and Innovation 2024).
- The European Union has provided roughly €1 billion in funding each year for AI capacity building since 2018. However, these funds vary among EU member states, and some states, such as France and Germany, are supplementing these funds (Fantini 2024).[23]
- In March 2024, the Saudi government announced that it would use some $40 billion of its $900 billion sovereign wealth fund, the Public Investment Fund, to invest in AI at home and abroad. Such huge sums would make the Saudis the largest investors in AI by far (Farrell and Copeland 2024).
- *The Economist* (2024) reported that in 2023, Britain, France, Germany, India, Saudi Arabia and the UAE promised to bankroll AI to the collective tune of around $40 billion.

Most countries simply cannot match these funding levels.

Meanwhile, policy makers are trying to find a middle ground between nurturing AI innovation and protecting their citizens and their firms from harm.[24] In attempting to balance these essential policy goals, these officials may discriminate among foreign and domestic actors.

How AI Sovereignty Efforts May Distort Trade in AI

Potentially Trade-Distorting Restrictions on Data

Data sets are a key element of AI. If a data set is inaccurate, incomplete or unrepresentative, it will likely yield inaccurate, incomplete or biased results (Aaronson 2024; Mazzucato et al. 2022). In general, AI developers want data sets that capture the real world, so the larger and more representative the underlying data set is, the better (Buchanan 2020). For this reason, AI developers often supplement their proprietary data sets with data licensed from data brokers and/or web-scraped data in the belief that acquisition of such data from multiple sources, venues and countries will yield more accurate, complete and representative data sets (Aaronson 2024).

Data Protection Laws

In the last decade, many nations adopted rules that require certain types of sensitive personal data to be stored in local servers or forbid cross-border transfer of such data. These rules are meant to protect privacy and not distort trade, yet they can have a trade-distorting effect. For example, the EU General Data Protection Regulation (GDPR) permits data to flow freely to those nations it deems have established adequate levels of personal data protection. However, policy makers from outside the European Union find that adequacy is a complicated process. To be deemed adequate, a nation must receive permission from several EU agencies and EU

21 All dollar figures in US dollars.

22 See www.nitrd.gov/apps/itdashboard/ai-rd-investments/.

23 See https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence.

24 As example, see Gov.UK (2024a).

member states. As of this writing, only 15 nations are deemed adequate by the European Union.[25]

The International Association of Privacy Professionals hosted a discussion among data privacy officials on the implications of data flow restrictions. Singapore's Personal Data Protection Commission Deputy Commissioner Denise Wong described three types of data flow restrictions:

- jurisdictions with specific local storage facility and local storage requirements without full restrictions on transfers;
- jurisdictions with local storage requirements and "disparate" transfer rule; and
- jurisdictions with strict local storage requirements and virtually total prohibitions on transferring personal data (LaCasse 2024).

All these restrictions distort trade between foreign and domestic entities that seek to transfer data. Wong noted that the sheer number and complexity of these rules hinder data collection and sharing, which, in fact, may make it harder to nurture AI. South Korea's Personal Information Protection Commission chairperson Haksoo Ko underscored this point, noting that such restrictions make joint national scientific and technological research endeavours more difficult (ibid.).

In 2023, after several years of debate, India enacted strict rules governing personal data collection and monetization by firms in the Digital Personal Data Protection Act (DPDPA). Building on the European Union's GDPR, the DPDPA permits cross-border data transfers to jurisdictions outside of India other than those jurisdictions specifically identified by the Indian government on its list of countries to which data transfers are restricted (to be published); otherwise, the DPDPA does not require the implementation of a transfer mechanism.[26] Here, again, without intent, privacy regulation could distort trade.

Meanwhile, China has long restricted cross-border data flows through its Great Firewall. In September 2022, the Chinese government implemented an administrative process to review data transfers through government security assessments for certain volumes and kinds of data.[27] In 2023, the Chinese government announced new restrictions on "important" and personal data — but neither term was clearly defined in the regulations. EU officials complained to the Chinese government that the lack of clarity was causing confusion and could lead to disinvestment (Reuters 2023a; Cash 2023). Moreover, foreign officials found these rules difficult to comply with (International Trade Administration 2023).

However, in March 2024, the Chinese government announced a major policy clarification. The Cyberspace Administration of China would exempt from declaration data collected and generated in activities such as international trade and cross-border transportation that do not contain personal information or "important data." However, some foreign firms reported that they did not understand how the government defined "important data."[28] Hence, China's approach to regulation still yields confusion, acting as a de facto trade barrier.

The United States views Russia's personal data protection law as a barrier to trade because it requires that "certain electronically-collected data about Russian citizens be processed and stored in Russia, imposing significant operational challenges on providers of data-intensive services, as well as on manufacturers who rely on those services. The requirements also raise concerns about state surveillance" (Office of the USTR 2024b, 310).

Meanwhile, because the United States lacks a personal data protection law, the country has had to resort to ad hoc policies to protect personal data. In February 2024, President Joe Biden issued an executive order that required the Department of Justice (DoJ) to issue regulations that establish clear protections for Americans' sensitive personal data from access and exploitation by countries of concern, such as China, Iran and Russia. The order notes that the "sale of Americans' data raises significant privacy, counterintelligence, blackmail risks and other national security risks —

25 See https://commission.europa.eu/law/law-topic/data-protection/international-dimension-data-protection/adequacy-decisions_en.

26 The DPDPA covers the collection, processing, storage and transfer of digital personal data. The act is applicable only to personal data in digital form. See www.dlapiperdataprotection.com/index.html?t=law&c=IN; also see Burman (2023).

27 Companies that are transferring less data or otherwise do not trigger the security assessment requirement can rely on a less burdensome "standard contract" filing to ensure their data transfers are compliant (Sacks, Luo and Webster 2024, 8).

28 In March 2024, China's cyberspace regulator revised rules on some types of cross-border data flows, clarifying reporting standards for security assessments of important data exports (Reuters 2024a).

especially for those in the military or national security community" (The White House 2024).

In March 2024, Commerce Secretary Gina Raimondo said she was open to banning any Chinese company that accesses US data from doing business in America (Ward and Miller 2024). She did not limit her statement to personal data. Several members of Congress proposed legislation that would enable her to do so, even though it would violate US trade obligations of non-discrimination.[29] Analysts for Stanford University's DigiChina Project noted that while China worried that too much control of data could hamper growth, the United States was more concerned about the national security risks of data than the opportunities data analysis presents for innovation and research (Sacks, Luo and Webster 2024, 5; Department of Defense 2024).

Restrictions on the Free Flow of Data (Data Localization)

Governments increasingly control the flow of data by limiting its movement or delineating how and where it can be stored. States argue that they are only restricting the free flow of data to data they deem sensitive or related to national security. Policy makers may also argue that such restrictions are necessary to protect privacy or create jobs. In 2017, the US government defined data localization as "unnecessary requirements to store data within a particular jurisdiction or locate computing facilities locally, as well as outright bans on cross-border data flows."[30] The current US government's definition is "measures designed to protect, favor, or stimulate domestic industries, service providers, and/or intellectual property (IP) at the expense of goods, services, or IP from other countries. Localization barriers are measures that can serve as disguised trade barriers when they unreasonably differentiate between domestic and foreign products, services, IP or suppliers, and may or may not be consistent with WTO rules."[31] With this revised definition, the US government is now signalling that some localization measures may be necessary.

Nonetheless, in its 2024 trade barrier report, the USTR noted that seven countries have data localization policies that distort trade.[32] Data localization rules were generally not designed to advance local AI, but some governments see these rules as an incentive for AI (McKinsey & Company 2022).

Data localization rules can distort trade and reduce cross-border investment. They may also reduce local provision of cloud services because compliance with such rules is expensive. Giant cloud providers, such as Amazon, Google and Microsoft, can more easily amortize these costs (ibid.).

Data-Sharing Initiatives

Many governments have established initiatives or incentives to encourage data sharing among various sectors of society. When entities share data, they increase its generativity — expanding its utility to diverse individuals, entities and groups. Such an approach can be particularly helpful to countries with relatively few AI firms or small populations.

Many countries, including Colombia (MinTIC 2022),[33] Japan (Ministry of Economy, Trade and Industry 2022; JIN Staff Writer 2023) and South Korea (Hwang 2022), have created data-sharing initiatives. Japan made a point of declaring that its data spaces are open to domestic and foreign companies — it wants to ensure that "non-Japanese companies are not left behind by utilizing Data Spaces."[34]

The European Union created common data infrastructures and governance frameworks, which facilitate data pooling, access and sharing. These data spaces are supposed to be open for the participation of all organizations and individuals. However, the data spaces are designed to make data available and exchangeable among EU entities. Businesses, public administrations and individuals will control the data they generate. The European Union asserts that these data spaces will enhance the development of new data-driven products and services among its members, forming the core of an interconnected and competitive

29 US, Bill S.686, *Restricting the Emergence of Security Threats that Risk Information and Communications Technology Act or the RESTRICT Act*, 118th Cong (2023), online: <www.congress.gov/bill/118th-congress/senate-bill/686>.

30 See https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2017/march/key-barriers-digital-trade.

31 See https://ustr.gov/trade-topics/localization-barriers.

32 See Office of the USTR (2024b, 25 [Bangladesh], 67 [China], 125 [El Salvador], 242 [Korea], 278 [Pakistan], 310 [Russia], 370 [Vietnam]).

33 Colombia, Resolution 460, *Por la cual se expide el Plan Nacional de Infraestructura de Datos y su hoja de ruta en el desarrollo de la Politica de Gobierno Digital, y se dictan los lineamientos generales para su implementación* (15 February 2022).

34 See www.ipa.go.jp/en/digital/data/data-spaces.html.

European data economy.[35] According to the European Union, "the strategy for data focuses on putting people first in developing technology and defending and promoting European values and rights in the digital world."[36] In so doing, the European Union will create a single market and ensure "data sovereignty" (European Commission 2024).[37] The author struggled to ascertain what this language means: it says, on the one hand, that data spaces are open and non-discriminatory, but on the other hand, they are meant solely for the purpose of European entities to share and exchange data.

Many countries, including the United States, have created platforms for government entities to share data with the public or among various branches of government. However, the United States has not created sectoral data spaces for the sharing of various types of data among different societal entities, such as business with civil society. Instead, US officials have focused on privacy-preserving data sharing and analytics (PPDSA) methods and technologies. These methods allow data users to anonymize data or prevent re-identification. US policy makers want to use these methods to enhance trade: "Certain PPDSA technologies can change the traditional conception of data flows by enabling the sharing of insights without sharing or exposing the actual data" (Executive Office of the President 2023, 34). The United States plans to use these techniques to tackle shared challenges, such as health care, climate change, financial crime, human trafficking and pandemic response, while mitigating privacy concerns (ibid., 32–34).

Data-sharing initiatives could distort trade if they do not allow foreign participation and, hence, limit access to information. But they are not necessarily trade distorting.

Rules Requiring AI Developers to Provide Information on Data Provenance

Most countries do not require that AI developers provide information on the provenance/sources of their data and how they obtained that data. But policy makers around the world, including in the United States,[38] are considering such regulations. Data transparency can help avoid problems such as bias, pornography, and misusing or illegally using copyrighted or personal data. Such provisions might also build trust among AI stakeholders. Moreover, data transparency can facilitate reproducibility of research results, which, in turn, will yield scientific progress (Longpre et al. 2024; Aaronson 2024).

The EU AI Act requires that AI developers disclose information about training, validation and testing data sets for high-risk AI systems and provide a summary of copyright-protected training data used in foundation models.[39] AI developers of high-risk systems must provide information such as how the data was obtained, labelled and processed (Aaronson 2024). The law does not require developers of other types of systems to provide such information. Such regulations are not intended to discriminate among domestic and foreign producers but could be perceived as discriminatory as the bulk of high-risk AI models are American and/or Chinese. Other nations, including the United States, are considering incentivizing data provenance requirements through various strategies, such as corporate governance or consumer disclosure rules, but have not yet moved beyond guidelines.[40]

Potentially Trade-Distorting Restrictions on Infrastructure

To build and run AI systems, AI developers need access to networked computers powered by advanced computer chips that have superior processing speed, computational power and energy efficiency. Hereafter, the author calls these assets "AI infrastructure." Countries that have larger supplies of the latest infrastructure, whether via cloud-computing hyperscalers or other supercomputing infrastructure, are more likely to be countries where AI developers make advancements in the field (Buchanan 2020, 7–8). Although AI infrastructure is largely owned and operated by private sector entities, governments

35 See https://digital-strategy.ec.europa.eu/en/policies/data-spaces; EC, *Commission Staff Working Document on Common European Data Spaces*, SWD(2024) 21 final, online: <https://digital-strategy.ec.europa.eu/en/library/second-staff-working-document-data-spaces>.

36 See https://digital-strategy.ec.europa.eu/en/policies/strategy-data.

37 See https://digital-strategy.ec.europa.eu/en/policies/strategy-data; https://digital-strategy.ec.europa.eu/en/policies/data-spaces.

38 US, Bill H.R.7766, *Protecting Consumers from Deceptive AI Act*, 118th Cong, online: <www.congress.gov/bill/118th-congress/house-bill/7766/text>.

39 See https://artificialintelligenceact.eu/article/10/.

40 For example, the US House of Representatives proposed the AI Foundation Model Transparency Act (Beyer 2023).

have long attempted to control that infrastructure to meet domestic policy priorities (Floridi 2020). But some governments are reaching beyond their borders to affect competitors in other nations.

Export Controls on Chips

Almost every device, from cars to toasters, includes semiconductors. However, the most advanced semiconductors can be used for a wide range of weapons and policing devices, such as tasers, that repressive states use to undermine human rights. In 2022, the United States initiated export controls on semiconductors to certain nations, including China and Russia, to prevent these nations from using advanced chips for military purposes (US Mission China 2022). Over time, these export controls got broader and tougher, making it harder for firms in these nations to produce such chips or to get financing for their manufacture. US policy makers moved from directing a policy aimed at limiting China's export growth to a policy that made it harder to not only produce AI but also other advanced technologies (Harris 2023a, 2023b; Braithwaite 2024; Kharpal 2022).

In September 2023, the Dutch government imposed additional restrictions on the export of machines that make advanced chips. It justified its actions by stating that it was acting to protect national security by limiting China's ability to make chips for AI (AP News 2023). The UK (*The Telegraph* 2024), Canadian[41] and Japanese (Nagao 2023) governments soon followed with their own controls on semiconductor exports.

On August 9, 2023, the US president issued an executive order calling for the development of regulations that require US persons to provide notification of information relative to certain transactions involving covered foreign persons (notifiable transactions) and that prohibit US persons from engaging in certain other transactions involving covered foreign persons (prohibited transactions). Put simply, the order regulates the behaviour of people involved in foreign investment related to AI and other critical technologies (The White House 2023). In addition, on March 6, 2024, the DoJ, the US Department of Commerce and the US Department of the Treasury issued a Tri-Seal Compliance Note (Tri-Seal Note) emphasizing the obligations of non-US persons to comply with US sanctions and export control laws. The Tri-Seal Note does not issue any new rules or regulations, but rather reiterates existing US trade compliance obligations for non-US persons. The United States wanted to reiterate that under US export controls, "foreign-produced items located outside of the United States that are produced using certain U.S.-controlled technology, software, or production equipment are subject to the EAR when exported from abroad, reexported, or transferred in-country to certain countries or parties on the Entity List" (US Department of Commerce, Department of the Treasury and Department of Justice 2024; Pillsbury Winthrop Shaw Pittman LLP 2024).

US officials have stated that export controls are narrowly targeted at technologies that have clear national security or human rights impacts and are not about containing China's economic growth (US Department of Commerce 2023). However, the United States keeps changing and adding to these rules, which can cause confusion and increase the costs of compliance for foreign market actors.[42] According to Reuters (2024b), the US Department of Commerce said it plans to continue updating its restrictions on technology shipments to China as it seeks to bolster and fine-tune the measures.

Despite US assurances, Chinese officials saw these policies as discriminatory, threatening to China's economic growth and a barrier to creating advanced AI. Zhang Yunquan, a member of the Chinese People's Political Consultative Conference National Committee and a computer scientist at the Chinese Academy of Sciences, said if China falls behind on its ability to create sovereign AI, "we may face the risk of being sanctioned and suppressed" (Caiyu and Juecheng 2024).

Chinese officials began to supplement their own efforts to nurture data-driven technology with efforts to "delete America from its technology" (Lin 2024). In 2022, China's State-Owned Assets Supervision and Administration Commission issued a directive, Document 79, which requires state-owned companies in finance, energy and other sectors to replace foreign software in their information technology systems by 2027. These companies must report quarterly on their progress. The journal also reports that the buy-local policy is trickling down to privately

41 See www.international.gc.ca/controls-controles/us-eu/index.aspx?lang=eng.

42 See www.bis.gov/ear.

run companies, which are showing greater inclination to buy domestic software, according to Morgan Stanley's CIO survey (ibid.).

Subsidization of Cloud Infrastructure and High-Speed Computing

In the first 60 years of AI development, most AI models were developed by academics. But as the speed of computers has advanced, many universities and research organizations cannot afford to provide their faculty and staff with the high-speed computing they need to continue to innovate (Maslej et al. 2023). As a consequence, policy makers around the world are trying to increase access to those resources and, in so doing, make it possible for more researchers to participate in such research.

For example, in her 2023 State of the Union address, EU President Ursula von der Leyen announced a new initiative to make Europe's supercomputers available to European AI start-ups to train their trustworthy AI models.[43] These supercomputers include LUMI, hosted by a consortium of 10 partners from Belgium, the Czech Republic, Denmark, Estonia, Finland, Iceland, Norway, Poland, Sweden and Switzerland (Häkkinen 2022). The European Commission also announced a "Large AI Grand Challenge" for which AI start-ups are given a prize of financial support and supercomputing access.

The European Union is also funding what it calls "AI factories" in which it will acquire, upgrade and operate AI-dedicated supercomputers to enable fast machine learning and training of large general-purpose AI models. At these AI factories, public and private users, start-ups and innovators can develop, test, evaluate and validate large-scale AI models, providing supercomputer-friendly programming facilities and other AI-enabling services. These opportunities are available only to European entities (European Commission 2023).

In another example, the French and German governments teamed up in 2019 to create a "secure and federated data infrastructure that stands for European values, digital sovereignty of the data owners, interoperability of different platform[s] and open source."[44] The two governments hope to create an ecosystem of interconnected data spaces, combining different cloud and service providers, that can meet industry-specific demands while processing data in compliance with European regulations.[45]

In March 2024, *The Financial Times* reported that some 17 city governments in China, including the largest, Shanghai, pledged to provide "computing vouchers" to subsidize AI start-ups facing rising data centre costs. These costs are increasing as a direct result of the United States and its allies making it harder for Chinese entities to get access to high-speed computer chips. The vouchers can be used to rent time in state-run AI data centres to train and run the companies' LLMs (Olcott and Liu 2024).

In addition, in January 2024, the US government initiated the National Artificial Intelligence Research Resource (NAIRR) pilot program. The program is designed to connect US researchers to the computational, data, software, model and training resources they need to participate in AI research. US officials hope that access to these resources will democratize AI, and academics will be able to produce new models and strategies for AI. US officials plan to evaluate the pilot by assessing both the number of underserved researchers who use the system and the quality of the projects they create (McKenzie 2024).[46]

The NAIRR is only available to researchers in the United States, but it appears foreign researchers at US institutions will be welcome to participate once it is fully implemented (NAIRR Task Force 2023, 47).[47]

These initiatives are designed to help domestic competitors excel in AI. They may be trade distorting if foreign market actors are excluded, but they are not designed to distort trade.

43 See https://state-of-the-union.ec.europa.eu/state-union-2023_en.

44 See www.bmwk.de/Redaktion/EN/Dossier/gaia-x.html.

45 See https://gaia-x-hub.de/en/.

46 See https://new.nsf.gov/focus-areas/artificial-intelligence/nairr#about-the-nairr-pilot-bcb.

47 The NAIRR Task Force (2023, C-3) consulted with representatives from other countries, including Brazil, Canada, France, Japan and the United Kingdom.

Why Is AI Nationalism Problematic?

Effects on Innovation

AI nationalism may not facilitate innovation. Scholars disagree as to the effect of protectionism and subsidization on innovation. For example, Nicholas Bloom, Mirko Draca and John Van Reenen (2016), and Yuriy Gorodnichenko, Jan Svejnar and Katherine Terrell (2015) argue that Chinese import competition induced innovative activity in exposed domestic sectors in Europe. In contrast, using US firms, David H. Autor, David Dorn and Gordon H. Hanson (2016), and David Autor et al. (2020) argue the opposite. Philippe Aghion, Benjamin F. Jones and Charles I. Jones (2017) looked at the early impact of AI and found ambiguous results. Hence, there is no clear answer.

AI nationalism may, over time, affect innovation in the home country. When one country tries to limit competition in new technologies through export restrictions, it may find its home market is characterized by oligopolies or monopolies. In so doing, the country has reduced incentives for innovation. Over time, these giant companies may take their success for granted and become lazy or less adept at innovation (Akcigit, Ates and Impullitti 2019; Lenway, Morck and Yeung 1996).

AI nationalism could also reduce the pace of development. If AI nationalism leads to oligopolies and monopolies, there will be less competition. With less competition, prices are often higher, which disproportionately hurts the poor, especially in developing economies, contributing to rising inequality. Moreover, business dynamism is important for innovation and economic growth to lift people out of poverty (Krieger Mytelka 1999; UNCTAD 2017; World Bank 2020).

US and EU firms need foreign AI competitors to keep them on their toes. Without such competition, firms may get lazy. Moreover, foreign firms may compete over attributes that consumers and governments may desire, such as more trustworthy, open or participatory AI (Aaronson 2023a; Carrozza, Marsh and Reichberg 2022). Finally, Western policy makers should acknowledge reality. AI research is international, therefore, researchers in one country benefit from research reproduced and replicated in another, building on progress. Moreover, AI research transcends borders. For example, the number of AI research collaborations between China and the United States quadrupled between 2010 and 2021, although the rate of collaboration has since slowed significantly and will likely continue to do so because of national security concerns (Maslej et al. 2023).

Effectiveness at Nurturing AI Systems

AI nationalism may not yield competitiveness as AI evolves (Schoelkopf, Skowron and Biderman 2024; McKendrick 2019; Tonkin 2022).[48] Competitiveness is a dynamic process that will change over time as consumer demand, technology, society and polity evolve. Governments cannot keep up with these changes, but governments can serve as a "catalyst and challenger" (Porter 1990).

AI systems are complex, comprised of applications, risks, benefits, uncertainties, stakeholders and public concerns. Indeed, no single entity is capable of fully governing them. Instead, policy makers must create a systemic approach to governance that cuts across sectors and disciplinary silos and solicits and addresses the concerns of many stakeholders around the world (Marchant and Wallach 2015; Mathews, Fabi and Offodile II 2022). Policy makers struggle to develop such an approach.

AI nationalism is not a systemic approach because adherents view AI development as a zero-sum game in which only one player can win. Hence, that player adopts policies that benefit local competitors. However, over the long run, that approach could be short-sighted because the research and data underpinning AI is global and constantly changing.

Effects on Monopolies

AI nationalism may further encourage monopolistic markets. According to the US Federal Trade Commission, which, along with the DoJ, regulates competition, only some 20 firms possess the cloud infrastructure, computing power, access to capital and vast troves of data to develop and deploy tools to create LLMs (Staff in the Bureau of

48 See https://openai.com/research/video-generation-models-as-world-simulators; https://blog.research.google/; Surden 2024.

Competition & Office of Technology 2023). These firms are also concentrated in a few advanced developed countries — in Asia, Europe and North America. As a result, a few companies with expertise in AI could hold outsized influence over a significant swath of economic activity (Staff in the Bureau of Competition & Office of Technology 2023; Hacker, Engel and Mauer 2023). Perhaps most importantly, these firms hold considerable political as well as economic clout globally and they often lobby against regulation. At times, they act as de facto private regulators, particularly in technologies such as AI, whereas policy makers are just learning how to govern in these emerging fields (Hearn 2024). Prowess begets economies of scale and scope, which, in turn, begets ever more digital prowess. According to the UK Competition and Markets Authority, these monopolistic markets cause three problems:

- firms controlling critical inputs for developing various AI models may restrict access to these models to shield themselves from competition;
- powerful incumbents could exploit their positions in consumer- or business-facing markets to distort choices and restrict competition in deployment; and
- partnerships among key players could exacerbate existing positions of market power through the value chain. (UK Competition and Markets Authority 2024)

In addition, monopolistic firms may control so much of the market that competition is limited. In turn, these firms have less incentive to innovate and may be less protective of workers and consumers (Aghion, Cherif and Hasanov 2021; Philippon 2019).

Government officials are beginning to recognize the benefits as well as the costs of nurturing the giant firms that excel in AI development. China and the United States are interesting case studies. In 2019–2020, the Chinese Communist Party became increasingly threatened by the market power and societal clout of its big tech firms. In 2020, the government warned 27 major Chinese internet companies that they were violating China's antitrust and fair competition practices. The government fined some of these firms and prevented some of the largest initial public offerings and mergers. However, by 2022, as growth slowed in China, President Xi Jinping changed course. At an address before the Central Economic Work Conference in Beijing, he stated that internet platforms will be supported to "fully display their capabilities" in boosting the economy, job creation and international competition (Zhang, L. 2023). Scholar Angela Huyue Zhang concluded that China "has been counting on its tech firms to help achieve technological self-sufficiency to catch up with the U.S. But the crackdown has crippled its most competitive tech giants" (Zhang, A. H. 2024).

Meanwhile, American officials were wrestling with equally complex problems: How do they regulate the tech firms, the cross-border data flows that underpin their innovation and market clout while competing with China? The Biden administration made its choices quite clear. It began to challenge big tech mergers and acquisitions, investigating how these firms use and store data, and finding privacy violations and fining those firms responsible, among other actions (Germain 2023).

Meanwhile, US policy makers worried that limiting the size and market clout of America's tech giants could weaken the ability of US firms to compete with China's tech behemoths, which are subsidized and supported to a much greater degree than those in the United States (Lewis 2024; Congressional Research Service 2024; Bradford 2023). As of this writing, the United States seems to be leaning toward ensuring US competitiveness for national security reasons rather than taking any steps to limit the market power of the data giants.

Finally, America's rethink of competition policy in the digital era is occurring while the country appears to be reconsidering its position on digital trade agreements. The USTR has pulled back from explicit support of specific positions regarding the free flow of data, data localization and source code. Other important US agencies, however, have simultaneously expressed their support for the open internet and the free flow of data (Lester 2024; Aaronson 2023a).

Ironically, this rethink has real implications for US competitiveness in various forms of AI. All types of AI require constant updating and new sources and types of data. Generative AI, in particular, is often built on inaccurate, biased and incomplete data sets. The best way to improve generative AI is to increase the quality and supply of data that underpins it. In so doing, AI developers will be better able to filter the underlying data set to ensure it is accurate, complete and representative. AI developers, deployers and users will be better off

if this data is obtained through an accountable, transparent set of rules negotiated globally, such as at the WTO (Aaronson 2023c). Nationalistic policies, whether Chinese or American, make that negotiation ever harder.

Undermining the Public Good Nature of AI

A growing number of researchers, international organizations and policy makers also acknowledge that monopolistic markets for AI could lead to an "increasing imbalance between those who can perform the most resource-intensive first steps of building such models and those who rely on pretrained models (i.e., foundation models)" (OECD 2024, 43). The OECD noted, "Access to the most advanced AI models could be limited by those who own them. This would pose challenges for policy makers and governments as they seek to create a level playing field that allows smaller and less-resourced groups to innovate" (ibid.). Moreover, the data giants that control the bulk of the world's data and AI capacity may not be interested in sharing that capacity with citizens in the developing world. As the CEO of the UK Competition and Markets Authority concluded, "Without fair, open, and effective competition and strong consumer protection, underpinned by these principles, we see a real risk that the full potential of organisations or individuals to use AI to innovate and disrupt will not be realised, nor its benefits shared widely across society" (Gov.UK 2024b).

Finally, when countries insist their data or AI is sovereign, they are basically saying the benefits of data and AI should only accrue within their borders. In so doing, they risk the generativity of data and AI (Aaronson 2021). Such a perspective is both ironic and unfortunate, given the global nature of the AI supply chain and ongoing international work on AI as a global public good.

Findings from the Analysis

Countries have adopted a wide range of strategies to nurture AI. Some of these policies may distort trade and impede the ability of other countries to nurture AI. Table 1 illuminates these findings.

- Some Western nations have relied on export controls as a means of slowing down China's AI competitiveness. No one knows if these steps will slow down authoritarian use of AI. Moreover, no one knows if the current approach to various forms of AI such as new entrants will become dominant based on comparative advantage in the diversity of data, creativity in algorithms, models, synthetic data and so on. Moreover, export controls are the policy equivalent of the game whack-a-mole, where the proposed solution looks remediative but, in reality, is temporary and/or inadequate to address the underlying problems.[49] Scholars have found they are often ineffective (Bown 2023; Lewis 2023; US Department of State 2023; Shivakumar, Wessner and Howell 2022). Moreover, export controls often bite back, damaging not only the targets but also their trade partners. For example, evidence shows that export controls aimed at China have negative effects on Western companies that rely on China as a key market (Mui 2024).

- Competition among nations on AI investment could stimulate more innovation; however, only a few countries can compete to provide such funding. As Pablo Chavez pointed out to the author, countries such as Taiwan and the UAE can build an AI model on open-source models if they have the AI expertise, chips and infrastructure.[50] But government officials will find it hard to build out the infrastructure to continuously innovate. Even wealthy countries cannot keep up with the biggest spenders — the Americans, the Chinese and the Saudis. For example, Germany plans to almost double its public funding for AI research to nearly a billion euros over the next two years, as it attempts to close a skills gap with sector leaders China and the United States. But the latter spent that amount on AI research in 2022 (Reuters 2023b).

- Nations that adopt tight controls on cross-border data flows are unlikely to deter their adversaries from acquiring large troves of data, which they could combine to make predictions about future policies or behaviours. Governments can purchase large troves of data from data brokers and other companies, scrape data off the Web or steal data through cybertheft.

Here, again, policy makers are playing a game of whack-a-mole. Instead, they should ensure that data subjects are protected by purpose-limitation provisions. Such provisions require that data

49 See https://en.wiktionary.org/wiki/whack-a-mole.

50 Email from Pablo Chavez to Susan Aaronson, 4.12.2024.

Table 1: Examples of AI Nationalism with Potential Trade-Distorting Effects

Policy	Actor(s)	Designed to Impede Foreign Competitors	Designed to Enhance Ability of Domestic Market Actors	How Does It Discriminate between Domestic and Foreign Acts?	Spillover Effects	Allowable under GATT Exceptions
Privacy laws	China, European Union, Russia, etc.			Nations not deemed adequate must negotiate special procedures	Patchwork of global rules yields uncertainty and complexity	Yes, under privacy exceptions
Laws requiring that data be stored locally	El Salvador, Russia, Vietnam	Localization requirements			Patchwork leads to uncertainty and complexity	Unclear
Regulations on personal and important data	China			Outsiders struggle to interpret regulations	Responsibilities and terms poorly defined, leads to confusion	Unclear — if necessary, under national security or social stability
Restrictions on data flows	United States	Ban on data broker sales to parties in China, Iran and Russia			Could lead to further discrimination by other countries	Under national security
Data-sharing initiatives	European Union		Yes		Multiply the utility of data but only for domestic entities?	Unclear
Data provenance requirements	European Union			Bulk of high-risk providers are American and Chinese	Could build greater trust in AI systems, but also without intent to discriminate among providers	Could be a form of social labelling and violate like product
Export controls on chips and chip-manufacturing equipment	Some EU countries, Japan, United States	Designed to impede Chinese access to high-speed chips		Discriminates against Chinese market actors	Alienate China, could make trade harder for many countries; over the long run, impede AI innovation	Under national security exception
Subsidization of AI infrastructure	China, European Union, United States		Yes	If foreign market actors cannot participate, it could be perceived as a discriminatory subsidy	Over time, it could stimulate AI innovation but could also reduce it, as high-speed computing is limited to researchers in a few countries	May be actionable under subsidies agreement

Source: Author.

cannot be sold for a purpose that is not defined at the moment of collection (Rieke et al. 2016, 22).

- AI nationalist strategies could alienate developing countries. Officials and firms in these countries are in a Catch-22: they need AI to export, yet they must pay the cost of AI services as rents to the very countries that specialize in AI and highly subsidize AI research and capacity (Goldberg 2024; Aaronson 2023b). These developing countries are also more vulnerable to risks such as cybercrime. If it is harder for them to tackle such risks with AI, cybercrimes could spread.
- AI nationalist strategies could also alienate smaller open economies. For example, AI advisers recently wrote a report for the government of Australia. The analysts noted "the concentration of generative AI resources within a small number of large multinational and primarily US-based technology companies poses potentials [*sic*] risks to Australia" (Bell et al. 2023, 8). Moreover, it notes, "the US's CHIPS Act and parallel EU measures aim to ensure ongoing onshore computational capabilities for future AI-driven industries, with a focus on infrastructure and semiconductor design and fabrication. Initiatives such as the proposed US National Artificial Intelligence Research Resource aim to shape markets and direct innovation and competition policies towards a domestic AI innovation system more closely aligned to national interests" (ibid., 14; Mazzucato et al. 2022). The report concludes, "For smaller countries and markets like Australia, this competition could present challenges for access and capability, as well as the suitability of models for our context and needs" (Bell et al. 2023, 14). In a similar vein, the Dutch government examined the future of generative AI and noted that the Netherlands is increasingly reliant on US firms that control access to data, computing power and AI development capacity. The government concluded, "Given the importance of generative AI for the innovation strength and long-term earning capacity of the Netherlands, this may lead to strategic dependencies," an area of risk for the Netherlands (Government of the Netherlands 2024, 14). Scholar Natasha Tusikov notes, "Smaller states like Canada lack the regulatory power or draw of a large internal market to enact necessary change. What's needed are international agreements undertaken by coalitions of like-minded states or we'll remain beholden to US rules that privilege US values, interests and actors" (Fay, Haggart and Tusikov 2021).
- AI nationalism could further the already overly strong oligopolistic positions of data giants in China and the United States.
- Many of the countries adopting AI nationalist policies are also the same countries that say they want to build trust in AI and in the governance of AI. Most of these countries have signed the OECD AI Principles for designing, deploying and governing AI.[51] Yet how can these countries claim they are trustworthy if they consistently favour local competitors?

Conclusion

Around the world, policy makers see AI as essential to economic growth and progress. AI is, at bottom, a global product — built over time on large troves of the world's data and knowledge. Yet some officials in some countries are limiting access to the building blocks of AI — whether funds, data or high-speed computing power — to slow down or limit the AI prowess of their competitors in country *Y* and/or Z. Meanwhile, some officials are also shaping regulations in ways that benefit local AI competitors and, in so doing, they may also impede the competitiveness of other nations' AI developers. These steps, over time, could reduce the potential of AI and data. Moreover, as the author has shown, sovereign AI policies could backfire, alienating potential allies and further dividing the world into AI haves and have nots.

AI nationalist policies appear to help countries with the largest and most established technology firms across multiple levels of the AI value chain. Hence, policy makers' efforts to dominate these sectors are not a good way to build trust.

Finally, AI is just one part of an integrated tech ecosystem with embedded technologies, such as virtual or extended reality (XR), that is built on AI. Because of network effects, policy makers and firms are likely able to replicate their efforts to promote

51 See https://oecd.ai/en/ai-principles.

sovereign AI in other data-driven technologies, such as XR or neurotechnology (Campbell 2023; Graylin and Rosenberg 2024), further raising questions of global equity. But it could go the other way. Policy makers may invest too much in current techniques such as LLMs, but current approaches to AI could be replaced by newer ones that use synthetic data, or less data, or different approaches to learning models. Hence, there is an opportunity cost to this focus on AI.

Perhaps Putin is right — the nation that leads in AI will rule the world. But leadership abroad begins at home. Today, vociferous constituents may demand AI nationalism. In the long run, however, AI internationalism is in everyone's interest. It is more likely to achieve the promise of AI — to enhance human capability and improve human welfare. Although the United States is one of the most active AI nationalist nations, policy makers also seem to recognize the dangers of such nationalism for diplomatic relations and trust among nations over time. As the author was finalizing this paper, the US Department of State announced a new United States International Cyberspace & Digital Policy Strategy (US Department of State 2024), which called for digital solidarity regarding digital technology.

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